Automobile Insurance Price Deregulation and Competition in the Nonlife Insurance Industry in Korea

1. Research Purpose, its Importance, and Short Literature Review

The automobile insurance price has been completely liberalized in Korea since the government allowed the insurer to substitute the KIDI's[1] reference rate with the company-made rate from August 1, 2001. The price liberalization would be expected to differentiate the insurance premium among auto insurers according to driver's age, car model, policy holding period and so on. As a result, the premium would reflect various risk factors of the driver, while the company-specific ratemaking would eventually lower the average premium due to the price competition among insurers.

There have been some studies dealing with deregulation of automobile insurance price. Grace, et al. (2001) investigated automobile insurance reform in South Carolina and found positive early outcome for both consumers and insurers after deregulating the automobile insurance rates. The overall insurance premiums were fallen, and the residual market facility has virtually disappeared, due to the insurers' use of risk-based pricing in the voluntary market.

Barkume and Ruser (2001) examined the impact of rate deregulation in workers' compensation insurance. They found that eliminating both rating bureau pricing and prior approval reduced long-run premiums by 13.7 percent and reduced injury rates at most by 8.2 percent. Their findings are consistent with those of Grace, et al., though they examined a different line of business.

Lee (2009) analyzed the influence of automobile insurance price liberalization. He measured the change in market concentration, insurance premium, distribution channel, and product/service, and concluded that price liberalization promoted competition and increased consumer benefits. He examined the change of market competition by comparing the major indicators before and after the implementation year using Structure-Conduct-Performance framework in Reid (1987).

The purpose of this study is to extend Lee (2009) by investigating the change in the level of competition due to the automobile insurance price liberalization and other deregulatory measures in Korean non-life insurance market by using Panzar-Rosse (1987)'s statistical model.

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[1] KIDI (Korea Insurance Development Institut) used to be the only ratemaking organization in Korea since 1983.

2. Research Methodology and Data

Theoretical Panzar-Rosse model with reference to empirical models of Bikker and Haaf (2002), Bikker, et al. (2006), and Kasman and Turgutlu (2008) will be used to empirical analysis of non-life insurance industry. To apply the model into the data, the 'income' equation is composed as follows:

Model 1:

$$\begin{aligned}\ln INCOME_{it} &= \alpha_i + \beta_1 \ln PPE_{it} + \beta_2 \ln PMEFA_{it} + \beta_3 \ln PNBCE_{it} + \gamma_1 \ln TPP_{it} + \\ &\quad \gamma_2 \ln RCP_{it} + \gamma_3 \ln REINP_{it} + \varepsilon_{it}, \\ \varepsilon_{it} &= \mu_i + \lambda_t + \upsilon_{it} \quad i = 1, \ldots, N; \quad t = 1, \ldots, T\end{aligned}$$

Model 2:

$$\begin{aligned}\ln INCOME_{it} &= \alpha_i + \beta_1 \ln PPE_{it} + \beta_2 \ln PMEFA_{it} + \beta_3 \ln PNBCE_{it} + \gamma_1 \ln LTPP_{it} + \\ &\quad \gamma_2 \ln RCP_{it} + \gamma_3 \ln REINP_{it} + \gamma_4 \ln NOATA_{it} + \gamma_5 \ln LONOA_{it} + \\ &\quad \gamma_6 \ln EQTA_{it} + \varepsilon_{it}, \\ \varepsilon_{it} &= \mu_i + \lambda_t + \upsilon_{it} \quad i = 1, \ldots, N; \quad t = 1, \ldots, T\end{aligned}$$

Definitions of variables used in the model

Variable		Definition
Dependent	INCOME	(i) insurance operation income = premium income + reinsurance income (ii) insurance operation income + investment income + other income
Explanatory (element price)	PPE	unit price of personal expenses
	PMEFA	unit price of maintenance expenses
	PNBCE	unit price of new business & collection expenses
Control	LTPP	ratio of long-term premium to premium income
	RCP	ratio of claims paid to premium income
	REINP	ratio of reinsurance expenses to insurance operating
	NOATA	ratio of non-operating assets to total
	LONOA	ratio of customer loans to operating assets
	EQTA	ratio of equity capital to total assets

Income is defined as 'income from insurance operation,' and the dependent variable is the sum of premium income and reinsurance income. Income can also be defined by including investment income

and other income. Accordingly, we conduct the analysis using two alternative definitions of income as a dependent variable.

ε_{it} is two-way error component disturbances. μ_i is fixed parameters that are estimated as individual-effect error components, while λ_t is individual-invariant time-effect error components that consider the effect of policy change on dependent variable. υ_{it} is remaining probabilistic error components with IID(0, σ_υ^2). υ_{it} and independent variables are assumed to be independent of all i's and t's.

All models employ two-way error component Fixed Effects Model using Panel OLS. To control for heteroscedasticity problem, all models use robust standard error, and STATA Version 10 is used for statistical software. T-test is used for all hypothesis testing.

The data for analysis are obtained from Financial Supervisory Service (FSS)'s *Finance Statistic Information Monthly* and KIDI's *Annual Insurance Statistic* for non-life and auto insurance line for 10-year period (1998-2007).

3. Expected Results

The non-life insurance market is expected to observe a decrease in concentration due to the entrance of new players with inexpensive distribution channel and thereby increased competition. Price liberalization is expected to lower the insurance premium, promote the development of risk-based pricing in underwriting, and develop product segmentation.

Due to the risk-based pricing, auto insurance market is likely to be segmented into standard and high-end markets. The share of residual market facility in the auto insurance market tends to decline, as higher risk drivers are absorbed in the voluntary market according to their risk-based premiums, as found in Barkume and Ruser (2001) and Grace, et al. (2001).

The overall impact of auto insurance deregulation is expected to promote the level of market competition in the non-life insurance industry, supporting the findings of Lee (2009).

4. References

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