An Analysis of Market Exit Forms and Decision Factors

- A Case of the U.S. Property-Liability Insurance Market* -

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This paper examines financial, managerial and market factors that insurance companies and regulators use to reach a decision of business continuance, merger/acquisition, or voluntary or involuntary liquidation of the entire business (i.e., a complete exit from the market). For this, we describe exit regulation in the insurance market and the importance of it on insurer operations. We then use the A.M. Best database of the U.S. property-liability insurance industry for 1999-2004 (for *t-1*) and a multinomial logit regression approach to empirically estimate the impact of financial (profitability, underwriting performance, liquidity, capital adequacy and capital measurement), managerial and political environments on the market stay/exit decision making process. The results show that asset size is not only positively related to the probability of business continuance but also likely leads insurers to choose voluntary liquidation or merger instead of involuntary liquidation when they have decided to leave the market. Profitability and capital adequacy also affect market exit decisions. Underwriting performance seems to affect the decisions but not necessarily consistently across the market stay/exit choices.

Key words: involuntary liquidation, market exit, multinomial logit regression, property-liability insurance, voluntary liquidation
학술진흥재단 분류 연구분야 코드: B051600

* We thank the editor of this journal and two anonymous reviewers for their insightful comments.
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논문 투고일: 2009. 07. 06, 논문 최종 수정일: 2009. 07. 15, 논문 게재 확정일: 2009. 07. 24

I. INTROUCTION

Theory suggests that regulation is costly and a mere presence of it prohibits the regulated market from being contestable[1]. Nevertheless, insurance markets around the world have long been subject to stringent regulation. Protection of policyholders' and claimants' rights and promotion of the growth of a financially sound insurance market are two of the common arguments for the regulation.

Existing regulatory measures can be broadly grouped into four categories (Skipper and Kwon, 2007). The first is market entry regulation, such as initial capital, fit-and-proper person, and license requirements. Second, licensed insurers are subject to prudential (also known as financial and solvency) regulation and, in selected market or lines of business, may also be subject to rate and product regulation. On-going capital regulation via a solvency margin or risk-based capital approach is an example of this type of regulation. The third is market conduct regulation and corporate governance regulation, which is related in part to regulation of accounting transparency and insurer investment activities. The fourth is exit regulation that prescribes how licensed insurers can and should exit from a line of business or completely from the insurance market. In some jurisdictions, insurers are bound to the market exit procedures stipulated in the general bankruptcy code. In some other jurisdictions (e.g., U.S. state governments), insurers

1) A contestable market allows firms to enter it free of cost and, on exiting the market, to liquidate their investment without any loss for an alternative use of the capital (Baumol et al., 1982). A mere presence of regulation thus prohibits any market from achieving a Pareto optimal equilibrium. Besides, an exit barrier can deter potential suppliers' entry to the market (Ilmakunnas and Topi, 1999; and Europe Economics, 2004).

are bound to the procedures stated in the insurance act and regulations[2]. In the remaining countries, insurers abide by both the general code and the insurance act.

This paper examines the impact of this less empirically known type of regulation[3].

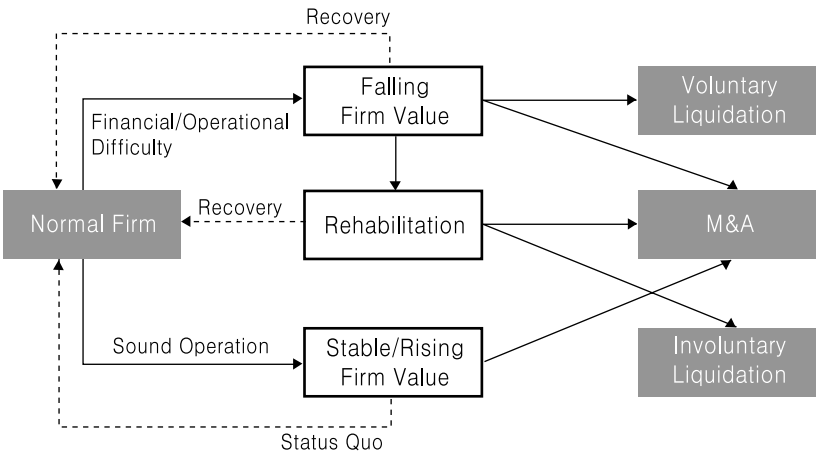
We illustrate this regulation-based life cycle of insurance companies in Figure 1. The figure shows that a typical insurance company begins its life as a financially and operationally sound firm. Termed as the normal firm in this paper, it usually continues its operation. We assume that a normal firm is not subject to involuntary liquidation by the regulator. Yet, voluntary liquidation occurs, albeit on the odd occasion, and some normal firms merge with another or become an acquisition target[4]. For example, equity-holders may decide to sell an insurer via merger or acquisition when the offer price is greater than the perceived market value of the firm.

2) U.S. state insurance acts are based mainly on the Uniform Insurers Liquidation Act of 1939 and the NAIC Insurers Rehabilitation and Liquidation Model Act of 2003.

3) Kwon et al. (2005) conducted a survey of the regulatory environments that govern exit processes of insurance companies in selected countries in Asia, Europe and North America. Their finding confirms that insurers withdrawing from a line of insurance business or completely from an insurance market are subject to a close control of the local regulatory authority. They also find that exit regulation in insurance is a concern from a public policy viewpoint as well as from an economic activity viewpoint.

4) In this paper, we use the term merger when two firms dissolve their businesses and emerge into a single, newly incorporated entity. An acquisition" takes place when a firm retains its name, thus its business licensure, and the target firm dissolves and becomes part of the acquiring firm.

Figure 1: Life Cycle of Insurance Companies



Source: Revised based on Kwon et al. (2005).

When an insurer experiences an extreme financial or operational difficulty, its equity-holders may evaluate other options to business continuation (discussed further later in the internal managerial factor section). We assume that ceteris paribus, equity-holders first attempt a merger or acquisition, with which they hope to cash out some franchise value of the firm, followed by (if permitted) an attempt of voluntary liquidation, with which they forego the entire franchise value of the firm but may still be able to salvage their capital investment.

Debt-holders, including policyholders, may initiate a market exit process. However, it is more than often the regulatory authority that speaks and acts for policyholders in the insurance market[5]. Further, insurance companies in

5) In fact, few countries permit such action by policyholders. Hong Kong is the only country we find where the law permits a group of 10 policyholders or more to file a bankruptcy petition for their insurance company.

many countries are not much financially leveraged. For instance, the U.S. property-liability insurance industry had 0.2 percent of their liabilities in the form of borrowed money (A.M. Best, 2006).

The regulator may intervene with the operations of non-performing insurers. It seems that regulators rarely use involuntary liquidation as their first choice of action. Instead, they offer those insurers an opportunity to return to normalcy and guide them to do so (e.g., overseeing a corporate restructuring plan). When that attempt fails, they may place the companies under receivership for rehabilitation. On concluding that the rehabilitation attempt has also failed, regulators may arrange acquisition of the companies by unaffiliated insurers. In the case that two insurers experience a similar difficulty, the regulator may propose a merger between them as an alternative. When none of these choices works, regulators may deliver the ultimatum involuntary liquidation and dissolve the companies[6]. Hence, the regulator's choices of action in market exit regulation in the order of preference would be rehabilitation, merger/acquisition (M&A), and involuntary liquidation.

We thus assume that the exit decision of an insurance company can be for M&A (for example, a decision by equity-holders or their agents) or for M&A /involuntary liquidation by the regulator. In selected markets, insurance companies may initiate an exit process, which we term as a voluntary liquidation. Nevertheless, they are still required to secure prior approval from the regulator of the exit process and, upon securing the approval, are continued to be subject to the regulatory oversight until the exit process is complete. Regulators tend to attach similar conditions to market exits via voluntary M&A.

6) Conservation of assets is synonymous with liquidation in several jurisdictions.

The size of runoff business insurance obligations (liabilities) of insurance companies that have been liquidated or have ceased operations in selected lines of business or territories continues to grow. In the global market, 71 percent of the runoff business is related to insurers' liabilities and the rest to reinsurers' (ARC, 2003).

The run-off business is concentrated in the markets in Bermuda, France, Germany, Japan, the U.K. and the U.S. Of which, the U.S. holds the largest share with estimated liabilities of US$150-200 billion (PwC, 2007). A KPMG survey (2006a) reports total run-off liabilities of 38.2 billion in the London market alternatively, around 19 percent of the U.K. nonlife insurance business in the market. Another survey by KPMG (2006b) for life insurance shows run-off liabilities amounting to 53 billion or 28 percent of liabilities of all U.K. life insurance firms.

In this study, we examine factors affecting insurers' decision to leave the market in lieu of continued operation in this regulated market. Based in part on the studies by Schary (1991) and BarNiv and Hathorn (1997), we investigate the relationship between exit forms and the characteristics reflecting the internal and external environments surrounding the firms at the time of decision-making. The paper is structured as follows. Immediately after this introductory section, we review theories and existing literature dealing with market exits in insurance. We then build models and empirically examine insurer behaviors using U.S. property-liability market data. The next section discusses key findings. We offer our conclusions in the final section.

II. REVIEW OF LITERATURE

Several studies examine entry barriers (e.g., Bain, 1956; Baumol et al., 1982; Bernheim, 1984) or market exit (e.g., Resnick, 1998; and Peach, 1998) in a competitive market environment as well as the determinants of the form of exit in markets in general (e.g., Schary, 1991). Studies about market exit in the financial services sector, particularly in the insurance industry, are found but in a limited scope. For example, Trieschmann and Pinches (1973) and BarNiv and Hershbarger (1990) attempt to predict insurer insolvency, and Carson and Hoyt (2000) examine causes of insolvency. BarNiv and Hathorn (1997) study factors affecting bankruptcy, voluntary retirement and merger of financially distressed insurers. However, no study is known to have examined the fuller multiplicity of exit forms merger and acquisition, voluntary liquidation and involuntary liquidation and factors affecting the decision process.

Numerous factors can affect the life cycle of the insurance company. For the sake of this paper, we group them broadly into: financial factors, internal management factors and external (political) factors. The financial factors can be further classified into those related to profitability, underwriting performance, liquidity, capital adequacy and the capital itself.

1. Financial Factors

All other things held constant, the owners of an exiting firm would attempt to maximize their own wealth before liquidation as well as the residual value of the firm at liquidation. Similarly, the non-owner management of the firm would attempt to increase not only their economic

wealth until liquidation but also their values in the job market they wish to enter after liquidation. In other words, a firm at a declining stage of business life cycle may form an exit strategy instead of, as Resnick (1998) argues, making a further capital commitment to the business. Karakaya (2000) supports the argument such that voluntary liquidation helps shareholders salvage their investment in the liquidated firm. Peach (1998) also suggests that firm owners and their agents have every incentive to recover their investment capital as much as legally permitted. We attempt to measure how strongly these wealth motives affect the exit decision using the following sub-categories, beginning with profitability.

Profitability

Several proxy variables have been used to measure insurer profitability. For example, the NAIC uses the ratio of 2-year investment yield average to invested assets for its IRIS analysis. BarNiv and Hathorn (1997) use the ratio of net income to total assets (ROA) to proxy measure the wealth motive.

It is assumed that the higher, say, the ROA ratio, the more it is likely that the firm continues operation or becomes an M&A target. As an alternative proxy, Cummins and Nini (2002) and BarNiv and McDonald (1992) use the return on equity (ROE). Underwriting Performance. Several conventional financial ratios have been used to measure insurers' underwriting performance. For example, the loss ratio, which often includes loss adjustment expenses, represents the pure cost of insurance coverage (e.g., Angoff, 2005) whereas the expense ratio corresponds to non-claims-related activities of the insurer. The sum of these two ratios (i.e., the combined ratio) is often used to measure the soundness of underwriting operations in the insurance market (e.g., Berger et al., 1992; Cummins and

Danzon, 1997; Hoyt and Powel, 2005)[7]. Ceteris paribus, the lower the loss (or combined) ratio, the healthier the company and the more likely it stays in business or becomes an M&A target.

Liquidity

We find two commonly used proxies for insurer liquidity measurement. The ratio of liabilities to liquid assets (LQAST), for instance, is used to evaluate insurer's ability to meet claims (e.g., Carson and Hoyt, 1995)[8]. Examination of the effect of intermediaries' concern about the insurer's claims paying ability (especially when they capture a signal indicating possible insolvency of the insurer), Trieschmann and Pinches (1973) use agent's balance to surplus (AGBAL)[9]. All being equal, we expect that normal firms or potential M&A targets reveal a lower LQAST or a lower AGBAL ratio than other firms.

Capital Adequacy

We may safely assume that adequately (highly) capitalized firms prefer staying in business or are attractive M&A targets. Capital adequacy can be proxy measured by the NAIC risk-based capital ratio (e.g., Cox, 2004) or a similar ratio such as A.M. Best's BCAR, although both ratios reflect more

7) The operating ratio can be another proxy although it reflects in part the investment performance of the company.

8) A related issue in exit regulation is valuation of outstanding insurance obligations. Generally, valuation of unearned premiums tends to be direct, but valuation of loss reserves including incurred-but-not-reported (IBNR) losses can be very complicated, especially for long-tail or volatile lines of business. In the case of a merger or acquisition involving a financially and operationally sound firm, measurement of the franchise value of insurance business becomes another issue.

9) AGBAL may also indicate the insurer's ability to manage account receivables.

about the insurer's ability to absorb a host of risks (shocks) than purely about its capital adequacy (Pottier and Sommer, 2002). We may also assume that firms with a low ratio of net premiums written to policyholders' surplus (NPWSUR) is relatively better capitalized (Ambrose and Steward, 1988) and thus has a strong growth potential. The quality of reinsurance, as measured by the surplus-aid-to- surplus ratio, has also been used by the NAIC as an IRIS test element to capital adequacy of insurance companies. Given that such surplus aid is generally available in proportional treaty reinsurance, it is not known a priori whether this ratio is powerful enough as a factor affecting market exit decisions.

Capital (Firm Size)

Generally, the greater the size of capital input such as surplus or assets, the greater the wealth motive of the equity-holders and management of the firm. Indeed, Fok et al. (1997) find some relationship between risk and profitability of insurance companies, large and small. Assets and policyholders' surplus are also used by Carson and Hoyt (1995) and BarNiv and McDonald (1992). When facing liquidation, such firms would prefer voluntary liquidation to regulatory intervention (including involuntary liquidation).

2. Internal Managerial Factors

Insurers may exit markets for reasons other than financial ones. As alluded to above, they may do so for a good cause. Through merger, for example, healthy companies expect improvement in scale and scope economies. Whether the target is financially or operationally sound or is

made available as a result of regulatory receivership should matter little as long as the merger partner or the acquiring company believes that the target company possesses some on- or off-balance sheet value over the price it is willing to pay. Thus, mergers and acquisitions are norm, rather than exception, in capital markets and in the insurance market in particular. We also observe cases where an internal (managerial) force may lead a complete cessation of business operation. For instance, we have discussed that a firm may decide so when it no longer realizes a sustainable rate of return in a market. Other internal forces that would change the date of the firm are ownership structure, business concentration, and product distribution channels.

Ownership Structure

Ownership structure has been an important variable employed in several efficiency and performance studies since Mayers and Smith (1988), although the findings are not consistent. Hence, it is not known whether separation of ownership and management (i.e., stock company structure) would result in more cases of voluntary liquidation than cases of regulatory intervention. The effect of the conflict between the principal and the agent can be proxy estimated using a dummy stock-mutual classification. (Refer also to the discussion later about the relationship between ownership structure and the political environment.)

Business Concentration (Diversification)

Portfolio theory suggests that the wider the scope of business of an insurer by line or territory, the more diversified its insurance risk portfolios and the less likely the firm exits the market (unless the exit is to realize a higher market value of the firm than its intrinsic value), all others things being

constant. One can attempt to proxy measure concentration of business in the insurance market with a Herfindale index. For example, the skewness of insurance risk portfolios to a single line or a few lines of business can be estimated using $\Sigma (Premium_j / Total\ Premium)^2$ where j stands for each line of business the insurer writes. A ratio near to zero indicates the firm's risk portfolios are well-diversified. A ratio of one indicates that it is a monoline insurer.

Product Distribution Channels

Some contend that differences in insurer expenses can be explained by the distribution channels they use (e.g., direct writing vs. agency writing). Such a contention is probably too strong in today's markets where insurers increasingly prefer a mix of multiple distribution channels to a single channel. Lee (1989) also finds constant returns to scale among direct writers in the U.S. property-liability market. Nevertheless, we test whether differences in the distribution channel would affect the exit decision making process of insurance firms.

3. External Political Factors

The political environment is assumed to affect the speed and quality of regulatory intervention with firms experiencing financial or operational difficulty within the jurisdiction[10]. For example, one may examine whether the insurance commissioners elected by the public would pay more attention

10) Other external forces, such as changes in government policy and catastrophic insured losses, can affect the national or regional market. In this paper, we only examine state-specific external factors.

to the protection of policyholders' interests than the commissioners appointed by the head of the state government do[11].

The U.S. state markets permit both voluntary and involuntary liquidation. Hence, it is not known a priori which one the insurer or the regulator would respond first to a sign of severe financial or operational distress. All other being equal, the management (also representing equity-holders) of the insurer would capture the signal before it is transmitted to the regulator[12]. However, whether the firm will respond in a timely manner to the signal may depend, as discussed earlier, on the expected net worth of the firm and the strength of the wealth motive of the management[13].

For example, Grace et al. (2005) find that the managers of stock insurance companies take on additional level of risk, as compared to owners of mutual firms, when the firm is under financial distress. Further, it can be contended that until detected by the regulator, they assume greater risk until bankruptcy when the liability of the firm is limited (stock companies) (e.g., stock companies) or when the guaranty fund system is expected to cover, even partially, claims of the affected policyholders and claimants (Grace et al., 2005). Conversely, the weaker the wealth motive of the

11) For empirical examination, we treat that the U.S. state of Florida has an appointed insurance commissioner, although the head (elected) of the financial services regulation department of the state appoints the commissioner.

12) This is an extension of the agency theory by Jensen and Meckling (1976) that the manager has superior information to the shareholder or the policyholder about the firm.

13) For foreign direct investment, Nees (1981) and Boddewyn (1983) argue that the fact that a firm is exiting an overseas market would often signal a failure where the investors play a waiting game. They may decide to withdraw from the market only after having tried to revive the firm, thus the return of their investment, and only with a support of the top management and others. See also Matthyssens and Pauwels (2000).

management or the smaller the net worth of the firm they can recover from taking on an additional level of risk, the less likely it is that the management takes a prompt action of liquidation. A slow response by the management to the signals may then lead to the regulator's taking over the control of the firm.

The conflict resulting from this type of information asymmetry is less likely to arise when the law bars voluntary liquidation. However, such a measure does not guarantee that the regulator will assist timely and effectively insurance companies under distress. Besides, whether or not voluntary liquidation is permitted may matter little in the markets where the regulator's decision reflects more of the interest of the industry than of the consumer, i.e., when evidence of capture theory of regulation is strongly found. Similarly, political traits and the philosophy of the regulatory authority, let alone the operating efficiency of the authority, can make a difference in the speed and the cost of exits from the market.

We list these candidate factors in Table 1. The table also offers specifics of the candidate variables for the empirical investigation of this study.

Table1: Factors Affecting Market Exit Decisions in Insurance

Category		Variable	Description
Financial	Profitability	ROA	Net income ÷ Assets
		INVYD	Two-year investment yield average based on cash + invested assets (IRIS6)[a]
	Underwriting Performance	LR	Loss ratio (Losses & LAE incurred ÷ Premiums earned)
		CR	Combined ratio
	Liquidity	LQAST	Liabilities ÷ Liquid assets (IRIS8)
		AGBAL	Agents' balance to surplus (IRIS9)
	Capital Adequacy	NPWSUR	Net premiums written ÷ Surplus (IRIS2)
		BCAR[b]	Best's Capital Adequacy (BCAR) ratio
	Capital	Ln(ASSET)	Log of total assets
		SURPLUS	Policyholders' surplus
Managerial		CONCENT[b]	Line-wise concentration (a Herfindale index)
		DISTRI[b]	Agency vs. direct vs. mixed marketing channels
		OWNER	Dummy (stock vs. mutual ownership)
Political		COMM	Dummy (appointed vs. elected commissioner)

Note : [a] IRIS refers to the Insurance Regulatory Information System of the NAIC.
[b] As plained later, these factors are not included in the final set of variables for this paper.

4. Ranking Market Exit Choices

By default, it is assumed that every company wishes to continue operations. If, however, one decides to exit the market — for a good cause or not — the company needs to rank the choices available to them. If it is financially and operationally sound, the only reasonable choice under typical circumstances is merger/acquisition at the right price.

For a company experiencing a severe financial or operational distress and wishing to exit the market, there are several choices but the company may not be able to fully control its order of preference. If, for example, a sign for

distress is not captured by the regulator or if the regulator decides to let the company find a reasonable solution, the insurer may prefer M&A followed by voluntary liquidation. With the regulatory intervention, the company is likely subject to the following sequence of actions—rehabilitation, M&A and involuntary liquidation.

Merger/acquisition remains as a choice for all types of insurance companies. Data compiled by SNL (1999 through 2007) show that the average purchase price to book value of all mergers and acquisitions in the U.S. property-liability insurance market was almost 2.0 for the 1997-2006 period[14].

The median price to earnings ratio also ranged between 10 and 20 in most quarter-year periods except for 2006. These findings imply that generally mergers and acquisitions in the market occur when the other party in the contract captures some on- or off-balance sheet value from the M&A deal. To date, however, no databases of the U.S. insurance markets are known to have separated insurer-initiated mergers and acquisitions from regulator-initiated ones.

III. EMPIRICAL INVESTIGATION

The model for this study has one categorically coded response variable and multiple independent variables representing financial, managerial and political factors affecting market exit decisions. For the empirical investigation, we employ a multinomial logistic (MNL) regression model,

14) The average is based on quarterly-year observation of the ratio and the data have some missing observations due to data unavailability or non-existence of transactions during the quarter-year period.

expressed as:

$$P_j = \frac{e^{\beta' jX}}{\Sigma_j e^{\beta' jX}} \text{ for } j = 1, ..., k+1.$$

where X is a vector of independent variables and β is a vector of parameters.

By setting β_{k+1} to 0 (a zero vector) for normalization, we obtain:

$$P_{k+1} = \frac{1}{\Sigma_j e^{\beta' jX}} .$$

This results in the j-th logit having the following form:

$$log \frac{P_j}{P_{k+1}} = \beta'_j X \text{ for } j = 1, ..., k+1.$$

In this logit form, the left-hand-side of the equation is the natural log of risk-ratio (also known as odd-ratio); that is, the risk ratio of two probabilities of, say, voluntary vs. involuntary liquidation. Using an MLE approach, we generate variable parameters in a linear form.

For the dependent variable, we apply the Figure 1 illustration to classify all observations into the following four mutually exclusive cases:

Y = 0 for normal insurer (non-exiting firm);
= 1 for insurer exiting through voluntary liquidation;
= 2 for insurer exiting through merger or acquisition; and
= 3 for insurer forced to exit through involuntary liquidation,

where the codes embed no particular rank of preference.

The data for this study include both normal firms in operation and those

insurers which left the market during 1999~2004. We use *t-1* data that depict the financial status of the firms one year prior to merger, acquisition or liquidation, based on our reasoning that *t-1* data would better reflect the financial position of the companies subjected to M&A than *t-2* data (or earlier data) and, given also the commonly long period of rehabilitation attempt by U.S. regulators, there would not be much difference of financial status between *t-1* and earlier data of liquidated insurers. For data selection, we adopt BarNiv and Hathorn's approach (1997) such that the percentage of exit firms (coded 1, 2 and 3 for Y) in a given year is used to randomly select the same percentage of normal firms from that year's database. The final data set has 2,200 observations, including 104 exited firms. There are two main data sources — A.M. Best database for property-casualty firms and the market exit information published annually in *Best's Reports*. We keep only stock and mutual companies and only complete exit cases from the latter source; that is, firms under rehabilitation (receivership) are excluded from this study.

Neither do we include cases of redomestication, localization nor mere changes in the company name. In this paper, we use observations one-year prior to the declaration of exit. Non-insurance specific data are collected from U.S. state governments and other reliable sources. Due to the instability of initial estimation results for *CONCENT* and *BCAR*, we decide not to include these two variables from further estimation[15]. After finding evidence that numerous insurers use multiple distribution channels, we also decide to exclude DISTRI from the final model.

15) A preliminary examination shows normal firms on the average have the lowest business concentration ratio, implying that they tend to maintain more diversified risk portfolios, in terms of premium volume by line, than any other firms.

1. Preliminary Findings

A Pearson correlation matrix test shows that, as expected, the profitability variables (*INVYD* and *ROA*) are highly correlated at 0.860. Similar high correlations are found for the proxies representing underwriting performance (*LR* and *CR*) at 0.639 and capital (*ASSET* and *SURPLUS*) at 0.594. We find no strong correlations for variables representing liquidity (i.e., *LQAST* and *AGBAL*).

Table 2 shows descriptive statistics of independent variables by exit type. As expected, investment yields (*INVYD*) and returns on assets (*ROA*) show similar patterns. However, their means and medians are lowest for merged firms and highest for involuntary liquidated firms, which appear to be counter-intuitive; that is, financially troubled firms tend to maintain their profitability during the one-year period prior to exit.

Underwriting performance measured by the loss ratio (*LR*) shows voluntarily exiting firms have the highest ratio on average as well as in terms of median. In contrast, the ratio is lowest for involuntarily exiting firms. Interestingly, the group of involuntary liquidated firms shows a higher standard deviation in the loss ratio than the group of merged/acquired firms, a finding implying that some of the involuntarily liquidated firms probably had very different loss experiences. The combined ratio (*COM_R*) is also lowest for involuntarily exiting firms.

This contrasts to the relatively high combined ratios for firms exiting voluntarily or through M&A. The high loss ratio for voluntary liquidation is probably indicative to the failure in underwriting, claims management, excess marketing or some combination of these effects.

Table 2: Descriptive Statistics of Candidate Independent Variables

(Analysis based on the data 1 year prior to actual exit)

Type		INVYD	ROA	LR	COMB_R	LQAST	AGBAL
Normal Firm	Mean	5.1188	5.0077	72.5996	107.0286	63.6374	14.4680
	N	2096	2096	2096	2096	2096	2096
	Std. Dev.	1.73459	1.76316	122.41554	128.59833	71.57419	51.74131
	Minimum	.00	.00	-199.80	-99.90	-99.90	.00
	Max	26.00	26.00	1999.80	999.90	999.90	999.90
	Median	5.0000	5.2000	70.8000	102.7000	63.0000	5.0000
Voluntary Liquidation	Mean	5.4182	5.3655	159.3673	174.1836	152.7636	109.0182
	N	55	55	55	55	55	55
	Std. Dev.	2.60833	2.54582	328.80953	191.84462	191.02171	264.25377
	Minimum	.00	.00	-1.50	.00	.00	.00
	Max	15.00	14.70	1999.80	999.90	999.00	999.00
	Median	5.0000	5.4000	95.7000	129.2000	107.0000	13.0000
Merger /acquisition	Mean	4.4118	4.2882	56.1059	161.2941	43.8824	5.2353
	N	17	17	17	17	17	17
	Std. Dev.	1.80481	1.70803	46.85062	251.40335	33.91328	6.31990
	Minimum	1.00	1.00	-3.40	-99.90	.00	.00
	Max	8.00	7.60	147.60	999.90	103.00	17.00
	Median	4.0000	4.4000	71.7000	111.5000	48.0000	1.0000
Involuntary liquidation	Mean	5.6563	5.4094	29.5500	51.2719	40.2813	13.8125
	N	32	32	32	32	32	32
	Std. Dev.	3.11717	3.23054	50.13764	69.68934	45.87798	39.10238
	Minimum	.00	.00	-96.20	-52.50	.00	.00
	Max	20.00	19.50	127.10	193.80	162.00	186.00
	Median	5.5000	5.3500	.0000	.0000	16.0000	.0000
All types	Mean	5.1286	5.0170	74.0151	108.3158	65.3732	16.7509
	N	2200	2200	2200	2200	2200	2200
	Std. Dev.	1.79010	1.81623	131.14331	131.78267	77.59701	67.12846
	Minimum	.00	.00	-199.80	-99.90	-99.00	.00
	Max	26.00	26.00	1999.80	999.90	999.00	999.00
	Median	5.0000	5.2000	70.9500	103.1000	64.0000	4.0000

Table 2: Descriptive Statistics of Candidate Independent Variables (Cont'd)

(Analysis based on the data 1 year prior to actual exit)

Type		INVYD	ROA	LR	COMB_R	LQAST	AGBAL
Normal Firm	Mean	5.1188	5.0077	72.5996	107.0286	63.6374	14.4680
	N	2096	2096	2096	2096	2096	2096
	Std. Dev.	1.73459	1.76316	122.41554	128.59833	71.57419	51.74131
	Minimum	.00	.00	-199.80	-99.90	-99.00	.00
	Max	26.00	26.00	1999.80	999.90	999.00	999.00
	Median	5.0000	5.2000	70.8000	102.7000	63.0000	5.0000
Voluntary Liquidation	Mean	5.4182	5.3655	159.3673	174.1836	152.7636	109.0182
	N	55	55	55	55	55	55
	Std. Dev.	2.60833	2.54582	328.80953	191.84462	191.02171	264.25377
	Minimum	.00	.00	-1.50	.00	.00	.00
	Max	15.00	14.70	1999.80	999.90	999.00	999.00
	Median	5.0000	5.4000	95.7000	129.2000	107.0000	13.0000
Merger/ acquisition	Mean	4.4118	4.2882	56.1059	161.2941	43.8824	5.2353
	N	17	17	17	17	17	17
	Std. Dev.	1.80481	1.70803	46.85062	251.40335	33.91328	6.31990
	Minimum	1.00	1.00	-3.40	-99.90	.00	.00
	Max	8.00	7.60	147.60	999.90	103.00	17.00
	Median	4.0000	4.4000	71.7000	111.5000	48.0000	1.0000
Involuntary liquidation	Mean	5.6563	5.4094	29.5500	51.2719	40.2813	13.8125
	N	32	32	32	32	32	32
	Std. Dev.	3.11717	3.23054	50.13764	69.68934	45.87798	39.10238
	Minimum	.00	.00	-96.20	-52.50	.00	.00
	Max	20.00	19.50	127.10	193.80	162.00	186.00
	Median	5.5000	5.3500	.0000	.0000	16.0000	.0000
All types	Mean	5.1286	5.0170	74.0151	108.3158	65.3732	16.7509
	N	2200	2200	2200	2200	2200	2200
	Std. Dev.	1.79010	1.81623	131.14331	131.78267	77.59701	67.12846
	Minimum	.00	.00	-199.80	-99.90	-99.00	.00
	Max	26.00	26.00	1999.80	999.90	999.00	999.00
	Median	5.0000	5.2000	70.9500	103.1000	64.0000	4.0000

Liquidity measured by the liquidity ratio (*LQAST*) and agent's balance (*AGBAL*) is again lowest for involuntary liquidation. M&A follows it with the second lowest ratio for both variables. Voluntarily liquidated firms have the highest ratio of liability to liquid asset (*LQAST*) and the highest amount of agents' balances expressed as a percentage of policyholders' surplus (*AGBAL*).

Involuntary liquidated firms in the aggregate show a higher standard deviation in the liability to liquid asset ratio than merged/acquired firms, although the mean and median of the former group of firms are than those of the latter group of firms. This indicates inconsistency in liquidity ratios among involuntarily exiting firms.

Regulators often use the ratio of net premiums to surplus (*NPWSUR*) as a proxy measure of the underwriting leverage of individual insurance companies. They supplement this ratio with the surplus ratio to measure the primary insurer's dependency on (proportional treaty) reinsurance for capital surplus. The summary statistics show that voluntarily liquidated firms tend to behave differently from other types of insurers. Although not proven in this paper, we suspect that to-be-voluntarily liquidated firms might attempt to maximize the residual value of the firm by engaging in, say, cash flow underwriting, or using reinsurance for the sake of generating ceding commissions. Table 2 also shows that the M&A group carries the lowest *NPWSUR* ratio. This may imply that the merger partner or acquiring firm probably captures some growth potential of the target firm.

The cases of normal operation and M&A show large asset sizes, in terms of both mean and median. In fact, asset sizes of M&A firms appear not to be quite different from those of normal insurers, an observation consistent with most other variables in the table. In contrast, firms exiting through involuntary liquidation tend to have the smallest asset size among all types

of firms. The political environment factor measured by *COMM* shows the highest average for M&A and the lowest average for involuntary liquidation.

2. Evaluation of Exit Preference Multivariate Model

The key objective of the empirical part in this study is to identify the environmental factors affecting exit forms (*not* bankruptcy) and to measure the degree of their impact on the decisions. For this, we run a multivariate model in two stages—once using the initially chosen set of variables and later using a set of alternative variables. For the first run, we choose one variable for each of the seven factor categories in Table 1.

ROA instead of *INVYD* is selected for profitability, because the latter explains only investment performance rather than overall profitability[16]. We select LR for underwriting performance because it better represents pure underwriting performance than *COM_R*.

For liquidity, *LQAST* is preferred to *AGBAL* because *AGBAL* does not capture the entirety of the insurer's liquidity. For size, we choose *Ln(ASSET)* after having found a number of observations with a negative value for *SURPLUS*. For the second run, we replace initially chosen variables with the alternatives. We have only one statistically significant variable for each factor —*NPWSUR* for capital adequacy, *OWNER* for organizational structure (stock vs. mutual) and *COMM* for political environment (appointed vs. elected commissionership) for each of the other categories. In both runs, we

16) See also BarNiv and Hathorn (1997). One journal reviewer suggests use of *INVYD* instead of *ROA* as the latter reflects both underwriting and investment returns. In our preliminary run, however, the model with *LR* and *ROA* performs better than the model with *LR* and *INVYD*.

find that the model is good for empirical testing at the 1 percent level of significance, with the explanatory power of 20.2 percent. No signs of multicollinearity between the final independent variables are observed in the model.

Normal Firm as a Basis. Using the group of normal firms as a basis, we estimate the impact of each of the explanatory variables on exit decisions. The impacts are found as follows:

$$\log \frac{P_1}{P_0} = -2.658 + 0.118 \cdot ROA^* + 0.001 \cdot LR^* + 0.002 \cdot LQAST^* + 0.005 \cdot NPWSUR^* - 0.304 \cdot Ln(ASSET)^* - 0.158 \cdot COMM + 0.751 \cdot OWNER$$

$$\log \frac{P_2}{P_0} = -4.053 - 0.208 \cdot ROA - 0.001 \cdot LR - 0.006 \cdot LQAST - 0.010 \cdot NPWSUR^* + 0.220 \cdot Ln(ASSET) - 0.851 \cdot COMM^* - 0.753 \cdot OWNER$$

$$\log \frac{P_3}{P_0} = +2.354 + 0.141 \cdot ROA^* - 0.010 \cdot LR^* - 0.002 \cdot LQAST - 0.004 \cdot NPWSUR^* - 0.849 \cdot Ln(ASSET)^* + 0.832 \cdot COMM + 0.653 \cdot OWNER$$

where p_0 denotes the group of normal insurers, p_1 the group of merged or acquired firms, p_2 the group of voluntarily liquidated firms, and p_3 the group of voluntarily liquidated insurers. The asterisk (*) denotes statistical significant at the $p = 0.1$ level or lower.

Table 3-A offers a summary of the results from the first run. For example, it shows that the likelihood of a firm continuing its operation or becoming subject to voluntary liquidation (denoted as $\log p_0 / p_1$) is affected by all five financial factors but not by managerial or political factor.

Table 3-A: Parameter Estimates

(Base = 0, Normal Firms)

	X Parameter	*Estimate*	Std. Error	Wald	Prob[a]		e^{β_b}
1. Voluntary liquidation	Intercept	- 2.658	1.150	5.344	0.021	*	
	ROA	0.118	0.067	3.099	0.078	*	1.125
	LR	0.001	0.001	3.705	0.054	*	1.001
	LQAST	0.002	0.001	4.134	0.042	*	1.002
	NPWSUR	0.005	0.001	65.511	0.000	**	1.005
	Ln(ASSET)	- 0.304	0.099	9.326	0.002	*	0.738
	COMM	- 0.158	0.362	0.191	0.662		0.854
	OWNER	0.751	0.512	2.152	0.142		2.120
2. Merger/ acquisition	Intercept	- 4.053	1.544	6.888	0.009	*	
	ROA	- 0.208	0.138	2.248	0.134		0.813
	LR	- 0.001	0.003	0.178	0.673		0.999
	LQAST	- 0.006	0.008	0.533	0.466		0.994
	NPWSUR	0.010	0.006	3.182	0.074	*	0.990
	Ln(ASSET)	0.220	0.138	2.550	0.110		1.246
	COMM	- 0.851	0.519	2.686	0.101	*	0.427
	OWNER	- 0.753	0.563	1.784	0.182		0.471
3. Involuntary liquidation	Intercept	2.354	1.539	2.341	0.126		
	ROA	0.141	0.069	4.209	0.040	*	1.151
	LR	- 0.10	0.004	5.878	0.015	*	0.990
	LQAST	- 0.002	0.004	0.318	0.573		0.998
	NPWSUR	0.004	0.001	8.445	0.004	*	1.004
	Ln(ASSET)	- 0.849	0.160	28.120	0.000	**	0.428
	COMM	0.832	0.621	1.797	0.180		2.298
	OWNER	0.653	0.572	1.301	0.254		1.921

Note: [a] *p*-value for Z test
[b] Factor change in odds for unit increase in variable X_j
* significant at the 0.05 level
** significant at the 0.01 level

As shown in the last column of Table 3-A, the e^{β} — a measure of factor influence for a unit change in the denominator — for capital adequacy indicates that one unit "increase" in *NPWSUR* increases the risk ratio (p_1/p_0) by 1.005 times. That is, a rise in *NPWSUR* (net premium written to surplus)

is more related to voluntary liquidation rather than staying in business. We find a similar relationship for profitability, underwriting performance and liquidity, but the actual impact is negligible as the ratios are almost one in those cases. If, however, the firm becomes large in size in terms of In(*Asset*), the more it is likely to consider staying in the market rather than liquidating the firm voluntarily.

In the case of continued operation vs. M&A, only *NPWSUR* is found statistically significant, indicating that improvement in (deterioration of) capital adequacy may lead insurers to a decision in favor of staying in the business (M&A). The actual impact (0.999) is negligible, however. Given also similar findings for other factors, we conclude that there is little difference between normal firms and merged/acquired firms. This is consistent with our discussion in the paper as well as in the preliminary statistics.

From the last set of rows in Table 3-A, we find that a rise in profitability or capital adequacy is likely to cause insurers to be subject to involuntary liquidation rather than to stay in the market. It is more likely so when the decision is based on overall profitability (*ROA*) than on capital adequacy (*NPWSUR*). We reason that conservative investment activities and, as shown in Table 1, the relatively small capital bases of firms near dissolution could lead to this finding. Although the actual impact of the premium-to-surplus ratio is negligible, the result for ROA is not in line with our assumption an issue warranting further investigation.

Merger/Acquisition as a Basis. We discussed earlier that a failure in an M&A attempt by a firm under distress may be followed by a decision to liquidate the firm. The liquidation is likely voluntary if the firm is ahead of making the decision; otherwise, we expect involuntary liquidation initiated by the regulator. Table 3-B summarizes our findings regarding this hypothesis.

Table 3-B: Parameter Estimates

(Base = 2, Merger/Acquisition)

	X Parameter	*Estimate*	Std. Error	Wald	Prob[a]		e^{β_b}
1. Voluntary liquidation	Intercept	1.396	1.919	0.529	0.467		
	ROA	0.325	0.153	4.494	0.034	*	1.384
	LR	0.003	0.003	0.633	0.426		1.003
	LQAST	0.008	0.008	1.039	0.308		1.008
	NPWSUR	0.015	0.006	6.699	0.010	*	1.015
	Ln(ASSET)	-0.524	0.169	9.543	0.002	**	0.592
	COMM	0.693	0.630	1.208	0.272		1.999
	OWNER	1.504	0.759	3.926	0.048		4.499
3. Involuntary liquidation	Intercept	6.408	2.172	8.707	0.003	*	
	ROA	0.348	0.154	5.110	0.024	*	1.417
	LR	-0.008	0.005	2.688	0.101	*	0.992
	LQAST	0.003	0.009	0.142	0.706		1.003
	NPWSUR	0.014	0.006	5.706	0.017	*	1.014
	Ln(ASSET)	-1.069	0.211	25.721	0.000	**	0.343
	COMM	1.682	0.806	4.360	0.037	*	5.379
	OWNER	1.406	0.800	3.087	0.079	*	4.078

Note: [a] *p*-value for Z test
[b] Factor change in odds for unit increase in variable X_j
* significant at the 0.05 level
** significant at the 0.01 level.

This table shows *Ln*(*ASSET*) and *NPWSUR* are significant at the 0.01 level, and *ROA* and *OWNER* at the 0.05 level. Therefore, we find that an increase in the firm size, *Ln*(*ASSET*), is likely to lead an M&A deal but a rise in *NPWSUR* is likely to lead the firm to voluntary liquidation when the firm has only two choices — voluntary liquidation or M&A. For *OWNER*, we find that stock insurers (mutual insurers) are more (less) likely to prefer voluntary liquidation to M&A. In the case of involuntary liquidation vs. merger/acquisition, our findings suggest that all factors except the liquidity factor (*LQAST*) significantly affect the exit decision. Specifically, a rise in profitability or capital adequacy, commissioner by election, and stock

ownership are likely to lead the regulator to explore an M&A opportunity before it decides to liquidate the affected insurer. Of the factors, the most powerful one is *COMM* — a finding supporting our argument that in the U.S. states where citizens elect the insurance commissioner, the regulatory authority is more likely to take care of policyholders' interests by taking over the manage-ment control of non-performing insurance companies than in other states. Among the financial factors, *ROA* is found the most powerful.

Voluntary Liquidation as a Basis. Finally, we examine the relationship between voluntary and involuntary liquidations. With this examination, we test whether the wealth motive of equity-holders or their agent-management plays a role in market exit decisions.

Table 3-C: Parameter Estimates

(Base = 1, Voluntary Liquidation)

	X Parameter	*Estimate*	Std. Error	Wald	Prob[a]		e^{β_b}
3. Involuntary liquidation	Intercept	- 1.396	1.919	0.529	0.467		
	ROA	- 0.325	0.153	4.494	0.034	*	0.722
	LR	- 0.003	0.003	0.633	0.426		0.997
	LQAST	- 0.008	0.008	1.039	0.308		0.992
	NPWSUR	- 0.015	0.006	6.699	0.010	*	0.985
	Ln(ASSET)	0.524	0.169	9.543	0.002	**	1.688
	COMM	- 0.693	0.630	1.208	0.272		0.500
	OWNER	- 1.504	0.759	3.926	0.048	*	0.222

Note: [a] *p*-value for Z test

[b] Factor change in odds for unit increase in variable X_j

* significant at the 0.05 level

** significant at the 0.01 level

As shown in Table 3-C, our findings suggest that larger insurers — thus probably with a stronger wealth motive by equity-holders and their management agents are more likely to respond to signals indicating financial or operational difficulty before the signals are captured by the

regulator; that is, they are likely to initiate voluntary liquidation. However, the finding that stock companies are much less likely to initiate voluntary liquidation is not in line with our assumption.

3. Alternative Models

The second run of the model is based on a set of alternative variables; that is, *INVYD* instead of *ROA*, *COMB_R* for *LR*, *AGBAL* for *LQAST*, and *SUR_100* for *Ln(ASSET)* while keeping the original variable – *NPWSUR*, *CONMM* and *OWNER* as there are no alternatives for them (see Table 1).

We compare the empirical results of the second run with those of the first run with respect to parameter estimates and *p*-values. For example, Table 4-A shows compassion result with continued operation as the base. Results of the two runs appear very similar except liquidity variables of P_1/P_0.

Table 4-B shows comparison results of two models with M&A as the base. We find little difference between voluntary liquidation and M&A. For the case of involuntary liquidation vs. M&A, we find that, as a proxy of underwriting performance, LR in the first run is not statistically significant but *COM_R* in the second run is. We also find that *OWNER*, which is insignificant in the alternative run but significant in the first run. Table 4-C shows comparison results of two models with the base of voluntary liquidation. For the alternative models, only *COM_R* and *SUR_100* are statistically significant.

Table 4-A: Comparison between the First and Alternative Runs

(Base = 0, Normal Firms)

	First Run				Alternative Run			
	Parameter		Prob[a]	e^{β_b}	Parameter		Prob[a]	e^{β_b}
1. Voluntary liquidation	Intercept	- 2.658	0,021		Intercept	-5.406	.000	
	ROA	0.118	0.078	1.125	INVYD	.102	.162	1.107
	LR	0.001	0.054	1.001	COMB_R	.001	.099	1.001
	LQAST	0.002	0.042	1.002	AGBAL	.002	.211	1.002
	NPWSUR	0.005	0.000	1.005	NPWSUR	.004	.000	1.004
	Ln(ASSET)	- 0.304	0.002	0.738	SUR_100	-.002	.071	.998
	COMM	- 0.158	0.662	0.854	COMM	-.072	.846	.930
	OWNER	0.751	0.142	2.120	OWNER	.722	.157	2.058
2. Merger/acquisition	Intercept	- 4.053	0.009		Intercept	-2.315	.010	
	ROA	- 0.208	0.134	0.813	INVYD	-.229	.126	.795
	LR	- 0.001	0.673	0.999	COMB_R	.001	.195	1.001
	LQAST	- 0.006	0.466	0.994	AGBAL	-.016	.554	.985
	NPWSUR	0.010	0.074	0.990	NPWSUR	-.009	.076	.991
	Ln(ASSET)	0.220	0.110	1.246	SUR_100	.001	.313	1.001
	COMM	- 0.851	0.101	0.427	COMM	-.884	.090	.413
	OWNER	- 0.753	0.182	0.471	OWNER	-.659	.252	.517
3. Involuntary liquidation	Intercept	2.354	0.126		Intercept	-3.989	.000	
	ROA	0.141	0.040	1.151	INVYD	.139	.045	1.149
	LR	- 0.10	0.015	0.990	COMB_R	-.012	.001	.988
	LQAST	- 0.002	0.573	0.998	AGBAL	-.001	.778	.999
	NPWSUR	0.004	0.004	1.004	NPWSUR	.002	.084	1.002
	Ln(ASSET)	- 0.849	0.000	0.428	SUR_100	-.011	.000	.989
	COMM	0.832	0.180	2.298	COMM	.867	.161	2.379
	OWNER	0.653	0.254	1.921	OWNER	.394	.488	1.483

Note: [a] *p*-value for Z test

[b] Factor change in odds for unit increase in variable X_j

Table 4-B: Comparison between the First and Alternative Runs

(Base = 2, Merger/Acquisition)

	First Run				Alternative Run			
	Parameter		Prob[a]	e^{β_b}	Parameter		Prob[a]	e^{β_b}
1. Voluntary liquidation	Intercept	1.396	0.467		Intercept	-3.090	.007	
	ROA	0.325	0.034	1.384	INVYD	.331	.046	1.392
	LR	0.003	0.426	1.003	COMB_R	.000	.954	1.000
	LQAST	0.008	0.308	1.008	AGBAL	.017	.514	1.017
	NPWSUR	0.015	0.010	1.015	NPWSUR	.014	.009	1.014
	Ln(ASSET)	-0.524	0.002	0.592	SUR_100	-.003	.050	.997
	COMM	0.693	0.272	1.999	COMM	.811	.203	2.251
	OWNER	1.504	0.048	4.499	OWNER	1.381	.071	3.979
3. Involuntary liquidation	Intercept	6.408	0.003		Intercept	-1.674	.188	
	ROA	0.348	0.024	1.417	INVYD	.368	.025	1.445
	LR	-0.008	0.101	0.992	COMB_R	-.013	.000	.987
	LQAST	0.003	0.706	1.003	AGBAL	.015	.579	1.015
	NPWSUR	0.014	0.017	1.014	NPWSUR	.011	.035	1.011
	Ln(ASSET)	-1.069	0.000	0.343	SUR_100	-.012	.000	.988
	COMM	1.682	0.037	5.379	COMM	1.750	.030	5.757
	OWNER	1.406	0.079	4.078	OWNER	1.053	.191	2.866

Note: [a] *p*-value for Z test

[b] Factor change in odds for unit increase in variable X_j

Table 4-C: Comparison between the First and Alternative Runs

(Base = 2, Voluntary Liquidation)

	First Run				Alternative Run			
	Parameter		Prob[a]	e^{β_b}	Parameter		Prob[a]	e^{β_b}
3. Involuntary liquidation	Intercept	- 1.396	0.467		Intercept	1.416	.217	
	ROA	- 0.325	0.034	0.722	INVYD	.037	.702	1.038
	LR	- 0.003	0.426	0.997	COMB_R	-.013	.000	.987
	LQAST	- 0.008	0.308	0.992	AGBAL	-.003	.445	.997
	NPWSUR	- 0.015	0.010	0.985	NPWSUR	-.002	.049	.998
	Ln(ASSET)	0.524	0.002	1.688	SUR_100	-.009	.002	.991
	COMM	- 0.693	0.272	0.500	COMM	.939	.189	2.557
	OWNER	- 1.504	0.048	0.222	OWNER	-.328	.664	.720

Note: [a] *p*-value for Z test

[b] Factor change in odds for unit increase in variable X_j

IV. CONCLUSIONS

In this paper, we have examined market exit choices available in the insurance market. We have also examined means of exit that insurance companies would prefer to a given set of financial, managerial and political factors. The descriptive analysis indicates similar behavioral patterns between normal and merged/acquired firms. Our empirical regression results confirm them and support the argument by BarNiv and Hathorn (1997) that the majority of merged insurers is financially sound. Our study offers a further contribution in that insurers exhibit differences in their preference in the case of M&A vs. liquidation as well as in the case of voluntary vs. involuntary liquidation. In general, profitability, capital adequacy and the capital itself (firm size) frequently affect the decision-making process. In contrast, liquidity and underwriting performance are found to be insignificant in all cases presented in Tables 3 and 4.

These findings offer a couple of policy implications. First, the regulatory authority needs to continue their focus not only on the financial aspects (e.g., capital adequacy and firm size) but also on sudden changes in the profitability of the regulated firms. For example, insurers experiencing financial difficulty may assume more risks as an attempt to conduct cash flow underwriting. If such an attempt is to benefit the shareholders and management of the firm at the cost of other stakeholders, the regulatory authority should be able to capture it and order the firm to implement a corrective measure.

Second, we find significant differences between the group of normal and M&A firms and the group of liquidated firms. Although we have not examined the regulatory cost for handling troubled insurers, we expect that the regulatory authority may reduce the cost by making the insurers

available for M&A than keeping them until liquidated. Our expected is based on the facts that it often takes years before the U.S. state governments finally decide to liquidate some of the firms and that policyholders and claimants of those firms may end up their claims covered by state guarantee funds.

There are a few research limitations. We find that presence of statistically significant influence of ownership structure on the case of voluntary vs. involuntary liquidation. However, the finding does not support our contention. We also find that elected insurance commissioners may prefer M&A to involuntary liquidation, as with the exercise of the former option the regulator may successfully transfer the entire liability portfolio of a non-performing insurer to an unaffiliated company. Finally, the findings for the influence of capital do not always support our contentions. This remains as an area for future investigation.

In today's insurance markets, a well-structured exit guideline is indicative of a transparent and prudent regulatory environment. It also helps the market attract more firms and improve their financial and operational stability. An IAIS Core Principle (ICP 16), for example, can be used when a government plans to introduce a guideline, or revise an existing one, dealing with insurer winding-up and exit. The principle states that regulatory authorities need to clearly define insolvency, establish the criteria and procedure for dealing with insolvency, and give priority to the protection of policyholders (IAIS, 2003). Merger with a healthier insurance company or a complete closure of the business are two of the means the IAIS suggests that troubled firms may use. Nevertheless, it seems that the best choice for the regulator is to assist non-performing insurers so that they can return to normalcy and continue to supply risk protection to the citizens of the state.

References

A.M. Best, *Best's Aggregates & Averages (U.S. & Canada)*, Oldwick: A.M. Best Company, 2006 edition.

Ambrose, J. M., and J. A. Seward, "Best's Ratings, Financial Ratios and Prior Probabilities in Insolvency Prediction", *Journal of Risk and Insurance,* 55, 1988, pp. 229~244.

Angoff, Jay, "Falling Claims and Rising Premiums in the Medical Malpractice Insurance Industry (New York: Center for Justice and Democracy)", www.hcla.org/studies/Hoyt-Powell-study.pdf, 2005, accessed on June 6, 2007.

Association of Run-off Companies (ARC), "The Size and Growth of the Run-off Market", www.arcrunoff.com, accessed on June 24, 2006.

Bain, J., *Barriers to New Competition,* Cambridge: Harvard University Press, 1956.

BarNiv, Ran, and B. MacDonald, "Identifying Financial Distress in the Insurance Industry: A Synthesis of Methodological and Empirical Issues", *Journal of Risk and Insurance,* 59, 1992, pp. 543~574.

BarNiv, Ran, and John Hathorn, "The Merger or Insolvency Alternative in the Insurance Industry", *Journal of Risk and Insurance*, 64, 1997, pp. 89~113.

BarNiv, Ran, and Robert Hershbarger, "Classifying Financial Distress in the Life Insurance Industry", *Journal of Risk and Insurance*, 57, 1990, pp. 110~136.

Baumol, W., J. Panzar, and R. Willig, *Contestable Markets and the Theory of Industry Structure*, New York: Harcourt, 1982.

Berger, Lawrence, J. David Cummins, and Sharon Tennyson, "Reinsurance and the Liability Crisis", *Journal of Risk and Uncertainty,* 5, 1992, pp. 253~272.

Bernheim, D.,"Strategic Entry Deterrence of Sequential Entry into an Industry", *Rand Journal of Economics,* 15, 1984, pp. 1~11.

Boddewyn, Jean, "Foreign and Domestic Divestment and Investment Decisions: Like or unlike?", *Journal of International Business Studies*, 14, 1983, pp. 23~35.

Borooah, Vani K, *Logit and Probit: Ordered and Multinomial Models*, Thousand Oaks: Sage Publications, 2001.

Carson, James, and Robert Hoyt, "Evaluating the Risk of Life Insurer Insolvency: Implications from the US for the European Union", *Journal of Multinational Financial Management*, 10, 2000, pp. 297~314.

Cox, Larry, Temporal Profitability and Pricing in Long-term Care Insurance, *Journal of Risk and Insurance,* 71, 2004, pp. 677~705.

Cummins, J. David, and Gregory Nini, "Optimal Capital Utilization by Finance Firms: Evidence from the Property-Liability Insurance Industry", *Journal of Financial Services Research*, 21(1/2), 2002, pp. 15~53.

Cummins, J. David, and Patricia Danzon, "Price, Financial Quality, and Capital Flows in Insurance Markets", *Journal of Financial Intermediation*, 6, 1997, pp. 3~38.

Europe Economics, *Study on Irish Non-life Insurance with Particular Reference to Motor Insurance, Employer's Liability and Public Liability Insurance,* February 16, London: Europe Economics, 2004.

Fok, Lilian, Wing M. Fok., Peihwang P. Wei, and Susan M. L. Zee, "The Effects of Firm Size on Risk and Profitability of the Property and Casualty Insurance Industry", *Journal of Insurance Issues,* 20(Spring), 1997, pp. 25~36.

Grace, Martin, Robert Klein, and Richard Phillips, "Insurance Company Failures: Why Do They Cost So Much", *Center for Risk Management and Insurance Research*, Working Paper 03-1, Atlanta: Georgia State University, 2005.

Hoyt, Robert, and Lawrence Powell, "Profitability in Medical Professional Liability", Washington, DC: Health Coalition on Liability and Access, www.hcla.org/studies/Hoyt-Powell-study.pdf, 2005, accessed on June 6, 2007.

Ilmakunnas, Pekka, and Jukka Topi, "Microeconomic and Macroeconomic Influences on Entry and Exit of Firms", *Review of Industrial Organization,* 15(November), 1999, pp. 283~301.

International Association of Insurance Supervisors, *Insurance Core Principles and Methodology*, Basel: IAIS, 2003.

Jensen, M. and W. E. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure", *Journal of Financial Economics*, 3, 1976, pp. 305~360.

Karakaya, F., "Market Exit and Barriers to Exit: Theory and Practice", *Psychology & Marketing*, 17, 2000, PP. 651~668.

KPMG International, *The U.K. Run-off Survey: Non-life Insurance,* London: KPMG, October 2006a.

_____, *The U.K. Run-off Survey: Life Assurance*, London: KPMG, October 2006b.

Kwon, W. Jean, Hunsoo Kim, and Soon-Jae Lee, "Can Insurance Firms Easily Exit from the Market? A Global Comparative Analysis of Regulatory Structures", *Geneva Papers on Risk and Insurance Issues and Practice*, 30 April, 2005, PP. 268~284.

Lee, Chong Gim, *Economies of Scale and Economies of Scope for Direct Writers in the Property-Liability Industry*, a Ph.D. dissertation, Philadelphia: University of Pennsylvania, 1989.

Mayers, David, and Clifford W. Smith, Jr., "Ownership Structure Across Lines of property-Casualty Insurance", *Journal of Law and Economics*, 31, 1988, PP. 351~378.

Matthyssens, Paul, and Pieter Pauwels, "Uncovering International Market-Exit Process: A Comparative Case Study", *Psychology & Marketing,* 17, 2000, PP. 697~719.

Nees, Danielle, "Increase Your Diversification Effectiveness", *Strategic Management Journal*, 1, 1981, PP. 119~130.

Peach, Niko, "Contestability Reconsidered: The Meaning of Market Exist Costs ", *Journal of Economic Behavior and Organization*, 34, 1998, PP. 434~

443.

Pottier, Steven, and David Sommer, "The Effectiveness of Public and Private Sector Summary Risk Measures in Predicting Insurer Insolvency", *Journal of Financial Services Research*, 21 (1/2), 2002, PP. 101~116.

PricewaterhouseCoopers (PwC), *US Discontinued Insurance Business Survey 2006: How US Run-off Liabilities Are Managed*, Philadelphia: PwC, 2007.

Resnick, L., "Making the Tough Decision: Hold or Fold", *National Underwriter,* 1998, 102, PP. 15~22.

Schary, Martha A., "The Probability of Exit", *RAND Journal of Economics*, 22(3), Autumn 1991, PP. 339~353.

Skipper, Harold D., and W. Jean Kwon, "Regulation and Taxation in Insurance Markets", *Risk Management and Insurance: Perspectives in a Global Economy*, Boston: Blackwell Publishing, 2007.

SNL Financial, *Deal Book 2007*, Charlottesville: SNL Financial, 2007.

_____, *Insurance Mergers &Acquisition Yearbook*, Charlottesville: SNL Financial, 2000-2003 and 2005.

Solvency Subcommittee, "Considerations on the Design of a Failure of Prudential Supervisory System", a paper for the Solvency Subcommittee, Brussels: European Commission, 2002.

Trieschmann, James S., and George Pinches, "A Multivariate Model for Predicting Financially Distressed P-L Insurers", *Journal of Risk and Insurance,* 40, 1973, PP. 327~338.

요 약

본 연구의 목적은 경쟁적인 손해보험시장에서 사업 유지, M&A, 자발적 청산 및 비자발적 청산이라는 시장 퇴출(잔류) 결정을 하는 보험회사들 사이에 재무적, 경영적 및 환경적 요인 차이가 존재하는 지를 분석하는 것이다. 먼저 손해보험시장 퇴출 관련 규제와 시장 환경에서 규제의 중요성에 대해서 정리하였다. 실증분석을 위해서 1999년부터 2004년까지 미국 손해보험회사 데이터(t-1)를 AM Best 데이터베이스로부터 추출하였으며 분석모형은 다항로짓모형을 사용하였다. 분석 결과 첫째, 자산 규모는 시장 잔류 결정과 유의하게 관련되어 있을 뿐만 아니라 비자발적 퇴출 형태 대신 M&A와 자발적 퇴출을 선택할 가능성이 높은 것으로 분석되었다. 나아가 수익성과 재무건전성(capital adequacy)도 퇴출 의사결정에 유의한 영향을 끼친다는 것이 밝혀졌다. 인수성과(underwriting performance)는 퇴출 의사 결정에 영향을 끼치는 것으로 나타났지만 일관성은 없었다.

※ 국문 색인어: 다항로짓모형, 비자발적 청산, 손해보험회사, 시장 퇴출, 자발적 청산