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(計畫名稱)

保險公司管理策略對再保險、經營績效與風險承擔行為之影響分析

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第二年計畫：**The Impact of Corporate Governance Reform on the Efficiency
Performance of Property-liability Insurance Industry**

成果報告類型(依經費核定清單規定繳交)： 精簡報告 完整報告

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I. 中文摘要

公司治理的結構與其組成要素是否影響保險公司之經營績效，一直是保險研究文獻中的重要問題，雖然過去文獻有許多討論，但是實證結果較多以製造業為主，尤其針對保險公司之公司治理的結構與其組成要素是否影響保險公司之經營績效，文獻中卻沒有一致的答案，因此本研究探討透過良好的公司治理是否真能提升保險公司之經營績效。美國最近實施 Sarbanes-Oxley Act 要求公司強化公司治理制度，本研究蒐集美國產險公司 2000 到 2007 年的實證資料，希望檢驗 Sarbanes-Oxley Act 是否真能有效改善公司治理並進一步提升美國保險公司效率。本研究利用資料包絡分析法 (data envelopment analysis) 以及公司治理相關變數，檢證 Sarbanes-Oxley Act 前後產險公司之經營績效是否有明顯差異，以及透過良好的公司治理是否真能提升產險公司之經營績效。研究結果發現美國產險公司之公司治理的結構與其組成要素的確顯著影響到保險公司之經營績效，而且在 Sarbanes-Oxley Act 頒訂之後，美國產險公司已實際執行相關公司治理要求，並增聘更多獨立審計與董事人員，但整體而言，卻並未發現在 Sarbanes-Oxley Act 之後美國產險公司之經營績效有明顯的提升。

I. Abstract

This study examines the relation between corporate governance and the performance of the U.S. property-liability insurance industry during the period from 2000 to 2007. We find a significant relation between performance and corporate governance (board size, proportion of independent directors on the audit committee, proportion of financial experts on the audit committee, director tenure, proportion of block shareholding, average number of directorships, proportion of insiders on the board, and auditor independence). We also find property-liability insurers have complied with the Sarbanes-Oxley Act to a large extent. While SOX achieved the goal of more auditor independence and might have prevented Enron-like scandals, it had some unexpected effects. For example, insurers became less efficient when they had more independent auditors because the insurers were unable to recoup the benefits of auditor independence.

II. Introduction

The role and quality of corporate governance mechanisms is the subject of current debate in the United States. The impetus for much of this interest was a series of unexpected accounting scandals (e.g. Enron and WorldCom) that highlighted the apparent weaknesses in the system of governance and accountability. The principal response to these concerns was passage of the Sarbanes-Oxley Act (SOX) in 2002. This law imposes a number of corporate governance, auditor independence, financial disclosure, and other rules on all publicly-traded companies in the United States. Passage of SOX provides additional motivation for insurers to address corporate governance issues.

The past decade has also witnessed increased interest in the quality of corporate governance in academic research. Many empirical studies examine the effect of corporate governance on the performance of industrial firms (e.g., Prowse, 1998; Rajan and Zingales, 1998; Vafeas and Theodorou, 1998, and Core et al., 1999). While much public and academic interest has been directed at non-financial service industries, little attention has been paid to the insurance industry with few exceptions. The issue of the role of board structure for property-liability insurers is important, because they face a different set of agency costs and more intense regulatory scrutiny than do the boards of non-financial firms. Prior studies use profitability measures (e.g., return on equity) or Tobin's Q as proxies for performance, but they have not examined the relation between corporate governance and performance in the U.S. property-liability insurance industry. Performance in this study is measured by efficiency scores estimated using data envelopment analysis (DEA).

Using 224 firm-year observations of U.S. property-liability industry over the period from 2000 to 2007, this study examines the relation between corporate governance and firm performance. In addition, we investigate whether the SOX affects insurer performance through changes in corporate governance. We find a significant relation between performance and corporate governance (board size, proportion of independent directors on the audit committee, proportion of financial experts on the audit committee, director tenure, proportion of block shareholding, average number of directorships, proportion of insiders on the board, and auditor independence). We also find property-liability insurers have complied with the Sarbanes-Oxley Act to a large extent. For example, independence of auditor as measured by the ratio of nonaudit fee to total fees decreased from 37.2% to 13.9%. While SOX achieved the goal of greater auditor independence and might have prevented Enron-like scandals, it had some unexpected consequences. For example, insurers became less efficient when they had more independent auditors because the insurers were unable to reap the benefits of auditor independence.

We believe our findings shed additional light on the issues related to corporate governance. This is the first study to document a relation between corporate governance and firm performance in the U.S. property-liability insurance industry. Second, SOX has imposed a number of changes in corporate governance for U.S. publicly-traded companies since 2002. However, no study has examined compliance with SOX by property-liability insurers. This study not only examines compliance, but explores the relation between corporate governance mechanisms and firm performance after implementation of the SOX. Our results have important policy

implications. For example, evidence of a linkage between board characteristics and performance measures could enable regulators to decide whether or not to improve the existing governance mechanisms of property-liability insurers.

SOX also requires auditor independence. One of the problems with Enron was that the auditing firm was collecting large fees for rendering additional services to Enron. The results of this study are important not only for understanding auditor independence after the implementation of the Sarbanes-Oxley Act, but also the impact of auditor independence upon insurers' performance.

Research Hypothesis

In this paper, we develop nine hypotheses we test to examine the relation between corporate governance and performance in the U.S. property-liability insurance industry as follows:

Hypothesis 1: There is no relation between board size and firm performance in the U.S. property-liability insurance industry.

Hypothesis 2: There is no relation between the independence of the audit committee and firm performance in the U.S. property-liability insurance industry.

Hypothesis 3: There is no relation between the proportion of directors with financial expertise on the audit committee and firm performance in the U.S. property-liability insurance industry.

Hypothesis 4: There is no relation between the average tenure of directors and firm performance in the U.S. property-liability insurance industry.

Hypothesis 5: There is no relation between the proportion of block shareholders and firm performance in the U.S. property-liability insurance industry.

Hypothesis 6: There is no relation between the average number of appointments that directors serve concurrently and firm performance in the U.S. property-liability insurance industry.

Hypothesis 7: There is no relation between the average number of directorships that directors serve concurrently and firm performance in the U.S. property-liability insurance industry.

Hypothesis 8: There is no relation between the proportion of executive directors on the board and firm performance in the U.S. property-liability insurance industry.

Hypothesis 9: There is no relation between auditor independence and firm performance in the U.S. property-liability insurance industry.

Data and Variables Description

Our data set initially consisted of all property-liability insurers for the period from 2000 to 2007. There were initially 24,161 data points (number of firms times years of data available, "firm-years"). We focus on publicly-traded, pure-play, insurers because the Sarbanes-Oxley Act applies only to publicly-traded companies. These companies have more complete corporate governance data available than companies that are not publicly-traded. Given the statistical

technique employed, we excluded firms that reported negative output and input variables (7,368 firm-year observations) and firms with fewer than 8 years of complete data available (5,402 firm-year observations). These restrictions result in a final sample of 28 publicly-traded firms with 224 firm-year observations. These companies have complete data available in the National Association of Insurance Commissioners (NAIC) database over the eight-year period. We obtained corporate governance data from Form DEF 14A (Definitive Proxy Solicitation Material) which these insurers filed with the Security and Exchange Commission (SEC).

Methodology

Previous studies examining performance have used a number of measures, such as return on assets (Core et al., 1999; Anderson and Reeb, 2003; Lai and Limpaphayom, 2003; Filatotchev et al., 2004) and Tobin's Q (Chen, 2001; Evans et al., 2002; Anderson and Reeb, 2003). A growing body of recent literature utilizes alternative measures of efficiency as proxies for performance. Specifically, the econometric (parametric) approach of data envelopment analysis (DEA) and the mathematical programming (non-parametric) approach of DEA (see Cummins and Weiss, 2000) have been employed to measure efficiency. These alternative methods provide meaningful and reliable measures of firm performance.

Following previous literature in the insurance industry, we use the non-parametric mathematical linear programming approach of data envelopment analysis (DEA) to measure efficiency (see Cummins et al., 1999; Cummins and Weiss, 2000; Hardwick et al., 2003; Jeng and Lai, 2005, and Jeng et al., 2007). One advantage of the DEA approach is that multiple inputs and outputs are considered when estimating efficiency. Moreover, it is less demanding than parametric approaches in terms of degrees of freedom. Finally, it avoids the problem of vulnerability to specification errors frequently encountered when the econometric approach is used (Cummins and Weiss, 2000; Diacon et al., 2002; Hardwick et al., 2003). To save space, we do not discuss the DEA approach in detail here. Please see Cummins and Weiss (2000) for a description of the technique.

The DEA approach requires multiple inputs and outputs to estimate efficiency. We use the value-added approach of DEA to measure outputs (Cummins et al., 1999; Jeng and Lai, 2005; Jeng et al., 2007).

We define insurance output as losses incurred (e.g., Cummins and Weiss, 1993; Berger et al. 1997). Because underwriting risk and service intensity vary by line of business, we further disaggregate losses into four categories: short-tail personal lines, long-tail personal lines, short-tail commercial lines, and long-tail commercial lines. Losses are deflated to the base year 2000 using the Consumer Price Index (CPI). In addition to pooling losses and providing insurance services, insurers also perform a financial intermediation function by borrowing funds from policyholders and investing the funds in financial securities. We use total invested assets as the output for the intermediation function. Total invested assets are deflated to the base year (2000) using the Consumer Price Index (CPI).

Following Cummins et al. (1999) and Cummins and Weiss (2000), we define four inputs: labor, business services, equity capital, and debt capital. Labor input is the sum of salaries, employee benefits, payroll taxes, and other employment-related costs. The quantity of labor input

is defined as labor costs divided by a salary deflator, which indexes average weekly employee wages for the North American Industry Classification System (NAICS) code 524126. The salary deflator is the price of the labor input. Business services consist of outside service costs (measured by agents' commissions) and material costs (measured by loss adjustment expenses). The price of business services is the labor price index which indexes average weekly wages for the North American Industry Classification System (NAICS) code 54. Following Jeng and Lai (2005), we use current surplus to measure equity capital. The price of capital input equals the debt-equity ratio of the previous year. The last input is debt capital supplied by policyholders, which consists primarily of funds borrowed from policyholders. These funds are measured in real terms as the sum of loss reserves and unearned premium reserves, deflated by the CPI to the base year (2000). The price of the debt input is equal to investment income attributed to debt divided by total debt capital.

In addition to univariate analysis, we also conduct regression analysis to explain the efficiency scores. The regression model is specified below:

$$ES_{it} = \alpha + \beta_1 B_{size}_{it} + \beta_2 Aud_{ind}_{it} + \beta_3 Aud_{exp}_{it} + \beta_4 Tenure_{it} + \beta_5 Block_{it} + \beta_6 Conmgt_{it} + \beta_7 Condir_{it} + \beta_8 Insider_{it} + \beta_9 Auditdependence_{it} + \beta_{10} Size_{it} + \varepsilon_{it} \quad (1)$$

The dependent variable in the model, ES (Efficiency Score), is the efficiency variable which can be technical efficiency (TE) or cost efficiency (CE).

The independent variables are defined as follows. B_{size}_{it} is the total number of directors on the board for firm i in year t . Aud_{ind}_{it} is defined as the proportion of independent non-executive directors on the audit committee for firm i in year t . Aud_{exp}_{it} is defined as the proportion of the members of the audit committee who have financial expertise for firm i in year t . $Tenure_{it}$ is defined as the average number of years the directors have been on the board for firm i in year t . $Block_{it}$ is defined as shares held by block shareholders divided by the outstanding shares for firm i in year t . $Conmgt_{it}$ is defined as the average number of appointments that directors serve concurrently for firm i in year t . $Condir_{it}$ is defined as the average number of directorships that directors serve concurrently for firm i in year t . $Insider_{it}$ is defined as the proportion of executive directors on the board for firm i in year t . $Auditdependence_{it}$ is defined as the ratio of the non-audit fee to the total fee charged by the auditor for firm i in year t . Previous research has repeatedly shown that company size has an impact on corporate performance (e.g., Chen 2001; O'Sullivan and Diacon, 2003; Hardwick et al., 2003). Therefore, we incorporate firm size as a control variable in the regression. Size is measured by the natural logarithm of the total equity of the firm.

In addition, we further conduct regression analysis to examine our hypotheses. The above regression model assumes that corporate governance is exogenous. If corporate governance variables are endogenously determined, the regression model may be misspecified. We use the two-stage least squares method (2SLS) to deal with the endogeneity issue. The Durbin-Wu-Hausman (DWH) test is performed to justify the use of 2SLS. First, a "suspicious" endogenous variable (e.g., B_{size}) is regressed against all the exogenous variables and instrumental variables, and the residuals are saved. The regression is specified as: Endogenous variables = f (instrumental variables, corporate governance variables, and control variables). The

instrumental variables are Tobin's Q, sales growth rate, and cash flow growth rate. Tobin's Q is defined as the market value of equity plus the book value of debt divided by the book value of total assets. Second, the residuals of the endogenous variable obtained from first stage are added as an additional independent variable in the following equation:

$$ES_{it} = \alpha + \beta_1 Bsize_{it} + \beta_2 Audind_{it} + \beta_3 Audexp_{it} + \beta_4 Tenure_{it} + \beta_5 Block_{it} + \beta_6 Conmgt_{it} + \beta_7 Condir_{it} + \beta_8 Insider_{it} + \beta_9 Auditdependence_{it} + \beta_{10} Size_{it} + \beta_{11} Bsize_res_{it} + \varepsilon_{it}$$

III. Research Results and Conclusion

This study examines the effects of corporate governance on firm efficiency and the impact of implementation of the Sarbanes-Oxley Act on the relation between corporate governance mechanisms and firm efficiency in the U.S. property-liability insurance industry. We summarize our findings below. We find the following corporate governance variables are significantly and positively related to cost efficiency: board size, the proportion of independent directors on the audit committee, director tenure, proportion of block shareholding, the average number of directorships, the proportion of insider on the board, and auditor dependence. On the other hand, we find that the proportion of financial experts on the audit committee and the percentage of ownership of block shareholders are negatively related to cost efficiency. The results of the relation between corporate governance and technical efficiency are very similar to the relation between corporate governance and cost efficiency.

The results of the difference of means tests for corporate governance variable prior to and following SOX implementation show that some governance measures changed significantly. The most important finding is that auditors are more independent post-SOX implementation, implying auditors in property liability insurance industry complied with the independence requirement under SOX. The overall results suggest that the property-liability insurance industry has responded to the implementation of the Sarbanes-Oxley Act.

We examine the impact of SOX on the relation between corporate governance and efficiency. The evidence shows that there is no difference in terms of efficiency prior to or following SOX implementation. We find that the greater independence of the audit committee has a positive effect on efficiency scores after the implementation of SOX, although the effect is marginal. The evidence also shows that although insurers have more financial expert seats on the audit committee post-SOX, efficiency declined. The results show insurers with greater auditor independence have lower firm efficiency following SOX implementation. In summary, SOX did not increase the overall efficiency of insurers, but has had an impact on three corporate governance variables.

Proponents of government intervention in corporate governance argue that there is a positive relation between the use of governance measures and firm performance. Therefore, proper governance measures should be mandated through law (e.g. Vafeas and Theodorou, 1998). Our overall results have important public policy implications. They show that most corporate governance variables do have a statistically significant impact on the efficiency of insurers. Although consistent with most previous literature, two results are somewhat surprising. First, a higher proportion of financial expert seats on the audit committees was associated with lower

firm efficiency. Second, auditor independence has a negative effect on firm efficiency. SOX required more independence of auditor and the industry complied. While the regulation achieved the goal of more auditor independence and might have prevented Enron-like scandals, it has unexpected effects: insurers became less efficient when they have more independent auditors because insurers were not able to enjoy the spillover effect of auditor dependence.