Organizational Structure and Risk Taking: Evidence from the Life Insurance Industry in Japan

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Abstract

This study examines the impact of organizational structure on risk taking behavior in the Japanese life insurance industry. Life insurance industry has an interesting feature that companies are structured as both mutual and stock forms of organization. Another special feature in Japanese life insurance industry is that some companies belong to a type of organizational structure which is known as 'Keiretsu' affiliation. Using Japanese life insurance data, we find that mutual insurers take less risk than stock insurers. Second, we find that Japanese life insurance companies belong to 'Keiretsu' affiliation (Japanese horizontal corporate group) have lower risk than independent insurance companies. Third, our results are robust with different proxies of risk measures (e.g., underwriting risk, financial risk, investment risk, and total risk).

Key Words: Risk taking, organizational structure, Keiretsu, Japanese life insurance market

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1. Introduction

The risk taking behavior of an insurance company is a very important issue because the behavior has impact on the stockholders, policyholders, employees and other stakeholders. It also has implication for regulators because it is their responsibilities to ensure the solvency of the insurance company. To our best knowledge, there are only two papers dealing with the risk taking behavior for insurance companies. Lamm-Tennant and Starks (1993) examine the relation between organizational structure and risk taking behavior for the U.S. property liability insurance companies. Limpaphayom, and Jeng (2007) examine the risk taking behavior for the Japanese property liability insurance companies. Over the past decades, a considerable number of studies have been conducted on the relation between the ownership and managerial activities (Alchian and Demsetz, 1972; Jensen and Meckling, 1976; Mayers and Smith, 1981, 1986; Fama and Jensen, 1983). Lai, Limpaphayom, and Jeng (2007) summarize and categorized the literature into two streams of research that can be applied to Japanese organizational structure.

The purpose of this paper is to examine the relation between the ownership structure and risk taking, and provide additional evidence on the relation under a unique and complex Japanese institutional framework. Specifically, this paper examines the relation between different organizational structures (‘Keiretsu’ versus independent and mutual versus stock) and firm risk

taking behavior in Japanese life insurance industry in various sample periods.

There are two characteristics for the Japanese insurance companies. First, like U.S., Japanese insurance companies have both stock and mutual companies. The majority of companies in Japanese life insurance industry are mutual companies. Specifically, the percentage of mutual life insurance companies in terms of premium income is 59.2 % at the end of fiscal year 2006. Second, Japanese insurance companies can be categorized into 'Keiretsu' insurance companies and independent insurance companies (non-'Keiretsu' insurance companies). To examine the risking taking behavior for the Japanese insurance company, we need to review the literature related to the organizational structure.

The first stream of research studies related to the organizational form: stock and mutual companies in life insurance industries. Many studies have examined the impact of organizational structure (stock versus mutual ownership structures) on performance and real activities including risk taking behavior (e.g., Mayers and Smith, 1981; Mayers and Smith, 1986; Mayers and Smith, 2000; Lamm-Tennant and Starks, 1993). The empirical results have shown that the two types of organizational structure yield significant different firm performance and risk taking behavior.

The second stream of research studies the relation between organizational structure and real activities in Japan. The Japanese firm's ownership structure provides researchers with an ideal institutional setting to test various aspects of financial theory. Specifically, many Japanese

companies belong to 'Keiretsu' affiliation, known for its extensive cross-shareholding among its member companies and the main bank system. Several studies argue that 'Keiretsu' has one of the most complex governance structures. While many companies belong to 'Keiretsu' affiliation, there are also many Japanese companies that are relatively independent of the 'Keiretsu' affiliation. Many empirical studies have examined the impact of Japanese ownership structure ('Keiretsu' companies or independent companies) on corporate behaviors (e.g., Hoshi, Kashyap and Sharfstein, 1991; Prowse, 1992; Weinstein and Yafeh, 1998).

Empirical findings from this study can shed additional light on the existing theoretical and empirical development of the relation between organizational structure and firm risk taking behavior for the following reasons. First, very few studies examine the effect of 'Keiretsu' structure on firm's real activities among financial firms, especially life insurance companies. This is the first paper to examine the risk taking behavior in Japanese life insurance industry. Second, this study can effectively control for the effect of government regulation because the Japanese life insurance industry is regulated by single insurance business law, the authorities, and tax code, while the U.S. insurance industry is regulated by the law of various states. That is, the Japanese life insurance industry is the second largest life insurance market in the world but is regulated by single insurance business law. Third, one special feature in Japanese life insurance industry is that all 'Keiretsu' life insurance companies are structured as mutual, thus, they do not participate in cross-shareholding.

Finally, this study extends the literature and includes using more proxies for risk taking variable. Lamm-Tennant and Starks (1993) is the first article that directly investigates the risk taking behavior of the insurance industry and uses underwriting risk measure. They use the standard deviation of loss ratio as risk measures which is a book-value measure because mutual companies do not have market value risk measure. We use additional risk measures include leverage ratio (Debt to assets ratio), investment risk (Government bond to total investment ratio), and total risk (Standard deviation of Return on Equity).

The remainder of the article is organized as follows. The next section provides the related literature. This is followed by a section describing the Japanese life insurance. An overview of Japanese financial 'Keiretsu' is summarized in the next section. The following section discussion the main research questions. This is followed by the results of empirical analysis. The article ends with a brief summary of conclusions and discussions.

2. Organizational Structure in the Japanese Insurance Industry

Japan is the world's second largest life insurance market as of 2006 (See, Figure 1). The industry has a history dating back to 1881. The Japanese life insurance the industry has undergone many changes after World War II. Before World War II, the industry was not strictly regulated and life insurance companies could enter and exit the market relatively easy. The impact of the World

War II on the industry was severe and the number of insurers was reduced drastically. The Japanese government tried to revitalize existing companies by limiting competition and forbidding entry of new companies after the war. Though American Life insurance Company (ALICO) broke into the Japanese life insurance market in 1973 and several companies gradually entered the market since then, the market share of these new entry firms is very small in the Japanese life insurance market. Therefore, there had virtually been only 20 life insurance companies after World War II until the introduction of new life insurance business law in 1996.

[Figure 1]

In addition, The Japanese life insurance industry is dominated by mutual life insurance companies. The percentage is 59.2 %, defined by premium income at the end of 2006 Fiscal Year (See, Figure 2).

[Figure 2]

The literature suggests that one advantage of mutual form is that the potential conflict between owners and customers are eliminated (e.g., Mayers and Smith, 2000). Mutual life insurance companies, thus, is predicted to take less risk than stock life insurance companies. In other words, in mutual insurance companies, the agency cost is reduced because there is no incentive for shareholders to expropriate wealth from policyholders (Lamm-Tennant and Starks, 1993).

Several life insurance companies in Japan belong to ‘Keiretsu’. ‘Keiretsu’ is a Japanese version of corporate groups or conglomerate. Firms are centered on financial institutions. It is said

that banks (and other financial institutions) have power over other members in the Keiretsu through cross-shareholding relationship. Several studies show that 'Keiretsu' relationship has impact on corporate behavior (e.g., Hoshi, Kashyap and Scharfstein, 1991; Weinstein and Yafeh, 1998). Prior to the end of World War Ⅱ, the dominant groups were vertical conglomerates called '*Zaibatsu'* in Japanese major industries. After World War Ⅱ, breaking up the '*Zaibatsu*' and other major holding companies was a goal of the occupation the Allied Forces, where General MacArthur was in control. In 1948 a law was passed prohibiting the use of names, trademarks and logos of '*Zaibatsu'*. Once the Occupation end, the companies of four major '*Zaibatsu*' began to coalesce into groups that are now commonly identified by Japanese word '*Keiretsu'*. In the early 1950s, Sumitomo's '*Hakusui-ka'*i (White Water Club, 1951) and Mitsubishi's '*Kin'yo-ka'i* (Friday Club, 1954) formed and began meeting once a month. These Gatherings ('*Shacho-ka'i* or President Councils) brought together the heads of key former '*Zaibatsu*' firms, along with other large associated firms, for informal discussions about matters of mutual interests. Mitsui's '*Ni-moku-ka'i* (Second Thursday Club) started in 1961 and included Fuji Bank's *'Fuyo-kai'* 1966, Sanwa's '*Sansui-kai*' in 1967 and Daiichi-Kangyo's '*Sankin-kai*' in 1978 (Hoshi and Kashyap, 2000).

It is well known that shareholders can increase their wealth by taking more risk because of the limited liability provision. In general, stakeholders other than stockholders such creditors and policyholders of insurance company are not able to monitor and/or control managers' (shareholder's)

activities closely. Japanese independent insurance companies are regular stock companies, thus, policyholders and creditors cannot closely monitor and control shareholder's actions. On the other hand, stakeholders other than stockholders (such as policyholders and creditors) of a Keiretsu insurance company can monitor and control shareholders much better than independent insurance companies for the following reasons. Keiretsu insurance companies underwrite insurance for other Keiretsu members in their respective group. In other words, some Keiretsu members are policyholders who are able and have incentive to monitor Keiretsu insurance companies. In other words, the agency cost of Keiretsu insurance company is reduced. Therefore, shareholders of Keiretsu insurance companies do not take lower risk than independent insurance companies.

3. Hypotheses Development

3.1 Risk taking behavior of stock versus mutual Japanese life insurance companies

The managerial discretion hypothesis developed by Mayers and Smith (1988, 1990) predict mutual insurance companies should be involved in less risky activities. Smith and Stuzer (1990) develop a model and show that low-risk insurance consumers would purchase participating policies while high-risk insurance consumers would purchase nonparticipating policies. In summary, the theories advanced by Fama and Jensen (1983), Mayers and Smith (1990, 1992) and Smith and Stutzer (1990) suggest that stock insurance companies should involve in more risky insurance activities than mutual insurance companies. On the other hand, Doherty and Dionne (1992) suggest

that mutual insurance companies would write insurance in risky lines because a participating policy which combines both policyholders and stockholders claims is a more efficient risk-sharing management.

Empirical studies also have provided some evidence of the relation between organizational structure and risk taking behavior. Lamm-Tennant and Starks (1993), examining corporate risk taking behavior in the U.S. insurance industry, show that mutual forms of organization are associated with lower risk taking than stock forms. On the other hand, Lai, Limpaphayom and Jeng (2007) find that stock companies in Japanese non-life insurance companies take more risk than mutual companies. In other words, the results of empirical studies regarding insurance companies' risk taking behavior are mixed. We propose the following testing hypothesis based on the above discussion.

Hypothesis 1: Mutual life-insurers are less risky than Stock insurance firms.

3.2 Risk taking behavior of Keiretsu versus independent Japanese life insurance companies

A substantial amount of research has been devoted to examining Keiretsu versus independent ownership characteristics of Japanese corporations (e.g., Hoshi, Kashyap, and Scharfstein, 1990; Nakatani, 1984). A financial or horizontal Keiretsu is a group of firms centered around affiliated banks and financial institutions (Hoshi, Kashyap and Scharfstein, 1990b). Sheard (1989, 1994) observes that the largest lender of a Keiretsu company generally is one of the five largest

shareholders. Companies in these groups also have strong business ties with one another and significant levels of corporate cross-holding ownership (Prowse, 1992).

The relationship between risk taking behavior and cross-holdings in Japanese life insurance companies is complex. For example, cross-share ownership in Japan will alleviate the discipline from stock market. Under heavy financial regulation, Japanese companies could not finance through the bond market. Therefore, Japanese companies were under control of main bank. However, Japanese companies began to start raising money from the market as the heavy regulations began to be relaxed. As a result, corporate managers have discretion and could be able to take too much risk beyond an adequate level of risk taking behavior. Actually, several Japanese companies took too much risk during the years of the bubble economy in Japan and went bankruptcy. That is, there is a possibility that cross-share ownership will bring more risk taking behavior than independent companies.

Cross-holding ownership in a Keiretsu may cause Keiretsu insurance companies taking less than independent insurance companies. It is well known that stockholders can increase their wealth by taking more risk because of the limited liability provision (e.g., Galai and Masulis (1976)). For the same reason, debt holders (policyholders) suffer when an insurance company takes excessive risk. In a cross-holding ownership system, debt holders (policyholders) can be also stockholders. The incentive of risk taking by stockholders will be mitigated by debt holders (policyholders)

because it does not make sense to take advantage of yourself. In summary, Keiretsu insurance companies may take less risk than independent companies because of cross-holding ownership system.

In addition, policyholders of a Keiretsu insurance company can monitor and control stockholders much better for the following reasons. First, Keiretsu insurance companies underwrite insurance on members' business. Member financial institutions of Keiretsu insurance companies place key personnel in top managerial positions of member firms to monitor financial conditions of member firms (such as Keiretsu insurance companies) directly. Second, along with the main banks, other Keiretsu financial firms (e.g., trust banks, securities and insurance firms) also provide funds to other members. As a result, the livelihood of the group depends on the financial health of the group insurance companies.

Based on the above theoretical observation, we cannot clearly predict that Keiretsu insurance companies would take less or more risk than independent insurance companies. To make things complicated, all Keiretsu life insurance companies are structured as mutual forms of organization. Therefore, the impact of Keiretsu relationship on Japanese insurance companies' risk taking behavior is also important empirical research question. We propose the following testing hypothesis on the above discussion.

Hypothesis 2: Keiretsu insurers are less risky than independent life-insurers.

4. Empirical Analyses

4.1 Data and Method

The data used in this study are obtained from the annual special issues of The Statistics of Japanese Life Insurance Business published by the Insurance Research Institute of Japan. The sample consists of 20 life insurers with complete records during 1976-1995. 16 mutual companies and 4 stock companies are in the sample. Foreign-affiliated life insurers are excluded from the sample. In addition, 7 insurers belong to one of the horizontal '*Keiretsu'* groups defined by the President Councils. Keiretsu classification is based on publications 'Kigyo Keiretsu Souran' by Toyo Keizai Sinpousya.

Table 1 presents summary statistics for variables included in this study. We find stock insurers (independent) have higher risk than mutual (Keiretsu) insurers. The return on equity (ROE) is higher for stock (independent) insurers than for mutual (Keiretsu) insurers.

[Table 1]

To test hypotheses 1 and 2, we use the following multiple regression models to examine the relation between organizational structure and risk taking behavior.

$$RISK = \alpha+\beta_1 ASSET+\beta_2 GROWTH +\beta_3 HHI\_PI +\beta_4 MUTUAL +\beta_5 KEIRETSU + \varepsilon$$

In the above equation, we treat risk as an endogenous variable and ownership structures as exogenous variables. A similar view is adopted by Sauners, Strock, and Troavlos (1990) for the banking literature. The variables in the equation are defined below.

Dependent Variables

To examine the differences in risk taking among a variety of organizational structures, we use only balance-sheet risk measure and do use market risk measure because mutual companies do not have market risk measure. Lamm-Tennant and Starks (1993) use standard deviation of loss ratio as risk measures in their study.

While we believe standard deviation of loss ratio is an appropriate risk measure, we use additional risk measures to further examine the risk taking behavior. We categorize risk measure into three risk measures: underwriting risk, financial and investment risk, and total risk. The first underwriting risk proxy is standard deviation of loss ratio. The second proxy is percentage of savings-type policy in the amount of annual new business. The death ratio is defined as amount paid for insurance against death divided by amount of total insurance against death contracts.

We use debt to equity ratio and non-government bond investment to proxy financial risk and investment risk, respectively. Non-government bond investment is defined as the complement of

government bond divided by total invested assets. Finally, we use standard deviation of return of equity (ROE) as a proxy for total risk.

Independent Variables

This section discusses the independent variables. The two main independent variables are mutual variable and a proxy variable for Keiretsu organizational structure. MUTUAL is a dummy variable that takes a value of 1 if a life insurer is a mutual insurer. KEIRETSU is a dummy variable that takes a value of 1 if a life insurers is belong to a Keiretsu affiliation, defined by the Japanese President Councils.

We next discuss the control variables. ASSET is a proxy for size and is defined as natural logarithm of the amount of asset of firm. Firm size has two potential effects on risk taking. On the one hand, larger insurance company is more likely to have low risk because of "law of large number" On the other hand, it quite likely that larger companies can bear more risk because of greater financial strength. Therefore, we have no predictions for the sign of the coefficient for of the size variable. GROWTH is defined as the average growth ratio of premium. HHI_PI is proxy for a product portfolio, which is defined by Herfindal index across the line of business in premium income.

4.2 Empirical Results

Table 2 reports the regression results during all sample period, 1976 to 1995. The coefficient of KEIRETSU ('Keiretsu' affiliation) in model 1 is negative and significant at the 1% level, implying 'Keiretsu' insurance company take less risk, in terms of standard deviation than independent companies. The dependent variable for model 2 is percentage of saving type of policy. We find that 'Keiretsu' companies issue more saving-type policies than independent companies. The evidence is consistent with the hypothesis that the agent cost of 'Keiretsu' companies is lower than independent insurers. The coefficients of both MUTUAL and KEIRETSU are negative and significant at the 1% level in Model 3. The evidence implies that mutual ('Keiretsu') companies have lower debt/asset ration than stock (independent) companies. We also find mutual companies have significantly lower investment risk than stock companies (see Model 4.). Finally, the evidence in Model 5 shows that mutual ('Keiretsu') companies have less total risk, in terms of ROE, than stock (independent) companies. Tables 3 & 4 present the results for the two sub-periods. The results are similar.

5. Conclusion

The coexistence of stock and mutual and of 'Keiretsu' and independent insurance companies provides an opportunity to examine whether different types of ownership structure insurers influence risk taking behavior. Our empirical results show that mutual life insurance companies are significantly associated with lower risk taking behavior in the Japanese life insurance industry. While Lai, Limpaphayom and Jeng (2007) do not find stock non-life insurance companies in Japan have higher underwriting risk when they use standard deviation and coefficient variation of loss ratio as a risk measure. Our results are consistent with previous studies such as Lamm-Tennant and Starks (1993).

Another important feature in Japanese life insurance industry is that some companies belong to a type of organizational structure which is known as 'Keiretsu' affiliation. Several previous studies have showed that 'Keiretsu' affiliation have impacts on companies' real activities including risk taking behavior (e.g., Lai, Limpaphayom and Jeng, 2007). Our empirical results indicate that 'Keiretsu' affiliation is associated with lower risk taking behavior than independent companies. This result is basically consistent with Lai, Limpaphayom and Jeng (2007) that find Japanese independent non-life insurance companies have higher total market risk (such as beta) than 'Keiretsu' non-life insurance companies.

Our results are robust with respect to different risk measures. Specifically, we use

underwriting risk, financial risk, investment risk and total risk as risk measures. Our results are also robust with respect to different sample periods. For our future research, similar analyses will be conducted for other sample periods. Specifically, we will examine the relation organizational structure, 'Keiretsu' affiliation and solvency margin ratio and risk taking behavior for post-Bubble period.

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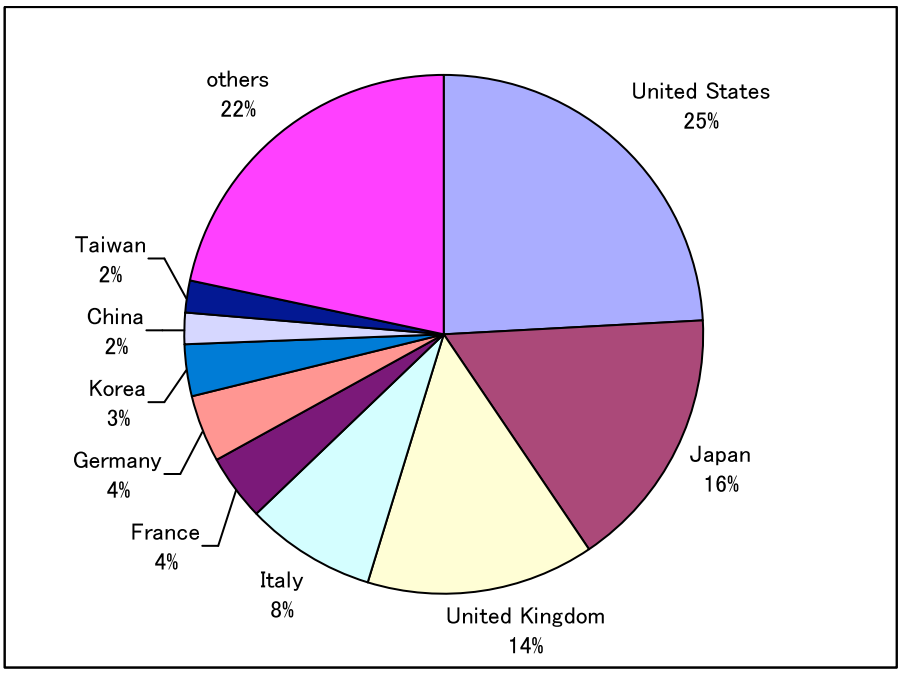
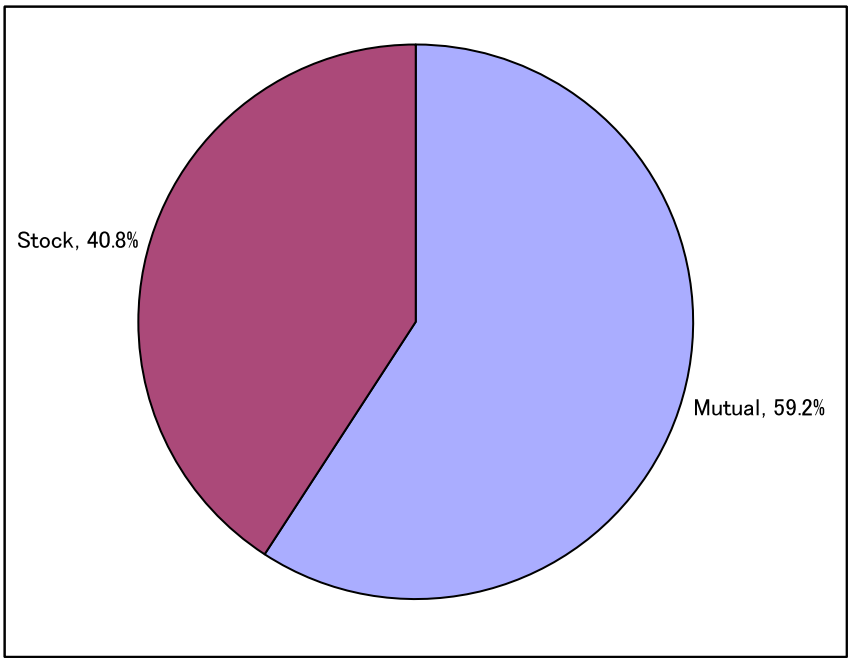
Figure 1 Share of life insurance premium in the world (Fiscal year end of 2006)



Source: "World insurance in 2006: Premiums came back to 'life'," sigma No4/2007

Figure 2 Share of mutual and stock life insurance companies by premium income (Fiscal year end of 2006)



Source: Statistics of life insurance business in Japan, 2006, Insurance Research Institute

Table 1 Descriptive Statistics

	All samples N=380	Mutual N=304	Stock N=76	President Club N=133	Independent N=247
Panel A: Risk Measures					
(1) Standard deviation of loss ratio					
Average	0.026	0.026	0.026	0.020	0.029
Standard Deviation	0.026	0.027	0.026	0.021	0.029
(2) Percentage of Saving-type policy					
Average	0.325	0.320	0.343	0.366	0.303
Standard Deviation	0.272	0.274	0.266	0.280	0.266
(3) Standard deviation of death rario (in amount)					
Average	0.069	0.064	0.090	0.031	0.090
Standard Deviation	0.082	0.077	0.097	0.024	0.094
(4) Debt to asset ratio					
Average	0.970	0.962	0.999	0.959	0.976
Standard Deviation	0.024	0.021	0.001	0.020	0.024
(5) 1-(Government bond to total investment ratio)					
Average	0.165	0.162	0.174	0.176	0.158
Standard Deviation	0.076	0.073	0.087	0.072	0.077
(6) Standard deviation of return of equity (ROE)					
Average	0.008	0.004	0.024	0.003	0.011
Standard Deviation	0.023	0.008	0.046	0.006	0.028
Panel B: Risk Determinants					
ASSET					
Average	14.275	14.589	13.019	15.318	13.713
Standard Deviation	1.551	1.436	1.355	1.076	1.476
GROWTH (%)					
Average	11.035	11.126	10.670	10.587	11.275
Standard Deviation	14.966	15.248	13.868	8.349	17.535
HHI_PI					
Average	0.563	0.558	0.583	0.553	0.568
Standard Deviation	0.164	0.150	0.208	0.121	0.182

Table 2 Regression Results during all sample period (1976-1995)

	Underwriting risks		Financial and Investment risks		Business risk
	(1)	(2)	(3)	(4)	(5)
ASSET	0.0028	-0.6251	-0.0073	0.0068	0.0024
	(2.445) **	(-6.381) ***	(10.772) ***	(2.139) **	(2.511) **
GROWTH	0.000006	0.0016	-0.0002	0.0002	-0.00006
	(0.072)	(2.103) **	(-4.185) ***	(1.122)	(-0.882)
HHI_PI	-0.0189	0.5769	-0.0099	-0.0208	-0.00057
	(-2.107) **	(7.492) ***	(-1.869) *	(-0.829)	(-0.076)
MUTUAL	0.0013	0.0199	-0.4263	-0.0301	-0.0217
	(0.353)	(0.627)	(-19.279) ***	(-2.904) ***	(-7.040) ***
KEIRETSU	-0.0135	0.1738	-0.1640	0.0139	-0.0048
	(-4.129) ***	(6.133) ***	(-8.336) ***	(1.505)	(-1.760) *
N	380	400	400	400	380
Pseudo R^2	0.061	0.334	0.602	0.031	0.135

[a] T-value are in parenthesis

*** Sinnificant at the level 1%

** Si mni ficant at the level 5%

* Si mni ficant at the level 10%

[b] Dependent variables (Risk indicators) are defined as the follwing:

(1) Standard deviation of loss ratio

(2) Percentage of Saving-type policy

(3) Debt to asset ratio

(4) 1-(Government bond to total investment ratio)

(5) Standard deviation of return of equity (ROE)

Table 3 Regression Results during all sample period (1976-1989)

	Underwriting risks		Financial and Investment risks		Business risk
	(1)	(2)	(3)	(4)	(5)
ASSET	-0.0011	-0.0561	0.0061	-0.0010	0.0019
	(-1.324)	(-4.077) ***	(9.720) ***	(-0.409)	(1.901) *
GROWTH	0.0006	0.0004	0.0005	0.0005	0.00006
	(10.842) ***	(0.432)	(2.864) ***	(2.438) **	(0.797)
HHI_PI	0.0128	0.4845	0.0214	-0.0175	0.0120
	(2.037) **	(4.618) ***	(4.481) ***	(-0.877)	(1.580)
MUTUAL	0.0039	0.0225	-0.0519	-0.0429	-0.0184
	(1.488)	(0.512)	(-25.894) ***	(-5.129) ***	(-5.794) ***
KEIRETSU	-0.0064	0.2029	-0.0150	0.0241	-0.0024
	(-2.715) ***	(5.116) ***	(-8.314) ***	(3.203) ***	(-0.863)
N	260	280	280	280	260
Pseudo R^2	0.341	0.177	0.760	0.107	0.119

[a] T-value are in parenthesis

*** Sinnificant at the level 1%

** Si nni ficant at the level 5%

* Si nni ficant at the level 10%

[b] Dependent variables (Risk indicators) are defined as the follwing:

(1) Standard deviation of loss ratio

(2) Percentage of Saving-type policy

(3) Debt to asset ratio

(4) 1-(Government bond to total investment ratio)

(5) Standard deviation of return of equity (ROE)

Table 4 Regression Results during all sample period (1990-1995)

	Underwriting risks		Financial and Investment risks		Business risk
	(1)	(2)	(3)	(4)	(5)
ASSET	0.0030	-0.4093	0.0005	0.0255	0.0002
	(1.136)	(-6.523) ***	(0.867)	(2.538) ***	(0.082)
GROWTH	-0.0027	-0.0009	0.0001	0.0007	-0.00005
	(-7.052) ***	(-1.059)	(1.362)	(0.538)	(-0.151)
HHI_PI	0.7570	0.3400	-0.0053	0.1017	-0.0284
	(2.761) ***	(5.233) ***	(-0.776)	(0.977)	(-1.104)
MUTUAL	-0.0003	-0.0351	-0.1119	0.0042	-0.0270
	(-0.053)	(-1.990) **	(-5.968) ***	(0.151)	(-3.857) ***
KEIRETSU	-0.0043	0.0528	-0.0064	-0.0049	-0.0061
	(-0.656)	(3.327) ***	(-3.805) ***	(-0.193)	(-0.974)
N	120	120	120	120	120
Pseudo R^2	0.291	0.544	0.381	0.042	0.132

[a] T-value are in parenthesis

*** Sinnificant at the level 1%

** Si nni ficant at the level 5%

* Si nni ficant at the level 10%

[b] Dependent variables (Risk indicators) are defined as the follwing:

(1) Standard deviation of loss ratio

(2) Percentage of Saving-type policy

(3) Debt to asset ratio

(4) 1-(Government bond to total investment ratio)

(5) Standard deviation of return of equity (ROE)