

Insuring Against Another Enron:
The Role of Cross-listing Status of Canadian Firms on the
Purchase of Directors' and Officers' Insurance
in the aftermath of Sarbanes-Oxley Act of 2002

Anna Oh '09
Department of Policy Analysis and Management
Cornell University

Senior Honors Thesis
May 2009

Insuring Against Another Enron: The Role of Cross-listing Status of Canadian Firms on
the Purchase of Directors' and Officers' Insurance
in the aftermath of Sarbanes-Oxley Act of 2002

I. Introduction

In the wake of the wave of corporate scandals surrounding Enron, WorldCom, and many other prominent firms in 2001 and 2002, there has been much discussion of corporate governance. As a result of these widely publicized scandals, shareholders' concern about agency problem that exists inherently in all corporations has increased. In response, the government enacted the Public Company Accounting Reform and Investor Protection Act, better known as the Sarbanes-Oxley Act (henceforth, SOX), in 2002. This monumental act seeks to prevent yet another crisis of corporate and accounting scandals by regulating publicly traded companies with strict measures for financial reporting, board composition, and disclosure (Harris 2003). With the passage of this legislation, there are now requirements for audit committee responsibilities and composition, certification of financial statements, timely disclosure, guidelines on penalties, as well as prohibitions against personal loans to directors (Harris 2003). These requirements serve the function of retaining investors' confidence in the capital market. However, critics claim that SOX would not in reality prevent future scandals and rather would result in substantial costs (Cohen 2007). This is debatable; however, what is certain is that while corporate directors and officers have always faced the risk of lawsuits from shareholders, these risks now have been elevated with the introduction of SOX.

With increased risk comes a higher demand for insurance. As a result of the recent scandal and the new legislation, directors' and officers' insurance (henceforth, D&O insurance) grew in importance in corporate America (Cotter 2003). The main

function of D&O insurance is to cover the expenses, which may include both court costs and any settlements, in lawsuits against corporate directors and officers brought by shareholders or a third party. About 44 percent of the lawsuits against managers originate from shareholders, which brings up an interesting aspect of D&O insurance: this insurance protects directors against lawsuits brought by the shareholders who appointed them in the first place (Boyer 2007). D&O insurers set the premium by assessing firms' litigation risk, which is found by multiplying the probability of a lawsuit by the expected cost of the suit. Yet, it is designed to benefit both parties involved: management is protected from possible liabilities while shareholders insure themselves against potential losses due to neglect in management. This design leads some researchers to suggest that D&O insurance may serve as a substitute for supervision of the board by shareholders (Boyer 2007). Rather than monitoring directors and managers against negligence, D&O insurance protects the portion of the firm that shareholders own. In 1998, about 92 percent of U.S. firms and 84 percent of Canadian firms purchased D&O insurance for their directors and officers. Although many firms had already purchased D&O insurance prior to the passage of SOX, the increased threat of lawsuits from this legislation may have had an impact on the amount of insurance purchased as well as the decision to purchase for the firms that did not previously purchase the insurance.

My goal is to determine the impact of Sarbanes-Oxley Act of 2002 on whether or not a firm decides to purchase D&O insurance and the policy limit of this insurance. I examine Canadian firms in part because there are fewer Canadian firms insured against directors' and officers' liability, as opposed to in the U.S. nearly all publicly traded firms purchase D&O insurance even before SOX. Thus, it would be difficult to study the trend

of D&O insurance purchase simply by examining only the American firms. Also, it is useful to compare Canadian firms that are cross-listed in the U.S. and those that are not because this comparison would allow for me to observe the impact of SOX. Yet another advantage of using Canadian firms is that companies listed on the Toronto Stock Exchange are required to disclose information about D&O insurance while most other stock exchanges do not. Currently there is little research on firms' purchase decision of insurance as a result of SOX. Most research examines firm characteristics that lead to an increase or a decrease in the likelihood that a firm will purchase D&O insurance. As numerous studies reveal, characteristics such as industry effects, size of the firm, and the characteristics of their board of directors, play an important role in insurance purchase decisions. Therefore, it is critical to control for these effects.

II. Existing Literature

Because it has not been long since SOX was enacted, very few literatures link it to firm behavior regarding D&O insurance. However, much research relates firm characteristics to D&O insurance purchase decisions. Martin M. Boyer of Université de Montréal (2005) tests the "shareholder protection hypothesis," which states that D&O insurance is valued the most by shareholders and protects them more than it protects managers. He finds that shareholder wealth and reliance on debt as the source of capital are positively related to the purchase of D&O insurance. He concludes that shareholders use D&O insurance in order to protect their own wealth in case of managerial incompetence. Therefore, increased shareholder risk raises insurance protection for managers. On the other hand, he also finds that managerial risk aversion and firms' financial distress do not significantly affect insurance decisions.

Boyer's later study (2007) contradicts some of these earlier findings. In this study, the only characteristics that he found to have a positive effect on D&O insurance purchase were corporations' size and firm's experience of financial distress. His sample consists of Canadian firms in eight different industries, 10 percent of which were listed in a stock exchange in the United States. Using this sample, Boyer also learned that being listed on a U.S. stock exchange did not have a significant impact on firms' decision to purchase D&O insurance, while stock price volatility, return on assets, the proportion of outsiders on the board, and stock ownership by financial institutions, all had a negative effect.

Martin Boyer and Sharon Tennyson's recent study (2008) goes even further by not only studying firms' D&O insurance purchase decisions, but also their choice of policy limit. Thus, they take into consideration the amount of insurance firms decide to purchase rather than simply whether or not insurance was purchased. They test separate factors related to these two distinct outcomes and find that firms compensating board members through options are less likely to purchase insurance while those with a larger percentage of outsiders on the board are more likely to purchase. In terms of insurance policy limit, larger firms are more likely to purchase a higher policy limit while a high unit price of insurance decreases the policy limit.

John E. Core (1997) conducts a similar study of the characteristics that affect the demand for D&O insurance. Core examines three issues: demand for personal coverage as a part of an efficient outside-director contract, demand for corporate coverage as a result of an efficient corporate insurance purchase decision, and demand for insurance as a result of managerial entrenchment. He concludes that some outside directors may not

fully understand the risk that they face because: (i) it is difficult to predict for the firms without D&O insurance; (ii) there is no substitution between D&O insurance and cash compensation for managers; and (iii) prior litigation predicts the insurance limit but not the deductible. A more recent study by Core (2007) varies slightly from Boyer's studies in that it rather measures the insurance premium. This study demonstrates that D&O premiums tend to be higher with a greater insider share of votes, lower inside ownership, more insider directors, more outside directors appointed by the CEO, and more inside officers with employment contracts. From these results, Core concludes that D&O premiums do in fact reflect the quality of corporate governance, since a high premium, which implies weak governance, is positively related to excess compensation.

Noel O'Sullivan (1997), on the other hand, uses a sample of 366 firms in the United Kingdom to conduct a virtually identical study. His results show that firms purchasing D&O insurance tend to have a greater portion of outside directors on the board and smaller executive ownership of the firm, while external shareholder control has no significant effect on insurance purchase decisions. O'Sullivan notes that these findings are relevant for American companies as well, since existing literature confirms the similarity between the two countries in shareholder and manager activities and motivation.

Some studies examine aspects of D&O insurance other than the characteristics that influence the demand and decisions regarding its purchase. A paper by Clifford G. Holderness (1990) asks whether liability insurance functions as a corporate monitor. His meta-analysis reveals that it is usually publicly traded corporations that buy these policies, group policies are more prevalent than individual policies, policies usually cover

only directors and officers and not any other employees, and initial announcement of purchase of insurance causes an increase in stock prices. From these results, Holderness concludes that liability insurance companies do serve as external monitors of the board through their litigation efforts and also by encouraging internal monitoring by facilitating the recruitment of outside directors. He explains that when a firm purchases D&O insurance, its directors and officers are essentially agreeing that a potential lawsuit would be investigated by a third party, which is the insurance company. He also finds that outside directors function as internal monitors because they are more effective in monitoring executives and other managers for the shareholders than are internal directors who also serve in the management of the company.

However, competing results are presented in a more recent paper by Tom Baker and Sean Griffith (2007), who interview individuals in the D&O insurance industry about the relationship between insurance companies and their public company insureds. They focus on whether insurers offer loss preventions services to their insureds and whether insurers monitor the insureds' corporate governance. Those interviewed include underwriters, actuaries, claim managers, brokers, lawyers, and corporate risk managers. The authors find that D&O insurance companies do not monitor corporations or provide loss preventions services, insurance pricing provides only a diffuse loss prevention incentive, and insurers manage settlements but not defense costs in case of litigation. These opposing findings may be attributed to the different methods used in the two studies.

John Chalmers, Larry Dann, and Jarrad Harford (2002) use the relationship between D&O insurance and performance to determine the existence of managerial

opportunism through the use of adverse information. Specifically, they ask whether the amount of D&O insurance coverage at the time of the firm's initial public offering (IPO) affects stock price performance after the IPO. They then ask whether abnormally high insurance premiums of firms with poor post-IPO performance signifies that managers have used adverse information in making insurance decisions and whether the insurers can distinguish the difference in purchase decisions driven by such adverse information. The results show that while a lower premium is not related to better corporate governance for high-performing companies, they did find a negative relationship between the amount of insurance at IPO and stock price performance in the next three years for other lower-performing firms. From these findings, the authors conclude that managers do in fact utilize such adverse information for personal advantage.

Although SOX is relatively new, there have been a number of studies on its impact in corporate governance literature. Daniel Cohen, Aiyesha Dey, and Thomas Lys (2004) examine the effects of SOX on compensation contracts and risk-taking behavior by managers. They run two-stage least squares regressions, one determining the impact on CEO compensation and the other on total risky investments. They find that after the enactment of SOX, there was an increase in salary and bonus compensation but a decrease in both option-based compensation and in the proportion of incentive-based salary to fixed salary. There also was a significant decline in risky investments made by the CEO, and the change in equity incentives and risky investments are negatively associated with future stock return volatility. James Linck, Jeffrey Netter, and Tina Yang (2008) study the impact of SOX on corporate boards more generally. After running a multivariate analysis, the authors find that SOX indeed has had a significant impact on

the cost and the structure of corporate boards. The average number of directorship held by one individual decreased, director compensation and D&O insurance premiums increased, and the boards have become larger with more independence. Also, posts of CEO and the chairman of the board (COB) are more likely to be separated, director turnover increased, and firms are more likely to add non-employee directors on board. This study is interesting because it directly addresses the effect of SOX on D&O insurance, although not from the perspective of the purchasing firm. Insurance premiums rose as a result of the new legislation, which is logical since the costs of managers' negligence and corporate fraud have increased as a result of SOX.

Kate Litvak (2007) conducts her research by comparing foreign companies cross-listed on a U.S. stock exchange with those that are not, which is quite relevant to this paper. She examines the stock price reactions to SOX in three groups of foreign companies: a control group consisting of cross-listed firms that are not subject to SOX but are indirectly affected by the general tightening of American regulations, a second control group of firms that are not cross-listed, and the treatment group of cross-listed firms that are subject to SOX. Using both the event study method and a multivariate regression approach, Litvak finds that stock prices of cross-listed companies subject to SOX responded strongly and negatively to American regulations as opposed to similar non-cross-listed firms. The cross-listed firms not subject to SOX responded negatively also, but not as strongly as those subject to the act. In addition, well-governed countries, such as the European countries and Canada, responded more strongly to SOX, and that there are three firm-level predictors. These predictors are (i) the level of disclosure, which was negatively related to stock prices; (ii) sales growth over 1999-2001 prior to the

enactment, which was positively related; and (iii) belonging to an already heavily regulated financial industry, which had negative effects.

Robert McDonnell's study (2004) looks specifically at the effect SOX has had on the conduct of directors and officers. He finds that SOX affects the monitoring and the self-control mechanisms in firms, which are two mechanisms that control agency problem. McDonnell argues that SOX has not greatly changed managers' conduct, but directors and officers are nevertheless performing their fiduciary duty more diligently because of a greater fear of liability. Robert Clark (2005), on the other hand, studies broader effects of recent changes in corporate governance. He identifies four essential phases in these recent changes: the passage of SOX, the new listing requirements of New York Stock Exchange, growth in the influence of corporate governance rating systems, and an apparent change in tone and focus of judicial opinions. Clark questions whether these reforms truly brought about improvements in corporate governance. He claims that the benefits of changes in audit services are offset by the higher cost of such services and the need to separate auditing services from non-auditing services. Also, the changes related to the board may overemphasize the monitoring role of the board over its management role, and the changes related to disclosure only encompass the types of fraud from the recent scandals and new type of fraud may possibly emerge in the future.

William Carney's (2005) study also questions the benefits of SOX, but he specifically looks at the firms' decision to terminate reporting under securities laws, or in other words, "going private" or "going dark." Through this qualitative study closely analyzes securities laws, historical changes, and other related literature, Carney first discusses the major costs associated with the activities in compliance with SOX. Such

costs include the use of external firms to evaluate internal control and an increase in the responsibilities of audit committees. Empirical evidence of such costs include increases in litigation and audit costs, and the impact of these costs on firms after the passage of SOX. He explains that there are advantages of firms going private because of these costs. The benefits of going private would induce many firms to terminate their reporting under the securities laws.

III. Sample and Hypotheses Development

A. Description of Data

The primary dataset used in this study was hand-collected and constructed by a researcher from Université de Montréal using publicly available data on Canadian companies on the Toronto Stock Exchange (TSE). These companies are all traded on TSE but are not limited to trading just on this stock exchange. The dataset not only includes information on D&O insurance purchases, premium, and deductibles, but also contains a wide range of financial and governance characteristics of the companies. Each firm's annual management proxy and information circular provides information concerning D&O insurance as well as board composition and compensation. Financial data comes from Compustat, and information on stock prices and total returns is provided by the data retrieval services of TSE. The sample of firms utilized in this study consists of 153 Canadian firms in seven different industries: biotechnology and pharmaceuticals, paper products, industrial products, high tech, consumer products, merchandising, and media. The number of firms in each industry varies, with industrial products firms being the largest group with 45 firms while biotechnology and pharmaceutical firms and media firms being the two smallest industries with 12 firms.

Because SOX was enacted in 2002, the years before and the years after must be examined in order to determine the effects of this legislation. Overall, data on these firms run from 1996 through 2005, but the years of available data vary for each firm. This is because some companies were not incorporated until years after 1996, others merged or were acquired by another firm during this time period, and some have declared bankruptcy and sold all of their assets. Thus, only the companies with data before and after the enactment of SOX are utilized in the analysis, and only the data from years 2000 through 2005 are examined. These firms are then separated into those that are listed only in Canadian stock exchanges and those that are listed in both Canadian and at least one of the U.S. stock exchanges. Information about firms' cross-listing status was obtained through the companies' annual reports found in the database Mergent Online.

The original dataset contains 342 firms over the same seven industries. However, many firms were dropped for one or more of the following reasons: (i) if the firms did not have data during the years examined; (ii) if the last year for which the data is available is 2002 or earlier; and (iii) if the information on cross-listing status was not available for the years studied.

Figures 1 through 3 describe the sample in terms of percentages of total observations. Figure 1 shows the trend of D&O insurance purchases between years 2000 and 2005 for both firms that are cross-listed and firms that are not. In year 2002, there is a slight increase in the proportion of firms that purchase D&O insurance and a slight decrease for firms that do not purchase the insurance. However, after 2002, the percentage slightly decreases again for those that buy insurance and slightly increases for those that do not, although not quite back to the pre-2002 levels. Figure 2 separates the

D&O insurance purchase decision according to each of the seven industries. The industry in which the largest portion of firms purchases D&O insurance is the biotechnology and pharmaceuticals industry, while a smaller proportion of firms in the paper industry purchase insurance. Then figure 3 illustrates the cross-listing status of firms in the sample by each industry. This figure is of interest because it shows that industry effects are potentially significant in the firms' decisions to list in the U.S. as well as in Canada. Of the seven industries, the merchandizing industry especially attracts attention, since all of the firms in this industry are not cross-listed during the years studied. On the other hand, the biotechnology and pharmaceuticals industry has the greatest proportion of its firms cross-listed, almost reaching 50 percent. Looking at the biotechnology and pharmaceuticals industry in figures 2 and 3, it is interesting to note the link between the firms' cross-listing status and the insurance purchase decision. As the industry in which the largest proportion of firms purchase D&O insurance, biotechnology and pharmaceuticals also is the industry in which a large portion of firms list their stocks in both the U.S. and Canada.

B. Hypothesis

First, I investigate and compare the general impact of the United States securities laws on firms cross-listed in the U.S. and Canada stock exchanges with those that are only listed in Canada. Even without considering the specific effects of SOX, being listed in the more regulated American market should have a greater impact on the cross-listed firms than on non-cross-listed firms. Both D&O insurance purchase decision as well as insurance policy limit are examined. I control for various firm characteristics, which include industry, year, firm size as measured by assets, number of shares owned by

insiders, and percentage of shares owned by financial institutions. I discuss specific firm characteristics in more detail in a later section.

Subsequently, the more specific impact of SOX will be examined, again comparing cross-listed firms with non-cross-listed firms. In this case, however, I compare the decisions regarding D&O insurance in these two types of firms before and after the enactment of SOX. Thus, I compare D&O insurance purchase decisions and insurance policy limit before and after SOX for companies only listed in Canada as well as for companies listed in both countries. The ratification of SOX in the United States should have an even greater impact on cross-listed firms' insurance decisions than the non-cross-listed firms' decisions. Cross-listed firms face restrictions not only from the stricter U.S. security laws, but with SOX they now face a higher penalty in case of managerial shirking. Thus, I hypothesize that firms listed in both the U.S. and Canada will be more likely to purchase D&O insurance and to choose a higher policy limit when compared to firms that are only listed in Canada, especially after the passage of SOX in 2002.

IV. Research Design

Table 1 shows the D&O insurance purchase decision of the firms in the sample by their cross-listing status. This table indicates that a greater percentage of cross-listed firms, at 86.11 percent, purchase D&O insurance while about 74.82 percent of non-cross-listed firms purchase the insurance.

I use a probit regression model to determine the effect of being listed in the U.S. on the decision to purchase D&O insurance. A probit model was used here because the dependent variable (insurance purchase decision) is a binary variable. I control for various firm characteristics that could potentially affect the purchase decision. This

allows me to control for other effects that may influence companies' decisions. I run two separate models in order to see the impact of cross-listing status on D&O purchase decisions: one with and one without considering the effects of SOX. The model without taking SOX into account is:

$$\text{Purchase} = \alpha + \beta_1 \text{crosslist} + \beta_n X + \beta_{n+1} \text{industry} + \beta_{n+2} \text{year} + \varepsilon$$

where purchase is a binary variable for the purchase decision equal to one if D&O is purchased, and zero otherwise. The variable crosslist is also a binary variable equal to 1 if listed in both Canada and in the U.S., and 0 otherwise. The variable X is a vector of all of the individual firm characteristics that are controlled in the regression. Characteristics included in X are: firm size in terms of assets (ln_assets); shareholding of insiders (inside_own); percentage of shares owned by financial institutions (fin_blockholder); volatility measured by the standard deviation of compounded daily returns (vol2); the standard deviation of return on assets over the previous three years (roa_sd3); lagged return on assets (lag_roa); percent of compensation in options (pct_options); a binary variable for growth in assets that equals one if assets increased more than 25 percent within a year (bigass_grow); the likelihood of financial distress (distress); number of board members (n_board); percent of outsiders on board (pct_outside); whether the CEO is also the Chairman of the Board (ceocob); and the percent of shares traded in the previous year (lag_pcttrade). This model not only controls for the firm characteristics, but also controls for industry effects and the variations found in different years in the data. Summary statistics of all of the descriptive variables can be found in Table 2. Similarly, the second regression that includes the effect of SOX is:

$$\text{Purchase} = \alpha + \beta_1 \text{ crosslist} + \beta_2 \text{ crosslist*post2002} + \beta_n X + \beta_{n+1} \text{ industry} \\ + \beta_{n+2} \text{ year} + \varepsilon$$

where the interaction term $\text{crosslist*post2002}$ is a term that is created by multiplying crosslist with a new variable, post2002 , which represents all observations after year 2002 when SOX was passed. This interaction shows the impact of the enactment of SOX on D&O insurance purchase decisions based on the cross-listing status of the firms.

Therefore, the coefficient β_2 demonstrates this impact.

The second set of regressions involves D&O insurance policy limits rather than the insurance purchase decision. In this case, the dependent variable is continuous, so ordinary least square regression is used, controlling for the same firm characteristics. The model of the effect of cross-listing status on policy limit without taking into account the impact of SOX is:

$$\text{Limit} = \alpha + \beta_1 \text{ crosslist} + \beta_n X + \beta_{n+1} \text{ industry} + \beta_{n+2} \text{ year} + \varepsilon$$

where limit is the natural log of aggregate policy limit purchased by the firm. Similar to the probit models used for insurance purchase decisions, I again used the same interaction term in order to observe the way SOX affects D&O policy limit. The model for this effect is the following:

$$\text{Limit} = \alpha + \beta_1 \text{ crosslist} + \beta_2 \text{ crosslist*post2002} + \beta_n X + \beta_{n+1} \text{ industry} \\ + \beta_{n+2} \text{ year} + \varepsilon$$

In this model, just as in the probit model for D&O insurance purchase decisions, the coefficient of interest is β_2 , which represents the effect of being cross-listed and of SOX on the amount of insurance a firm purchases.

V. Empirical results and Discussion

A. Analysis of D&O Insurance Purchase Decision

As seen in Table 4, the results from the probit model show that the general regulatory environment in the U.S. does not have a significant effect on a firm's decision to purchase D&O insurance. The coefficient of *crosslist* is not only small and negative, but also is not statistically significant at either the 5 percent or the 10 percent level. Most of the descriptive variables are also not significant, but the percent of outsiders on the board (*pct_outside*) is significant at the 5 percent level. This variable is positively associated with the insurance purchase decision, which means that with a greater proportion of outsiders on the board, it is more likely for the firm to purchase D&O insurance.

Also, years 2002 and 2004 are both significant at the 5 percent level while 2005 is marginally significant (at the 10 percent level). Although individually, only these three years are significant, all years after SOX (2002-2005) are jointly significant with a chi-square value of about 0.03 for both when effects of SOX are and are not taken into account. These results suggest that even though cross-listing status does not show a significant effect of SOX on firms' insurance purchase decisions, there still is an overall effect of the post-SOX years for both types of firms. There are several possible interpretations of this upward shift in D&O insurance purchase after 2002. This may be due to SOX or the general changes in corporate environment following the scandals. It is important to recognize that in year 2004, D&O insurance prices decreased by about 10 percent, which means that insurance became more attractive for firms to purchase (Taub 2004). Moreover, after the United States passed SOX, Canada also implemented several

measures in order to regulate and strengthen corporate governance, many of which were passed in year 2004 (Ben-Ishai 479). Some of these measures include regulations on the oversight of auditors and audit committee, CEO and CFO certifications, and other corporate governance guidelines (Ben-Ishai 479). Although it is difficult to separate these various possible reasons for the joint significance of the post-SOX years, all of these possibilities may have contributed to the positive relationship between the years after 2002 and D&O insurance purchase decisions and may explain why cross-listing status itself is not statistically significant.

When the interaction variable *crosslist*post2002* is included in the model in order to determine the effect of SOX on insurance purchases in the two types of firms, the results are similar, as shown in Table 5. Neither *crosslist* nor *crosslist*post2002* are significantly associated with the insurance purchase decision, while the percent of outsiders on the board and the years 2002 and 2004, are significant in the 5 percent significance level. In addition, for both of the probit models described previously, the industry variable is highly significant. This significant industry variable suggest the possibility that certain industries have qualities that make D&O insurance more valuable than in other industries.

B. Analysis of Aggregate Insurance Policy Limit

Estimates of the impact on insurance policy limits are displayed in Tables 6 and 7. As in the case for D&O insurance purchase decision, these regression models also show that there is no significant effect of cross-listing status on the amount of insurance purchased. The coefficient of the cross-listing status variable when the effects of SOX are not taken into account is positive but not statistically significant. However, some of the

other descriptive variables are significantly related to the amount of insurance purchased. Firm size in terms of assets (\ln_assets) is positive and highly significant, which means that larger firms tend to buy more insurance. Shareholding by insiders, represented by the variable $inside_own$, is negative and significant at the 5 percent level. This is reasonable because when many insiders own shares in the firm, agency costs are reduced since managers now have financial stakes in the firm. Thus, D&O insurance is less likely to be essential for the firm. Also, the standard of deviation of return on assets over 3 years (roa_sd3) is positive and significant at the 5 percent level. This variable is a measure of earnings uncertainty, so a firm would be more likely to purchase insurance for their directors and officers if the firm's earnings and performance are perceived less secure. In addition, growth in assets of over 25 percent per year ($bigass_grow$) is negative and significant at the 5 percent level. Because this variable is indicative of unusual activities such as a merger or an acquisition, the negative coefficient also seems reasonable. Major changes such as mergers or acquisitions often tend to increase shareholder value and improve the outlook for firms under stress, so D&O insurance may not be as necessary when such changes take place. Furthermore, the year variable shows results similar to that of D&O insurance purchase decisions. Although 2002 is not statistically significant in this case, both the years 2004 and 2005 are positive and significant at the 5 percent level. Again, an unknown factor, such as the decrease in insurance prices or the laws enacted to raise director accountability in 2004, may have had some impact on firms' decisions to purchase more insurance for their directors and officers. However, unlike the insurance purchase decision, here there is no industry effect, since none of the industries are even marginally significant. Thus, I speculate that even though firms in certain

industries are more likely to buy D&O insurance than others, once the firm buys insurance, the firm's particular industry does not affect how much insurance it decides to purchase. This means that after purchasing insurance, the amount of insurance becomes a firm-specific decision.

When the effects of SOX are taken into account by adding the interaction variable, the results remain essentially equal. While both the cross-listing status variable and the interaction between cross-listing and the years after SOX are not statistically significant, all of the variables that had an impact on the amount of insurance purchased when effects of SOX were not considered retain their significance, as Table 7 indicates. One small difference is that year 2005 is now significant only at the 10 percent level. Therefore, as with the D&O insurance purchase decision, regression results indicate that neither the cross-listing status nor the enactment of SOX had an impact on the firms' decisions to increase insurance policy limits.

There are several possible explanations why cross-listing status and SOX are not significantly associated with D&O insurance decisions. One such explanation is that the act of cross-listing in the two countries may change governance forms of these firms. However, this is difficult to determine from this study, for almost none of the firms in the sample change their cross-listing status during the years studied. A second possible reason is that certain firm characteristics may lead to the propensity to cross-list in stock exchanges of both countries. If either of these explanations is true, it is reasonable to conjecture that cross-listing status was not significant in the models because the characteristics that are related to cross-listing status were all controlled in these models.

In order to test these possibilities, I conducted *t*-tests of all of the descriptive variables between the cross-listed and the non-cross-listed firms. The purpose of these *t*-tests was to observe the differences in means across these two types of firms without taking various firm characteristics into account. The results, as shown in Table 3, demonstrate that the two groups of firms are significantly different in most of these firm characteristics, with the exception of the standard deviation of return on assets over the previous three years, lagged return on assets, percent of compensation in options, growth in assets of more than 25 percent per year, and the likelihood of financial distress in the firm. These *t*-tests suggest a potential reason why cross-listing status was not statistically significant for all of the models: cross-listed firms and non-cross-listed firms may be fundamentally different in some of the firm characteristics that were controlled in the regression models.

VI. Conclusion

The hasty enactment of Sarbanes-Oxley Act in 2002 after the wave of large-scale corporate scandals has certainly had a large effect on the corporate environment in the United States, although it is debatable whether this effect has been positive or negative. The logic behind this study was that after Sarbanes-Oxley Act was passed in 2002, Canadian firms that list their shares in one of the stock exchanges in the U.S. as well as their own Toronto Stock Exchange would be more affected by this legislation when compared to the firms only listed in Canada. Specifically, I examined the effect of this legislation on the firms' decisions regarding directors' and officers' insurance. Although I had hypothesized that the firms listed both in Canada and the U.S. would both be more likely to purchase D&O insurance and to choose a higher policy limit if they had already

provided the insurance, the empirical results indicate that such relationships do not exist. However, various firm characteristics and some of the specific industries may either promote or discourage the provision of D&O insurance for the firms' directors and officers. It is also interesting to note that although the cross-listing status of firms or the enactment of Sarbanes-Oxley Act do not directly affect D&O insurance decisions, the general environment of corporate law may have had an influence, as shown by the significant year effects in years 2004 and 2005 for decisions regarding aggregate policy limit. On the other hand, years 2002 through 2005 are all significant for insurance purchase decision. This may mean that SOX and the changes in corporate regulation environment may have had some effect on purchase decisions, but not policy limits, for both cross-listed and non-cross-listed firms. It is worth investigating in the future how Sarbanes-Oxley Act has had an impact on Canadian corporate laws and the general public sentiment about corporate governance in Canada.

Figure 1: D&O Insurance Purchase By Year

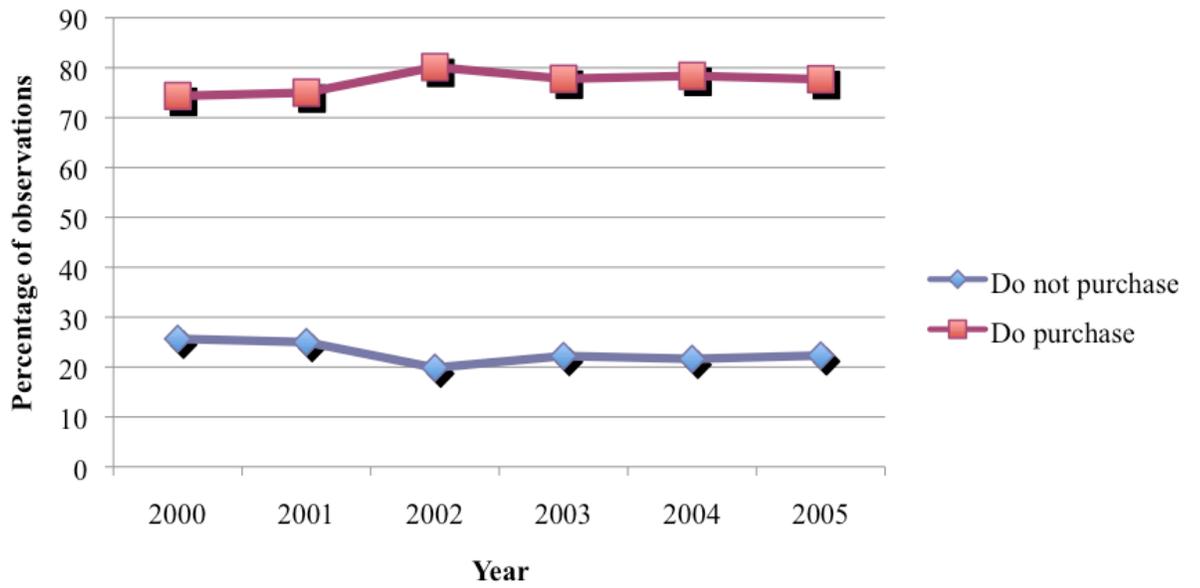


Figure 2: D&O Insurance Purchase by Industry

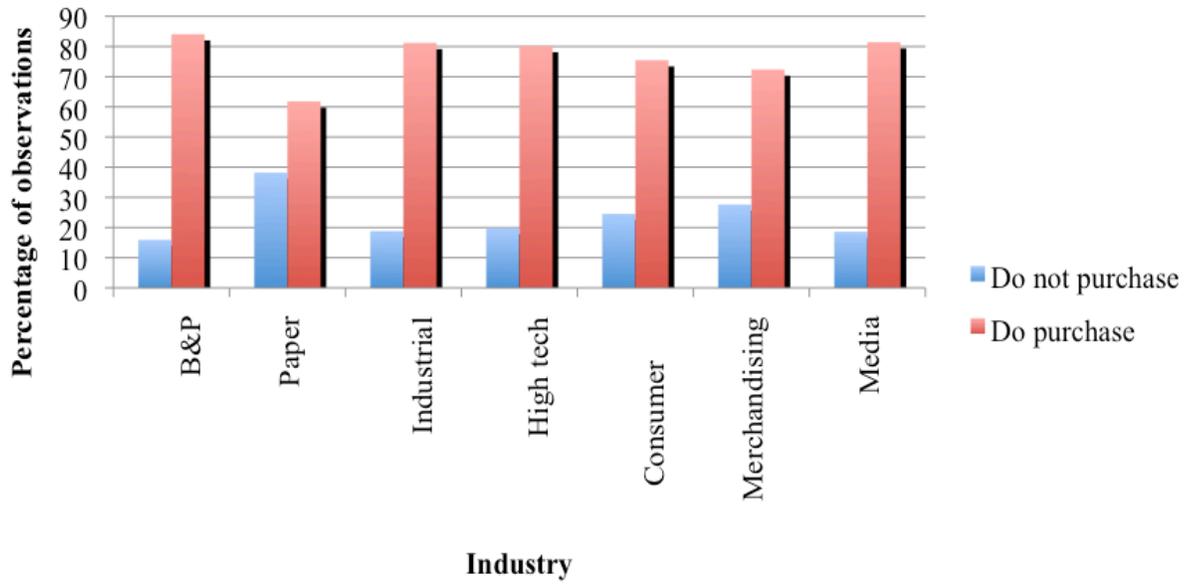


Figure 3: Cross-list Status by Industry

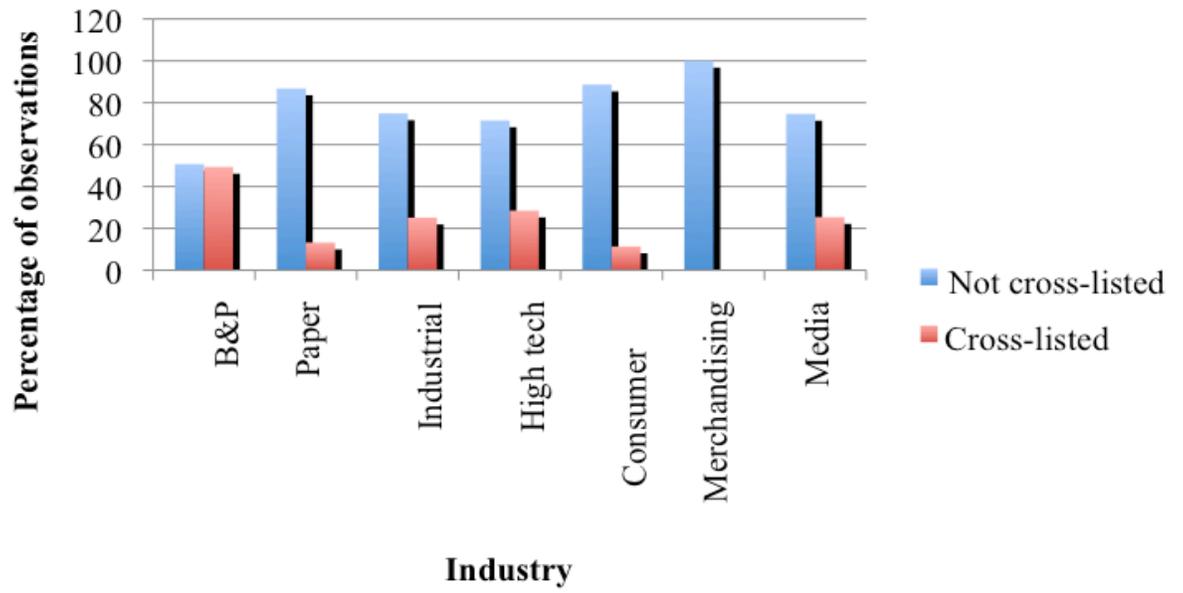


Table 1: D&O Insurance Purchase Decision by Cross-list Status

Cross-list Status	D&O Insurance Purchase		Total
	Do not purchase	Purchase	
Not Cross-listed	172 25.18	511 74.82	683 100.00
Cross-listed	25 13.89	155 86.11	180 100.00

Table 2: Summary statistics of descriptive variables

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
Firm	868	4156.5	1999.888	1001	8031
Year	868	2002.377	1.672013	2000	2005
CEO is also COB	844	0.3151659	0.4648574	0	1
Volatility (std. dev. of compounded daily returns)	731	2.908865	3.535359	0.0070711	25.22415
Lagged return on assets	727	-0.02292	0.3089368	-6.412963	0.6082234
Percent of shares traded previous year	718	0.41382	0.3776626	0.0065309	3.158811
Likelihood of financial distress	683	-8.355093	18.09863	-242.1688	50.35197
Industry	868	4.124424	2.00477	1	8
D&O purchase	863	0.7717265	0.4199632	0	1
Shareholding by insiders	868	24.25765	30.41147	0	100
Number of board members	855	8.928655	2.822345	3	17
Percent of outsiders on board	855	0.622035	0.1603878	0.1	1
Growth in assets (if increased more than 25% in a year)	720	0.1819444	0.3860669	0	1
Firm size in assets	722	6.043141	1.97146	-0.6161861	11.05593
Aggregate policy limit	642	1.69E+01	1.08E+00	13.87739	2.00E+01
Percent of compensation in options	868	0.175313	1.343734	0	17.47793
Percent of shares owned by financial institutions	868	0.3548387	0.4787403	0	1
Standard deviation of return on assets over previous 3 years	723	0.0873791	0.2656867	0.0007621	3.640651
Cross-list status	868	0.2073733	0.4056589	0	1

Table 3: T-test of differences in means across cross-listed and non-cross-listed firms

Variable	Mean: Not Cross-listed	Mean: Cross-listed	<i>t</i> -statistic
Purchase decision	0.7481698	0.8611111	-3.2273
Aggregate policy limit	16.7057	17.36219	-6.8085
Firm size in assets	5.697827	7.256059	-9.3325
Shareholding of insiders	26.70057	14.92028	4.6824
Percent of shares owned by financial institutions	0.3822674	0.25	3.3191
Volatility (std. dev. of compounded daily returns)	2.450873	4.543323	-6.8198
Standard deviation of return on assets over previous 3 years	0.0901478	0.0776368	0.5254
Lagged return on assets	-0.0166791	-0.0450356	1.0254
Percent of compensation in options	0.1501471	0.2715029	-1.0788
Growth in assets (if increased more than 25% in a year)	0.1696429	0.225	-1.6013
Likelihood of financial distress	-8.736162	-7.067762	-1.0114
Number of board members	8.712593	9.738889	-4.3807
Percent of outsiders on board	0.6137371	0.6531519	-2.9426
CEO is also COB	0.3403614	0.2222222	3.039
Percent of shares traded previous year	0.3348896	0.6890895	11.3527

Table 4: Estimates of D&O insurance purchase decision based on cross-listing status

	dF/dx	Robust Std. Err.	z	P>z
Cross-list status	-0.0442695	0.0751383	-0.64	0.519
Firm size in assets	0.031821	0.0176862	1.78	0.075
Shareholding by insiders	0.000136	0.0007096	0.19	0.848
Percent of shares owned by financial institutions	-0.0180876	0.0404324	-0.46	0.647
Volatility (std. dev. of compounded daily returns)	-0.0015932	0.0041076	-0.38	0.702
Std. dev. Of return on assets in previous 3 years	0.0689626	0.0781541	0.88	0.377
Lagged return on assets	0.1268805	0.0777779	1.73	0.083
Percent of compensation in options	-0.0109597	0.010374	-1.1	0.272
Growth in assets (if increased more than 25% in a year)	0.0124716	0.0251965	0.48	0.631
Likelihood of financial distress	0.0003333	0.0006257	0.54	0.592
Number of board members	0.0046377	0.0098945	0.47	0.641
Percent of outsiders on board	0.2976909	0.0974005	2.96	0.003
CEO is also COB	0.0206926	0.0431613	0.46	0.647
Percent of shares traded previous year	-0.0336691	0.0441278	-0.76	0.444
Year 2001	0.0146734	0.0126484	1.09	0.275
Year 2002	0.0432367	0.0153401	2.57	0.01
Year 2003	0.0327745	0.0190525	1.57	0.116
Year 2004	0.0551334	0.0193596	2.59	0.01
Year 2005	0.0461221	0.0218256	1.96	0.05
Industry 2	-0.9835875	0.0068643	-9.88	0
Industry 3	-0.9994051	0.0007412	-10.63	0
Industry 4	-0.9875035	0.0055832	-10.55	0
Industry 5	-0.9963774	0.0022889	-10.13	0
Industry 6	-0.9760402	0.0089809	-9.61	0
Industry 7	-0.9715864	0.0101351	-8.65	0

Table 5: Estimates of D&O insurance purchase decision based on cross-listing status controlling for interaction between cross-listing status and years after SOX

	dF/dx	Robust Std. Err.	z	P>z
Cross-list status	-0.0256334	0.0787593	-0.34	0.73
Interaction of cross-list status and post-SOX years	-0.0352685	0.0566562	-0.67	0.504
Firm size in assets	0.0311982	0.0176045	1.75	0.079
Shareholding by insiders	0.0001462	0.000704	0.21	0.835
Percent of shares owned by financial institutions	-0.0177698	0.040033	-0.46	0.649
Volatility (std. dev. of compounded daily returns)	-0.0016421	0.0040898	-0.4	0.692
Std. dev. Of return on assets in previous 3 years	0.0701791	0.0769813	0.91	0.361
Lagged return on assets	0.128423	0.0774886	1.76	0.078
Percent of compensation in options	-0.0108893	0.0103623	-1.09	0.275
Growth in assets (if increased more than 25% in a year)	0.0114073	0.0254366	0.44	0.663
Likelihood of financial distress	0.0003367	0.0006197	0.55	0.584
Number of board members	0.0047192	0.0098414	0.48	0.633
Percent of outsiders on board	0.2959727	0.096639	2.96	0.003
CEO is also COB	0.0206269	0.042794	0.46	0.645
Percent of shares traded previous year	-0.032107	0.0439003	-0.73	0.463
Year 2001	0.0142906	0.0126557	1.07	0.287
Year 2002	0.042692	0.0152882	2.55	0.011
Year 2003	0.0373644	0.018693	1.77	0.076
Year 2004	0.0588769	0.0185626	2.83	0.005
Year 2005	0.0505665	0.0204087	2.27	0.023
Industry 2	-0.9842318	0.0067229	-9.88	0
Industry 3	-0.9994914	0.0006418	-10.66	0
Industry 4	-0.9880959	0.0054302	-10.55	0
Industry 5	-0.9966188	0.0021804	-10.15	0
Industry 6	-0.9768544	0.0088355	-9.63	0
Industry 7	-0.9724524	0.0099991	-8.68	0

Table 6: Estimates of D&O policy limit based on cross-listing status

	Coefficient	Robust Std. Err.	t	P>t
Cross-list status	0.0815569	0.1596069	0.51	0.611
Firm size in assets	0.3724443	0.0695143	5.36	0
Shareholding by insiders	-0.007373	0.0028559	-2.58	0.011
Percent of shares owned by financial institutions	-0.0566571	0.1223257	-0.46	0.644
Volatility (std. dev. of compounded daily returns)	0.0046918	0.0203113	0.23	0.818
Std. dev. Of return on assets in previous 3 years	0.4190388	0.1560892	2.68	0.009
Lagged return on assets	-0.072399	0.2533767	-0.29	0.776
Percent of compensation in options	-0.0897553	0.0463706	-1.94	0.056
Growth in assets (if increased more than 25% in a year)	-0.1723225	0.0781101	-2.21	0.03
Likelihood of financial distress	0.0032777	0.0024881	1.32	0.191
Number of board members	0.022098	0.0310784	0.71	0.479
Percent of outsiders on board	0.1200078	0.3768241	0.32	0.751
CEO is also COB	-0.2093519	0.1258906	-1.66	0.1
Percent of shares traded previous year	-0.0981707	0.1705433	-0.58	0.566
Year 2001	0.0285749	0.065822	0.43	0.665
Year 2002	0.0110879	0.0665139	0.17	0.868
Year 2003	0.0784966	0.0744498	1.05	0.294
Year 2004	0.1960254	0.0769133	2.55	0.012
Year 2005	0.1983658	0.092942	2.13	0.035
Industry 2	-0.2879129	0.247387	-1.16	0.247
Industry 3	-0.021039	0.185651	-0.11	0.91
Industry 4	-0.0761114	0.2207887	-0.34	0.731
Industry 5	0.2971036	0.3197329	0.93	0.355
Industry 6	-0.0108682	0.2128623	-0.05	0.959
Industry 7	0.1518345	0.3991291	0.38	0.704
Constant	14.51952	0.4907241	29.59	0

Table 7: Estimates of D&O policy limit based on cross-listing status controlling for interaction between cross-listing status and years after SOX

	Coefficient	Robust Std. Err.	t	P>t
Cross-list status	0.0562323	0.1729817	0.33	0.746
Interaction of cross-list status and post-SOX years	0.0496296	0.1007626	0.49	0.623
Firm size in assets	0.3732793	0.0698134	5.35	0
Shareholding by insiders	-0.0073847	0.0028587	-2.58	0.011
Percent of shares owned by financial institutions	-0.0567891	0.1224572	-0.46	0.644
Volatility (std. dev. of compounded daily returns)	0.0049456	0.0204173	0.24	0.809
Std. dev. Of return on assets in previous 3 years	0.4196777	0.1564346	2.68	0.009
Lagged return on assets	-0.080332	0.2519938	-0.32	0.751
Percent of compensation in options	-0.0906324	0.0473003	-1.92	0.058
Growth in assets (if increased more than 25% in a year)	-0.1701033	0.0781277	-2.18	0.032
Likelihood of financial distress	0.003257	0.0024854	1.31	0.193
Number of board members	0.021916	0.0311415	0.7	0.483
Percent of outsiders on board	0.1214775	0.3772933	0.32	0.748
CEO is also COB	-0.2077411	0.1258128	-1.65	0.102
Percent of shares traded previous year	-0.1020614	0.1718772	-0.59	0.554
Year 2001	0.0292052	0.0660738	0.44	0.659
Year 2002	0.0109899	0.0665645	0.17	0.869
Year 2003	0.0663785	0.0798009	0.83	0.408
Year 2004	0.1831885	0.0821125	2.23	0.028
Year 2005	0.1856234	0.0992744	1.87	0.065
Industry 2	-0.2883703	0.247562	-1.16	0.247
Industry 3	-0.0219449	0.1856336	-0.12	0.906
Industry 4	-0.0744055	0.2215357	-0.34	0.738
Industry 5	0.2953112	0.3198324	0.92	0.358
Industry 6	-0.0126325	0.2130626	-0.06	0.953
Industry 7	0.1507401	0.3996845	0.38	0.707
Constant	14.5221	0.4908497	29.59	0

REFERENCES

- Baker, Tom, and Sean Griffith. 2007. "The missing monitor in corporate governance: The directors' & officers' liability insurer." *Georgetown Law Journal* 95: 487-544.
- Ben-Ishai, Stephanie. 2008. "Sarbanes-Oxley Five Years Later: A Canadian Perspective." *Loyola University Chicago Law Journal* 39: 469-491.
- Boyer, M. Martin. 2007. "Directors' and officers' insurance in Canada." *Corporate Ownership & Control* 4, (4): 141-5.
- Boyer, M. Martin. 2005. "Directors' and officers' insurance and shareholder protection."
- Boyer, M. Martin, and Sharon Tennyson. 2008. "Directors' and officers' liability insurance, corporate risk and risk taking: New panel data evidence on the role of directors' and officers' liability insurance."
- Carney, William J. 2005. "The costs of being public after Sarbanes-Oxley: The irony of 'going private'." Emory Law and Economics Research Paper ed.
- Chalmers, John M. R., Larry Y. Dann, and Jarrad Harford. 2002. "Managerial opportunism? Evidence from directors' and officers' insurance purchases." *Journal of Finance* 57, (2) (04): 609-36.
- Clark, Robert Charles. 2005. "Corporate governance changes in the wake of the Sarbanes-Oxley Act: A morality tale for policymakers too."
- Cohen, Daniel A., Aiysha Dey, and Thomas Z. Lys. 2007. "The Sarbanes Oxley act of 2002: Implications for compensation contracts and managerial risk-taking." NYU working paper.
- Core, John E. 2000. "The directors' and officers' insurance premium: An outside assessment of the quality of corporate governance." *Journal of Law, Economics & Organization* 16 (2).
- Core, John E. 1997. "On the corporate demand for directors' and officers' insurance." *Journal of Risk & Insurance* 64 (1) (03): 63-87.
- Cotter Jr., William. 2003. The changing state of D&O insurance. *Corporate Governance Advisor* 11, (1): 8-16.
- Harris, Craig. 2003. The D&O shakeout. *Canadian Underwriter* 70, (3) (03): 24-30.
- Holderness, Clifford G. 1990. "Liability insurers as corporate monitors." *International Review of Law and Economics*, 10 (2) (9): 115-29.

- Li, Haidan, Morton Pincus, and Sonja Olhoft Rego. 2008. "Market reaction to events surrounding the Sarbanes-Oxley Act of 2002 and earnings management." *The Journal of Law and Economics* 51 (1) (02/01): 111-34.
- Linck, James S., Jeffrey M. Netter, and Tina Yang. 2008. "Effects and unintended consequences of the Sarbanes-Oxley act on corporate boards." AFA 2006 Boston Meetings Paper ed.
- Litvak, Kate. 2007. "The effect of the Sarbanes-Oxley act on non-US companies cross-listed in the US." *Journal of Corporate Finance*, 13 (2-3) (6): 195-228.
- McDonnell, Brett. 2004. "Sarbanes-Oxley, fiduciary duties, and the conduct of officers and directors." Minnesota Legal Studies Research Paper ed.
- O'Sullivan, Noel. 1997. "Insuring the agents: The role of directors' and officers' insurance in corporate governance." *Journal of Risk & Insurance* 64 (3) (09): 545-56.
- Taub, Stephen. "D&O Premiums Fell 10 Percent in 2004." 9 Dec. 2004.
http://www.cfo.com/article.cfm/3470704/c_3471624?f=TodayInFinance_Inside
(accessed Mar. 1, 2009).