Capital Market Risk Implications of Governance and Disclosure for the Insurance Industry: The Case of Sarbanes-Oxley

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Abstract: We analyze the changes in capital market risk measures following the passage of the Sarbanes-Oxley (SOX) Act of 2002 for publicly-traded insurers. The most substantive impact occurs for life insurers, who experience significant increases in all risk measures, although we also document significant increases in market risk for non-life insurers. We find that insurers with relatively weak disclosure and governance in the pre-SOX period experience the greatest increases in risk, consistent with the expectation that (1) less credible insurers will divulge new information that is worrisome, and (2) weakly governed insurers will increase investor protection, leading to less conservative investment strategies. We also find that changes in governance that occur following the passage of SOX are positively and significantly related to changes in risk, further supporting the notion that improved investor protection is associated with increased managerial risk taking. [Key words: Sarbanes-Oxley, risk, governance, disclosure]

INTRODUCTION

The corporate governance structure is designed to promote oversight and accountability and protect the interests of shareholders. Arguably, no single piece of legislation focuses more on corporate governance than

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the Sarbanes-Oxley (SOX) Act of 2002. The legislation is designed to increase the accountability of the firm's management to existing and potential investors. All publicly-traded companies are required to provide accurate and more transparent financial statements, and top management are held accountable for noncompliance with the law's provisions.

We examine the impact of SOX on risk within the insurance industry. The risk shifts are found to be significantly related to the pre-SOX levels of disclosure and governance characteristics of the insurers. Using factor analysis, we derive three key factors from a set of disclosure and governance measures—*Information Quality, Board Independence,* and *Internal Monitoring*—which we then use as explanatory factors in the cross-sectional regression models. Our analyses show that the capital market assigns higher risk estimates to insurers with relatively weak disclosure in the pre-SOX period; that is, insurers with weak disclosure in the pre-SOX period experience the greatest increase in risk following SOX's passage. In terms of the governance measures, the capital market assigns higher risk estimates in the post-SOX period to insurers that had less independent boards in the pre-SOX period. These results are consistent with the theoretical model and empirical results provided by John *et al.* (2005), which shows that increases in investor protection are associated with riskier investment strategies. In this context, greater investor protection reduces the optimal level of perk consumption, leading managers to become less risk averse. Since the incremental improvements are likely to be greater for firms with weak disclosure and poor governance in the pre-SOX period, it is clear that these insurers will benefit more from the investor protection measures. Finding a significant increase in systematic risk also corroborates Botosan (1997), Botosan and Plumlee (2002), and Jorgensen and Kirschenheiter (2003). Jorgensen and Kirschenheiter argue that mandatory risk disclosure regimes result in higher betas relative to discretionary disclosure regimes because managers can choose to withhold information with voluntary disclosure regimes. However, when disclosures are mandatory, managers may then disclose unfavorable or worrisome news that may reduce the stock price, increase the risk premium, and increase volatility.

Our results have important implications for investors and managers of publicly-traded insurance companies. For well-diversified investors who are primarily concerned about systematic risk,[4] our results imply that they should require a higher return on insurance company stocks in the

[4]We note, however, that Harrington (1983) finds that unsystematic risk is a significant determinant of stock returns of life insurers. He documents a stronger relationship between returns and unsystematic risk than between returns and systematic risk, and concludes that life insurers should consider the impact of their decisions on variance.

post-SOX period. For managers who use capital market risk measures to price insurance products (Fairley, 1979; Witt and Urrutia, 1983; Cummins and Harrington, 1988; Moridaira *et al.*, 1992), our results suggest that insurance premiums may increase. However, the riskiness of insurers with strong disclosure and governance in the pre-SOX period may be less affected. Thus, the competitive position of these firms relative to those with weak disclosure and governance may be bolstered.

When we compare our results that focus on risk shifts of insurance companies to previous studies that more broadly examine risk shifts (Akhigbe and Martin, 2008; Akhigbe *et al.*, 2008), we find notable similarities and notable differences. First, similar to these past studies, life insurers experience significant increases in their capital market risk measures. However, non-life insurers experience significant decreases in total and unsystematic risk. Second, similar to Akhigbe and Martin (2008), our analyses show that the capital market assigns higher risk estimates to insurers with relatively weak disclosure and governance in the pre-SOX period. Third, unlike Akhigbe *et al.* (2008) in their examination of SOX risk implications across 1,160 firms, we are able to document a significant link between changes in board independence and total risk shifts as well as unsystematic risk shifts, consistent with the work of John *et al.* (2005).

The remainder of the paper is organized as follows. Section 2 focuses on the unique characteristics of the insurance industry and explains how these characteristics relate to the risk implications of SOX for the insurance industry. Section 3 develops the hypotheses, Section 4 presents the data and methods, and Section 5 discusses the empirical results. Section 6 summarizes our primary conclusions.

UNIQUE CHARACTERISTICS OF THE INSURANCE INDUSTRY

Although SOX applies to all publicly-held firms, the insurance industry has a number of characteristics that make it unique both in general terms and in terms of the specific provisions of SOX. These characteristics are likely to impact the resulting risk shifts associated with SOX, and warrant a separate analysis of the insurance industry.

General Characteristics of the Insurance Industry

In terms of the general characteristics, several points are worth noting. First, the role that risk assessment plays in the insurance industry is unique. Many insurance pricing models establish the price of insurance as a function of the riskiness of the insurer. For example, Fairley (1979) and

Moridaira *et al.* (1992) among others, describe the use of the capital asset pricing model (CAPM) for pricing insurance. Unsystematic risk also has been found to be important in determining insurers' rate of return (see Cummins and Harrington, 1988; Witt and Urrutia, 1983), and thus, may influence product pricing. Sommer (1996) also shows that property-casualty prices are inversely related to the insurer's insolvency risk. It is our understanding that companies from other industries typically do not link the pricing of their products to risk in the same way. For example, IBM does not set their software prices based on their beta. To the extent that SOX alters the risk estimates for the industry, key stakeholders, including policy holders, will be affected directly by the SOX-imposed changes.

Second, insurance companies are regulated at the state level. This is in sharp contrast to banks, for example, which are monitored at both the federal and state levels. State regulation of insurance companies leads to greater variation in the extent of regulatory supervision within the industry. Thus, there may be greater need for insurers to have consistent disclosure and governance regulations that are federally mandated. As it relates to the potential risk implications of SOX, insurers may experience risk shifts to the extent that the changes imposed by SOX differ from the state regulations.

Third, two types of companies dominate the industry: life- and non-life insurers. Each type has very different characteristics. For example, non-life insurers, which are mainly property/casualty firms, generally have more volatile earnings compared to life insurers. Cummins (2007) documents that the frequency and severity of catastrophic events, such as hurricanes, have resulted in significant losses for property-casualty insurers. The two types of insurers may differ in terms of disclosure and governance practices, which would ultimately cause investors to analyze the impact of SOX differently. It is plausible, for example, that non-life insurers, particularly property-casualty firms, face greater scrutiny both by regulators and investors than do life insurers. Catastrophic events, such as hurricanes, generally precipitate increased attention from regulators and the public on property/casualty insurers (Cummins, 2007). In contrast, life insurers deal with more predictable events that do not trigger significant scrutiny. This difference may cause non-life insurers to impose more stringent governance and disclosure measures pre-SOX, resulting in a less pronounced impact for non-life insurers.

Finally, although many insurance companies are stock owned, mutual insurance companies play an important role in the industry. Madura (2006) reports that approximately 95 percent of U.S. life insurance companies are stock owned, but mutual companies account for more than 46 percent of the total assets of life insurers. Even though SOX affects publicly-traded

companies, the dynamics in an industry where mutuals control a significant percentage of the assets are likely to be significantly different from industries where such marked distinctions do not exist. For example, the additional burden imposed by SOX may place publicly-traded insurers at a competitive disadvantage in terms of product pricing. Indeed, the National Association of Insurance Companies (NAIC) has developed provisions similar to those imposed by SOX that would be applicable to mutually-owned insurance companies in an effort to remedy the disparity. Nonetheless, the perception that publicly-traded insurers will be at a competitive disadvantage relative to their mutual counterparts may result in a more pronounced shift in risk for insurers relative to other financial institutions.[5]

SOX Requirements and the Insurance Industry

In terms of the specific provisions of SOX, there are several factors that may cause the risk implications for insurers to be different from those experienced by other firms. First, key provisions with SOX require CEO/CFO certification of the financial statements, documentation and evaluation of disclosure controls and procedures, and a fully independent audit committee. These changes represent a significant departure from pre-SOX standards in the industry. However, there are those who argue that some SOX provisions are redundant for insurers (see discussion by Augustinos, 2005). Depending on the jurisdiction, top managers were already required to attest to the fact that the statements are "full and true" and are in compliance with the NAIC's requirements to the best of their knowledge. Thus, for insurers with weak disclosure and governance practices prior to SOX, we expect that risk may be affected by its passage.

Second, SOX mandates changes in disclosure. For example, off–balance sheet activities must be reported and material information must be reported in a timely manner. Using disagreements between rating agencies to measure uncertainty, Morgan (2002) provides evidence that insurance companies are more opaque than banks; that is, rating agencies disagree more frequently over the ratings assigned to insurance companies compared to banks. The evidence suggests that the difficulty of valuing assets and the use of different accounting methods have made it difficult to ascertain the accuracy of financial statements. Thus, SOX's disclosure requirements may help to reduce the opacity in the insurance industry. As it relates to risk, a reduction in opacity may translate into a corresponding

[5]The perception that publicly-traded insurers will be at a competitive disadvantage may also *be the result of* increased risk for insurers that establish premiums as a function of their risk.

reduction in risk. However, it is also possible that reduced opacity translates into increased risk, if the additional disclosures are perceived adversely by the market (e.g., Jorgensen and Kirschenheiter, 2003)

HYPOTHESES

The unique characteristics of insurers suggest that their risk is likely to be affected by SOX, though the direction of influence is an empirical question. In this section, we develop formal hypotheses that integrate the evidence from existing literature with the risk implications of insurers' unique characteristics. We develop the arguments from three alternative perspectives.

Null hypothesis: Any improvements in governance and disclosure in the insurance industry did not have, on average, a significant impact on the risk of insurance companies.

According to the null hypothesis, the impact of SOX on risk may be insignificant for three reasons. First, if SOX is considered to be redundant, risk may not be affected. Second, to the extent that investors and other external parties disagree on the implications of the new information and governance structure improvements, risk may not change. Third, it is possible that large variation in the risk changes may result in a statistically insignificant change in risk on average across the sample.

Alternative hypothesis 1: Any improvements in governance and disclosure in the insurance industry resulted in a significant decrease in risk of insurance companies.

According to alternative hypothesis 1, the changes mandated by SOX reduce uncertainty for investors, resulting in decreases in all three capital market measures of risk. As noted previously, one unique characteristic of insurers is that they are perceived to be relatively opaque (Morgan, 2002). To the extent that SOX increases transparency and the resulting disclosures are not unfavorable, risk may decline. Several existing studies corroborate this view using different measures of risk. Collins and Simonds (1979) find that segment disclosure regulation resulted in declining betas, which is consistent with a reduction in investor uncertainty. McNichols and Manegold (1983) find significant decreases in variance for firms that release interim financial statements. Kim and Verrecchia (1994) and Fischer and Verrecchia (1999) document reductions in stock return variances as information quality increases. Regarding improvements in corporate governance, Bhojray and Sengupta (2003) argue that firms with strong

governance mechanisms should have lower risk. They document that as the percentage of institutional ownership and outside directors increase, bond ratings increase and bond yields decrease. Anderson *et al.* (2004) find that the cost of debt is lower for firms with more independent boards and boards with fully independent audit committees. In the insurance industry, Christensen *et al.* (2005) find that pre-disclosure uncertainty is associated with a stronger market response to the earnings release. Overall, these studies suggest that risk should decline to the extent that SOX reduces uncertainty and improves governance.

Alternative hypothesis 2: Any improvements in governance and disclosure in the insurance industry resulted in a significant increase in risk of insurance companies.

According to alternative hypothesis 2, improvements in disclosure and governance may be accompanied by increases in risk. It is possible that SOX reduces the opacity of insurance firms but results in more unfavorable information being released to the market. In this case, increased transparency may result in an increase in risk. Jorgensen and Kirschenheiter (2003) argue that mandatory risk disclosures are expected to result in higher betas. Their work is based on the premise that favorable information would have already been disclosed, and the mandatory disclosures would induce only unfavorable incremental information. Ross (1989) argues that since prices change in response to information, a greater flow of quality information may be expected to induce greater price volatility. Lang and Lundholm (1993) and Bushee and Noe (2000) find that return volatility increases as information quality increases. The findings reported by Botosan (1997) and Botosan and Plumlee (2002) show a positive relationship between market betas and firm disclosure. Regarding the impact of stronger governance on risk, Saunders *et al.* (1990) find a positive relationship between managerial ownership and total risk as well as unsystematic risk for a sample of 38 bank holding companies. Further, the model of John *et al.* (2005) implies that, to the extent that SOX legislation improves investor protection, managerial risk-taking may increase.

In summary, although there are arguments supporting the three hypotheses, it is also true that the impact of SOX on risk is dependent on the extent to which external parties agree or disagree about the implications of the changes. For example, if investors agree (disagree) that governance structures will improve because of SOX, the stock price may change but the stock may not become more volatile. If there is a divergence of opinion among investors regarding the changes in the governance structure, the risk effects may be neutralized by offsetting opinions. As previously indicated, the impact on risk is an empirical question.

DATA AND METHODS

Estimating Risk Shifts

We begin by identifying all publicly-traded insurance companies with daily stock price data available from the Center for Research in Security Prices (CRSP) during the period surrounding SOX's passage. We use Mergent Online to categorize our sample into life and non-life insurers. Mergent Online provides financial data and industry classification for firms. Using their classification scheme, we identify 133 insurance companies, of which 33 can be classified as life insurers and 100 as non-life insurers. Recognizing that many insurers are involved in multiple lines of insurance we classify the insurer as a life insurer if life insurance is listed as the primary line of business. Otherwise, we classify the insurer as non-life.

We rely on existing studies to help identify the time period over which SOX was developed and passed (Akhigbe and Martin, 2006; Zhang, 2007). On February 2, 2002, the Treasury Secretary called for changes in corporate governance; most acknowledge the reform legislation was triggered by the Enron bankruptcy that occurred on December 2, 2001. Thus, we use 180 days preceding the Enron failure as the pre-SOX period. Since the SOX legislation was passed by the House-Senate conference committee on July 25, 2002 and it was virtually certain to be enacted, we refer to the 180 days following this point as the post-SOX period. We estimate and compare the pre- and post-SOX total, unsystematic, and systematic risk measures for each insurer in our sample, similar to Amihud *et al.* (2002) and Akhigbe and Martin (2008). Our total risk measure is the variance of returns, and we calculate the change in total risk as the difference between pre- and post-SOX periods return variances, $\Delta\sigma_r^2 = \sigma_{r,post}^2 - \sigma_{r,pre}^2$. Our unsystematic risk measure is the variance of the residuals, and we similarly calculate the change in unsystematic risk as $\Delta\sigma_e^2 = \sigma_{e,post}^2 - \sigma_{e,pre}^2$. The variance of the residuals is calculated over their respective 180-day periods, using the residuals generated by the market model that is estimated with ordinary least squares. The market model is $R_t = \beta_0 + \beta_1 R_{mt} + e_t$, where R_t is the stock return on day t, R_{mt} is the return on the *CRSP* equally-weighted market index on day t, β_0 is the intercept, β_1 is the market beta, and e_t is the residual on day t. We estimate the change in systematic risk using an augmented market model, $R_t = \beta'_0 + \beta'_1 R_{mt} + \beta'_2 \delta_t R_{mt} + \varepsilon_t$, where δ_t is equal to 1 on all days in the post-SOX period and 0 otherwise, the intercept

is β'_0, the pre-SOX market beta is β'_1 and the change in market risk is β'_2. $\beta'_2\delta_t$ is an interaction term that captures the shift in systematic risk that is attributable to the passage of SOX. This model has been used in previous studies, including Amihud *et al.* (2002) and Akhigbe and Martin (2008).

Multivariate Analyses on Risk Shifts

A key contribution of our study is that we evaluate underlying factors driving the post-SOX risk changes in the insurance industry. We accomplish this objective by modeling the changes in risk as a function of the levels of insurer-specific disclosure and governance characteristics in the year prior to SOX's passage. We also model the risk shifts as a function of the changes in the disclosure and governance measures that occur following SOX's passage. The basic cross-sectional model is $\Delta Risk = f(Disclosure, Governance, Control)$, where $\Delta Risk$ is the change in one of three capital market measures of risk (total, unsystematic, and systematic risks), *Disclosure* captures the quality and quantity of disclosure provided by the insurer, *Governance* captures the quality and degree of corporate governance of the insurer, and *Control* is a series of control variables that may also impact risk. We obtain data for the various disclosure and governance measures described below using proxy statement data included in The Corporate Library's *Board Analyst* database, except where indicated otherwise. Other financial data are obtained from Compustat. It should be noted that the disclosure and governance measures are proxies, and thus are imperfect.

Disclosure Measures

The impact of enhanced disclosure on risk depends on the extent of investor agreement about the implications of the information. In other words, more and/or better information does not mean that investors will evaluate the information in the same way. For example, if investors are unanimous in their assessment that the information is favorable, the measures may be inversely related to risk changes. However, if investors disagree on the implications of the information, the results may be mixed.

Additionally, the work of Coles *et al.* (1995) suggests that the relationship between disclosure and market risk shifts is unclear. Since estimation risk may distort market risk measures, as uncertainty is resolved with enhanced disclosures, these risk measures may converge to their appropriate levels, making it difficult to detect a significant link between disclosure and market risk shifts.

Quantity of disclosure. The SOX legislation requires reporting off–balance sheet transactions and communicating material information in a

timely fashion. The impact of the additional information on risk is unclear. On the one hand, more disclosures may signify less uncertainty for investors, thereby reducing risk. For example, Collins and Simonds (1979) find that segment disclosure information reduced risk. However, to the extent that greater disclosure implies that more unfavorable information will be released, market risk estimates may increase (Jorgensen and Kirschenheiter, 2003). As a proxy for quantity of information, following Akhigbe and Martin (2008) and Akhigbe *et al.* (2008), we use FNRATIO, which is defined as the number of footnote pages in the annual report scaled by the total number of pages in the annual report.

Quality of disclosure.[6] The SOX legislation specifies that the audit committee be composed entirely of independent members and that the firm report whether or not a member of the audit committee is considered to be a financial expert. Both angles aim to improve the accuracy of information that is disclosed. Sengupta (1998) reports a positive association between the quality of disclosure and bond ratings, which suggests that total risk is perceived to be lower for firms with better disclosure. However, Bushee and Noe (2000), for example, find that greater return volatility is associated with higher quality disclosure due to institutional investors shifting their funds as they seek higher quality disclosures. We capture quality of disclosure using two measures, FINEXPT and AUDIND. FINEXPT is equal to one if there is an independent financial expert on the audit committee and zero otherwise, and AUDIND captures the independence of the audit committee. Since SOX requires the audit committee to be 100 percent independent, AUDIND has a value of 1.00 if the insurer is compliant with the SOX legislation in the post-SOX period.

Governance Measures

The SOX legislation has been summarized by Securities and Exchange Commission into five focus areas.[7] The focus areas of improving the "tone at the top" and improving the performance of "gatekeepers" embody the governance concerns. More specifically, the legislation addresses firm-level governance through its focus on CEO/CFO certification, board composition and responsibilities, and oversight of internal controls.

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[6]Studies in the past have used AIMR disclosure ratings. Because the index was discontinued in 1997, it is not considered in this study.

[7]See www.sec.gov/news/press/2003-89a.htm for how the SEC summarizes the legislation into five categories: restoring confidence in the accounting profession, improving the "tone at the top", improving disclosure and financial reporting, improving the performance of "gatekeepers", and enhancing enforcement tools.

Board independence. The governance requirements within SOX endorse the view that more effective monitoring occurs with independent members of the board. As board independence increases, governance quality is expected to improve. Improvements in governance quality may reduce investor risk perception. For example, Anderson *et al.* (2004) find that the cost of debt is lower for firms with more independent boards and fully independent audit committees. However, John *et al.* (2005) show that investor protections may increase managerial risk taking. In addition to the proportion of independent board members on the audit committee, AUDIND, we also measure the percentage of independent board members, BRDIND, percentage of independent nominating committee members, NOMIND, and the percentage of independent compensation committee members, COMPIND.

Board credibility. In the spirit of SOX's focus on the board, we look at the credibility of the board. A credible board is generally associated with strong corporate governance and decision-making that is in the best interest of shareholders. We believe the impact of board credibility on risk is similar to that of board independence, described above. Firms with more credible boards may be perceived to be less risky. Yet, credible boards may more carefully act on behalf of their shareholders, leading to greater risk taking (John *et al.*, 2005). Following Akhigbe and Martin (2008), we capture board credibility using BRDSTOCK, the percentage of board members who own stock in the insurer, and BRDEXP, the percentage of board members with seats on other boards. We expect boards to credibly act in the best interest of shareholoders when a greater proportion of the board owns stock and a greater proportion of the board holds seats on other boards.

CEO involvement. A more involved CEO may signify that the firm is well governed and could more easily comply with the various provisions of SOX, such as certifying the accuracy of the financial statements. Alternatively, the more involvement and influence of the CEO, the less effective may be the monitoring by the board. Thus, the direction of influence that CEO involvement has on risk is an empirical question. The degree of involvement by the CEO, CEOINV, is measured by the number of his/her high-profile roles. The roles considered are chairman of the board and membership on the compensation, nominating, and audit committee.

Institutional ownership. As the level of institutional ownership increases, greater monitoring occurs and greater influence is exerted over the decisions made by the insurer. This additional external monitoring should improve corporate governance. Bhojray and Sengupta (2003) find that bond ratings are positively associated with degree of institutional ownership, which suggests that total risk is perceived to be lower for firms with greater external monitoring. We measure institutional ownership,

INST, as the percentage of the insurer's stock that is owned by institutional investors.

Insider ownership. As the level of insider ownership increases, insiders become more vulnerable to the decisions they make regarding the insurer's activities. In effect, their interests become more closely aligned with those of the other shareholders. However, with a great degree of insider ownership, insiders are less diversified and more entrenched, which may increase their risk aversion. With a focus on bank holding companies, Saunders *et al*. (1990) find a positive relationship between managerial ownership and risk. We define INSIDE as the percentage of the insurer's stock that is owned by insiders.

Control Variables

We include the following control variables in the model: LEV is long-term debt/total assets (a measure of leverage); ROE is earnings before interest and taxes (EBIT)/book value of equity (a measure of profitability); LNSIZE is the natural log of market capitalization (a measure of size); and MVBV is market value of equity/book value of equity (a measure of growth opportunities).

EMPIRICAL RESULTS

Impact of SOX on Risk

We evaluate the change in total risk, unsystematic risk, and market risk for each insurer and report the mean and median values in Table 1. We use a t-test to evaluate the significance of the mean change, and the Wilcoxon signed-rank test to evaluate the significance of the median change.

When we examine the full sample of insurers, it can be seen that the total risk and unsystematic risk of insurers on average are not significantly affected, but the market risk shows a significant increase at the one percent level. Our results show stark differences in the impact on total risk and unsystematic risk between the group of life insurers and the group of non-life insurers. Life insurers experience significant increases in all three risk measures. For non-life insurers, the total risk and unsystematic risk measures show declines, but only the decline in unsystematic risk is significant. The greater reduction in unsystematic risk for non-life insurers compared to life insurers may reflect the fact that (1) the incremental disclosures for life insurers are expected to be unfavorable and/or worrisome, and/or (2) while non-life insurers may already face relatively greater regulatory scrutiny, the incremental disclosures and governance within the SOX legislation nevertheless are expected to benefit these firms.

Table 1. Summary of Risk Shift Estimates for Insurers Following the Passage of SOX

This table shows risk shifts for the full sample and for life insurers and non-life insurers. The mean and median changes in total risk ($\Delta\sigma_r^2$), unsystematic risk $\Delta\sigma_e^2$, and systematic risk (β'_2) following the passage of SOX are reported. The pre-SOX and post-SOX periods each include 180 days. We estimate change in total risk ($\Delta\sigma_r^2$) as the difference in the post-SOX variance of returns compared to the pre-SOX variance of returns ($\sigma^2_{r,\,post\text{-}SOX} - \sigma^2_{r,pre\text{-}SOX}$). We measure the change in unsystematic risk ($\Delta\sigma_e^2$) as the difference in the post-SOX error variance compared to the pre-SOX error variance ($\sigma^2_{e,\,post\text{-}SOX} - \sigma^2_{e,pre\text{-}SOX}$). The error variances are calculated from the error terms in the single factor market model that is estimated using OLS with daily returns in the pre-SOX period and then again for the post-SOX period. We obtain estimates of the change in systematic risk (β'_2) using OLS with daily returns over the full examination period as follows: $R_t = \alpha' + \beta'_1 R_{mt} + \beta'_2 \delta_t R_{mt} + e_t$ where R_t is the stock return on day t; R_{mt} is the market return on day t; δ_t is equal to 1 on all days in the post-SOX period and 0 otherwise; α is the intercept; β'_1 is the pre-SOX market beta and e_t is the error term on day t. The t-test and Wilcoxon signed rank test in parentheses evaluate the null hypothesis that the mean and median change in risk is zero; ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Estimates	Full aample (N = 133)	Life insurers (N = 33)	Non-life insurers (N = 100)
Total risk shift, $\Delta\sigma_r^2$			
Mean	0.0096	0.0810	–0.0139
	(0.71)	(2.66)***	(–0.97)
Median	–0.0030	0.0142	–0.0049
	(252.0)	(147.5)***	(–311.0)
Unsystematic risk shift, $\Delta\sigma_e^2$			
Mean	–0.0001	0.0653	–0.0217
	(–0.01)	(2.18)**	(–1.64)*
Median	–0.0085	0.0054	–0.0107
	(–747.5)*	(95.5)*	(–861.0)***
Market risk shift, β'_2			
Mean	0.4031	0.6187	0.3319
	(7.94)***	(6.20)***	(5.78)***
Median	0.3894	0.6070	0.3583
	(3208.5)***	(248.5)***	(1672.0)***

Finding a significant increase in systematic risk corroborates Botosan (1997), Botosan and Plumlee (2002), and Jorgensen and Kirschenheiter (2003). Jorgensen and Kirschenheiter argue that mandatory risk disclosure regimes result in higher betas relative to discretionary disclosure regimes because when disclosures are voluntary, managers can choose to withhold worrisome information. However, when disclosures are mandatory, managers are forced to disclose unfavorable news, which reduces the stock price and increases the risk premium. Our results are also consistent with the argument of John *et al.* (2005) that increases in investor protection are associated with less conservative investment strategies.

The results in Table 1 refute the argument that the provisions of SOX are redundant for insurers. Instead, our results are consistent with the alternative view presented in Augustinos (2005) that SOX represents a significant change from the existing practices within the insurance industry.[8] In addition to the market risk increases discussed above, finding significant increases in total and unsystematic risks of life insurers is consistent with Ross (1989), Lang and Lundholm (1993), and Bushee and Noe (2000) and finding significant decreases in unsystematic risk of non-life insurers is consistent with Bhojray and Sengupta (2003) and Anderson *et al.* (2004).

The fact that the risk shifts differ between life and non-life insurers makes sense when examined in the context of the disclosure and governance measures by type of insurer. The descriptive statistics are reported in Panel A of Table 2. Panel A compares the characteristics of life and non-life insurers, first in the pre-SOX period then again in the post-SOX period. The descriptive statistics for the firm-specific disclosure, governance, and other characteristics in the pre-SOX (post-SOX) period are from year-end 2001 (2003).[9] We use a t-statistic to test whether the means in the pre-SOX period are significantly different for life insurers compared to non-life insurers. A similar comparison is shown for the post-SOX period.[10] The

[8] Since SOX requires that the CEO and CFO personally certify that their financial statements are accurate and subjects these executives to criminal penalties for violations, we expect that this could trigger greater demand for Directors' and Officers' (D&O) insurance policies (Forbes.com, November 2002). Given this expectation, we separately evaluate the impact of SOX on the two major providers of D&O insurance—Chubb and American International Group (AIG). Both firms exhibit significant increases in risk, consistent with the results for the sample as a whole. Thus, it appears that there are no unique risk implications for providers of D&O insurance. In the interest of brevity, the results are not tabulated.

[9] Data on the financial expertise of audit committee members were not tracked prior to SOX; thus the pre-SOX value of this variable is from 2002.

[10] In Panels A and B, we also compare median values using the Wilcoxon signed-rank test, and find the same results. For the sake of brevity, these results are not tabulated.

Table 2. Descriptive Statistics for Firm-Specific Characteristics

This table provides the mean values for the firm-specific disclosure, governance, and other characteristics. We use a t-statistic to test whether the means are different in Panel A between life insurers and non-life insurers in the pre-SOX period and the post-SOX period, and in Panel B between pre- and post-SOX periods for the full sample and for each subset. FINEXPT is equal to 1 if there is an independent financial expert on the audit committee; AUDIND is the percentage of independent members on the audit committee; FNRATIO is number of footnote pages scaled by the total number of pages in the annual report; BRDIND is the percentage of independent board members; NOMIND is the percentage of independent nominating committee members; COMPIND is the percentage of independent compensation committee members, BRDEXP is the percentage of the board with seats on other boards; BRDSTOCK is the percentage of board members who own stock; CEOINV is the number of high-profile roles held by the CEO; INSIDE is the percentage of insider ownership; INST is the percentage of institutional ownership; LEV is long-term debt/total assets; ROE is EBIT/book value of equity; LNSIZE is natural log of market capitalization; and MVBV is market value of equity/book value of equity. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Comparison between life and non-life insurers in pre- and post-SOX periods

	Mean pre-SOX values		Mean post-SOX values	
Variable	Life insurers (N = 15)	Non-life insurers (N = 52)	Life insurers (N = 9)	Non-life insurers (N = 39)
Disclosure variables				
FINEXPT	0.7333	0.9615*	0.8889	0.9487
AUDIND	0.7113	0.8990	1.0000	0.9949
FNRATIO	0.2078	0.3080**	0.2180	0.2234
Governance variables				
BRDIND	0.6880	0.6925	0.8693	0.8429
NOMIND	0.6080	0.7113	1.0000	1.0000
COMPIND	0.7113	0.8858	1.0000	1.0000
BRDEXP	0.6400	0.8300	0.5362	0.5992
BRDSTOCK	0.7253	0.8144	0.9343	0.8779
CEOINV	0.8000	1.1731	0.1667	0.1538
INSIDE	0.0234	0.0721***	0.0772	0.0669
INST	0.4175	0.7087***	0.7101	0.7490
Other characteristics				
LEV	0.0386	0.0738**	0.0270	0.0688
ROE	0.2883	0.1906	0.0642	0.2471
LNSIZE	7.3191	8.0719	7.6522	8.6022
MVBV	1.0667	1.6637	1.2056	1.8412

Panel B. Comparison of insurer characteristics between pre- and post-SOX periods

	All insurers		Life insurers		Non-life insurers	
Variable	Pre-SOX values (N = 67)	Post-SOX values (N = 48)	Pre-SOX values (N = 15)	Post-SOX values (N = 9)	Pre-SOX values (N = 52)	Post-SOX values (N = 39)
Disclosure variables						
FINEXPT	0.9104	0.9375	0.7333	0.8889	0.9615	0.9487
AUDIND	0.8570	0.9958***	0.7113	1.0000	0.8990	0.9949***
FNRATIO	0.2856	0.2224***	0.2078	0.2180	0.3080	0.2234***
Governance variables						
BRDIND	0.6915	0.8478***	0.6880	0.8693**	0.6925	0.8429***
NOMIND	0.6882	1.0000***	0.6080	1.0000	0.7113	1.0000***
COMPIND	0.8467	1.0000***	0.7113	1.0000	0.8858	1.0000***
BRDEXP	0.7874	0.5874***	0.6400	0.5362	0.8300	0.5992***
BRDSTOCK	0.7945	0.8885	0.7253	0.9343	0.8144	0.8779
CEOINV	1.0896	0.1563***	0.8000	0.1667**	1.1731	0.1538***
INSIDE	0.0612	0.0688	0.0234	0.0772	0.0721	0.0669***
INST	0.6434	0.7417***	0.4175	0.7101**	0.7087	0.7490
Other characteristics						
LEV	0.0659	0.0610	0.0386	0.0270	0.0738	0.0688
ROE	0.2124	0.2128	0.2883	0.0642	0.1906	0.2471
LNSIZE	7.9033	8.4203	7.3191	7.6522	8.0719	8.6022
MVBV	1.5300	1.7220	1.0667	1.2056	1.6637	1.8412

summary statistics show in the pre-SOX period that life insurers generally had weaker disclosure requirements and less effective governance structures. Life insurers had an independent financial expert (FINEXPT) on the audit committee less frequently than non-life insurers, 73.33 percent compared to 96.15 percent, respectively, with the difference being significant at the 10 percent level. Life insurers maintained proportionately less independent audit committees (71.13 percent) compared to non-life insurers (89.90 percent), although the difference is not statistically significant. The relative number of footnote pages in the annual report (FNRATIO), a proxy for degree of disclosure, shows that life insurers provided less footnote disclosure than non-life insurers, significant at the 5 percent level. Thus, life insurers had lower quality and quantity of disclosures than non-life insurers in the pre-SOX period.

Life insurers also had weaker governance measures in the pre-SOX period across all measures, but the differences are only statistically significant for insider and institutional ownership. Insiders and institutional investors of life insurers owned 2.34 percent and 41.75 percent, respectively, while the ownership figures for non-life insurers were 7.21 percent and 70.87 percent, respectively. In both instances the difference is significant at the 1 percent level.

In terms of the control variables, Panel A shows that life insurers had considerably lower percentage of leverage than non-life insurers (3.86 percent and 7.38 percent, respectively), suggesting that life insurers were also less extensively monitored by creditors. The difference is significant at the 1 percent level. Life insurers had a higher ROE (28.83 percent) than non-life insurers (19.06 percent), were generally smaller, and had lower market-to-book ratios than non-life insurers. However, the differences were not statistically significant.

The disclosure, governance, and control variables are also reported for the post-SOX period. Interestingly, there is no significant difference between life and non-life insurers in the post-SOX period. This finding suggests that life insurers and non-life insurers are becoming more similar in terms of governance and disclosure in the post-SOX period.

Panel B of Table 2 provides a comparison between pre- and post-SOX characteristics for all insurers and the subsets of life and non-life insurers.[11] In this panel, t-statistics are used to test whether the level of the variable in the post-SOX period is significantly different from the level in the pre-SOX period. Generally, Panel B shows that disclosure and governance are significantly stronger in the post-SOX period for the insurers.[12] While life insurers do not show statistically significant changes in disclosure measures following SOX's passage, they do show significant increases in board independence (BRDIND), CEO involvement (CEOINV), and institutional ownership (INST). It is likely that the life insurer sample is just too small

[11]The reduction in sample size from the pre-SOX period to the post-SOX period occurs because the governance and disclosure variables are not available for some insurers in the post-SOX period.

[12]We also conduct paired t-tests using only the 48 insurers with data available in the pre- and post-SOX periods to determine how the loss of sample size may be affecting our results reported in Panel B of Table 2. We are able to draw the same conclusions on the significance of the changes in disclosure and governance variables as are reported, but we find two minor differences in the control variables: (1) firm size increases for the full sample and each subset, and (2) ROE increases for the subset of non-life insurers. The fact that we are able to draw the same conclusions on the disclosure and governance variables with the paired comparisons suggests that the change in the sample size is not the reason. Instead, the changes in disclosure and governance are likely attributable to the changes resulting from SOX.

(N = 9) to detect statistical significance on the changes, especially where the nominal differences appear quite large (e.g., AUDIND, NOMIND, COMPIND, BRDSTOCK, INSIDE).

Cross-Sectional Evaluation of Changes in Capital Market Risk Measures

Although reviewing the descriptive statistics provides preliminary insights into our results, we obtain further understanding by analyzing the cross-sectional relationship between the risk shifts and the disclosure and governance factors. We use principal axis factor analysis to identify the latent key factors, which are then used as explanatory variables in the cross-sectional regression models.[13] Factor analysis is a statistical technique that measures the degree of commonality among variables and constructs a parsimonious set of independent indices or "factors." There are different approaches that may be used to identify the appropriate number of factors and to interpret the factors. Our use of the Scree diagram to identify the number of factors and the Varimax rotation to interpret the factors is consistent with previous research (Mayers and Smith, 1988; Crutchley *et al.*, 2007; Akhigbe and Martin, 2008; Akhigbe *et al.*, 2008).

We conduct two separate principal axis factor analyses, one analysis on the eleven pre-SOX disclosure and governance variables and one analysis on the changes that occur with these eleven variables between the pre-SOX and post-SOX periods. Table 3 reports the VARIMAX rotated component analysis factor matrix, where those variables with factor loadings greater than a somewhat arbitrary 0.50 are highlighted in boxes. Panel A reports these results using the pre-SOX measures and Panel B reports these results using the changes in the measures subsequent to the passage of SOX. The analyses reported in these panels indicate that the variables and the changes in the variables embody three similar attributes: *Information Quality, Board Independence,* and *Internal Monitoring*. The factor names are determined by the variables that load heaviest on the factors. Ultimately, the factor scores created from the standardized scoring coefficients are used in the cross-sectional analyses reported in Panels A and B of Table 4.

Panel A of Table 3 shows that the first factor loads most heavily on the existence of a financial expert on the audit committee (FINEXPT), proportion of institutional ownership (INST), proportion of the board with seats on other boards (BRDEXP), and degree of audit committee independence (AUDIND), representing the degree *Information Quality*. The second factor,

[13]The cross-sectional results with the composite measures of Akhigbe and Martin (2006) are qualitatively the same.

Table 3. Factor Analysis on Disclosure and Governance Characteristics

This table provides the VARIMAX rotated component factor matrix used to identify factors. Panel A uses the 2001 measures for 67 insurers with available data, whereas Panel B uses the changes from 2001 to 2003 in the measures for 48 insurers with available data. The key variables with the highest loadings on each factor are highlighted by boxes. FINEXPT is 1 if there is an independent financial expert on the audit committee and 0 otherwise, AUDIND is the proportion of independent members on the audit committee, FNRATIO is number of footnote pages/total number of pages in the annual report, BRDIND is the proportion of independent board members, NOMIND is the proportion of independent nominating committee members, COMPIND is the proportion of independent compensation committee members, BRDSTOCK is the proportion of board members who own stock, BRDEXP is the proportion of the board with seats on other boards, CEOINV is number of high-profile roles held by the CEO, INSIDE is proportion of insider ownership, and INST is the proportion of institutional ownership.

Panel A: Pre-SOX measures

Variables	Factor 1: *Information Quality*	Factor 2: *Board Independence*	Factor 3: *Internal Monitoring*
Disclosure variables:			
FINEXPT	0.8066	0.1855	0.1799
AUDIND	0.6893	0.5824	0.2614
FNRATIO	0.3629	0.1196	0.1545
Governance variables:			
BRDIND	–0.0738	0.8230	–0.1354
NOMIND	0.3498	0.8133	–0.2516
COMPIND	0.6272	0.6107	0.3066
BRDSTOCK	0.4871	0.4208	0.1637
BRDEXP	0.7421	0.4509	0.1836
CEOINV	0.5008	–0.0821	–0.0456
INSIDE	0.0918	–0.1636	0.8833
INST	0.7677	0.1543	–0.1148
Eigenvalue	4.9149	1.3516	0.6151

Panel B: Changes in measures

Variables	Factor 1: *ΔBoard Independence*	Factor 2: *ΔInformation Quality*	Factor 3: *ΔInternal Monitoring*
Disclosure variables:			
ΔFINEXPT	0.1097	0.6976	0.0113
ΔAUDIND	0.6590	0.3739	0.4034
ΔFNRATIO	0.1369	0.0617	0.4830
Governance variables:			
ΔBRDIND	0.8882	–0.0311	0.0397
ΔNOMIND	0.6858	0.0696	0.0908
ΔCOMPIND	0.7063	0.3276	0.1964
ΔBRDSTOCK	0.1860	0.7176	0.0937
ΔBRDEXP	0.3372	0.0995	0.5431
ΔCEOINV	0.0197	0.4274	0.0014
ΔINSIDE	–0.0314	–0.1214	0.5922
ΔINST	0.0695	0.3465	0.4264
Eigenvalue	3.2618	1.0569	0.8570

Board Independence, is most correlated with the degree of board independence (BRDIND) and degree of nominating committee independence (NOMIND), but essentially loads heavily on all the measures of board and board committee independence. The third factor is referred to as *Internal Monitoring* since it loads most heavily on the degree of inside ownership.

In Panel B of Table 3, the first factor represents the change in board independence (Δ*Board Independence*) as it loads heavily on the changes in all the measures of board and board committee independence. The second and third factors are a bit more difficult to interpret. Nevertheless, we believe that the second factor is appropriately named Δ*Information Quality* since it is highly correlated with the change in the existence of a financial expert (ΔFINEXPT); it also is highly correlated with the change in the

proportion of board members that own stock (ΔBRDSTOCK). The last factor is referred to as Δ*Internal Monitoring* since it is most correlated with the change in the degree of inside ownership (ΔINSIDE) and the change in the proportion of the board with seats on other boards (ΔBRDEXP).

We analyze the cross-sectional relationship between the risk shifts and the disclosure and governance factors using multivariate regression analysis. Table 4 reports these results. Panel A shows the results when we use the three factors that emerged from the principal components analysis on pre-SOX levels of disclosure and governance variables. Panel B re-estimates the model using the three key factors generated from changes that occurred in the disclosure and governance variables following the passage of SOX. Across both panels, the full models include the control variables whereas the reduced models include only the three main factors. We analyze reduced models because of collinearity between the control variables and the factors generated from changes in the disclosure and governance factors of Panel B. For uniformity, we also report the reduced model in Panel A.

Panel A of Table 4 shows *Information Quality* to be inversely related to all three risk measures, significant at the 1 percent level. The inverse relationship suggests that insurers perceived as providing less (more) credible information in the pre-SOX period experienced greater increases (decreases) in risk. This result is plausible, based on the expectation that SOX disclosures by the less credible insurers will divulge worrisome information (Jorgensen and Kirschenheiter, 2003).

A significant inverse relationship also exists between *Board Independence* and risk. This shows that the capital market assigned higher risk estimates in the post-SOX period to insurers that had less independent boards and board committees in the pre-SOX period. The results support the argument of John *et al.* (2005) that increases in investor protection are associated with less conservative investment strategies. Since incremental improvements in board independence are expected to occur primarily among those insurers that had less independent boards, managers of these firms are expected to become less risk averse following board improvements.

Internal Monitoring is only marginally significantly related to the total risk and systematic risk measures. This may reflect the fact that insurance companies are highly regulated, whereby this alternative monitoring mechanism reduces the importance of inside and institutional monitors (Booth *et al.*, 2002).

Two additional observations are worth noting. First, since the relationships between the changes in systematic risk and the two governance factors are only marginally significant, we conclude that the changes in systematic

Table 4. The Influence of Disclosure and Governance Factors on Risk Shifts

This table evaluates the influence of various characteristics on changes in risk as measured by three different risk shifts. In Panel A, *Information Quality*, *Board Independence*, and *Internal Monitoring* are measures from the factor analysis on pre-SOX characteristics. In Panel B, Δ*Board Independence*, Δ*Information Quality*, and Δ*Internal Monitoring* are measures from the factor analysis on the changes in the characteristics. Across both panels, LIFE equals 1 for life insurers and 0 for non-life insurers, LEV is long-term debt/total assets, ROE is EBIT/book value of equity, LNSIZE is natural log of market capitalization, and MVBV is market value of equity/book value of equity. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Factors are based on pre-SOX disclosure and governance characteristics

	Full models			Reduced models		
Variable	Total risk shift, $\Delta\sigma_r^2$	Unsystematic risk shift, $\Delta\sigma_e^2$	Beta shift, β'_2	Total risk shift, $\Delta\sigma_r^2$	Unsystematic risk shift, $\Delta\sigma_e^2$	Beta shift, β'_2
Intercept	–0.0787 (–2.06**)	–0.0079 (–1.51)	–0.6724 (–2.68***)	0.0045 (0.65)	–0.0020 (–2.18**)	0.5739 (11.74***)
Information Quality	–0.0588 (–6.98***)	–0.0064 (–5.52***)	–0.3212 (–5.82***)	–0.0437 (–6.15***)	–0.0048 (–5.01***)	–0.2896 (–5.70***)
Board Independence	–0.0226 (–2.85***)	–0.0026 (–2.41**)	–0.0447 (–0.86)	–0.0191 (–2.26**)	–0.0024 (–2.14***)	0.0079 (0.13)
Internal Monitoring	–0.0135 (–1.73*)	–0.0016 (–1.51)	–0.0959 (–1.88*)	–0.0136 (–1.65*)	–0.0016 (–1.45)	–0.1225 (–2.08**)
LIFE	0.0021 (0.10)	0.0007 (0.25)	0.1565 (1.18)	–	–	–
LEV	–0.1496 (–1.78*)	–0.0212 (–1.85*)	0.7664 (1.39)	–	–	–
ROE	–0.0200 (–1.21)	–0.0028 (–1.22)	0.1304 (1.20)	–	–	–
LNSIZE	0.0122 (2.48**)	0.0009 (1.27)	0.1712 (5.32***)	–	–	–
MVBV	0.0132 (0.88)	0.0029 (1.42)	–0.2752 (–2.81***)	–	–	–
N	67	67	67	67	67	67
F-value	11.05***	7.60***	11.53***	19.91***	14.06***	14.26***
Adjusted R^2	0.5493	0.4445	0.5606	0.4622	0.3725	0.3760

Panel B: Factors are based on changes in disclosure and governance characteristics

	Full models			Reduced models		
Variable	Total risk shift, $\Delta\sigma_r^2$	Unsystematic risk shift, $\Delta\sigma_e^2$	Beta shift, β'_2	Total risk shift, $\Delta\sigma_r^2$	Unsystematic risk shift, $\Delta\sigma_e^2$	Beta shift, β'_2
Intercept	–0.0427 (–0.94)	–0.0019 (–0.27)	–0.8606 (–3.17***)	–0.0120 (–1.42)	–0.0037 (–3.11***)	0.4279 (7.89***)
Δ*Board Independence*	0.0129 (1.42)	0.0012 (0.82)	0.0334 (0.62)	0.0303 (3.34***)	0.0033 (2.53**)	0.0783 (1.35)
Δ*Information Quality*	0.0138 (1.04)	0.0025 (1.16)	0.0545 (0.69)	0.0067 (0.64)	0.0011 (0.74)	0.1015 (1.52)
Δ*Internal Monitoring*	–0.0033 (–0.34)	0.0002 (0.16)	–0.0822 (–1.42)	–0.0064 (–0.57)	–0.0006 (–0.38)	0.0107 (0.15)
LIFE	0.0185 (0.86)	0.0007 (0.22)	0.5119 (3.97***)	–	–	–
LEV	–0.8673 (–5.35***)	–0.1196 (–4.65***)	0.0923 (0.09)	–	–	–
ROE	0.0122 (0.43)	–0.0007 (–0.15)	0.3796 (2.23**)	–	–	–
LNSIZE	0.0126 (2.25**)	0.0009 (1.04)	0.1750 (5.24***)	–	–	–
MVBV	–0.0208 (–1.50)	–0.0013 (–0.59)	–0.3420 (–4.12***)	–	–	–
N	48	48	48	48	48	48
F-value	9.47***	5.62***	9.46***	3.91***	2.37*	1.58
Adjusted R^2	0.5906	0.4401	0.5900	0.1565	0.0802	0.0356

risk are influenced primarily by information quality of insurers rather than by their governance structure. Thus, these analyses suggest that insurers using CAPM to price their product can influence their pricing and competitive position within the industry through greater transparency and higher quality disclosures. Second, the LIFE dummy variable is not significant in any of the models. Thus, the stark differences in the risk shifts between life and non-life insurers appear to be explained by the variation in the governance and disclosure factors.

Panel B re-estimates the cross-sectional models using the three key factors generated from changes that occurred in the disclosure and gover-

nance variables following the passage of SOX. None of the factors are significant in the full models, which likely is due to collinearity between the control variables and the factors based on the high variance inflation factors. The reduced models reveal a significant and positive link between Δ*Board Independence* and total and unsystematic risks. Since the results in Panel B are based on changes in disclosure and governance (as opposed to the pre-SOX levels in Panel A), the positive coefficient suggests that insurers with the greatest improvements in board independence have the greatest risk increases. This finding is consistent with our interpretation of the results in Panel A, as well as with John *et al.* (2005), as previously discussed.

We confirm our belief that the results reflect greater risk increases for insurers that had greater improvements in board independence by evaluating subsets containing insurers with the weakest and strongest *Board Independence*. These weakest (strongest) insurers are identified as those with below (above) the median values on the *Board Independence* factor generated from the factor analysis described in Panel A of Table 3. When we rerun the reduced model on these subsets, it is clear that the positive and significant link between Δ*Board Independence* and risk is driven by the insurers with the least independent boards and board committees. The coefficient on Δ*Board Independence* is positive and significant for the subset of insurers with less independence in the pre-SOX period and not significant for the subset of insurers that had a strong degree of independence.

CONCLUSIONS

We analyze the risk implications of the Sarbanes-Oxley (SOX) Act of 2002 for the insurance industry, and find a significant increase in systematic risk across our full sample of 133 insurers. The most substantive increases in risk are observed among life insurers. Across all three risk measures, our subset of 33 life insurers experiences a significant increase in risk following SOX's passage. In contrast, our subset of 100 non-life insurers does not experience increases in the total and unsystematic risk measures.

We find the risk shifts are significantly related to the pre-SOX levels of disclosure and governance characteristics of the insurers. Using factor analysis, we derive three key factors from a set of disclosure and governance measures; *Information Quality, Board Independence,* and *Internal Monitoring* are used as explanatory factors in the cross-sectional analyses. Our analyses show that the capital markets assign higher risk estimates to insurers that had relatively weak disclosure at the time of SOX passage. In other words, insurers with weak disclosure in the pre-SOX period experience the greatest increase in risk following SOX's passage. In terms of the

governance measures, the capital market assigns greater risk following SOX passage for those insurers that had less independent boards.

Our results have important implications for investors and managers of publicly-traded insurance companies. From the perspective of well-diversified investors who are primarily concerned about systematic risk, our results imply that they should require a higher return on insurance company stocks in the post-SOX period. From the perspective of managers who use capital market risk measures to price insurance products (Fairley, 1979; Witt and Urrutia, 1983; Cummins and Harrington, 1988; and Moridaira *et al.*, 1992), our results suggest that insurance premiums may increase. However, the riskiness of insurers that had strong disclosure and governance in the pre-SOX period may be less affected. Thus, the competitive position of these firms relative to those with weak disclosure and governance may be bolstered.

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