REINSURANCE COUNTERPARTY ANALYSIS IN LIFE INSURANCE INDUSTRY: THE IMPACT ON FIRM PERFORMANCE/MERGERS AND ACQUISITIONS IN GLOBAL INSURANCE INDUSTRY

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ABSTRACT

The first part of the dissertation aims to determine whether and how variances in reinsurance relationships impact insurers' financial performance during the sample period of 2002-2012. Such impact on insurers' financial performance is measured by accounting measurements of ROA and ROE and by the efficiency scores (cost, revenue, and profit) estimated using data envelopment analysis (DEA). This essay analyzes how the usage of captive reinsurance affects life insurers' firm performance using multivariate regression model. Results show that firm performance is negatively related to captive reinsurance arrangements.

The second essay analyzes the value effects of mergers and acquisitions (M&As) in the global insurance industry by conducting an event study of M&A transactions that occurred during the period of 1990-2014, including two M&A waves before the financial crisis and the M&A activities after it. Our results show that (1) M&As are value-enhancing for both acquirers and targets over the whole sample period; (2) for acquirers, within-border transactions are more likely to be value-enhancing, while for targets, both cross-border and within-border transactions are value-enhancing; and (3) for acquirers, the cross-industry M&As are more likely to be value-enhancing, while for targets both cross- and within- border M&As are value-enhancing.

THIS DISSERTATION IS DEDICATED TO MY ALWAYS ENCOURAGING, EVER FAITHFUL PARENTS AND MY LOVED ONE, XIAOXIANG.

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CHAPTER 1

REINSURANCE COUNTERPARTY ANALYSIS IN LIFE INSURANCE INDUSTRY: THE IMPACT ON FIRM PERFORMANCE

1.1 Introduction

Traditionally, life insurers are motivated to reduce liabilities through reinsurance arrangements for four reasons: risk transfer, underwriting assistance, tax management and capital management. After 2000, new regulations were implemented that require life insurers to hold increased statutory capital reserves against life insurance liabilities. In response, certain state laws were enacted after 2002 that allowed life insurers to establish captives to circumvent such increased capital requirements. Thus life reinsurance has been more heavily motivated by capital and tax management, rather than risk transfer and underwriting assistance. Many life insurers have established captives whose primary purpose is to assume reinsurance from parent companies in order to reduce capital reserves. Affiliated life reinsurance grew from $90 billion in 2002 to $572 billion in 2012 and has surpassed unaffiliated reinsurance since 2007. In contrast, unaffiliated reinsurance peaked at $287 billion in 2006 and has remained nearly constant thereafter (Koijen and Yogo, 2016b).

The impact of captive reinsurance on life insurers' performance has not been clearly delineated as of yet and is subject to hot debate. The New York State Department of Financial Services asserted in a report published in June 2013 that such "shadow insurance" arrangements place the broader financial system at risk because such arrangements tend to obscure financial weaknesses. Further, there is little public disclosure of financial statements to accurately assess this risk. On the other hand, Koijen and Yogo (2016b) find

that such practices reduce marginal cost of issuing policies, eases the burden imposed by statutory requirements and has beneficial effect on the retail market's efficiency. Further, with shadow insurance, life insurers may also issue more policies for a given amount of equity and the result is reduced risk-based capital and increased expected loss for the industry. Thus, Koijen and Yogo (2016b) argue that the use of shadow insurance increases the riskiness of life insurers. Harrington (2014, 2015) finds no credible evidence proving that insolvency risk significantly increased due to captive reinsurance arrangements. In view of the above, this paper aims to determine whether and how use of shadow insurance impact insurers' financial performance.

We also examine the effects of affiliated life reinsurance on the performance of ceding life insurers in this paper. In general, affiliated reinsurance can help reduce informational asymmetries, control for adverse selection and moral hazard, reduce counterparty risk in long-term contracts, and may be more efficient in circumventing increased capital requirement. On the other hand, non-affiliated reinsurance may be beneficial for risk transfer and diversification, as compared to affiliated reinsurance. We measure insurers' financial performance using efficiency scores estimated by data envelopment analysis (DEA) as well as conventional accounting measures such as return on asset (ROA) and return on equity (ROE) over the sample period 2002-2012. The cost efficiency, profit inefficiency, and revenue efficiency scores capture any reduction in the marginal cost of issuing a policy. The performance measures are then regressed on a set of independent variables that include measures of captive reinsurance and unaffiliated reinsurance as well as firm-specific control variables to determine the relationship between performance and reinsurance counterparty choice.

Although the debate and controversy over captive reinsurance arrangements have received substantial attention, there are limited studies on the impact of such practices because there is little public disclosure on captive reinsurance in the ceding company's financial statement until 2013. Harrington (2014, 2015) examines the use of captive reinsurance and discusses benefits and potential risks of captive practice in life insurance based on qualitative and quantitative analysis. Koijen and Yogo (2016) also document new facts about shadow insurance and develop a simple model to investigate the effect of shadow insurance on marginal cost of issuing policies and risk-based capital. They conduct an empirical analysis on the relation between rating and shadow insurance and find the coefficient of shadow insurance statistically insignificant. Our work contributes to the current literature by showing the effect of shadow insurance on firm performance measured by efficiency scores and accounting measures. Based on these results, we find shadow insurance overall decreases the firm performance.

The remainder of this paper is organized as follows: Section 2 briefly reviews the related literature in property and casualty insurance industry, life industry and captive reinsurance. Section 3 develops hypotheses about the impact of counterparty relationships on insurer financial performance, including the use of unaffiliated reinsurance and the use of captive reinsurance. Section 4 outlines our methodology, the procedures to estimate efficiency scores and data sources, and section 5 presents the data and empirical results. Section 6 concludes.

1.2 Literature review and the use of captive insurance

1.2.1 Property-Casualty reinsurance literature

As a mechanism to transfer risk and increase underwriting capacity, reinsurance has been critical for primary insurers. Property-casualty (PC) insurers extensively use reinsurance to reduce the volatility of loss claims for large and infrequent losses. Reinsurance may also decrease the strain on insurer's capital resulting from the relative unpredictability of loss claims with higher loss ratio volatility. By reducing exposure and increasing surplus, reinsurance also reduces the strain on capital imposed by regulations. The reinsurers may also assist the primary insurers with regard to underwriting, marketing, pricing, industry data analysis and risk modeling, that is reinsurance can essentially serve as informal consulting service providers and facilitate the primary insurers' risk mitigation.

Demand for reinsurance in the PC insurance market has been well documented in the existing literature. Mayers and Smith (1990) find that ownership structure, firm size, geographic concentration and line-of-business concentration are significantly related to the demand for reinsurance. Garven and Lamm-Tennant (2003) argue that as the firm's leverage increases, the correlation between the firm's investment returns and claims costs decreases, firms assume more long-tail risk and invest more in tax-favored assets; as a result, the demand for reinsurance will increase. However, they only examined data of unaffiliated insurers, which represent only a small segment of the reinsurance industry. Shiu (2011) draws a similar conclusion that the level of reinsurance purchases correlates with the insurer's leverage. Shiu (2011) examined U.K. non-life insurers' capital structure and its correlation to reinsurance demand.

Reinsurance transactions generally decrease regulatory capital requirement and reduce taxable income. These effects suggest that, all else being equal, reinsurance should increase with regulatory costs and decline with the high marginal tax rate. Adiel (1996) finds that insurers enter into financial (finite) reinsurance transactions to reduce regulatory costs, but his results do not support the hypothesis that the marginal tax rate motivates insurers to purchase more reinsurance.

By comparing reinsurance activities between affiliated and unaffiliated insurers, Powell and Sommer (2007) argue that certain common determinants exist for the demand for affiliated and unaffiliated reinsurance; but the purchase of affiliated reinsurance is more motivated by cost-reduction such as reducing information asymmetries, and concerns over firm organization that often prevent mutual insurers from accessing external capital. Powell, Sommer, and Eckles (2008) find internal capital market transactions, measured by affiliated reinsurance, are positively related to expected performance. The internal capital market within insurance group members created by affiliated reinsurance transactions has significant effects on the premium written by affiliated insurers. However, they primarily focus on the efficiency of affiliated reinsurance, rather than the impact of affiliated reinsurance on firm performance, which is addressed in this paper.

Cummins and Weiss (2014) investigate reinsurance counterparty relationships of property-liability and life insurers in the U.S. by providing both aggregate level and firm level reinsurance information. They find relatively high concentrations of ceded reinsurance premium as well as reinsurance recoverable, indicating that if several large reinsurers become financially unstable, many primary insurers would be put at risk. Indeed,

18.4% of life insurer insolvencies were triggered due to interconnectedness with a few reinsurers (Cummins and Weiss, 2014).

Reinsurance purchases stabilize loss volatility, increase capacity, limit liability for specific risks, and/or protect against catastrophes. Consequently, reinsurance purchases should reduce insurers' insolvency risk and capital costs. However, the cost of reinsurance as a method of risk transfer may be much larger than the actuarial price of the risk transferred to reinsurers. Cummins, Dionne, Gagne, and Nouira (2008) conduct empirical analysis on the costs and the benefits of reinsurance for a sample of US property-liability insurers. They find that reinsurance purchase significantly increases the insurer's costs but significantly reduces the volatility of the loss ratio. With reinsurance purchase, insurers pay higher cost of insurance production to reduce their underwriting risk.

Reinsurance can be ceded to both authorized and unauthorized reinsurers. Unauthorized reinsurers are defined as those who are not licensed, accredited or approved by the ceding company's domicile state. SAP considers unauthorized reinsurers to be riskier than authorized, therefore mandates substantially stringent regulatory requirements for these reinsurers, unless their balances are secured or collateralized. The collateral requirement imposes additional cost on reinsurer, increasing the price of reinsurance. The difference between authorized and unauthorized reinsurance has not been extensively studied. Browne and Ju (2009) distinguish authorized reinsurance from unauthorized reinsurance in a study of loss reserve error and reinsurance purchase, and find that companies that purchase unauthorized reinsurance post less accurate loss reserves. Cole, McCullough, and Powell (2007) examine the relationship between price and uncollateralized reinsurance recoverable from unauthorized foreign reinsurers, and find no

significant relation between the use of unauthorized reinsurance and the price of insurance. They also find that larger firms, group members, stock companies, firms that write a larger percentage of catastrophe-exposed business, firms with a larger percentage of reinsurance ceded to foreign reinsurers, and firms that are more concentrated in terms of geography and product lines, to report a provision for unauthorized reinsurance. Their results suggest the required collateralization of reinsurance recoverable is not as necessary to protect U.S. insurers and insurance consumers as previously thought.

Some studies suggest primary insurers' performance is affected by their relationship with the reinsurance counterparties. In Jean Baptiste and Santomero's study (2000), they propose a theoretical model indicating that information asymmetry causes the price of reinsurance to increase and the efficiency of risk allocation to decrease. Long-term implicit contracts between insurers and reinsurers, as suggested by their model, allow the inclusion of new information into reinsurance pricing, resulting in a more efficient risk allocation between the counterparties. Garven and Grace (2011) test Jean-Baptiste and Santomero's theory by providing empirical evidence that long-term reinsurance contracting relationships are associated with higher levels of reinsurance coverage, higher insurer profits and lower risk of bankruptcy, other things equal. Scordis and Steinorth (2012) examine a sample of publicly traded insurance firms and find that hedging risk through reinsurance creates value for shareholders.

Cummins, Feng, and Weiss (2012) investigate the relationship between ceding insurer performance and the affiliation, the domicile, and the authorization of its counterparties in the U.S. property-liability insurance market. They find empirical evidence that ceding insurer financial performance is positively related to the use of

affiliated reinsurance and that performance is negatively related to the use of unauthorized reinsurance. These results provide significant empirical support for the cost of information asymmetry hypothesis, which predicts that a higher level of information asymmetry may reduce firm performance through a higher cost of reinsurance.

1.2.2 Life reinsurance and captive literature

Whereas the PC insurance industry commonly experiences large payouts triggered by natural catastrophes, the life insurance industry face fairly predictable longevity risk, as changes in mortality rates are closely associated with age. Longevity risk, being systematic in nature[1], also causes reinsurance treaties covering such risk to be expensive. As a result, when it comes to longevity risk, reinsurance is a very limited method to transfer risk. The substantial credit risk associated with long-term reinsurance coverage also deters life insurance companies to buy such coverage. Indeed, life insurers have put relatively less emphasis on reinsurance. In 2009, $112.5 billion was ceded by life insurers in reinsurance premiums, representing 19.0% direct premiums written and 32.3% of surplus, whereas PC insurers ceded $405.8 billion in reinsurance premiums, representing 85.0% of direct premiums written and 76.3% of surplus (Cummins and Weiss, 2014).

The National Association of Insurance Commissioners (NAIC) adopted Model Regulation 830 ("Regulation XXX", as commonly referred to) in January 2000, and Actuarial Guideline 38 (often referred to as "Regulation AXXX") in January 2003. Due to the implementation of these regulations, life insurers are required to hold more capital reserves against newly issued term life insurance and universal life insurance policies with

[1] Longevity risk is the risk of the whole populations having longer than anticipated life expectancy—for example, due to factors such as breakthroughs in medical treatment of certain diseases or general improvement of living conditions. These factors affect the general population. Thus, this risk is systematic in nature.

secondary guarantees so as to satisfy the statutory requirements. The effect of this was to strain life insurers' capital positions. On the other hand, after 2002 many states adopted laws that allowed life insurers to establish "captives," affiliated companies established primarily for the purpose of assuming the parent's reinsurance, to circumvent the new capital requirements. The rationale behind this arrangement is as follows: Regulations XXX and AXXX are required by statutory regulation and apply to statutory accounting principles (SAP) but not to generally accepted accounting principles (GAAP). Under GAAP, the reserve requirements are closer to economic values or actuarial values and generally lower than those under SAP. Captives are not subject to statutory regulations and report under GAAP. and Therefore insurers affected by Regulation XXX and AXXX may reduce overall capital reserves by ceding reinsurance to captives. As a result, in the past decade, captive reinsurance has become very popular with life insurers (Koijen and Yogo, 2016b).

For the life insurance business, industry players have been debating over the growing use of captive reinsurance arrangements in capital management. NAIC (2013) defines an affiliated non-traditional insurer/reinsurer as an insurance or reinsurance company that reinsures risks only from its parent or affiliates, and is subject to a financial solvency regulatory system separate from that generally applicable to traditional insurers and/or reinsurers in the ceding entity's domestic jurisdiction. Captive reinsurance has potential advantages over affiliated reinsurance.

First, Harrington (2014, 2015) argues that captive reinsurance is subject to less capital requirements, which provides ceding parent insurers an important tool for efficiently reducing the gap between statutory and economic reserves and managing capital,

thus enabling lower prices and issuing more insurance policies without increasing insolvency risk. Both the insurance company's state of domicile and the captive's state of domicile review and analyze each captive transaction to ensure they meet regulatory requirements[2]. In the context of captive transactions, the insurance company will determine the economic reserves associated with the obligations through actuarial analysis. The formula used to determine the economic reserves is reviewed by an independent third party actuary and may be subject to an annual independent third party actuarial review.

Second, captives have a more flexible financial structure for funding the gap between statutory and economic reserves or the reserve redundancy. For the life insurers to take credit for reserves ceded to the captive, the captive reinsurer must be authorized in its domicile state. If not authorized, the captive must post collateral that meets the regulatory requirements of the domicile state. Life insurers ceding to unauthorized captives can reduce the required Risk Based Capital while keeping the reserves on the ceding insurers' balance sheet. Collateral can take the form of assets held in trust, a letter of credit (LOC), or funds withheld. According to an August 2013 Moody's report (Moody's Investor Service 2013; also see Koijen and Yogo, 2016b), at year-end 2012, life insurers reported $169 billion of reserve credits from business ceded to unauthorized affiliates and another $155 billion of reinsurance with unauthorized affiliates which provided some capital relief without reducing reported reserves. The total of $324 billion represented 12% of total reserves and equaled about 85% of total capital and surplus.

[2] The transactions must face regulatory scrutiny. The ceding insurer's domicile states will scrutinize the terms of the reinsurance agreement, and examine the use of reinsurance trusts, LOCs, as well as assets investment within or outside of the trust. The ceding insurer must also meet SAP and state regulatory requirements to receive reserve or RBC credit. On the other hand, regulators of the captive reinsurers' domicile state also impose certain requirements that must be satisfied.

On the other hand, captive insurance may reduce risk-based capital and increase expected loss for the industry (Koijen and Yogo, 2016b). Fragile sources of funding, such as conditional letters of credit (guaranteed by the parent company) and naked parental guarantees, was found to be in widespread use by Lawsky (2013) after examining non-public financial statements of captives that assume reinsurance from primary companies in New York. These fragile sources of funding erode the effective equity in captives because many companies' captives are capitalized at lower levels compared to large and healthy companies (Moody's Investor Service, 2013). Koijen and Yogo (2016b) also conclude that the average insurer utilizing shadow insurance would experience a 53% reduction in risk-based capital and a 350% increase in default probability if the shadow insurance transactions were properly adjusted.

Existing literatures on the impact of captive reinsurance lack empirical analysis. We use the definition of shadow insurance by Koijen and Yogo (2016b) to study the impact of captive reinsurance on firm performances, measured by cost efficiency, revenue efficiency, profit inefficiency, as well as ROA and ROE, while previous literatures use A.M. best ratings.

1.3. Hypotheses: Affiliation and Captive Reinsurers

This section discusses the development of hypotheses that are tested in the subsequent sections of this chapter, including the use of unaffiliated reinsurance and the use of captive reinsurance. The motivation of using captive reinsurance, the benefits and risk of captive reinsurance are discussed in detail.

1.3.1 Affiliated vs. Unaffiliated Reinsurance

Although there are fewer affiliated than unaffiliated reinsurance agreements, the typical amount ceded is significantly higher for affiliated than unaffiliated reinsurance. Affiliated reinsurance may outperform unaffiliated reinsurance for several reasons.

Most importantly, unaffiliated reinsurance is more expensive than affiliated reinsurance because unaffiliated reinsurance increases asymmetric information, adverse selection and moral hazard between counterparties. That is, in an unaffiliated reinsurance transaction, the insurer possesses more information about the risks than the reinsurer, and the resulting information asymmetry incentivizes the insurer to transfer the worst risks to the reinsurer and/or to assume otherwise unacceptable risks if they are covered by the reinsurance contract. Such moral hazard can be reduced in an affiliated reinsurance relationship because if the insurer and the reinsurer share common ownership, their incentives are better aligned. Internalization of the costs of adverse selection and moral hazard is possible through vertical integration.

The cost disadvantages not only affect the demand for unaffiliated reinsurance, but also have significant effects on the efficiency of life insurers. Information asymmetry increases the price of reinsurance, thus reducing the efficiency of risk allocation between insurer and reinsurer (Jean-Baptiste and Santomero, 2000). Unaffiliated reinsurance will increase the long-term counterparty risk exposure associated with affiliated reinsurance. As a result of all of the above, the price of unaffiliated reinsurance might be higher than affiliated reinsurance (Powell and Sommer, 2007).

Second, unaffiliated reinsurance often requires longer negotiations over the terms and price of the contract, as well as expensive monitoring of the unaffiliated parties'

performance under the contract (Doherty and Smetter, 2005). On the other hand, transaction costs are lowered for affiliated reinsurance because insurers and reinsurers belonging to the same insurance group usually have good communication channels that already exist prior to the reinsurance purchase. Unaffiliated reinsurance is also more susceptible to price increases and supply restrictions in the hard-market of the underwriting cycle. Meanwhile, affiliated reinsurance provide a substitute for reducing the demand for external reinsurance and therefore efficiently lower expected bankruptcy costs (Mayer and Smith, 1990).

In addition, the use of reinsurance is related to primary insurers' efficiency and financial performance. Powell, Sommer, and Eckles (2008) find potential positive effects from affiliated reinsurance on an insurer's financial performance. This is because through affiliated reinsurance capital can be transferred to the affiliates with the best perceived investment opportunities. Cummins and Trainar (2009) argue that the risk warehouse model of reinsurance operates very efficiently for relatively small, mostly uncorrelated risks; but when the magnitude of potential losses and the correlation of risks increase, the traditional reinsurance model may become costly and uneconomical. This also suggests that traditional unaffiliated reinsurance is costly for life insurance because longevity risk in the life insurance industry is fairly predictable and is a systematic risk in nature. The improvement of mortality table and technology changes in medical engineering are all correlated and affect the whole population at the same time.

The above discussion suggests the following hypothesis:

H1: Ceding insurer performance is negatively related to the use of unaffiliated reinsurance.

1.3.2 Captive insurance

Over the last decade, capital management has become an increasingly important motive for life and annuity reinsurance. Capital requirements are also the most fundamental element of state solvency regulation. An insurer's regulatory capital roughly equals its total assets minus its total liabilities. Insurers that hold more capital relative to their liabilities have lower insolvency risk, other things being equal, and receive higher financial ratings by rating agency than those insurers with less capital. Strong financial ratings are beneficiary to attract risk-sensitive customers. However, holding more capital means increased costs, which are generally covered by higher premiums. Most of life insurance policies are price-sensitive. Insurers are strongly motivated to manage capital efficiently to provide more competitive prices for any given level of financial strength. Such incentives come from competitive market pressure, as well as minimum risk-based capital (RBC) requirements imposed by the states over the insurers. Failure to meet the RBC minimums leads to various levels of regulatory intervention. For these reasons, most life insurers hold capital substantially in excess of the RBC minimums in order to achieve high financial strength ratings to attract customers, and reduce the likelihood of regulatory intervention or insolvency (Harrington, 2014, 2015).

Because capital equals assets minus liabilities, to calculate an insurer's total capital, the insurer's liabilities must be accurately estimated. However, life insurers' liabilities to policyholders are affected by various uncertainties, such as mortality of policyholder, interest rates, and surrender rates. To account for such unique opacity of insurers' liabilities to policyholders, reserve regulations require insurers to calculate these liabilities using conservative assumptions and formulas. The Standard Valuation Law is the fundamental

law for life insurance reserving, which requires that reserves equal "the excess, if any, of the present value, at the date of valuation, of the future guaranteed benefits ... over the then present value of any future modified net premiums." Under this methodology, policies with high guaranteed premiums at later policy durations will have lower reserves than similar policies with a level premium. During the 1990s some insurers would use these strategies to reduce statutory reserves for certain term life policies and for certain universal life policies[3]. In response to concerns over such strategies to circumvent capital requirements, the NAIC adopted new reserve requirements for level premium term life insurance policies that required significantly higher reserves (known as XXX reserves) in 2000. To financing the reserve redundancies resulting from the new requirements, insurers have upward pressure on term life insurance rates, even after the adoption of a revised mortality table in 2001. In 2003, the NAIC adopted new reserve requirements (known as AXXX reserves) for certain universal life policies with secondary guarantees. In response to the XXX and AXXX statutory reserve regulations, insurers adopted new methods of capital management, which led to the development and continued expansion of captive reinsurance arrangements.

For the life insurance company either to take credit for reserves ceded to the captive or in some transactions reduce its required RBC while keeping the reserves on the ceding insurer's balance sheet, the captive reinsurer must either be "authorized", licensed or accredited in the ceding company's state of domicile. Alternatively, the life insurer could post collateral that met the regulatory requirements of the ceding company's state of domicile if the captive was "unauthorized". Collateral can be provided to back an

[3] Improved mortality had put a strain on capital for universal life policies with secondary guarantee.

unauthorized reinsurer's obligations to a ceding insurer. The three most common types of collateral are assets held in a reinsurance trust account, a qualified letter of credit (LOC) from an accredited bank, and specified funds withheld on the ceding insurer's balance sheet.

Captive reinsurance is commonly arranged in the form of coinsurance, modified coinsurance, and funds withheld. Coinsurance is also used extensively in non-captive reinsurance. With coinsurance, the ceding insurer transfers assets and reserves to the captive. The RBC requirements of ceding insurer can be lowered for the reinsurer authorized in the ceding insurer's domicile state or unauthorized but with enough credit in satisfaction of the collateral requirements. Just like with non-captive reinsurance, the ceding insurer may transfer to the captive reinsurer specified risks without transferring associated assets in captive reinsurance arrangements. The "modified coinsurance" (modco) is an arrangement form in which the ceding insurer transfers specified risk to the reinsurer while maintaining the assets and reserves on its balance sheet and receives credit in its required regulatory capital. The "funds withheld" arrangement allows the ceding insurer to transfer policy reserves and specified risk, withhold the associated assets and report an offsetting accounts payable liability on its balance sheet. Because the ceding insurer maintains the assets, modco and funds withheld agreements generally entail less default risk than ordinary coinsurance (Harrington, 2015).

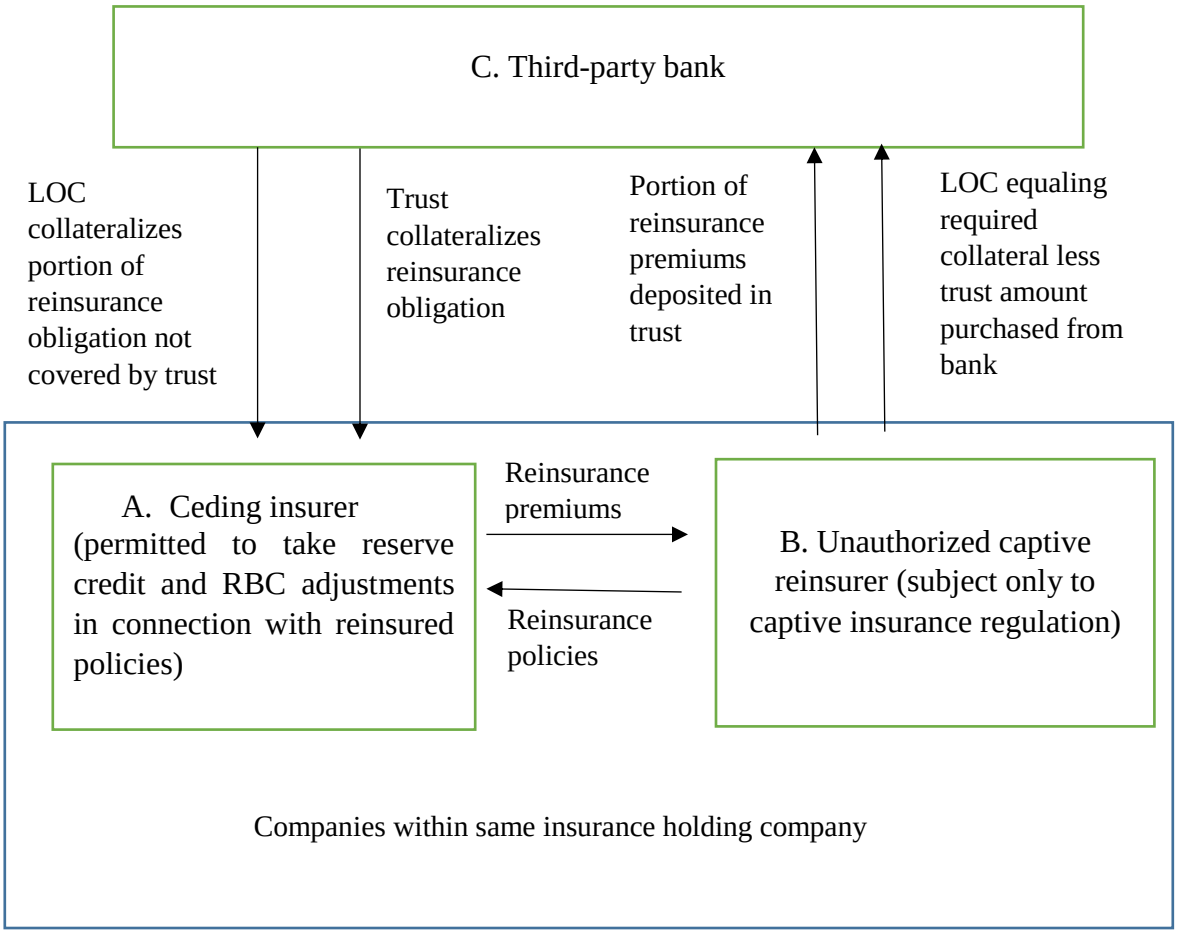
Captive reinsurers are subject to comparatively lax regulatory standards. First, captive insurers can operate with less relative equity than the primary insurers because they report under GAAP and are not subject to statutory regulation. For example, captives in Vermont are required to have only $250,000 in equity and are allowed to count LOC as admitted assets (Captives and Special Purpose Vehicle Use Subgroup, 2013). Second,

some states allow captives to recognize various "assets" on their balance sheets that would not be recognized under SAP or even GAAP. These assets can include LOC from banks, contingent notes, and parental guarantees[4]. Frequently, such collateral can be provided through a combination of a trust account (in which a portion of premiums paid by the ceding company are deposited to finance the economic reserve) and a LOC (issued from banks to finance the reserve redundancies). Both the trust and the LOC serve the dual roles of (1) serving as assets of the captive, and (2) providing collateral for the captive's reinsurance obligations. Figure 1 illustrates the structure of such a transaction. By contrast, in ordinary reinsurance transactions with unauthorized reinsurers, the reinsurer's assets are totally distinct from the collateral that backs its obligations to the ceding insurer. Third, in some states the reserve levels of captive insurers can be set on GAAP rules rather than SAP rules mandated under Regulations XXX and AXXX. Finally, captive insurers are generally not required by most states to disclose their financial statements to the public (Schwarcz, 2015).

Meanwhile, captive reinsurance arrangements also pose potential insolvency risks and could decrease the firm performance, including (1) limited transparency and diverse state regimes for regulating captives. The details of the captive reinsurance arrangements and specific effects on costs and prices are complex. And the financial statements of captives are confidential to the public, rating agencies, and even regulators outside their

[4] No. 109: Iowa's Frightening Accounting Rules—An Update, Belth, Josephm (July 13, 2013), http://Josephmbelth.com/2015/07/no-109-iowas-frightening-accounting.html. These reports identified various assets on these entities balance sheets that would not be treated as assets under either SAP or GAAP, including contingent notes, parental guarantees, and letters of credit.

Figure 1 Shadow Insurance Transaction Using LOC and Trust as Collateral to Back Unauthorized Captive Reinsurer's Obligations



state of domicile. Recent state regulatory reforms designed to disclose more details of shadow insurance transactions only partially address this problem because they fail to mitigate the opacity that results from the complexity of captive reinsurance. (2) the riskiness of flexible financing instruments and weakly capitalized captives. Fragile sources of funding, such as conditional letters of credit (guaranteed by the parent company) and naked parental guarantees, was found to be in widespread use by captives that assume reinsurance from primary companies in New York. These fragile sources of funding erode the effective equity in captives because many companies' captives are capitalized at lower levels compared to flagship companies (Moody's investor service, 2013). The Iowa Insurance Division (2014) recently released financial statements for eight captives in their domicile for 2013 and 2014. These financial statements report how much equity these captives have when evaluated under the statutory accounting principles that apply to operating companies. Six of the eight captives have significantly negative equity under statutory accounting (Koijen and Yogo, 2016b).

Shadow insurance likely lowers the cost of life insurance by decreasing the amount of capital that must be held by insurers. At the same time, however, shadow insurance has initial set-up costs and maintenance costs and also creates various potential risks for policyholders, the insurance industry, and perhaps even the broader financial system. Weighing these costs and benefits is a complicated and ultimately value-laden exercise. Based on the above discussion, we propose the following hypothesis:

H2: Ceding insurer performance is positively related to the use of shadow insurance.

1.4. Methodology

This section first discusses the measures of firm performance, including estimation of firm efficiency using data envelopment analysis (DEA). Then the discussion turns to the specification of multivariate regression models and the definition of dependent and independent variables.

1.4.1 Measures of Firm Performance

We estimate firm performance using modern frontier efficiency analysis as well as conventional performance measures such as return on equity (*ROE*) and return on assets (*ROA*). The performance measures are then regressed on a set of independent variables representing the use of various types of reinsurance as well as control variables to determine the relationship between primary insurer performance and the use of reinsurance.

To estimate how well firms are doing relative to the existing production technology we use frontier efficiency. Two major frontier efficiency estimation methodologies exist: the econometric methodology and the mathematical programming (nonparametric) methodology. In Berger, Cummins, and Weiss (1997) the econometric methodology is used. However, the mathematical programming method has several advantage over the econometric methodology by avoiding the choice of a functional form for the technical, cost, or revenue function, allowing for zero inputs and outputs, and requiring no distributional assumptions. For these reasons we apply the mathematical programming in this study.

The most popular non-parametric method is "data envelopment analysis" (DEA). The objective of this technique is to find the set of "best practice" firms that dominate each firm in the industry and then measure the performance of each firm relative to "best practice"

frontiers. We use DEA (Cummins et al. 2010) to estimate efficient production, cost and revenue efficiency, and profit inefficiency for each firm in our sample.

Insurers are analogous to other financial firms, so in keeping with recent banking and insurance literature we measure the output of insurance firms using the value-added approach. The principal services provided by insurers include risk pooling and risk bearing, real financial services relating to insured loss, and financial intermediation services. We proxy the quantities of risk-pooling and real insurance services by net benefits plus additions to reserves (Yuengert, 1993; Berger, Cummins, and Weiss, 2000; Cummins et al., 2010). Because the lines of life-health insurance differ in risk characteristics and contingent events, we group together lines with similar characteristics and contingent events. Five lines are created: individual life (including industrial life, ordinary life, supplementary contract, credit life, and miscellaneous lines), group life, individual annuities, group annuities, and accident and health.

To be consistent with the value-added approach, the output prices are defined as the sum of premiums and considerations minus output for each line divided by output. If the output quantity is 0 and therefore output price cannot be defined, we try replacing the output price by 0, the 10^{th} percentile, 25^{th} percentile and median of the corresponding price distribution. Sensitivity tests shows that revenue efficiency and profit efficiency are relatively low if we choose a high percentile to replace the undefined price. A lower percentile for price is used because it is assumed the insurer would make relatively lower profit in the output line. Lower profit is associated with low profit. We calculate revenue efficiency and profit efficiency using 0 and the 25th percentile of the price distribution to replace the undefined observations. The regression results are robust to the output

replacement prices utilized. We present results using 0 as the replaced output price for undefined prices in the regressions.

Meanwhile, the insurance company provides financial intermediation services. We measure the quantity of the intermediation output by average invested assets. The price of this output is defined as the expected return on invested assets. We treat stocks and other invested assets separately. The expected return for stocks for a given year is the average 30-day Treasury bill rate at the end of the preceding year plus the long term (1926 to the end of year t-1) average market risk premium on large company stocks from Ibbotson Associates (2013). The price for other invested assets is the income earned for the year. The price of intermediary output is the weighted average of expected returns on stocks and the actual return on other invested assets. [5]

The inputs are classified into four groups: administrative (main office) labor, agent labor, materials and business services, and financial capital. We measure the current price of administrative labor using the home office's US Department of Labor (DOL) average weekly wage rate for life insurers (NAICS code 524113). The current price of agent labor is calculated as the state-premium weighted average of agent wage using the US Department of Labor average weekly wage rate for insurance agents (NAICS 524210). [6]The current price of the materials/business services input is the weighted average of DOL price indices for business services based on insurer non-wage expenses. All variables are deflated to real 2003 values by the CPI to obtain the real prices of the inputs. The quantity

[5] Jeng, Lai, and McNamara (2007) estimate efficiency to discuss the effect of demutualization. Although they use DEA and the valued added approach, they define input and output differently from Cummins et al. (2010) and what is used here. In Jeng, Lai, and McNamara (2007), outputs are categorized as death, annuity, surrender, and accident and health. This classification fails to distinguish individual business and group business.

[6] National average weekly wage rates are used to avoid missing observations.

of labor is computed by dividing the total expenditure on labor by the price of labor. The price and quantity of agent labor and business services are defined similarly. Our final input is financial capital. The quantity of this input is measured as the average of beginning and year-end equity capital and surplus, deflated by the CPI. To estimate the cost of equity capital, we adopt an approach utilized in prior insurance efficiency research (Cummins et al., 2010). For a given year, the cost of equity is calculated as the 30-day Treasury bill rate at the end of year t-1, plus the long term average market risk premium on large company stocks, plus the long term average size premium (Ibbotson Associates 2013).

1.4.2 Specifications of Multivariate Regression Models

Specification tests were conducted to determine whether company and year effects were present and whether random or fixed effects estimation would be more appropriate. The Hausman test[7] suggests that the fixed effects model is preferable to random effects model. We use two-way fixed effects model with year dummy included[8] for panel data in our subsequent regression analysis.

We estimate the following model with two stage least squares (2SLS) regressions to test the Hypotheses:

$$y_{i,t} = \alpha + \sum_{j=1}^{n} \beta_j REINS_{i,j,t} + \sum_{k=1}^{m} \gamma_k CTRL_{i,k,t} + \sum_{p=1}^{p} \varphi_p YearDummy_{i,p,t} + \varepsilon_{i,t} \qquad (1)$$

Where $y_{i,t}$ is the firm's efficiency score or risk measure in period t. Separate regressions are estimated for cost efficiency, revenue efficiency, and profit inefficiency[9].

[7] P value of Hausman test is <0.05.

[8] Because there is not enough time series data points for each company to investigate company effect, our model does not include company effect.

[9] Technical efficiency is also tested and has the same result as cost efficiency and revenue efficiency. It is not reported in this paper.

We also estimate regressions with reported accounting performance variables such as return on assets (ROA) and return on equity (ROE) as dependent variables. The independent variables REINS and control variable CTRL are described as follows. They are also summarized in Table 1 Year Dummy variables are included to control for year effects.

Use of Unaffiliated Reinsurance We use reinsurance premium ceded to measure the ceding insurer's reliance on reinsurance. The use of unaffiliated reinsurance can be defined as the percentage of premium ceded to unaffiliated reinsurers to total ceded premium.[10] According to the hypotheses, the use of unaffiliated reinsurance are expected to be negative related to cost efficiency, revenue efficiency, ROA and ROE and positive related to profit inefficiency.

Use of captive insurance In 2013, insurers were required to provide information for authorized captives, unauthorized captives, and all captives combined. For our sample period of 2002-2012, reinsurance schedules in life insurers' statutory financial statements did not separately identify aggregate transaction statistics for captive reinsurance versus other affiliated reinsurance. Therefore we follow the definition of shadow reinsurers by Koijen and Yogo (2016b) as affiliated and unauthorized reinsurers without an A.M. Best rating. This definition is more restrictive than "captives" because some captives are actually authorized. With "modified coinsurance" (modco) and funds withheld arrangements, the ceding insurer maintains the associated assets while transferring

[10] The use of unaffiliated reinsurance is also measured by the percentage of premium ceded to unaffiliated reinsurance relative to total direct premium plus net reinsurance assumed and the percentage of reserve credit taken from unaffiliated reinsurance relative to adjusted reserve. The use of affiliated reinsurance is also included in these two regressions. The coefficients of affiliated reinsurance are both insignificant.

specified investment and mortality risk to the reinsurer and receiving credit in its required regulatory capital. Because the ceding insurer maintains the assets, modco and funds withheld agreements generally entail less credit risk than regular coinsurance.

We use the percentage of reserve credit taken for shadow insurance in the adjusted reserve as the measurement of captive insurance, where we define adjusted reserves as reported life and annuity policy reserves plus reserve credit taken for shadow insurance. Because there are relatively few companies that use shadow insurance, there is little cross-sectional variation in the intensity margin that could be used to identify the extent of use of shadow insurance. Therefore, we report the results based on a dummy variable for captive insurance. We use the same dummy variable for shadow insurance as Koijen and Yogo (2016b). The dummy for captive insurance is 1 if reserve credit taken received from shadow reinsurance is positive.

However, the use of captive reinsurance could be endogenous given the fact that firm performance can also affect the use of captive reinsurance, and we might omit variables that could explain the relationship between the firm performance and the use of captive reinsurance, making the shadow dummy variable correlated with the error term in equation (1). To control for the potential endogeneity problem, we estimate equation (1) using 2SLS regressions instead of ordinary least squares (OLS). We use the same instrumental variable as in Koijin and Yogo (2016b), which is the market share for term life insurance in 1999, interacted with a dummy for a stock company in 1999. For each company, we calculate the market share as the face amount of term life insurance in force divided by the sum across all companies. The motivation for the instrument is that Regulation XXX had a stronger impact on life insurers with more presence in the term life

insurance market. The interaction accounts for the fact that among those companies affected by Regulation XXX, the stock companies have a stronger incentive to take advantage of the captive laws after 2002 (Mayers and Smith, 1981). The market share in 1999 is plausibly exogenous to the firm performance after 2002, conditional on the conventional determinants of firm performance. This is because Regulation XXX applies only to new policies issued after 2000 and does not apply retroactively to existing liabilities.

Other Control Variables Corporate finance theory predicts that certain firm specific characteristics affect agency costs and hence the firm's performance. The selection of control variables in our paper is based on previous studies of insurer performance, which document that firm size, leverage, organizational form, group affiliation, line of business mix, geographic concentration, and asset risk are important firm characteristics that are likely to affect an insurer's financial performance. Firm size is proxied by the natural logarithm of total adjusted liability of the firm. Leverage is measured by the ratio of adjusted liability to total asset and the ratio of premiums to adjusted surplus. Organizational form is measured by a Stock dummy variable which equals 1 when the firm is a stock company and equals 0 otherwise. Group affiliation is measured by a Group dummy variable which equals 1 when the firm belongs to a group. Product concentration is measured by HHI by product line, and we classify product line as individual life, individual annuity, group life, group annuity, and, accident and health. Geographic concentration is measured by the Herfindahl index across states. Finally, asset risk is measured by percentage of stock in total invested assets and the percentage of derivative income in total invested income. Table 1 presents a summary of definitions of variables used in the multivariate analyses.

Table **1 Summary of Variable Definitions**

Variables	Definition
%RPC_UNAFF	percentage of premium ceded to unaffiliated reinsurers to total ceded premium
ShadowDummy	a dummy variable equal to 1 if reserve credit taken received from shadow reinsurers (unrated, unauthorized, and affiliated reinsurer) is positive, and 0 otherwise
Firm Size	the natural logarithm of the insurer's adjusted liability
Leverage	Adjusted liability divided by total assets*
Premium/Surplus	premium written divided by adjusted surplus**
Premium/Asset	premium written divided by total asset
Group	a dummy variable equal to 1 if the insurer is an affiliated member of a group, and 0 otherwise
Stock	a dummy variable equal to 1 if the insurer is a stock company, and 0 otherwise
GHHI	Geographical Herfindahl Index
Product HHI	Product line Herfindahl Index
AssetRisk	percentage of stock in total invested assets
%Deriv.Inc.	percentage of derivative income in total invested income
%IndividualLife	percentage of total premiums and annuity considerations from individual life
%GroupLife	percentage of total premiums and annuity considerations from group life
%IndividualAnnuity	percentage of total premiums and annuity considerations from individual annuity
%GroupAnnuity	percentage of total premiums and annuity considerations from group annuity
%AccidentandHealth	percentage of total premiums and annuity considerations from accident and health
ROA	net income divided by total assets
ROE	net income divided by total surplus

*Adjusted liability equals reported liability plus the reserve credit taken from unrated unauthorized affiliate reinsurance

**Adjusted surplus equals reported surplus minus the reserve credit taken from unrated unauthorized affiliate reinsurance

1.5. Empirical Results

1.5.1 Data and Summary Statistics

The data for our study are taken from the National Association of Insurance Commissioners (NAIC) annual statement database for all life-health insurance companies in the US insurance industry over the annual sample period 2002-2012. The decision-making units in the insurance industry consist of all affiliated insurers and unaffiliated insurers.[11] We exclude firms that report negative surplus, assets, losses or expenses. Such firms are not viable operating entities but are retained in the database by the NAIC for regulatory purposes such as the resolution of insolvencies. Firms with less than $5 million in assets also were eliminated because extremely small firms tend to operate in narrow geographical areas or product niches that are not representative of the market. We also delete firms producing large negative output quantities. Our final sample consists of 5,234 year-firm observations for the analysis.

In addition to the NAIC database, we also collect data from *Best's Aggregates & Averages* and *Best's Key Rating Guide* for life insurers. We obtain data from the U.S. Bureau of Labor Statistics to calculate input prices and quantities, and from the St. Louis Federal Reserve Bank's FRED database for interest rates and other economic variables. Table 2 presents the summary statistics of variables used in our analysis.

To meet the capital requirement increase from recently enacted regulations, firms can use captive reinsurance arrangements as a substitute for holding additional assets and capital on the insurer's balance sheet.

[11] The alternative would be to use data aggregated to the group level. But use of group data would net out the affiliated transactions that we are interested in.

Table 2 Summary Statistics: 2002-2012

This table presents summary statistics for variables used in this study. The covered period is from 2002 to 2012. The sample consists of 5,234 year-firm observations for the analysis.

VARIABLES	Mean	Std. Dev.	Min	Max
%RPC_UNAFF	0.0767	0.145	0.000	0.901
ShadowDummy	0.0787	0.269	0.000	1.000
Firm Size	19.11	2.796	12.410	26.580
Leverage	0.746	0.226	0.0415	1.000
Premium/Surplus	2.799	36.59	0.002	0.997
Premium/Asset	0.415	0.637	0.001	0.990
Group	0.753	0.432	0.000	1.000
Stock	0.914	0.280	0.000	1.000
GHHI	0.403	0.390	0.000	1.000
Product HHI	0.676	0.231	0.184	1.000
AssetRisk	0.0640	0.116	0.001	0.999
%Deriv.Inc.	0.162	0.226	-0.081	3.444
%IndividualLife	0.360	0.367	0.000	1.000
%GroupLife	0.0641	0.155	0.000	1.000
%IndividualAnnuity	0.180	0.293	0.000	1.000
%GroupAnnuity	0.0425	0.147	0.000	1.000
CE	0.312	0.214	0.023	1.000
RE	0.282	0.237	0.008	1.000
PI	3.539	5.608	0.000	42.070
ROA	0.0183	0.0531	-0.750	0.505
ROE	0.0676	0.777	-0.200	0.200

Table 3 reports summary statistics for life and annuity reinsurance agreements, divided into two categories: those ceded to unaffiliated or affiliated reinsurers. Also reported in this table are the same statistics for shadow reinsurers. There are fewer affiliated than unaffiliated reinsurance agreements. For example, 235 affiliated reinsurance agreements originated in 2010, 185 of which were ceded to shadow reinsurers. In comparison, 548 unaffiliated reinsurance agreements originated in 2010. The typical amount ceded under affiliated agreements is significantly higher than for unaffiliated, as shown in Figure 2. For example, in 2010, the average amount ceded under unaffiliated reinsurance agreements was $284 million, which is much lower than $1,035 million for affiliated reinsurance and $707 million for shadow insurance. The average amount ceded under shadow insurance agreements grew from $113 million in 2002 to $768 million in 2012.

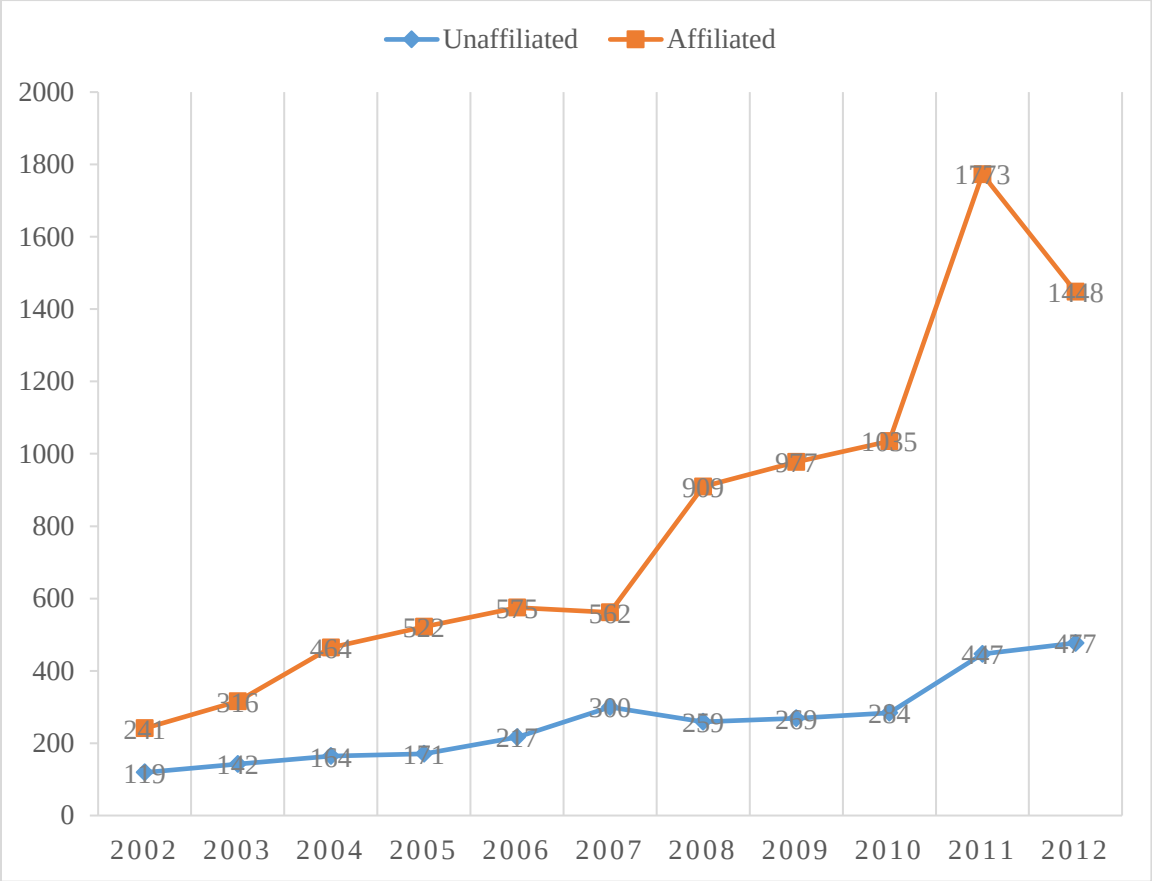
We calculated ratios of reserve credits taken with shadow insurance (i.e. unrated, unauthorized and affiliated reinsurance) to adjusted reserves and adjusted surplus during 2002-2012 to examine captive reinsurance trends. This is because actual detailed information on the use of *captive* reinsurance, whether authorized or unauthorized, was not separately identified in insurers' statutory financial statements until 2013. Adjusted reserve is defined as the sum of reported policy reserves and reserve credit taken for shadow insurance. Adjusted surplus equals reported policyholders' surplus minus the reserve credit taken for shadow insurance. Figure 3 shows the trend in shadow insurance growth. For the aggregate life and annuity industry, in 2012, reserve credits taken for shadow insurance accounted for 6% of industry adjusted reserves. Reserve credit taken grew rapidly from

Table 3 Summary Statistics for Reinsurance Counterparties

Number of reinsurance Counterparties Ceded to				Mean reinsurance ceded (million $)		
Year	Unaffiliated	Affiliated	Shadow	Unaffiliated	Affiliated	Shadow
2002	739	306	165	119	241	113
2003	684	283	160	142	316	182
2004	664	274	161	164	464	275
2005	650	264	186	171	522	323
2006	623	254	183	217	575	410
2007	602	247	180	300	562	629
2008	582	234	201	259	909	699
2009	562	234	180	269	977	704
2010	548	235	185	284	1035	707
2011	445	185	234	447	1773	570
2012	443	171	179	477	1448	768

Summary statistics for life and annuity reinsurance counterparties are reported, by year and whether they are unaffiliated or affiliated reinsurers. Shadow reinsurers are a subset of affiliated reinsurers that are unauthorized and do not have an A.M. Best rating. Reinsurance ceded is reserve credit taken.

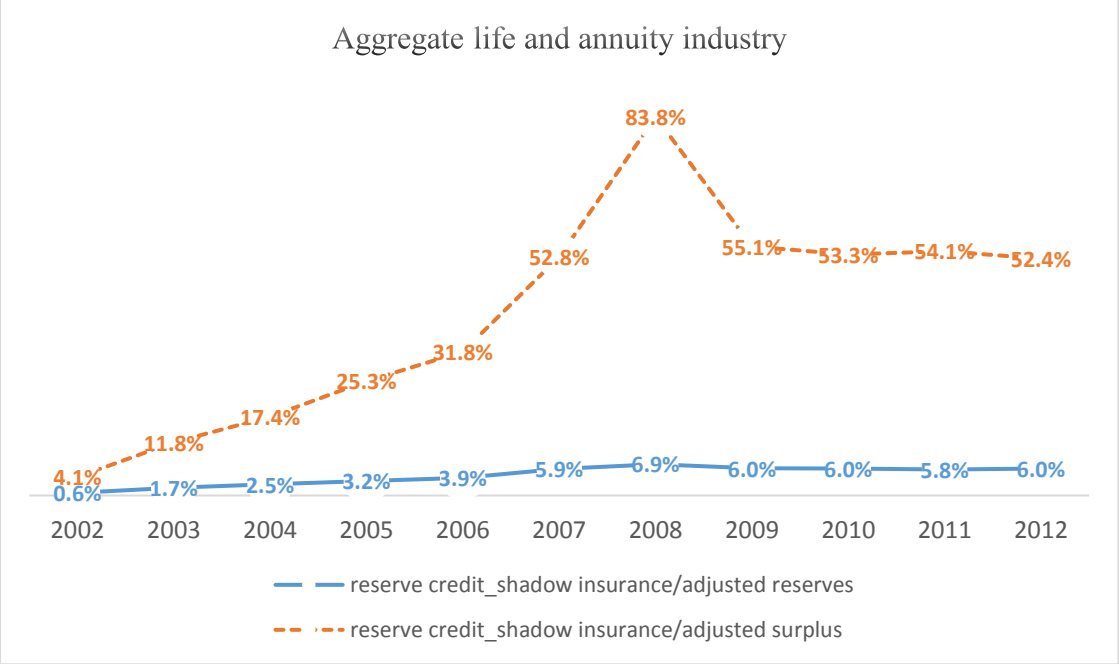
Figure 2 Reinsurance Ceded to Affiliated and Unaffiliated Reinsurers



Life and annuity reinsurance ceded by U.S. life insurers to affiliated and unaffiliated reinsurers is reported. Reinsurance ceded is measured by reserve credit taken in million $.

Source: The National Association of Insurance Commissioners

Figure 3 Reserve Credit Taken for Shadow Insurance as Percentage of Adjusted Reserves and Adjusted Surplus,* 2002-2012



*Adjusted reserves equal reported policy reserve plus reserve credit taken for shadow insurance. Adjusted surplus equal reported policy holders' surplus minus reserve credit taken for shadow insurance. Shadow insurance is defined as reserve credit taken for unrated, unauthorized affiliated reinsurance.

Source: The National Association of Insurance Commissioners

0.6% in 2002 to 5.9% in 2007 and then remained rather stable after that. A similar general growth trend exists for adjusted surplus during this period, except that the percentages of adjusted surplus spiked sharply in 2008 due to the negative impact of the financial crisis on policyholders' surplus. Therefore, shadow insurance provided an alternative to increasing the capital level during the financial crisis.

Figure 4 shows various sources of collateral for reserve credits from shadow insurance during 2002-2012. The first panel shows percentages of total collateral represented by LOCs, trust assets, and funds deposited with the ceding insurer. The second panel shows each source of collateral as a percentage of adjusted reserves, while the third panel shows each source as a percentage of adjusted surplus. LOCs represented 26% of total collateral in 2002, which grew to 31% in 2003, dropped to 22% in 2007, and then rebounded to 28% by 2012. Each source of collateral for shadow insurance as a percentage of adjusted reserves and adjusted surplus also follows a trend similar to that of reserve credit taken from shadow insurance.

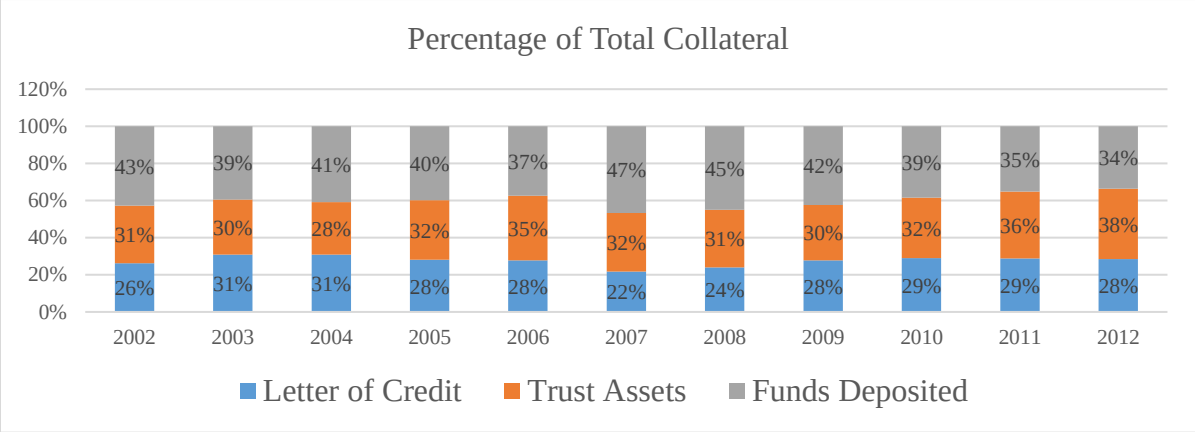
1.5.2 Regression Results

Tables 4 shows the results of the multivariate regression analysis. Using the same set of independent variables, we run five regression models. In Models 1 to 5 respectively, the dependent variables are cost efficiency, revenue efficiency, profit inefficiency, ROA, and ROE.

According to Hypothesis 1, insurer performance is negatively related to the use of unaffiliated reinsurance. This is partially supported by our empirical results. In Table 4, the coefficients of %RPC_UN AFF are negative and significant for cost efficiency and revenue efficiency, and positive and significant for profit inefficiency, but insignificant for ROA and ROE. This result indicates that the use of affiliated reinsurance positively affect the financial performance of the ceding insurer, regardless of the domicile status of reinsurance counterparties.

Figure 4 Sources of Collateral for Shadow Reinsurance, 2002-2012

Panel A



Panel B

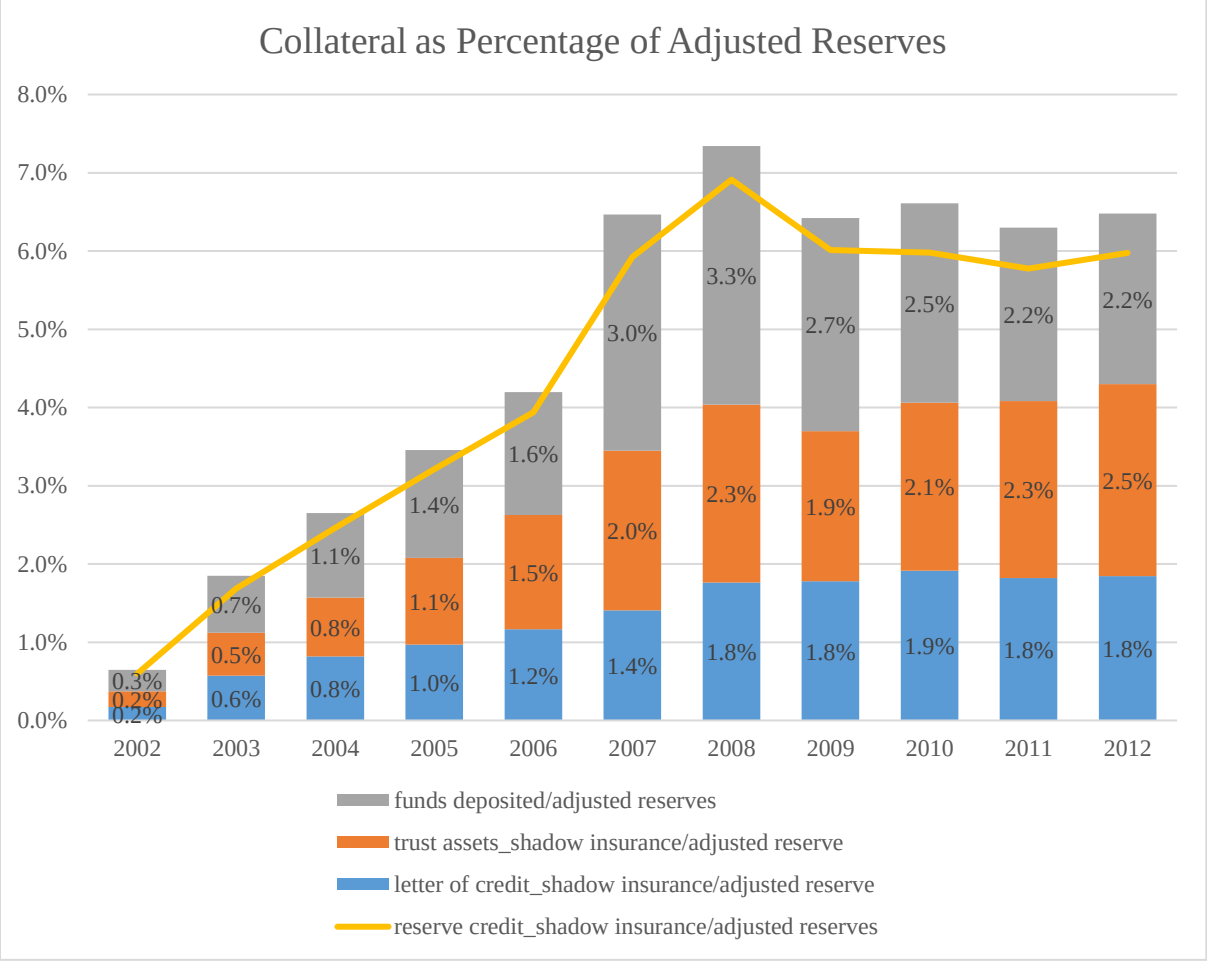
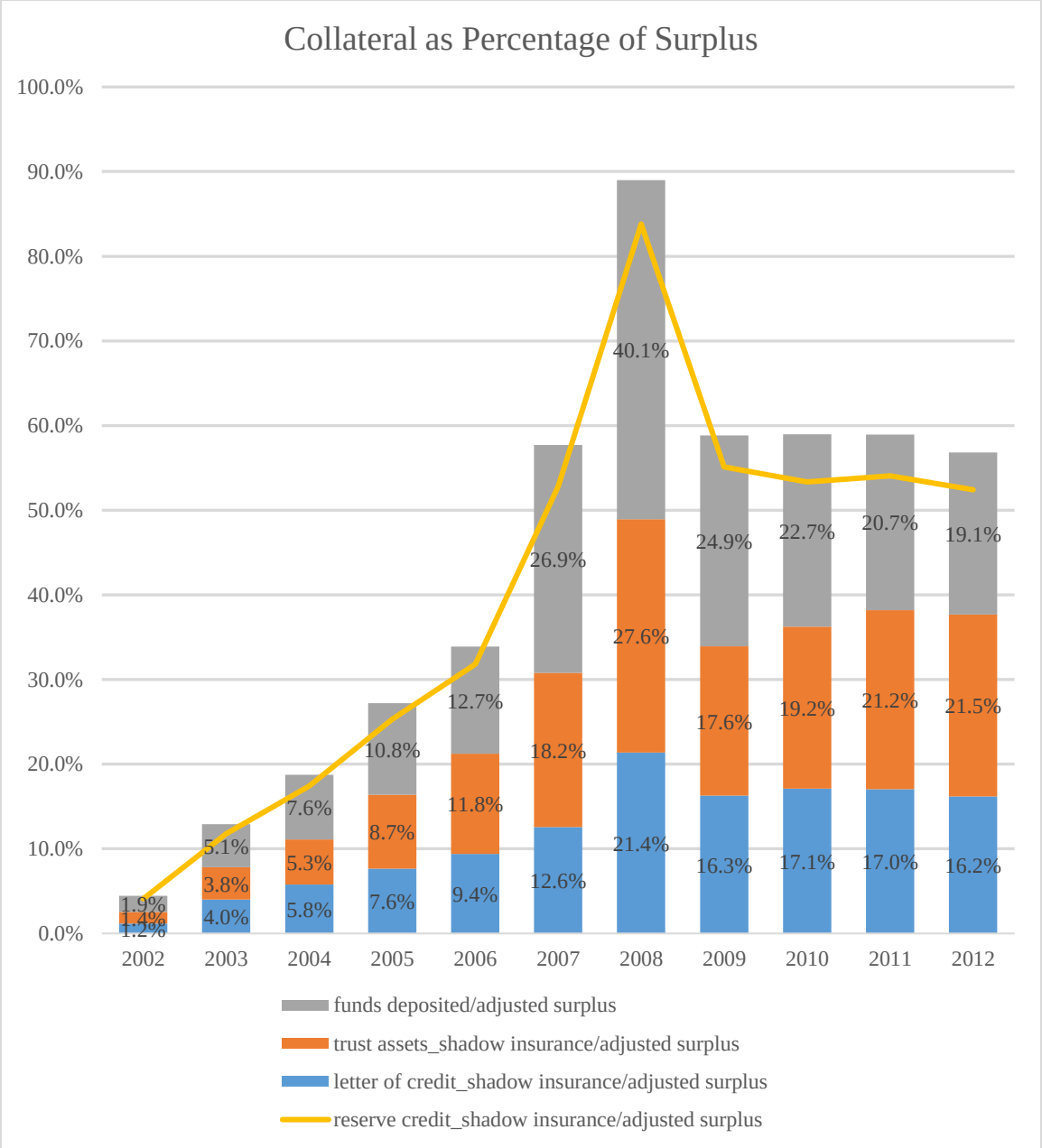


Figure 4 (Continued) Sources of Collateral for Shadow Reinsurance, 2002-2012

Panel C



*Adjusted reserves equal reported policy reserve plus reserve credit taken for shadow insurance. Adjusted surplus equal reported policy holders' surplus minus reserve credit taken for shadow insurance. Shadow insurance is defined as reserve credit taken for unrated, unauthorized affiliated reinsurance.

Source: The National Association of Insurance Commissioners

These results are consistent with the cost of information asymmetry hypothesis suggested by Jean-Baptiste and Santomero (2000) and other studies.

In Hypothesis 2, we proposed that ceding insurer performance is positively related to the use of captive reinsurance. To test this hypothesis, we examine the effect of captive reinsurance on firm performance measures. The coefficient on the shadow dummy is negative and significant for cost efficiency, revenue efficiency, ROA, and ROE-- the dependent variables are 0.291, 0.147, 0.042, and 0.054 lower, respectively, for life insurers that use shadow insurance. These results suggest that the primary firms suffer increased cost and reduced revenue when ceding premium and receiving reserve credit from unrated, unauthorized, and affiliated shadow insurance, inconsistent with Hypothesis 2. However, the coefficient of profit inefficiency and ROE is not statistically significant for life insurers that use shadow insurance. Overall, the evidence in Table 4 suggests firm performance is negatively related to captive insurance. This findings reject Hypothesis 2. Captive insurance appears incapable of improve cost efficiency scores by reducing marginal costs of issuing policies; neither can captive insurance enhance revenue efficiency. A possible explanation is that captives require an initial investment to set up, therefore increasing the cost of captive reinsurance arrangement. Another possible reason is that life insurers affected by Regulation XXX and AXXX tend to use captive reinsurance, and as a result these firms do not have comparative advantages over each other.

The coefficients on the control variables have the expected signs: performance is better for life insurers that are larger, affiliated, or stock companies, have higher leverage or lower investment risk, or are more concentrated in terms of product lines or geographic regions.

Table 4 2SLS Regressions for Reinsurance Counterparty-Firm Performance Relationships: the Use of Unaffiliated Reinsurance and Captive Reinsurance

VARIABLES	(1) CE	(2) RE	(3) PI	(4) ROA	(5) ROE
%RPC_UNAFF	-0.035*	-0.103***	2.808***	0.004	0.009
	(0.019)	(0.025)	(0.906)	(0.006)	(0.011)
ShadowDummy	-0.291***	-0.147*	5.251	-0.042***	-0.054
	(0.068)	(0.081)	(3.523)	(0.012)	(0.034)
Firm Size	0.0400***	0.0128***	-0.341***	0.00532***	0.011***
	(0.003)	(0.004)	(0.124)	(0.001)	(0.001)
Leverage	0.0987***	0.128***	-2.526***	-0.0959***	-0.059***
	(0.018)	(0.025)	(0.604)	(0.006)	(0.009)
Premium/Surplus	0.0002	0.0004	-0.0003	0.0002***	-0.001**
	(0.0003)	(0.0005)	(0.0018)	(0.00001)	(0.0003)
Premium/Asset	0.075***	0.063***	-0.797***	0.015***	0.0001
	(0.005)	(0.008)	(0.125)	(0.003)	(0.003)
Group	0.020***	0.020**	0.185	-0.003	-0.012***
	(0.006)	(0.008)	(0.191)	(0.002)	(0.003)
Stock	0.004	0.032***	0.170	0.014***	0.027***
	(0.010)	(0.011)	(0.334)	(0.003)	(0.004)
GHHI	0.076***	0.043***	0.058	0.007***	0.009**
	(0.008)	(0.010)	(0.245)	(0.003)	(0.004)
HHI	0.149***	0.252***	-3.686***	-0.003	-0.0005
	(0.016)	(0.019)	(0.657)	(0.003)	(0.008)
AssetRisk	-0.121***	-0.056*	1.860**	-0.015	-0.026**
	(0.019)	(0.030)	(0.811)	(0.011)	(0.011)
%Deriv.Inc.	-0.043***	-0.036**	0.532	-0.016***	-0.003
	(0.011)	(0.015)	(0.378)	(0.004)	(0.006)
%IndividualLife	0.029***	-0.0002	0.812***	0.003	-0.012**
	(0.008)	(0.012)	(0.292)	(0.003)	(0.005)
%GroupLife	0.371***	0.089***	-3.886***	0.0004	-0.001
	(0.023)	(0.023)	(0.412)	(0.005)	(0.009)
%IndividualAnnuity	0.189***	0.101***	-0.995***	-0.011***	-0.041***
	(0.012)	(0.016)	(0.329)	(0.003)	(0.006)
%GroupAnnuity	0.279***	0.144***	-2.589***	-0.013***	-0.027***
	(0.024)	(0.027)	(0.424)	(0.0034)	(0.009)
Observations	5,234	5,234	5,234	5,234	4,225
Adjusted R-squared	0.401	0.140	0.057	0.132	0.030
Year Dummy	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap LM Test	18.024	18.024	18.024	18.024	17.010

Note: The dependent variables for models 1 to 5 are CE, RE, PI, ROA, and ROE, respectively. CE = cost efficiency score; RE = revenue efficiency score; PI = profit inefficiency score based on Cooper et al. (2000). ROA = net income on total assets. ROE =net income to total surplus. %RPC_UNAFF= percentage of premium ceded to

unaffiliated reinsurers to total ceded premium. ShadowDummy= a dummy variable equal to 1 if reserve credit taken received from shadow reinsurers (unrated, unauthorized, and affiliated reinsurers) is positive, and 0 otherwise. Firm Size= the natural logarithm of the insurer's adjusted liability. Leverage= Adjusted liability divided by total asset. Premium/Surplus= premium written divided by adjusted surplus. Premium/Asset= premium written divided by total asset. Group= a dummy variable equal to 1 if the insurer is an affiliated member of a group, and 0 otherwise. Stock=a dummy variable equal to 1 if the insurer is a stock company, and 0 otherwise. GHHI=Geographical Herfindahl Index based on percentages of premium written across U.S. states. HHI=Product line Herfindahl Index based on percentages of premium written across product lines. AssetRisk=percentage of stock in total invested asset. %Deriv.Inc.=percentage of derivative income in total invested income. %IndividualLife=percentage of total premiums and annuity considerations from individual life. %GroupLife=percentage of total premiums and annuity considerations from group life. %IndividualAnnuity=percentage of total premiums and annuity considerations from individual annuity. %GroupAnnuity=percentage of total premiums and annuity considerations from group annuity. The instrument variable for shadow dummy is the market share for term life insurance in 1999, interacted with a dummy for stock company in 1999. Instrument relevance is tested via a Kleibergen-Paap LM statistic of their joint significance in the first-stage regression. All specifications include dummies for year. Robust Standard errors are shown in brackets below the coefficients. Statistical significance at the 1, 5, and 10 percent levels is denoted by ***, **, and * respectively.

1.6. Conclusion

Using data from the U.S. life insurance market, this paper investigates the relationship between performance of a ceding insurer and its reinsurance arrangement including the use of unaffiliated reinsurers and captive reinsurance. Insurer performance is measured by accounting measurements, ROA and ROE, and by various types of efficiency scores estimated using modern frontier efficiency analysis. We construct a set of independent variables based on firm-level reinsurance information from NAIC Schedule S. We measure the use of unaffiliated reinsurance with the percentage of reinsurance premium ceded to unaffiliated reinsurers in relation to total premium ceded, and use the shadow dummy variable to indicate whether the ceding insurance company utilizes "shadow

reinsurance" (defined as reserve credit taken for affiliated, unauthorized, and unrated reinsurance).

Using multivariate regression analysis, we find that ceding insurer financial performance is negatively related to the use of unaffiliated reinsurance. The result provides significant empirical support for the cost of information asymmetry hypothesis, which predicts that higher levels of information asymmetry may reduce firm performance through higher reinsurance costs. Interestingly, firm performance is found to be overall negatively related to the use of captive reinsurance. This indicates that the cost of using captive reinsurance outweighs its benefit. Further investigation is warranted to examine in detail the potential risks posed through captive reinsurance to policyholders, the insurance industry, and even the financial system as a whole.

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CHAPTER 2
MERGERS AND ACQUISITIONS IN THE GLOBAL INSURANCE INDUSTRY

2.1 Introduction

Market participants engage in mergers and/or acquisitions (M&A) as a means to boost profitability and to bolster their balance sheets. In the last twenty-five years, several merger and acquisition waves have occurred in the insurance industry, the biggest of which happened in the late 1990s and the mid-to-late 2000s. Of particular note, the latest M&A wave occurred just prior to the 2009 financial crisis. The number of M&A transactions dropped significantly during the financial crisis and remained relatively stable since then. Curiously, in recent years, the level of M&A activity in the insurance industry has not rebounded back, despite the fact that the global stock market has enjoyed a gradual recovery in the past few years. The reluctance of insurance industry participants to engage in M&A activity likely reflects a long-term negative outlook of insurance mergers on corporate earnings. However, as of late 2014, total M&A announcements had increased from 295 in the first half of 2014 to 359 in the second half. Based on survey results, insurance industry market participants are generally looking positively towards the economic outlook and as a result their sentiment towards M&A is gradually improving (Swiss Re, 2015).

Waves in M&A could be due to market timing or to clustering of industry shocks for which mergers facilitate change to the new environment. Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004) develop models in which merger waves result from managerial timing of market overvaluation of their firms. Management of companies with overvalued stock may seek to acquire lower-valued firms. Surges in merger activity

numbers may result since more firms may become overvalued during stock market booms (Petmezas, 2009). On the other hand, Harford (2005) finds that changes in macroeconomic and regulatory factors as well as the emergence of new technologies drive industry merger waves. Furthermore, factors like changes in distribution channels and substitute products, shifts in customer preferences, and changes in the cost and capital liquidity alter competitive conditions, which drive firms to reallocate assets to improve efficiency.

The merger wave in the insurance industry in the past twenty-five years has been influenced by how firms and managers responded to structural shifts in the industry and to economic factors. In the late 1990s, booming stock markets and availability of cheap credit provided favorable financing conditions for M&As. The absence of any major loss event in this period increased capital, which in turn encouraged consolidation in the non-life insurance sector. Increased price and production competition due to demutualization of large life insurers and deregulation on financial conglomerates led to a number of mega M&A transactions (eg, the Citicorp-Travelers merger in 1998 valued at USD 73 billion).

In the European Union (EU), the gradual deregulation of the financial services sector progressed through a series of banking and insurance directives that culminated in the virtual deregulation of financial services (except for solvency) in the Second Banking Coordination Directive, implemented in the early 1990s, and the Third Generation Insurance Directives, implemented in 1994 (Swiss Re, 1996; Group of 10, 2001). The objective of the banking and insurance directives was to create a single unified market in the EU financial services sector. The introduction of the Euro in 1999 also profoundly changed the economic landscape for financial services firms in the European market. Mergers between banks and insurers became particularly popular in Europe.

Many countries such as Japan, Australia, the Netherlands, and the U.K. opened up their national markets to international competition and permitted universal banking or consolidation across financial sectors during the 1990s (Dekle, 1998; Group of 10, 2001; Honda, 2003). [12] The principal U.S. deregulation during this period was the passage of the Gramm-Leach-Bliley Act in 1999, which permitted financial holding companies to own banks, insurers, and other financial firms (Neale and Peterson, 2005). Banks and other financial institutions were allowed to offer financial services, like investments and insurance-related services, as part of normal operations. These regulatory changes facilitated mergers and acquisitions (M&As) in the financial industry both at the country level and globally. The forces of rapidly improving technology and globalization of financial and real markets also helped drive the merger wave.

The wave of M&A activity in the mid-to-late 2000s also coincided with economic growth and a rising stock market. The adoption of new risk transfer techniques and products attracted alternative capital into insurance markets. This intensified competitive pressure and prompted some consolidation among insurers seeking increased scale and international diversification.

After declining sharply in 2009, overall M&A activity in insurance remained relatively low. The financial crisis and subsequent economic downturn caused shrinkage of asset value, weakening insurers' balance sheets, and eroding capital. New trends in

[12] Deregulation measures in specific countries are traced in Swiss Re (1996) for Europe and Group of 10 (G10) (2001) for developed insurance markets worldwide. Besides the EU Third Generation Directives, there were several specific law changes in individual European countries. Japan introduced the "Big Bang" deregulatory policy in 1996, and Australia gradually deregulated financial services, with major changes in 1984, 1992, and 1997. The U.K. introduced the "Big Bang" reform of the London Stock Exchange in 1986 and other reforms in the 1980s and 1990s gradually permitting universal banking. For further details and specifics on other countries, see G10 (2001).

insurance M&A transactions include divestments of closed blocks and run-off operations. Forced divestments were made by life insurers under severe financial stress. Government assistance given to insurers during the crisis period drove the largest deals in the post crisis period. For example, AIG had to restructure and divest part of its insurance operations to repay the $80 billion government bailout[13]. Activity in the run-off segment of non-life insurers became more significant. Run-off may quickly and effectively achieve early exit from business so that capital can be redistributed to support new or expanded lines of business. There has also been more activities in the specialty re/insurance sector as a response of incumbent firms to heightened competitive pressures. Prices in some property and casualty lines have faced downward pressure by the emergence of alternative risk-absorbing capacity from hedge funds, investment banks and pension funds, as a result of which some specialist re/insurers in Bermuda and Lloyd's are combining their operations to take on wider and emerging corporate risks and reduce operating costs.

In sectors other than specialty reinsurers, insurers have also been using strategic deals to expand distribution capabilities and expertise, as well as to extend geographical reach. In the emerging markets, such as the Asian Pacific and Latin American markets, M&A activities have increased. Insurers in these emerging markets have increased acquisition activities in markets of advanced countries, in order to diversify across different geographical regions and business sectors. Meanwhile, in advanced countries, insurers continue to expand in high growth markets.

[13] AIG's sale of American Life Insurance Co (ALICO) to Metlife in 2010 was valued at USD 16 billion. It also sold AIG Star Life Insurance and AIG Edison Life Insurance to Prudential Financial in 2011 for USD 4.8 billion

Literature on global insurance mergers is sparse, despite that pre-crisis M&A activity level was high and post-crisis activity recently exhibited new trends. Prior studies focusing on M&A cost and benefit analysis have not reached consensus as to M&A's value-creation effects. Although M&A studies on multiple industries and banking often conclude that M&As destroy value for acquirers but create value for targets (e.g., Dobbs, Goedhart, and Suonio, 2007; Asimakopoulos and Athanasoglou, 2013), studies focusing on the insurance industry have found that M&As are either value-neutral for acquirers and value-creating for targets (Cummins and Weiss, 2004), or value-creating for both acquirers and targets (Akhigbe and Madura, 2001 and Cummins, Klumpes, and Weiss, 2014). The previous M&A insurance papers utilized the event study approach to study cumulative abnormal returns of the stock price of the acquirers and targets around the announcement date, with the market index as a benchmark. Cummins, Weiss and Klumpes (2014) analyzed the international aspects of financial firm M&As during the sample period of 1990 and 2006, which does not include the M&A activities after the financial crisis.

The objective of the present study is to remedy this limitation in the existing literature by extending the results of Cummins, Weiss and Klumpes (2014) to analyze the effects of M&A transactions on the market value of target and acquiring firms in the global insurance market over the period 1990-2014, using data reported in the Thomson One Database. The analysis includes all transactions where either the acquiring firm or the target firm is an insurance company. Included in the analysis are all completed transactions that involve a change in control, defined as an acquisition that increases the stake of the acquiring institution from less than 50% to 50% or more of the ownership shares of the target institution. Tests are conducted for differences in market value effects of mergers by

country/region, by whether the transaction is cross-border or within-border, and by whether the transaction is focusing versus diversifying.

To analyze the market value impact of M&As in the global insurance industry on both target and acquiring firms, we conduct an event study analysis to determine the market value effects of the transactions included in our sample. Specifically, we obtain stock price data from the Thomson Datastream database and study the market reaction to the M&A transactions on both target and acquirer firms in a series of event windows surrounding the announcement dates. Conducting an event study enables us to capture the market's expectation of the net effect of M&A transactions on the present value of the expected future cash flows of the firms involved in the transactions and thus to determine whether M&As tend to create value for shareholders.

This study contributes to the literature as the first paper to analyze the market value effects of global insurance mergers in recent time periods. There have been few market value studies of global financial sector M&As of any kind. Cummins and Weiss (2004), the leading study of European insurance mergers, analyze M&As in 17 European countries over the period 1990-2002. Similar results for banks are reported by Cybo-Ottone and Murgia (2000) and for Lepetit et al. (2002). Delong (2002) finds that bank mergers focusing on their product-line and geographic region in the U.S. create value but that diversifying mergers do not create value. By contrast, Akhigbe and Madura (2001) find that U.S. insurance mergers are value-creating for both acquirers and targets. Cummins, Klumpes, and Weiss (2014) provide evidence that global insurance M&As are also value-enhancing for both acquirers and targets before the financial crisis.

The remainder of the paper proceeds as follows. Section 2 develops hypotheses concerning the economic effects of mergers and acquisitions. Section 3 explains our sample selection and event study methodology. Section 4 presents the results. Section 5 concludes.

2.2 Hypotheses

In this section, we discuss motivations for M&A activities and the effect of M&As on the market value of acquirers and targets. This section discusses hypotheses about the value effect of cross-border and domestic M&As and within-industry and cross-industry M&As. If M&As are motivated by opportunities to improve performance and if managers succeed in accomplishing their objectives, value should be created for the targets and/or the acquirers. If M&As are motivated by non-value-enhancing factors or if the market expects post M&A firms to be unsuccessful, then the merger activity may be value-neutral or value-reducing for the targets and/or the acquirers.

2.2.1 Economic Motivations for M&As

There are a number of rationales for M&As. One rationale often given for M&As is economies of scale, usually associated with the cost function. The usual source of cost scale economies is the spreading of fixed input costs over a broader output base. For insurers, important fixed costs include computer systems and software development costs. The actuarial, underwriting, and investment operations of insurers also have fixed cost components that can be sources of scale economies. Another source of scale economies that is expected to be particularly important for insurers is earnings diversification (Cummins et al., 1999). The basic principle of insurance is "the law of large numbers," which holds that expected losses become more predictable as the size of the insured pool

increases. Enhanced predictability implies that large insurers have less volatile earnings and thus need to hold less equity capital per policy underwritten, allowing firms to charge a lower premium. Increasing underwriting diversification also may permit insurers to engage in higher risk, higher return investment strategies without increasing their costs of capital. M&As often enable insurers to expand their pool of policyholders more rapidly than is usually possible through organic growth. Although evidence on the potential for scale economy gains in the insurance industry is mixed (e.g. Cummins and Santomero, 1999; Cummins and Xie, 2008), scale economies may provide a potentially valid motivation for M&As.

Economies of scope provide another production theory rationale for mergers and acquisitions. Scope economies can be present for costs, revenues, and profits. Cost economies of scope generally arise from the joint use of inputs such as managerial expertise, customer lists, computer technologies and brand names; and revenue economies of scope are often said to arise due to reductions in consumer search costs and improvements in service quality from the joint provision of related products. If M&As enable firms to achieve economies of scope, mergers that result in increased geographical or product line diversification are expected to lead to higher efficiency or productivity gains than focusing mergers. Berger et al. (2000) provide evidence that scope economies are present for some types of firms in the U.S. insurance industry.

An important production-theory rationale for M&As is provided by potential gains in X-efficiency (e.g., Cummins and Xie, 2009). X-inefficiency arises when firms incur higher costs or earn lower revenues due to failure to operate on the cost, revenue and/or profit frontiers. Such inefficiency includes technical inefficiency, failure to operate on the

cost minimizing isoquant; allocative inefficiency, failure to choose input combinations that minimize costs; and scale inefficiency, and failure to operate with constant returns to scale.

Corporate control theory (e.g., Jensen, 1988; Shleifer and Vishny, 1988) argues that M&As are an efficient means to replace inefficient managers of target companies. The target firm may under-perform either because its managers pursue their own interests at the expense of owners' interests or because they lack the knowledge and skills to maximize firm value. If managers of acquiring firms are more capable than those of acquired firms, they can improve the efficiency of targets. This theory predicts that poorly performing firms are more likely to be acquired and that the performance of targets will improve after the takeover. Acquiring firms are also expected to gain from the takeover activity if they have the ability to bring operating synergy to the post-takeover entity. The efficiency rationale for M&As may be somewhat stronger for focusing rather than diversifying M&As, however. If the objective is to improve the efficiency of the target, it seems reasonable to expect that such improvements are more likely to be realized if the managers of the acquiring firm already have expertise in the operations conducted by the target.

On the other hand, there is some evidence in the insurance industry that acquirers might prefer efficient targets, especially firms that possess competencies in certain areas or product lines that could bring the acquiring insurers market power and more cost and revenue efficiency (Cummins et al., 1999). There is some evidence that insurance M&A transactions have led to efficiency gains in the U.S. life and P–L insurance industries (Cummins et al., 1999b; Cummins and Xie, 2008) and the Spanish insurance industry (Cummins and Rubio-Misas, 2006).

M&As also may be value-relevant due to the existence of various market imperfections. One important market imperfection is the existence of financial distress costs. Financial services firms such as banks and insurers face stringent solvency regulation which creates the potential for significant financial distress costs. Insurers that are over-leveraged or in weakened financial condition for other reasons incur increased regulatory costs and may not undertake valuable investment opportunities (Myers and Majluf, 1984). Moreover, because buyers of insurance are especially sensitive to insolvency risk, insurers in deteriorating financial health are likely to lose their best customers to rivals.

On the other hand, raising capital from external capital markets can be difficult for financially distressed insurers, especially mutual or private stock companies with limited ability to raise new capital quickly[14]. These insurers also face substantial transactional costs when raising new capital, due to information asymmetries. Outside investors generally have less information about the quality of an insurer's assets and the value of its reserve estimates for unpaid losses, especially for property-casualty long-tail lines such as commercial liability insurance. Outside investors therefore may tend to charge a premium for investing in such insurers, making it unattractive to raise new capital from external capital markets (Chamberlain and Tennyson, 1998). If the information asymmetry between the acquiring firms and target insurers is less than the asymmetry between the targets and capital markets, financially sound firms will seek to acquire firms that are financially weak but have attractive growth opportunities. If the financial synergy between acquirers and

[14] Capital alternatives for mutual companies can include senior bank debt, surplus notes, trust-preferred securities, reinsurance, divestiture of a subsidiary or business unit, and mutual merger.
See more detail at http://www.propertycasualty360.com/1999/09/24/raising-capital-what146s-a-mutual-co-to-do

targets dominates other motivations, we should find value improvements for either the targets or combined firms.

There are also non-value-maximizing motives for consolidation. The agency cost theory of M&As argue that takeover often results from acquiring managers pursuing their own interests rather than stockholders' interests. Instead of taking actions to maximize firm value, managers may act to maximize their own compensation by increasing the size of the firm through non-value enhancing mergers. Managers also may intentionally acquire businesses that require their personal skills in order to make it costly for shareholders to replace them. To the extent that M&As are primarily motivated by managerial self-interest, they are unlikely to generate operating or financial synergies that lead to improvements in efficiency or productivity.

Further, for M&As, managers may be motivated to increase their own compensation and prestige at the cost of the firms' value. Managers may engage in transactions of dubious value (Jensen, 1986), or use defensive acquisitions to fend off hostile acquirers that threaten their jobs. Such M&As likely have adverse effects in terms of market value. Moreover, when post-merger firms are unable to efficiently integrate with each other, the value of M&As may also be reduced. Such post-merger integration is particularly difficult for cross-industry mergers and/or cross-border mergers, as cultural differences may impede smooth integration.

The rationales for M&As discussed above are not necessarily independent or mutually exclusive. In many cases, different motivations work interactively to bring about an M&A deal. Moreover, some hypotheses have similar implications for the effect of acquisitions on M&A firms, and it can be difficult to disentangle them. However, the

analysis does enable us to identify whether M&As are primarily value-enhancing, value-neutral, or value-reducing. M&As will be value-enhancing if they enable firms to achieve economies of scale and scope, improve X-efficiency, gain market power, achieve earnings diversification, and/or improve other aspects of financial performance. M&As may be value-reducing if firms engage in M&A transactions due to managerial hubris, empire-building, attempts to increase managerial compensation, or expense preference behavior. If synergies primarily motivate M&As, we expect to observe value improvements in acquirers and/or targets following acquisitions. If non-value-enhancing motives predominate, we expect productivity or efficiency losses as a result of M&As and other findings inconsistent with value-enhancement theories.

Hence, we specify two production theory-based hypotheses:

Hypothesis 1: Mergers and acquisitions are value-creating for acquirers.

Hypothesis 2: Mergers and acquisitions are value-creating for targets.

There hypotheses are inline with the findings of the most recent global insurance merger study (Cummins, Klumpes, and Weiss, 2014).

2.2.2 Cross-Border versus Domestic M&As

For value-creating M&As, deregulation can also potentially motivate M&A transactions (Buch and DeLong, 2004; Lin et al., 2013). For example, traditionally the European insurance industry was more stringently regulated than its counterparts in other regions. Regulation affected, among other things, pricing, contracting, branch establishment, and standards for solvency. While each European country has its own market, cross-border transactions were uncommon other than for reinsurance and certain

commercial coverage, and cross-border competition was minimal in price and product (Swiss Re, 2000). This was changed when the European Union implemented Third Generation Insurance Directives on July 1, 1994, creating conditions in the European Union that are closer to a single national market that had been deregulated (Swiss Re, 1996; Group of 10, 2001).

In the early 1990s, in the US P-C insurance industry, a large number of weaker insurers were forced to merge with willing acquirers due to the economic difficulties caused by depressed premium rates, record catastrophe losses from Hurricane Andrew of 1992 and the Northridge Earthquake of 1994, as well as poor stock price performance (Conning and Company, 1995). Further, in 1994 more weak insurers were forced to be merged with acquirers by the adoption of the regulatory risk-based capital (RBC) system, in order to resolve financial distress and avoid regulatory costs. Insurance industry performance surged into prosperity starting with 1995, as evidenced by rapidly declining leverage ratios and growth of equity capital. Insurers gained ample resources for M&A transactions to stimulate growth, obtain new technology, and expand distribution systems (Conning and Company, 1998). Therefore, industry shock theory likely explains most of the M&A activities in the first M&A wave.

Meanwhile, the U.S. life insurance industry had a high-cost distribution system and lacked price competition in the 1990s. Since then, competition from non-traditional sources such as mutual funds, investment advisory firms and banks have amped up. These competitors now own a large share of the market for asset accumulation products, e.g. cash value life insurance and annuities. Profit margins have narrowed due to the increased competition, and as a result, insurers are motivated to reduce costs. In 1993, the solvency

standards became more stringent when the risk-based capital system (RBC) was adopted, which in turn pressured insurers to strengthen their financial statements. Insurers have also become more innovative with new technologies of sales, pricing, underwriting and policyholder services. These new systems have relatively high fixed costs that would potentially affect the minimum efficient scale of the industry. All of these factors have provided motivation for domestic M&As.

U.S. insurers also are motivated to conduct M&A transactions internationally and have never faced major U.S. regulatory impediments to this activity within the insurance industry. Cross-industry mergers in the U.S. became possible following the passage of the Gramm-Leach-Bliley Act in 1999.

As mentioned, deregulation in many other countries, including Australia, Japan, the Netherlands, and the U.K., also provided motivations for M&As (Group of 10, 2001; Dekle, 1998). Expanding into other national markets by acquiring firms is likely to be more effective than organic growth because local firms have superior knowledge of the language, culture, and legal system of their home countries. Thus, expanding geographically through M&As is likely to be value-creating, suggesting the following hypothesis:

Hypothesis 3: Cross-border transactions are value-creating for acquirers.

Hypothesis 4: Cross-border transactions are value-creating for targets.

2.2.3 Focusing versus Diversifying M&As

According to the conglomeration hypothesis, economies of scope provide another potential rationale for M&As (Berger et al., 2000). Scope economies can be present for costs, revenues, and for profits. If cost (revenue) economies of scope are present, the cost

(revenue) of producing (selling) two outputs jointly in a single firm will be lower (higher) than if the outputs were produced (sold) by two separate firms. Cost economies of scope generally arise from the joint use of inputs such as managerial expertise, customer lists, and brand names. Revenue economies of scope may arise due to reductions in consumer search costs and improvements in service quality from the joint provision of related products such as life insurance and auto insurance ("one-stop shopping").

The "one-stop shopping" argument is often utilized to justify financial sector mergers. However, many of the arguments supporting the conglomeration hypothesis have been called into question in the more recent literature, where proponents of the strategic focus hypothesis argue that firms can maximize value by focusing on core businesses and core competencies. A fundamental argument is that conglomeration exacerbates managerial incentive conflicts and agency costs by: (1) increasing the span of control, (2) motivating central managers to add divisions to protect their human capital, and (3) providing more opportunities for the misalignment of incentives between central and divisional managers (Berger et al., 2000). Conglomeration also can lead to inefficient investment decisions by providing additional free cash flow or unused debt capacity (Jensen, 1986)[15]. Internal capital markets also may be less efficient than external capital markets, leading to value-destroying cross-subsidization among divisions (Scharfstein and Stein, 2000).

[15] Conglomeration that have stable business histories and substantial free cash flow (i.e., low growth prospects and high potential for generating cash flows) tend to conduct leveraged buyout. In this case, agency costs of free cash flow are likely to be high.

There is some empirical evidence for the existence of scope economies between life and property-casualty insurance, although findings suggest that economies may exist only for specific types of producers and products (Berger et al., 2000). More recent research provides evidence of diseconomies of scope in the U.S. insurance industry (Cummins et al., 2000). Moreover, Delong (2002) finds that product-line and geographically focusing bank mergers in the U.S. create value but that diversifying mergers do not. This suggests the following hypotheses:

Hypothesis 5: Focusing M&As are more likely to create value for insurance acquirers than diversifying M&As.

Hypothesis 6: Focusing M&As are more likely to create value for insurance targets than diversifying M&As.

2.3. Methodology and sample selection

2.3.1 Data and Sample Selection

We capture all change in control transactions during the sample period 1990 through 2014 where either the acquirer or target was an insurance company. A change in control transaction is defined as an acquisition that increases the stake of the acquiring institution from less than 50% to 50% or more of the ownership shares of the target institution. [16]We decide to use the universe of transactions rather than a random sample

[16] The first pass through the Thomson One database produced a substantial number of transactions involving minority stakes. We decided to exclude the minority stake transactions and analyze only the change in control transactions. This decision was made both to focus on the transactions most likely to create value and to be consistent with the prior literature (e.g., Cybo-Ottone and Murgia, 2000; Delong, 2002; Cummins and Weiss, 2004; Cummins, Klumpes, and Weiss, 2014).

because the statistical power of our tests will be improved with a larger sample size. The sample period is selected to cover the introduction of deregulatory measures such as the European Union's Third Generation Insurance Directive and similar deregulation in other countries such as Australia, Japan, and the Netherlands, and also to include the recent financial crisis. The data on M&A transactions are obtained from the Thomson One Database. Insurance companies are defined as all firms with four-digit Standard Industrial Classification (SIC) codes in the insurance industry: 6311, life insurance; 6321, accident & health insurance; 6331, fire, marine & casualty insurance; 6399, insurance companies Not Elsewhere Classified (NEC); and 6411, insurance agents, brokers, & service.

Because either the target or the acquirer (not both) has to be an insurer, included in the sample are transactions where insurers are acquired by non-insurance firms such as banks, other financial firms, and industrials, and where non-insurance firms are acquired by insurers, as well as transactions within the insurance industry (insurer-to-insurer). The study focuses on transactions in member countries of Europe and United Kingdom, North America (the U.S. and Canada), and eleven Asian countries with sufficient data. The Europe (including U.K.) and North America are included because they have highly developed insurance markets and are known to have substantial M&A activity. Asian countries are included because Asian countries are either developed (Japan or South Korea) or important developing markets and M&A activity has risen there recently, especially after financial crisis. The countries included in the study are listed in Table 5.

The stock price data for the event study are obtained from the Thomson Datastream Database. Using the Thomson One sample as the transactions database, we identify all transactions where either the acquirer or the target firm is also present in Thomson

Table 5 Countries Included in the Study

Europe/United Kingdom	Asia and Pacific
Belgium	Australia
Denmark	Hong Kong
Finland	India
France	Indonesia
Germany	Japan
Ireland	Malaysia
Italy	Philippines
Netherlands	Singapore
Norway	South Korea
Portugal	Taiwan
Spain	Thailand
Sweden	
Switzerland	
United Kingdom	

North America
Canada
United States

Datastream and obtain Thomson Datastream stock price data for the periods needed to conduct the event study.

2.3.2 Event Study Methodology

To assess the immediate impact of M&A announcements on stock prices, we follow the standard market model event study methodology. The analysis involves computing the returns for each of the transactions in our sample using data from the Thomson Datastream database. For each transaction included in the study, the event study methodology computes the *abnormal return* associated with a specified event, defining benchmark returns using the market model (Mackinlay, 1997). The market model is:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it}) = 0 \quad (2)$$

$$Var(\varepsilon_{it}) = \sigma^2_{\varepsilon i}$$

Where R_{it} is the return on the i-th stock on day t; R_{mt} is the return of the market portfolio on day t. The parameter α_i and β_i are estimated for each stock i in our sample using pre-event returns for the estimate period (-280, -30) days. Using the parameters estimated from the market model and the movement of the market index during the event period, we compute the expected return on each stock during each day of the event window. The daily unexpected or abnormal return (AR) for each security is obtained by subtracting the expected return from the actual return on each day.

$$\widehat{AR_{it}} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \quad (3)$$

We then calculate the cumulative average abnormal return over different event windows and over sample firms. We utilize several event windows for the study, extending a maximum of 15 days before and after the event date. The notation for an event window extending m days prior to the event date and p days following the event date is (-m, +p), with the event date as day 0.The mean cumulative abnormal return is expected to be zero in the absence of abnormal performance. We conduct the Patell Z-test, which standardizes each abnormal return using its estimated standard deviation. This standardization process helps ensure that no single firm in the sample dominates the results of the analysis and helps improve the power of the test statistics. We also conduct the standardized cross-sectional test procedure (Boehmer et al., 1991) and the non-parametric generalized sign test (Cowan, 1992).

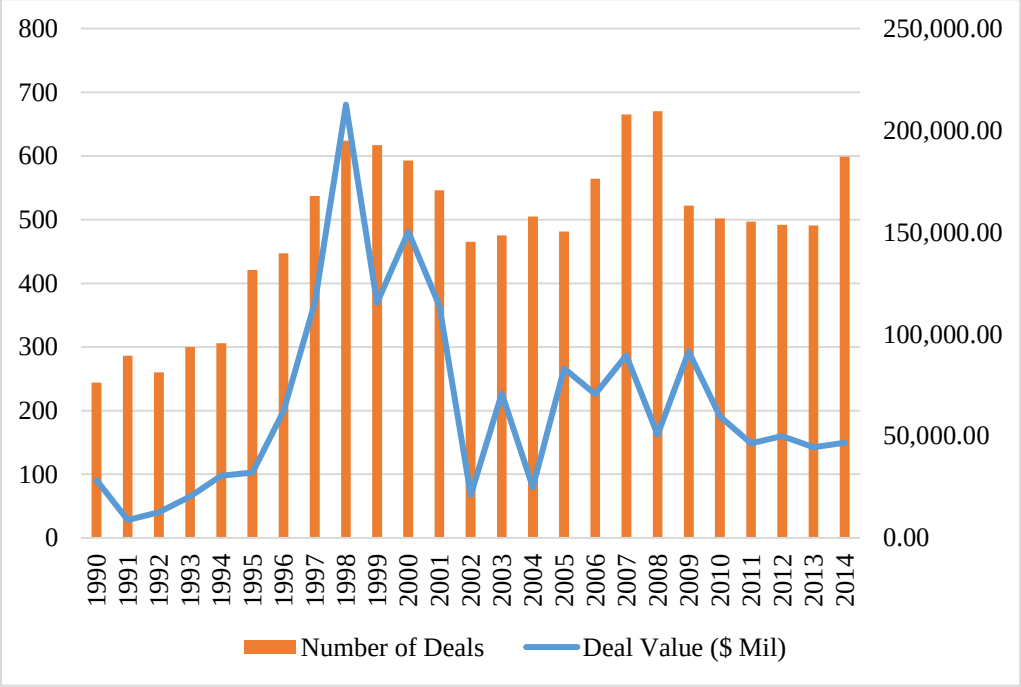
2.4 Empirical results

This section reports the empirical analysis. First, section 4.1 describes the data in more detail. Then, section 4.2 presents the results of the event study analysis.

2.4.1 Insurance M&As: Deals and Deal Volume

Figure 5 shows the insurance M&A transactions where either the acquirer or the target is an insurance entity. The deals shown in the figure are completed transactions. There are at least 240 deals in each year of the sample period with a total of 12,323 deals over the entire sample period. The first M&A wave was in the late 1990s with at least 400 transactions

Figure 5 Global Insurance M&As Number of Deals and Deal Value by Year



taking place each year from 1996 through 2000, the peak of which occurred in 1998, with more than 600 transactions. The second peak was in the mid-to-late 2000s, prior to the financial crisis and subsequent global economic downturn. Deal volume exceeded $200 billion in 1998 and was at least $100 billion in the first peak[17]. Deal volume was relatively less than $100 billion per year after 2001. Total deal value for the entire period covered by the study is more than $1.3 trillion.

The number of deals and deal value by country are shown in Table 6. [18]The number of deals is shown in Panel A of Table 6 and the deal value is shown in Panel B. Acquiring countries are shown as rows in the table, while targets are shown in columns. Only the largest 13 countries are shown; M&A transactions in other countries are classified under 'other.' As expected, the largest number of transactions in terms of acquirers was within North America (1,587), 1,394 in the U.S. and 193 in Canada. The next largest number, 952, involved European acquirers, with the largest number of acquirers in the U.K. (423) and France (104). 67 transactions involved Bermuda acquirers, and there were 336 acquirers transactions in Asia in contrast to only 74 acquirers included in Cummins, Klumpes, and Weiss (2014). Overall, there were 2,942 total transactions. For the cross-border transactions, the vast majority were intra-region (e.g., within Europe, North America, or Asia-Pacific) rather than cross-region. This makes sense if firms conduct most of their cross-border activities in regions with which they are most familiar.

[17] Note that deal value is not always reported by Thomson One.

[18] The total number of deals and total deal volume used in the event study are smaller than shown in Figure 1 because the observations in Table 2: include change in control transactions only; acquirer and the target must not be involved in M&A deals within 3 months. Stock price data must also be available from Thomson Datastream.

Table 6 Deals by Country – Insurance Acquirer or Target: Deals Involving a Change in Control

Panel A: Number of Deals, 1990-2014

Target country: in colums															
Acquirer country: in rows	Aus	Belgium	Bermuda	Canada	Dnk	Fra	Ger	Italy	Japan	Neth	Switz	UK	US	Other*	Grand Total
Australia	99										1	7	4	4	115
Belgium		11				4	1			7			1	1	25
Bermuda	2		20		1	3					2	10	29		67
Canada	1		4	128	1	1						10	45	3	193
Denmark					17		1			2		1		6	27
France	1	3		3		64	2	5	2	2	5	3	3	11	104
Germany	2					2	42	4		1	2	3	11	4	71
Italy						3	3	60			4		1	2	73
Japan	1					1			75	2		1	3	7	90
Netherlands		6		2		2	1	2		24		4	9	10	60
Switzerland		2	4			2	6	6	1	1	10	14	16	11	73
United Kingdom	4	1	5	6		8	7	3	1	2		333	29	24	423
United States	10	1	13	15	1	3	3	1	3	1		42	1289	12	1394
Other*	1	1			3			2				2	3	215	227
Grand Total	121	25	46	154	23	93	66	83	82	42	24	430	1443	310	2942

*Targets in the "Other" category (with the number of transactions in parentheses) include Finland (12), Hong Kong (4), Ireland (4), Indonesia (9), India (8), Malaysia (18), Norway (20), Phillipines (8), Portugal (15), Singapore (6), Spain (24), Sweden (21), South Korea (23), Taiwan (17), and Thailand (18).

Table 6 (Continued): Deals by Country – Insurance Acquirer or Target: Deals Involving a Change in Control

Panel B: Deal Value (USD millions), 1990-2014

Target country: in columns / Acquirer country: in rows	Aus	Belg	Berm	Cana	Dnk	Fra	Ger	Italy	Japan	Neth	Switz	UK	US	Other*	Grand Total
Australia	24,770											876	1,001	426	27,073
Belgium		14,236				15				7,907			2,630		24,787
Bermuda	518		7,904		28	1,074					439	2,766	8,926		21,655
Canada			447	24,368	10	137						558	21,404	450	47,376
Denmark					4,352									791	5,143
France	817	460		108		28,695	770	1,694	1,954	3,107	12,889	2,435	1,058	4,255	58,240
Germany	203					124	25,636	1,055				1,985	14,274	630	43,907
Italy						327	5,483	27,103			2,558		285	1	35,757
Japan	1,203								24,714	13		973	13,048	822	40,773
Netherlands		5,186		521			2,338			21,387		1,380	28,830	1,521	61,163
Switzerland			961			543	371				32,123	43,328	14,786	1,322	93,433
United Kingdom	239	8	306	1,200		2,171	436	95	196	554		85,138	8,273	7,071	105,688
United States	1,651	410	5,017	1,613		305			6,957			6,123	450,065	990	473,131
Other*	18	40			799			747				1,319	2,317	42,663	47,902
Grand Total	29,420	20,340	14,634	27,810	5,190	33,392	35,032	30,694	33,822	32,968	48,008	146,880	566,897	60,941	1,086,028

*Targets in the "Other" category (with the number of transactions in parentheses) include Finland (12), Hong Kong (4), Ireland (4), Indonesia (9), India (8), Malaysia (18), Norway (20), Phillipines (8), Portugal (15), Singapore (6), Spain (24), Sweden (21), South Korea (23), Taiwan (17), and Thailand (18).

Table 6, Panel B shows the value of deals in millions of U.S. dollars by country of the acquirer and target. Overall, total deal volume amounted to $1.09 trillion for the sample period. The United States dominates with 43.6% of total worldwide deal value, measured by acquirer transactions, followed by the United Kingdom (9.7%), Switzerland (8.6%), and the Netherlands (5.6%). Others with significant deal volume include France, Canada, and Germany.

2.4.2 Event study results

The first stage in the event study analysis is to capture the Thomson Datastream data on M&As for traded insurers in the overall Thomson One sample. The sample for the event study consists of 3,027 acquirers and 620 targets, with some loss of data due to incomplete stock return information. This section analyzes the event study results by investigating several event windows, with the discussion emphasizing the (-1,+1), (-2,+2), and (-5,+5) results. To test Hypotheses 3 through 6, the results are also broken down in terms of cross-border versus within-border transactions and cross versus within-industry transactions. The country/regional analysis focuses on U.S., Europe, and Asia.

2.4.2.1 Overall results: acquirers and targets

Hypotheses 1 and 2 state that M&A transactions are value-creating for both acquirers and targets. The overall event study results presented in Table 7 provide evidence on these two hypotheses. The results show relatively large and statistically significant value gains for acquirers in the (-1,+1), (-2,+2), and (-5, +5) windows. The mean gain in the (-1,+1) window is 6.42%. Thus, contrary to the findings of Cummins and Weiss (2004), we find evidence of market value gains for acquirers which are larger in magnitude than value

Table 7 Cumulative Average Abnormal Returns Across Event Windows -Change in Control Transactions, Market Model, Equally Weighted Index, 1990-2014

Panel A: Acquirers, All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	2537	6.42%	1.22%	1275:1262>>>	13.591***	2.094*	4.454***
(-2,+2)	2537	6.20%	1.20%	1246:1313>>	10.930***	2.007*	2.884**
(-5,+5)	2537	4.26%	1.13%	1224:1343>	6.684***	2.042*	1.863*
(-10,+10)	2537	3.12%	0.97%	1211:1365	3.954***	1.400$	1.183
(-15,+15)	2537	0.97%	0.93%	1211:1366	3.162***	1.137	1.164
(-1,0)	2537	6.12%	1.00%	1233:1282>>>	12.457***	1.614$	3.197***
(-2,0)	2537	6.18%	1.01%	1229:1306>>	10.312***	1.680*	2.659**
(-5,0)	2537	5.14%	0.86%	1192:1361	5.690***	1.454$	0.852
(-10,0)	2537	5.45%	0.76%	1203:1360	3.858***	1.236	1.105
(-15,0)	2537	4.32%	0.64%	1160:1408	2.414**	0.856	-0.69
(0,+1)	2537	0.65%	0.48%	1271:1244>>>	9.147***	4.451***	4.717***
(0,+2)	2537	0.36%	0.45%	1241:1300>>	7.177***	4.068***	3.024**
(0,+5)	2537	-0.57%	0.53%	1275:1280>>>	6.126***	4.049***	4.111***
(0,+10)	2537	-2.03%	0.47%	1249:1314>>	3.933***	2.560**	2.928**
(0,+15)	2537	-3.07%	0.55%	1249:1316>>	4.002***	2.655**	2.891**

Panel B: Targets, All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	472	16.37%	5.55%	375:97>>>	87.774***	11.229***	14.510***
(-2,+2)	472	16.90%	5.79%	381:100>>>	71.992***	11.733***	14.542***
(-5,+5)	472	18.18%	6.14%	378:106>>>	51.721***	11.596***	14.097***
(-10,+10)	472	17.48%	6.57%	378:107>>>	40.553***	11.915***	14.041***
(-15,+15)	472	16.93%	6.70%	373:113>>>	34.126***	11.359***	13.529***
(-1,0)	472	11.87%	4.15%	319:140>>>	81.376***	8.729***	10.032***
(-2,0)	472	12.25%	4.31%	345:123>>>	69.997***	9.197***	11.961***
(-5,0)	472	13.75%	4.65%	347:131>>>	54.091***	9.458***	11.595***
(-10,0)	472	13.91%	5.14%	355:125>>>	44.382***	10.120***	12.219***
(-15,0)	472	13.93%	5.31%	350:132>>>	38.010***	10.161***	11.653***
(0,+1)	472	15.86%	5.25%	371:96>>>	101.053***	10.658***	14.430***
(0,+2)	472	15.85%	5.34%	368:107>>>	83.618***	10.729***	13.692***
(0,+5)	472	15.36%	5.32%	360:119>>>	58.960***	10.526***	12.733***
(0,+10)	472	14.42%	5.27%	351:130>>>	43.306***	10.331***	11.798***
(0,+15)	472	13.76%	5.12%	343:140>>>	35.724***	9.837***	10.960***

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

gains in the global insurance market before the financial crisis. Cummins, Klumpes, and Weiss (2014) find the mean gain in the (-1, +1) window is 0.52% for the sample period of 1990-2006. This result is consistent with Akhigbe and Madura's (2001) earlier findings for U.S. M&As.

The target results in Table 7 provide support for Hypothesis 2. Consistent with the previous literature, we find substantial market value gains for M&A targets. The gains are statistically significant at the 1% level or better. For example, the mean cumulative abnormal returns for the (-1,+1), (-2,+2), and (-5,+5) windows are 16.37%, 16.90%, and 18.18%, respectively. Hence, in the insurance industry, M&As are value-creating for both acquirers and targets, with targets showing particularly large market value effects.

We also investigate the value effect of M&As between pre-crisis (1990-2006) and post-crisis (2010-2014). The results in Table 8 and Table 9 show that M&A deals create more value for acquirers pre-crisis than post-crisis and targets gain slightly higher value post-crisis than pre-crisis.

2.4.2.2 Results: country/regional analysis

We next analyze the overall results by specific country/region during the whole sample period 1990-2014. After detailed preliminary analysis revealed the principal patterns in the data, we decide to focus the analysis on the U.S., Europe (including the U.K.), and Asia (including Pacific Rim countries such as Australia and Japan). The geographically decomposed results for acquirers are shown in Table 10. The Table 10 results show that the overall results are strongly driven by the U.S. and the significant market value gains for U.S. acquirers are 8.71%, 9.20% and 7.60% for the (-1, +1),

Table 8: Cumulative Abnormal Returns Across Event Windows -- Change in Control Transactions, Market Model, Equally Weighted Index, 1990-2006

Panel A: Acquirers, All Years 1990-2006

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	1829	8.59%	1.32%	917:912>>>	12.987***	1.787*	4.257***
(-2,+2)	1829	8.04%	1.21%	879:960>	9.410***	1.590$	2.253*
(-5,+5)	1829	6.02%	1.00%	868:978)	6.234***	1.751*	1.586$
(-10,+10)	1829	4.89%	0.50%	855:999	3.253***	1.029	0.808
(-15,+15)	1829	2.78%	0.48%	864:991	2.946**	1.013	1.206
(-1,0)	1829	8.16%	1.05%	865:948>	11.031***	1.313$	2.163*
(-2,0)	1829	7.96%	0.90%	852:974	7.708***	1.234	1.268
(-5,0)	1829	6.84%	0.76%	835:1003	5.355***	1.24	0.213
(-10,0)	1829	7.45%	0.51%	855:989	3.308***	0.973	1.021
(-15,0)	1829	6.25%	0.36%	828:1020	2.326**	0.73	-0.326
(0,+1)	1829	0.51%	0.50%	900:915>>>	7.590***	4.190***	3.770***
(0,+2)	1829	0.14%	0.44%	876:951>>	5.979***	3.676***	2.374**
(0,+5)	1829	-0.79%	0.47%	907:931>>>	4.496***	3.239***	3.587***
(0,+10)	1829	-2.53%	0.26%	872:973>	2.308*	1.426$	1.795*
(0,+15)	1829	-3.45%	0.38%	884:962>>	2.661**	1.798*	2.335**

Panel B: Targets, All Years 1990-2006

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	339	15.02%	3.88%	262:77>>>	62.440***	8.050***	11.863***
(-2,+2)	339	15.75%	4.08%	269:77>>>	52.152***	8.615***	12.156***
(-5,+5)	339	16.77%	4.08%	265:83>>>	37.354***	8.621***	11.593***
(-10,+10)	339	16.35%	4.58%	269:80>>>	31.058***	9.233***	11.958***
(-15,+15)	339	16.09%	4.81%	271:79>>>	26.789***	8.995***	12.107**
(-1,0)	339	10.42%	2.76%	222:105>>>	56.148***	6.115***	8.237***
(-2,0)	339	10.85%	2.92%	242:94>>>	49.537***	6.626***	9.872***
(-5,0)	339	12.31%	2.97%	243:101>>>	38.253***	6.948***	9.473***
(-10,0)	339	12.72%	3.54%	252:94>>>	33.433***	7.823***	10.320***
(-15,0)	339	13.15%	3.84%	253:94>>>	29.657***	8.227***	10.364***
(0,+1)	339	14.23%	3.52%	257:78>>>	69.475***	7.417***	11.583***
(0,+2)	339	14.34%	3.65%	257:84>>>	57.670***	7.550***	11.186***
(0,+5)	339	13.62%	3.60%	248:96>>>	40.644***	7.374***	10.015***
(0,+10)	339	12.68%	3.55%	246:100>>>	30.194***	7.298***	9.672***
(0,+15)	339	11.93%	3.18%	239:109>>>	24.755***	6.851***	8.793***

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

Table 9: Cumulative Abnormal Returns Across Event Windows -- Change in Control Transactions, Market Model, Equally Weighted Index

Panel A: Acquirers, All Years 2010-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	391	1.87%	0.68%	202:189>	4.905***	1.749*	1.949*
(-2,+2)	391	2.48%	0.83%	204:194>	4.790***	1.937*	1.804*
(-5,+5)	391	2.69%	0.91%	190:208	3.560***	1.799*	0.397
(-10,+10)	391	2.97%	1.12%	203:195>	3.567***	1.948*	1.703*
(-15,+15)	391	2.25%	0.70%	196:202	2.045*	1.197	1
(-1,0)	391	2.18%	0.69%	210:179>>	6.364***	1.633$	2.862**
(-2,0)	391	2.60%	0.86%	211:181>>	6.309***	1.852*	2.810**
(-5,0)	391	2.41%	0.61%	199:197)	3.228***	1.167	1.399$
(-10,0)	391	2.27%	0.61%	191:206	3.030**	1.118	0.545
(-15,0)	391	1.73%	0.25%	183:214	1.608$	0.718	-0.259
(0,+1)	391	1.85%	0.64%	208:180>>	5.039***	1.715*	2.710**
(0,+2)	391	2.02%	0.62%	206:190>	4.183***	1.710*	2.104*
(0,+5)	391	2.39%	0.94%	215:182>>	4.792***	2.480**	2.960**
(0,+10)	391	2.80%	1.16%	218:179>>>	4.705***	2.709**	3.261***
(0,+15)	391	2.62%	1.09%	209:188>>	3.806***	2.414**	2.356**

Panel B: Targets, All Years 2010-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	74	17.47%	19.03%	61:13>>>	50.025***	5.889***	5.787***
(-2,+2)	74	17.76%	19.22%	63:12>>>	39.807***	5.853***	6.098***
(-5,+5)	74	18.75%	19.76%	62:14>>>	28.011***	5.220***	5.716***
(-10,+10)	74	17.48%	18.79%	60:16>>>	19.282***	5.135***	5.257***
(-15,+15)	74	16.68%	18.56%	57:19>>>	15.688***	4.800***	4.569***
(-1,0)	74	13.43%	14.83%	56:18>>>	47.943***	4.753***	4.624***
(-2,0)	74	13.88%	15.17%	61:13>>>	40.187***	4.849***	5.787***
(-5,0)	74	15.41%	16.49%	58:16>>>	31.199***	4.535***	5.090***
(-10,0)	74	15.43%	16.35%	58:16>>>	22.817***	4.648***	5.090***
(-15,0)	74	13.54%	15.08%	54:21>>>	17.627***	4.164***	4.019***
(0,+1)	74	17.85%	19.17%	61:12>>>	61.628***	5.882***	5.941***
(0,+2)	74	17.70%	19.03%	62:12>>>	50.543***	5.803***	6.020***
(0,+5)	74	17.19%	18.29%	63:12>>>	34.692***	5.550***	6.098***
(0,+10)	74	15.89%	17.44%	58:17>>>	24.596***	5.322***	4.943***
(0,+15)	74	16.76%	18.24%	58:17>>>	21.452***	5.538***	4.943***

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

Table 10 Cumulative Average Abnormal Returns Across Event Windows – Acquirer Transactions by Country/Region, Market Model, Equally Weighted Index

Panel A: Acquirers, US Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	1108	8.71%	2.31%	578:530>>>	12.856***	1.549$	3.480***
(-2,+2)	1108	9.20%	2.39%	568:546>>	11.214***	1.576$	2.701**
(-5,+5)	1108	7.60%	2.40%	560:559>	7.396***	1.712*	2.075*
(-10,+10)	1108	7.22%	2.47%	554:569)	5.822***	1.791*	1.600$
(-15,+15)	1108	5.97%	2.36%	552:572)	4.445***	1.516$	1.452$
(-1,0)	1108	7.57%	1.95%	533:569	12.160***	1.242	0.943
(-2,0)	1108	8.17%	1.98%	534:571	10.108***	1.289$	0.917
(-5,0)	1108	7.51%	1.93%	536:574	6.930***	1.305$	0.894
(-10,0)	1108	7.48%	1.89%	547:570)	5.584***	1.339$	1.354$
(-15,0)	1108	7.14%	1.71%	514:606	4.007***	1.104	-0.708
(0,+1)	1108	2.01%	0.68%	575:526>>>	6.986***	3.211***	3.508***
(0,+2)	1108	1.91%	0.72%	561:546>>	6.209***	3.499***	2.486**
(0,+5)	1108	0.95%	0.79%	588:527>>>	4.826***	3.262***	3.872***
(0,+10)	1108	0.57%	0.89%	574:544>>	4.107***	2.858**	2.943**
(0,+15)	1108	-0.35%	0.96%	585:535>>>	3.730***	2.646**	3.543***

Panel B: Acquirers, Europe or UK Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	917	6.86%	0.36%	428:489)	4.164***	2.549**	1.410$
(-2,+2)	917	5.53%	0.13%	399:520	1.354$	0.913	-0.576
(-5,+5)	917	2.27%	-0.02%	410:510	-0.016	0.057	0.125
(-10,+10)	917	0.18%	-0.28%	406:515	-1.178	-0.946	-0.17
(-15,+15)	917	-4.52%	-0.16%	413:508	-0.57	-0.178	0.294
(-1,0)	917	7.56%	0.35%	439:474>	4.971***	3.008**	2.264*
(-2,0)	917	7.00%	0.27%	424:494	3.229***	2.129*	1.114
(-5,0)	917	5.13%	0.01%	403:517	0.129	0.14	-0.34
(-10,0)	917	6.32%	-0.15%	398:522	-0.893	-0.593	-0.672
(-15,0)	917	3.69%	-0.11%	405:515	-0.594	-0.203	-0.207
(0,+1)	917	-1.02%	0.20%	430:478>	2.937**	1.576$	1.817*
(0,+2)	917	-1.81%	0.05%	415:497	0.831	0.456	0.695
(0,+5)	917	-3.21%	0.17%	414:501	1.541$	1.078	0.539
(0,+10)	917	-6.50%	0.06%	425:491	0.524	0.36	1.241
(0,+15)	917	-8.58%	0.14%	411:505	0.83	0.841	0.309

Table 10 (Continued): Cumulative Average Abnormal Returns Across Event Windows – Acquirer Transactions by Country/Region, Market Model, Equally Weighted Index

Panel C: Acquirers, Asia (Including Japan) Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	278	0.78%	0.84%	144:134>	4.381***	2.599**	1.747*
(-2,+2)	278	1.13%	1.17%	154:130>>	4.929***	2.930**	2.585**
(-5,+5)	278	0.97%	1.17%	137:149	3.216***	2.210*	0.451
(-10,+10)	278	-0.79%	0.18%	135:152	0.661	-0.35	0.158
(-15,+15)	278	-1.49%	-0.24%	127:160	0.154	-0.847	-0.789
(-1,0)	278	0.42%	0.31%	137:132)	2.058*	1.264	1.432$
(-2,0)	278	0.63%	0.56%	148:126>>	2.930**	1.867*	2.469**
(-5,0)	278	0.29%	0.39%	131:151	1.516$	0.839	-0.04
(-10,0)	278	-0.18%	0.25%	132:150	0.823	0.244	0.079
(-15,0)	278	-0.84%	-0.41%	116:168<	-0.672	-1.383$	-1.935*
(0,+1)	278	0.71%	0.72%	144:132>	4.396***	2.407**	1.865*
(0,+2)	278	0.85%	0.80%	149:135>	4.288***	2.450**	1.990*
(0,+5)	278	1.01%	0.96%	158:127>>	3.497***	2.542**	3.000**
(0,+10)	278	-0.29%	0.11%	136:151	0.607	-0.29	0.276
(0,+15)	278	-0.33%	0.34%	137:150	1.156	0.177	0.395

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

(-2, +2), and (-5, +5) windows, respectively. The market value gain for European acquirers is less than U.S. acquirers for the (-1, +1) window (6.86%) and it is significant at 10% level for one test and 2 of the tests show higher significant level. The market value gains are insignificant for the (-2, +2) window (5.53%) and for the (-5, +5) window (2.27%). However, unlike Cummins, Klumpes, and Weiss (2014), we find slightly significant positive gains of 0.78% and 1.13% for the (-1,+1) and (-2,+2) windows, respectively, for Asian acquirers (including Japan). Within Asia, Japanese life insurers have been especially active acquirers in an attempt to expand their international strategies. Low domestic funding costs have encouraged investment in overseas markets where prospective returns are higher (Swiss Re, 2015)[19]. In the meanwhile, Japanese P&C insurers are motivated by lack of organic growth opportunities and pressure to reduce costs. They have acquired deals in Southeast Asia to diversify away from domestic catastrophe risk exposures such as typhoon and earthquake damage. [20] Thus, the results for the U.S. and Asia support Hypothesis 1, i.e., M&As create value for acquirers on average. But the results for Europe, overall, do not support Hypothesis 1.

Table 11 provides the results for targets for our selected country/regions. There are two primary conclusions based on Table 11: (1) there are significant market value gains for targets in all the three major markets; (2) the market value gains for targets are substantially larger in the U.S. than they are for Europe or Asia. For example, the market value gain for targets in the (-2,+2) window is 24.27% for the U.S, 12.55% for Europe

[19] For example, Tokio Marine acquired Delphi Financial in 2011 and Dai-ichi's acquired Protective Life in 2014.
[20] For example, Tokio Marine acquired Philadelphia Consolidated, a US P&C insurer in 2008.

Table 11 Cumulative Abnormal Returns Across Event Windows – Target Transactions by Country/Region, Market Model, Equally Weighted Index

Panel A: Targets, US Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	205	23.64%	4.44%	175:30>>>	79.621***	11.326***	11.138***
(-2,+2)	205	24.27%	4.64%	178:28>>>	64.434***	11.546***	11.465***
(-5,+5)	205	27.26%	4.81%	178:28>>>	45.336***	10.998***	11.465***
(-10,+10)	205	26.65%	4.96%	180:26>>>	33.972***	11.312***	11.744***
(-15,+15)	205	28.46%	5.28%	182:24>>>	29.716***	11.880***	12.024***
(-1,0)	205	18.11%	3.33%	148:55>>>	73.780***	8.545***	7.525***
(-2,0)	205	19.05%	3.54%	157:47>>>	64.372***	8.927***	8.704***
(-5,0)	205	22.14%	3.75%	163:42>>>	48.359***	8.669***	9.458***
(-10,0)	205	22.01%	3.88%	167:38>>>	37.012***	8.923***	10.018***
(-15,0)	205	23.91%	4.19%	172:33>>>	33.171***	9.636***	10.718***
(0,+1)	205	22.67%	4.27%	175:30>>>	93.143***	10.750***	11.138***
(0,+2)	205	22.29%	4.24%	173:33>>>	75.459***	10.623***	10.767***
(0,+5)	205	22.11%	4.21%	170:36>>>	53.295***	10.531***	10.348***
(0,+10)	205	21.63%	4.23%	168:38>>>	39.558***	10.609***	10.068***
(0,+15)	205	21.55%	4.24%	167:39>>>	32.832***	10.498***	9.929***

Panel B: Targets, Europe or UK Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	157	12.27%	7.91%	119:38>>>	36.891***	3.770***	7.492***
(-2,+2)	157	12.55%	6.78%	120:40>>>	29.949***	3.940***	7.361***
(-5,+5)	157	12.19%	7.27%	118:43>>>	22.499***	4.114***	6.949***
(-10,+10)	157	11.37%	7.93%	122:40>>>	19.816***	4.700***	7.486***
(-15,+15)	157	9.67%	8.10%	119:43>>>	16.506***	4.421***	7.013***
(-1,0)	157	7.46%	6.15%	102:49>>>	35.473***	2.953**	5.314***
(-2,0)	157	7.22%	5.31%	114:43>>>	29.940***	3.107***	6.691***
(-5,0)	157	7.27%	5.80%	109:51>>>	23.750***	3.303***	5.616***
(-10,0)	157	7.78%	7.00%	113:48>>>	22.163***	4.013***	6.159***
(-15,0)	157	6.86%	7.01%	108:53>>>	18.920***	4.052***	5.368***
(0,+1)	157	12.06%	7.31%	114:39>>>	40.938***	3.441***	7.077***
(0,+2)	157	12.39%	7.41%	116:39>>>	34.004***	3.485***	7.205***
(0,+5)	157	11.83%	7.56%	112:44>>>	24.633***	3.544***	6.465***
(0,+10)	157	10.35%	7.19%	114:44>>>	18.318***	3.487***	6.597***
(0,+15)	157	9.43%	4.98%	112:48>>>	14.897***	3.219***	6.092***

Table 11 (Continued): Cumulative Average Abnormal Returns Across Event Windows ─ Target Transactions by Country/Region, Market

Panel C: Targets, Asia (Including Japan) Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	64	9.23%	10.94%	50:14>>>	21.530***	4.369***	5.286***
(-2,+2)	64	10.74%	13.21%	50:16>>>	20.638***	4.644***	4.981***
(-5,+5)	64	12.13%	14.37%	49:17>>>	15.028***	4.608***	4.734***
(-10,+10)	64	9.04%	12.96%	45:21>>>	10.722***	3.795***	3.745***
(-15,+15)	64	5.85%	12.16%	40:27>>	8.475***	2.983**	2.378**
(-1,0)	64	6.11%	6.67%	42:18>>>	15.924***	3.650***	3.853***
(-2,0)	64	6.95%	7.37%	45:16>>>	13.694***	4.038***	4.477***
(-5,0)	64	7.49%	7.85%	43:22>>>	11.563***	4.064***	3.388***
(-10,0)	64	6.24%	7.86%	43:22>>>	9.394***	3.608***	3.388***
(-15,0)	64	5.35%	7.84%	40:26>>	7.873***	3.040**	2.508**
(0,+1)	64	8.52%	9.96%	49:14>>>	23.323***	4.180***	5.189***
(0,+2)	64	9.19%	11.62%	44:21>>>	22.820***	4.290***	3.637***
(0,+5)	64	9.49%	11.72%	46:20>>>	15.923***	4.072***	3.992***
(0,+10)	64	7.64%	10.30%	41:25>>	10.887***	3.491***	2.755**
(0,+15)	64	5.33%	9.56%	36:30)	8.651***	2.993**	1.519$

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

(including the U.K.), and 10.74% for Asia (including Japan). The gains are largest in the U.S., perhaps showing evidence of a more fertile market for M&As or more advantageous regulatory conditions. But the gains are strongly significant for all three country/regional tabulations. This provides further support for Hypothesis 2 and shows that the results for targets are not driven solely by the U.S.

2.4.2.3 Results: cross-border versus within-border transactions

To investigate Hypothesis 3, Table 12 breaks down the overall acquirers' results into cross-border (Panel A) and within-border (domestic) transactions (Panel B). Whereas the results for cross-border transactions (Panel A) are positive across all windows, they are only significant for Patell Z test and insignificant for the other two test. However, the results are significantly positive across all windows for the domestic transactions, with the gains of 4.90% and 4.78% for the (-1,+1) and (-2,+2) windows, respectively. Hence, there is strong evidence to reject Hypothesis 3 that cross-border acquisitions are value-creating for acquirers. Instead, domestic transactions create large market value gains, suggesting that within-border transactions can be effective for insurance acquirers with less risk involved, especially during and after the financial crisis. This result is consistent with the recent studies of Boston Consulting Group (2009) and Swiss Re (2015). Both studies find investors tend to favor deals that are done in acquirers' home market. Besides gains in the short term, deals involving domestic transactions are also rewarded most over the long term by investors.

Table 13 reports the equivalent cross-border and within-border (domestic) transaction results for targets. In both cases, the CAARs are large, positive, and statistically significant for nearly all windows shown. For example, for the (-1,+1) and (-2,+2) windows,

Table 12 Cumulative Average Abnormal Returns Across Event Windows – Acquirer Domestic and Cross-Border Transactions, Market Model, Equally Weighted Index

Panel A: Acquirers, Cross-border Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	704	10.39%	2.35%	340:364	11.138***	1.117	1.134
(-2,+2)	704	9.93%	2.30%	322:384	9.217***	1.102	-0.296
(-5,+5)	704	8.90%	2.16%	327:381	5.032***	0.977	0.012
(-10,+10)	704	7.23%	1.98%	316:396	2.886**	0.516	-0.954
(-15,+15)	704	5.27%	1.68%	317:395	1.25	0.099	-0.879
(-1,0)	704	10.63%	2.38%	344:356)	13.744***	1.133	1.581$
(-2,0)	704	10.29%	2.33%	338:365	11.018***	1.136	1.019
(-5,0)	704	9.70%	2.06%	318:387	5.952***	0.96	-0.563
(-10,0)	704	8.99%	2.04%	319:388	4.307***	0.884	-0.557
(-15,0)	704	7.80%	1.78%	318:390	2.242*	0.567	-0.667
(0,+1)	704	-0.24%	0.08%	325:371	1.226	0.586	0.281
(0,+2)	704	-0.39%	0.07%	319:383	0.931	0.547	-0.384
(0,+5)	704	-0.83%	0.20%	331:375	1.417$	1.125	0.383
(0,+10)	704	-1.77%	0.05%	324:386	0.236	-0.374	-0.284
(0,+15)	704	-2.56%	0.01%	320:390	-0.042	-0.265	-0.585

Panel B: Acquirers, Domestic Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	1832	4.90%	0.71%	934:898>>>	9.078***	4.380***	4.512***
(-2,+2)	1832	4.78%	0.71%	923:929>>>	7.161***	4.016***	3.548***
(-5,+5)	1832	2.50%	0.68%	897:961>	4.775***	3.171***	2.204*
(-10,+10)	1832	1.56%	0.52%	895:968>	2.878**	1.841*	2.002*
(-15,+15)	1832	-0.68%	0.60%	893:971>	2.934**	1.695*	1.887*
(-1,0)	1832	4.38%	0.37%	889:925>>	6.135***	2.526**	2.802**
(-2,0)	1832	4.61%	0.42%	891:940>>	5.325***	2.560**	2.518**
(-5,0)	1832	3.40%	0.32%	874:973)	3.042**	1.785*	1.371$
(-10,0)	1832	4.11%	0.19%	884:971>	1.900*	0.994	1.664*
(-15,0)	1832	2.99%	0.13%	841:1018	1.445$	0.673	-0.425
(0,+1)	1832	0.99%	0.66%	945:873>>>	9.979***	4.529***	5.349***
(0,+2)	1832	0.64%	0.62%	921:917>>>	7.851***	4.183***	3.768***
(0,+5)	1832	-0.47%	0.68%	944:904>>>	6.332***	3.953***	4.618***
(0,+10)	1832	-2.13%	0.65%	924:928>>>	4.473***	3.051**	3.595***
(0,+15)	1832	-3.27%	0.79%	928:926>>>	4.725***	3.149***	3.737***

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

the gains are 17.99% and 18.77%, respectively, for cross-border transactions and 15.68% and 16.13%, respectively, for domestic transactions. The results support Hypothesis 4 – cross-border transactions are value-creating for targets – but only within-border transactions appear to generate market value gains for acquirers.

2.4.2.4 Results: cross and within-industry analysis

To investigate whether the sources of value creation in M&As are related to conglomeration or strategic focusing, this section discusses the results for cross-industry and within-industry M&A transactions.

We first consider the results for acquirers. Table 14 shows the acquirer CAARs for the case where both the acquirer and target are insurance companies (panel A) and where the acquirer is an insurance company but the target is from some other industry (any industry except insurance company or insurance agent/broker) (panel B). The results show that focusing transactions are more likely to reduce value for acquirers than diversifying transactions. The CAARs for the (-1,+1) and (-2,+2) windows are -0.19% and -0.60%, respectively, for transactions where the acquirer and target are both insurers. Both CAARs are statistically significant by all three significance tests. By contrast, when the acquirer is an insurer and the target is not, the (-1,+1) and (-2,+2) CAAR are slightly positive and statistically significant by at least two significant tests. The CAAR for (-5. +5) window is negative and significant by at least two significant tests. And a longer window is negative but insignificant by all tests.

Thus, the results in panels A and B of Table 14 reject Hypothesis 5. This result is in contradicts with Cummins, Klumpes, and Weiss (2014), which find slightly positive and significant gains for focusing deals and value-neutral for diversifying deals before the

Table 13 Cumulative Abnormal Returns Across Event Windows – All Target Domestic and Cross-Border Transactions, Market Model, Equally Weighted Index

Panel A: Targets, Cross-border Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	140	17.99%	2.94%	113:27>>>	55.560***	8.398***	8.460***
(-2,+2)	141	18.77%	2.95%	114:27>>>	45.006***	8.661***	8.523***
(-5,+5)	141	19.26%	2.95%	112:29>>>	32.857***	8.859***	8.184***
(-10,+10)	141	19.39%	3.25%	113:28>>>	26.827***	9.319***	8.354***
(-15,+15)	141	17.52%	3.27%	111:30>>>	22.293***	8.302***	8.015***
(-1,0)	136	12.93%	2.28%	104:32>>>	55.765***	7.421***	7.344***
(-2,0)	138	13.46%	2.33%	109:29>>>	47.765***	7.874***	7.991***
(-5,0)	141	14.21%	2.37%	107:34>>>	37.433***	8.332***	7.338***
(-10,0)	141	14.36%	2.69%	110:31>>>	31.122***	8.818***	7.846***
(-15,0)	141	13.07%	2.70%	106:35>>>	25.923***	8.373***	7.169***
(0,+1)	136	17.27%	2.72%	107:29>>>	63.833***	8.057***	7.861***
(0,+2)	137	17.36%	2.78%	103:34>>>	52.474***	7.780***	7.068***
(0,+5)	139	16.55%	2.75%	101:38>>>	37.004***	7.604***	6.522***
(0,+10)	140	16.41%	2.75%	102:38>>>	27.699***	7.807***	6.592***
(0,+15)	141	15.72%	2.48%	102:39>>>	23.195***	7.359***	6.492***

Panel B: Targets, Domestic Transactions for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	332	15.68%	11.75%	262:70>>>	68.579***	8.188***	11.813***
(-2,+2)	340	16.13%	12.46%	267:73>>>	56.647***	8.625***	11.812***
(-5,+5)	343	17.73%	12.94%	266:77>>>	40.373***	8.452***	11.501***
(-10,+10)	344	16.70%	13.50%	265:79>>>	30.977***	8.570***	11.326***
(-15,+15)	345	16.69%	13.73%	262:83>>>	26.252***	8.370***	10.935***
(-1,0)	323	11.43%	8.56%	215:108>>>	60.824***	6.039***	7.202***
(-2,0)	330	11.75%	8.88%	236:94>>>	52.471***	6.349***	9.083***
(-5,0)	337	13.55%	9.48%	240:97>>>	40.208***	6.467***	9.069***
(-10,0)	339	13.72%	10.41%	245:94>>>	32.740***	6.939***	9.485***
(-15,0)	341	14.28%	10.84%	244:97>>>	28.522***	7.135***	9.247***
(0,+1)	331	15.28%	11.16%	264:67>>>	79.116***	7.783***	12.103***
(0,+2)	338	15.24%	11.33%	265:73>>>	65.719***	7.949***	11.730***
(0,+5)	340	14.87%	11.15%	259:81>>>	46.323***	7.803***	10.942***
(0,+10)	341	13.60%	10.79%	249:92>>>	33.685***	7.524***	9.790***
(0,+15)	342	12.96%	10.38%	241:101>>>	27.561***	7.173***	8.858***

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

Table 14 Cumulative Abnormal Returns Across Event Windows – Acquirer Cross and Within-Sector Transactions, Market Model, Equally Weighted Index

Panel A: Acquirers, Acquirer and Target are Insurance Companie for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	1189	-0.19%	0.38%	599:590>>	5.062***	2.941**	2.801**
(-2,+2)	1194	-0.60%	0.40%	587:607>	4.050***	2.498**	1.964*
(-5,+5)	1197	-2.57%	0.27%	570:627	2.063*	0.994	0.896
(-10,+10)	1199	-1.63%	0.14%	556:643	0.785	0.034	0.03
(-15,+15)	1199	-3.92%	0.21%	567:632	0.945	0.173	0.667
(-1,0)	1181	-0.28%	0.22%	580:601>	3.533***	2.024*	1.918*
(-2,0)	1188	-0.52%	0.19%	577:611)	2.550**	1.494$	1.549$
(-5,0)	1193	-1.25%	-0.06%	539:654	-0.333	-0.487	-0.795
(-10,0)	1195	0.97%	-0.13%	554:641	-0.639	-0.892	0.022
(-15,0)	1196	-0.17%	-0.28%	532:664	-1.401$	-1.245	-1.281
(0,+1)	1176	0.03%	0.31%	603:573>>>	4.939***	2.575**	3.402***
(0,+2)	1186	-0.14%	0.36%	596:590>>	4.565***	2.689**	2.710**
(0,+5)	1191	-1.39%	0.49%	596:595>>	4.543***	2.838**	2.570**
(0,+10)	1194	-2.67%	0.42%	586:608>	2.843**	1.801*	1.906*
(0,+15)	1194	-3.83%	0.64%	604:590>>	3.676***	2.335**	2.951**

Panel B: Acquirers, Acquirer is Insurance Company and Target is Not for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	518	0.23%	0.51%	250:268	3.791***	2.609**	1.204
(-2,+2)	518	0.14%	0.56%	253:274	3.376***	2.493**	1.097
(-5,+5)	518	-1.43%	0.47%	245:283	1.959*	1.903*	0.357
(-10,+10)	518	-4.10%	0.24%	241:288	1.118	0.893	-0.033
(-15,+15)	518	-6.35%	-0.12%	239:290	0.022	0.104	-0.207
(-1,0)	518	0.08%	0.26%	260:255>	2.320*	1.725*	2.213*
(-2,0)	518	0.30%	0.42%	264:255>>	3.240***	2.569**	2.396**
(-5,0)	518	-0.53%	0.39%	262:264>	2.260*	2.087*	1.926*
(-10,0)	518	-2.09%	0.21%	244:283	1.360$	0.751	0.31
(-15,0)	518	-3.47%	0.03%	232:296	0.462	0.171	-0.779
(0,+1)	518	0.33%	0.44%	251:265)	4.183***	2.432**	1.375$
(0,+2)	518	0.02%	0.33%	245:278	2.634**	1.726*	0.559
(0,+5)	518	-0.72%	0.27%	239:289	1.549$	1.387$	-0.167
(0,+10)	518	-1.84%	0.22%	242:286	0.96	1.051	0.095
(0,+15)	518	-2.71%	0.03%	229:299	0.201	0.452	-1.041

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

financial crisis for acquirers. Hence, Acquiring insurance companies diversifying the business into a different industry especially after the financial crisis will create value.

Table 15 shows the within and cross-industry results for targets. Panel A shows results for targets where both the acquirer and target are insurance companies, and Panel B shows results where the acquirer is an insurance company but the target is from some other industry (any industry except insurance company and insurance agent/broker). Two conclusions may be drawn from Table 15: (1) Both insurance and non-insurance targets realize substantial market value gains from being involved in M&A transactions. For example, the (-2,+2) CAAR is 18.68% for insurance targets and 11.8% for non-insurance targets, both of which are statistically significant at the 0.1% level. (2) The market value gains are generally higher for insurance targets than for non-insurance targets. For example, the (-5,+5) CAAR is 19.01% for insurance targets and 11.8% for non-insurance targets, respectively. The results thus support Hypothesis 6 in the sense that M&A market value gains are larger for insurance targets than for non-insurance targets. This provides evidence supporting the strategic focus hypothesis for the insurance industry from the targets' perspective.

2.5 Conclusions

This paper investigates the value effect of M&A transactions in the global insurance industry in the past two decades. The M&A transactions included in the study are those where either the acquirer or the target is in the insurance industry. We examine the value effect of M&A transactions on both the acquiring firm and the target firm during the period

Table 15 Cumulative Average Abnormal Returns Across Event Windows – Acquirer Cross and Within-Sector Transactions, Market Model, Equally Weighted Index

Panel A: Targets, Acquirer and Target are Insurance Companie for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	235	18.22%	4.37%	193:42>>>	76.285***	10.767***	11.406***
(-2,+2)	235	18.68%	4.34%	188:48>>>	61.411***	11.024***	10.669***
(-5,+5)	235	19.01%	4.38%	189:47>>>	44.145***	10.691***	10.800***
(-10,+10)	235	18.02%	4.62%	190:47>>>	34.544***	10.979***	10.848***
(-15,+15)	235	16.41%	4.61%	189:48>>>	28.590***	10.449***	10.718***
(-1,0)	235	13.03%	3.38%	164:66>>>	74.291***	8.835***	7.985***
(-2,0)	235	13.39%	3.42%	178:55>>>	63.538***	9.194***	9.599***
(-5,0)	235	13.91%	3.43%	179:56>>>	48.655***	9.044***	9.571***
(-10,0)	235	13.72%	3.78%	181:54>>>	39.433***	9.464***	9.833***
(-15,0)	235	12.94%	3.79%	179:56>>>	32.973***	9.379***	9.571***
(0,+1)	235	17.75%	4.09%	190:42>>>	87.427***	10.300***	11.262***
(0,+2)	235	17.69%	4.12%	182:51>>>	71.448***	10.130***	10.125***
(0,+5)	235	17.23%	4.09%	178:57>>>	50.477***	10.022***	9.440***
(0,+10)	235	16.44%	4.02%	174:62>>>	37.241***	10.034***	8.837***
(0,+15)	235	15.54%	3.64%	176:61>>>	30.806***	9.496***	9.021***

Panel B: Targets, Acquirer is Insurance Company and Target is Not for All Years 1990-2014

Days	N	Mean CAAR	Precision Weighted CAAR	Positive: Negative	Patell Z	SCS Z	Generalized Sign Z
(-1,+1)	111	11.03%	6.99%	84:27>>>	21.679***	2.048*	5.901***
(-2,+2)	111	11.80%	8.23%	95:22>>>	19.289***	2.521**	7.254***
(-5,+5)	111	11.80%	8.13%	92:26>>>	13.443***	2.456**	6.582***
(-10,+10)	111	13.00%	9.60%	91:27>>>	11.174***	2.804**	6.398***
(-15,+15)	111	13.94%	10.08%	88:31>>>	10.049***	2.792**	5.732***
(-1,0)	111	7.52%	3.82%	69:37>>>	13.842***	1.109	3.585***
(-2,0)	111	8.30%	4.50%	78:32>>>	13.409***	1.388$	4.873***
(-5,0)	111	8.60%	5.12%	79:35>>>	10.841***	1.595$	4.616***
(-10,0)	111	9.71%	6.43%	83:33>>>	9.984***	1.988*	5.143***
(-15,0)	111	10.05%	6.57%	81:37>>>	8.834***	2.056*	4.554***
(0,+1)	111	10.86%	6.67%	86:24>>>	24.899***	1.915*	6.400***
(0,+2)	111	10.74%	7.08%	89:26>>>	21.237***	2.110*	6.374***
(0,+5)	111	10.17%	6.38%	86:30>>>	14.279***	1.922*	5.700***
(0,+10)	111	10.13%	6.56%	83:33>>>	10.697***	1.943*	5.143***
(0,+15)	111	10.69%	6.85%	80:36>>>	9.505***	1.988*	4.585***

***Significant at 0.1% level, **Significant at 1% level, *Significant at 5% level, $ Significant at 10% level

Key: CAAR = cumulative average abnormal return, SCS Z = standardized cross-sectional Z score, Generalized sign Z = non parametric test statistic. Note: This table reports results for all transactions reported in the Thomson One Database for which corresponding Thomson Datastream stock returns exist, where the transaction resulted in a change in control.

immediately preceding and following the announcement, over various event windows. The analysis includes the overall results for the whole sample period of 1990-2014 in the global insurance market and also breaks down the results by country/region, by cross-border versus within-country transactions, and by whether the transaction was within or cross-industry (i.e., focusing or diversifying).

Based on the overall results, there are large and highly significant gains for both acquirers and targets, with targets showing particularly large market value effects. Breaking the results out by country/region, we find relatively large significant market value gains for acquirers in the U.S. and Europe and also small significant gains in Asia. Significant market value gains are also found for targets in the U.S., Europe, and Asia. The gains for targets are larger in the U.S. than they are in Europe or Asia. Thus, the U.S. was a particularly fertile environment for M&As during our sample period.

Breaking down the results into cross-border and within-border (domestic) transactions, we find that insignificant gains for acquirers in cross-border transactions and significant positive gains in within-border transactions. Similar substantial gains for targets in both cross-border and within-border transactions are reported. The results suggest cross-border deals do not create competitive or efficiency advantages for acquirers and both cross-border and within-border deals are value-enhancing for targets.

We also compare M&A transactions within the insurance industry with transactions where the acquirer is in the insurance industry and the target is in some other industry. The results show that acquirers realize small market value gains from cross-industry transactions but that within-industry results lead to market value losses for acquirers. Hence, the results for acquirers do not support strategic focus hypothesis – diversifying deals are

more likely to create value after the financial crisis. There are large and significant market value gains for targets in both within and cross-industry transactions, but the gains are larger for within-industry deals. This is consistent with strategic focus hypothesis.

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