Some variables which affect sales of insurance companies – after 1998 in Japan -

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1. Introduction

The Japanese life insurance market experienced considerable change as a result of mergers, acquisitions, and reorganizations including demutualization after 1990s. At the same time, the financial authorities conducted liberalization and deregulation. Mahlberg and Url (2003) measured the effects of liberalization on technical efficiency and the productivity development of the Austrian insurance industry. They predicted that bancassurance could improve productivity of insurance companies. Bancassurance is defined as selling insurance through a bank's established distribution channels. Teunissen (2008) introduces the four typical bancassurance models; the pure distributor model, the strategic alliance model, the joint venture model, and the financial holding company model. Although the common styles of bancassurance in Japan belong to the pure distribution model, other models of bancassurance may prevail in the future. Consequently, liberalization, deregulation, and competition diversified the distribution channels of insurance products.

Obviously, prevalence of the internet influences the insurance markets in the world. Brown and Goolsbee (2002) investigated the market for term life insurance in the United States from 1992 to 1997. They already found that expanding the share of people in a group that used the internet to research insurance on-line lowered their quality-adjusted prices.

Brockett et al. (2005) presented the financial intermediary approach with a new DEA model to examine the efficiency of the marketing distribution channel and organizational structure for insurance companies. Trigo-Gamarra (2008) measured the service quality provided by insurance intermediaries in Germany. She compared it between independent and exclusive agencies and showed that the former had higher levels of service quality.

Although customers have been able to select the most suitable one among the multiple distribution channels, a new problem has been pointed out. Cooper and Nakabayashi (2010) compared the views of groups of leading U.S. and Japanese life insurance sales professionals on the extent to which certain ethical issues were perceived as having presented problems to those working in their respective industries during the selected periods of unethical behavior (1990-2006). Chen and Mau (2009) analyzed the relationship between ethical sales behavior and customer loyalty in the life insurance industry in Taiwan. They found that the salesperson's ethical sales behavior was important for the life insurance company's competitive advantage as manifested by customer loyalty through the mediation of customer trust.

2. Sales of insurance products

Figure 1 displays the transition of individual life insurance from fiscal 1998 to 2009. Although the number of policies for individual life insurance in force turned to grow after 2008, the amount of policies in force continues to fall during a period of time.

Figure 1 (omitted)

Figure 2 displays the transition of individual annuities during the same period. Both the number and the amount of contracts of new business for individual annuity were rapidly growing from fiscal 2002 to 2006. Moreover, the efficiency defined as the number or the amount of contracts per branch office was improved after 2002. In table1, although the number of contracts of new business for individual annuity per branch office was 32.7 in fiscal 2001, it rose up to 56.5 in fiscal 2002 and 88.6 in fiscal 2003. Table1 also shows that the efficiency became different among prefectures because the coefficient of variation for the number of contracts per branch office was relatively high from fiscal 2002 to 2006. For example, the number of contracts per branch office was 45.6 and 100.6 in fiscal 2001 and 2002 in Nara prefecture. In Okinawa prefecture, on the other hand, it was 12.3 and 14.7 in fiscal 2001 and 2002.

Figure 2 (omitted)

Table 1

New Business for Individual Annuity

	Number of Contracts		Ammount of Contracts	
FY	mean (No.)	coefficient of variation	mean (mil. Yen)	coefficient of variation
1998	70.9	0.2034	344.7	0.2193
1999	45.0	0.2249	195.9	0.2382
2000	58.1	0.2072	246.9	0.2346
2001	32.7	0.2167	137.8	0.2668
2002	56.5	0.4425	261.4	0.4238
2003	88.6	0.3466	411.5	0.3822
2004	104.7	0.3312	542.6	0.4015
2005	118.6	0.3196	625.1	0.3836
2006	125.1	0.3041	668.0	0.3639
2007	123.6	0.2983	636.7	0.3639
2008	135.2	0.2398	644.7	0.2876
2009	141.1	0.2149	673.7	0.2776

Source: Insurance Research Institute "Statistics of Life Insurance Business in Japan"

Table 2 shows the distribution of population, establishments (all industries and insurance institutions), post offices, and offices of financial institutions in 1795 regions. 1795 regions consist of municipalities at 2009 but we use the data at 2006 because of availability. Although the number of municipalities decreased by local government amalgamation policy in 2000s, we can find that a lot of small villages and towns still exist in 2009. For instance, 286 regions have no establishments of insurance institutions, so that the "0-ratio" is 0.159.

Table 2

		No.	mean	median	s.d.	0−ratio*
	population**	127,809,599	71,203	25,190	179,390	−
	establishments (all industries)	5,910,305	3,293	1,191	8,777	0.000
	establishments (insurance institutions)***	41,056	22.87	5	61.42	0.159
	post office	24,060	13.40	7	23.65	0.000
office	city bank	1,925	1.07	0	5.96	0.812
	trust bank	255	0.14	0	0.82	0.942
	regional bank	7,399	4.12	1	10.32	0.249
	regional bank II	3,255	1.81	1	6.30	0.484
	shinkin bank	7,737	4.31	1	10.41	0.262
	credit union	1,886	1.05	0	3.09	0.655
	labor bank	685	0.38	0	0.78	0.704

Source: The Statistics Bureau and the Director-General for Policy Planning of Japan "Establishment and Enterprise Census 2006"

The Japan Financial News Co., Ltd. “Nihon Kin’yu Meikan 2007”

Note: * “0-ratio” stands for the ratio of the number of municipalities which have no establishments or branch offices of a bank per the number of all municipalities.

** Miyake village (Tokyo) is excluded.

*** Insurance institutions include non-life insurance institutions.

3. Empirical studies

3.1. Cross-sectional study

The issues on deregulation of financial systems have been argued for a long time. Evanoff (1988) tested whether branch banking affected service accessibility in the United States. He measured accessibility as the number of banking facilities per square mile and regressed it on independent variables depicting population, the distribution of the population, per capita income, the degree of state regulatory stringency, and branching restrictions. Avery et al. (1999) examined the association between consolidation and changes in levels of banking branching as measured by changes in the number of bank branches per capita. Azegami (2010) also regressed the number of branches or offices of banks on independent variables depicting population, the number of establishments in a business area, and the size of an area.

In this study, we select the number of establishments of insurance institutions, post offices, and financial institutions as explained variables and regress them on several explanatory variables, such as the size of an inhabitable area (km^2), the number of establishments of all industries, the share of elderly (65+) in the population, the total fertility rate, and the sum of the taxable income.

[Notation]

NI: the number of establishments of insurance institutions

NF: the number of branches or offices of financial institutions

NP: the number of post offices

INH: the size of an inhabitable area (km^2)

OFC: the number of establishments of all industries

ER: the share of elderly (65+) in the population

FR: the total fertility rate

TX: the sum of the taxable income

We use the Box-Cox transformation as follows: For variable X,

(1) $X[\lambda]=(X^{\lambda}-1)/\lambda$, $0<\lambda<1$.

Thus, our linear regression equation is written as (2).

(2) $X[\lambda]=\beta 0+\beta 1*INH[\lambda]+\beta 2*OFC[\lambda]+\beta 3*ER+\beta 4*FR+\beta 5*TX[\lambda]$,

where $X[\lambda]=NI[\lambda]$, $NF[\lambda]$, $NP[\lambda]$.

Table 3 offers three regressions for each dependent variable. It is not surprising that more offices are in a large municipality, so that the sign of the coefficient of the size of an inhabitable area is positive. The older the population, the fewer the establishments of insurance institutions. On the other hand, the influence on the number of establishment of post offices is significantly positive. The sum of the taxable income gives an opposite influence

on these two variables.

Table3

	Insurance institutions NI			Financial institutions NF			Post Offices NP		
	Coef.	*S. E.*		*Coef.*	*S. E.*		*Coef.*	*S. E.*	
Constant (β 0)	−3.54	0.38	***	−3.44	0.27	**	−6.76	0.63	***
INH	0.11	0.01	***	0.07	0.01	***	0.22	0.01	***
OFC	0.25	0.01	***	0.12	0.01	***	0.59	0.04	***
ER	−5.52	0.67	***	−0.11	0.48		5.00	0.31	***
FR	0.14	0.19		0.28	0.14	*	0.07	0.07	
TX	−0.001	0.00	**	0.00	0.00		0.14	0.05	***
R^2	0.89			0.92			0.87		

Note: Standard errors are heteroscedastic-consistent. Parameter λ is selected such that NI[0.33], NF[0.38],and NP[0.000001].

3.2. Panel data analysis

It is possible to use data about the business results of insurance companies in the LIAJ statistics. Panel data set for 12 years from fiscal 1998 to 2009 and 47 prefectures was created. We examine the quantitative disparities of contracts of new business for individual annuity per branch office among prefectures. The dependent variable is the amount of contracts, denoted by AM, and the independent variables are as follows.

[Notation]

TXTP: the taxable income per capita (previous term)

HOS: the number of households per square kilometer of inhabitable land

BBRS: the number of offices or branches of banks per square kilometer of inhabitable land

POS: the number of post offices per square kilometer of inhabitable land

dBD: the changes in bank deposits (from the previous term)

dPD: the changes in postal savings (from the previous term)

Since each variable is observed every year and prefecture, our data set is a balanced panel. If one denotes time period and prefecture as t and p respectively, then variable X might be written such as X_t^p, t=1998,…,2009, and p=1,…,47. But we omit these indices in order for brevity. (3) is a linear regression equation.

(3) AM= β 0+ β 1*TXTP+ β 2*HOS+ β 3*BBRS+ β 4*POS+ β 5*dBD+ β 6*dPD

After testing several estimations, we adopted fixed-effects model. The results of the estimations are shown in Table4.

Table4 (omitted)

The presence of autocorrelation in residuals is detected by the Durbin-Watson statistics in Table4. Therefore, we modify this model by AR1 with maximum likelihood method. Table 5 depicts the results.

Table5 (1998-2009)

	TXTP		HOS		BBRS	POS	dBD		dPD	ρ	
Coef.	−0.92		0.82		−401.16	−863.14	−0.01		0.00	0.59	
S. E.	0.06	***	0.25	***	396.05	2027.88	0.00	***	0.00	0.03	***
p-values	0.00		0.00		0.31	0.67	0.00		0.17	0.00	

Note: *** significant at 1 percent level.

The signs of coefficients in Table 5 are consistent with Table4 except for the number of post offices per square kilometer. It is unexpected that the sign of the coefficient of the taxable income per capita is significantly negative. While the share of age 60 and over in those who contracted an individual annuity in fiscal 2002 was 23.9 per cent, it rose up to 32.8 per cent in fiscal 2003 and continued to be above 30 per cent ever since. Since the elderly get lower income than the younger, we suggest that the high share of elderly induced the negative sign of this coefficient.

The number of households per square kilometer of inhabitable land is proportion to population density, so that insurance branches in an area with higher HOS can sale insurance products more efficiently. Accordingly, the sign of the coefficient is significantly positive.

Table1 showed disparity among prefectures was enlarged after fiscal 2002. In order to consider this phenomenon, we estimate equation (3) for the period from fiscal 2002 to 2009. The results are listed in Table6. The signs of the coefficients of the taxable income per capita, the number of households per square kilometer of inhabitable land, and the changes in bank deposits are the same as in Table5. The coefficient of the changes in postal savings becomes significantly negative in Table6. The outstanding balance of postal savings is decreasing since 2000 and it is said that the customers use some amount of their postal savings to purchase individual annuity.

Table6 (2002-2009)

	TXTP		HOS		BBRS		POS	dBD		dPD		ρ	
Coef.	−0.835		1.681		−1113.040		−191.233	−0.017		−0.024		0.423	
S. E.	0.056	***	0.255	***	517.009	**	1876.960	0.002	***	0.004	***	0.057	***
p−values	0.000		0.000		0.031		0.919	0.000		0.000		0.000	

Finally, we convert the amount of contracts of new business for individual annuity per branch office into the amount of contracts of new business for individual insurance per branch office as the dependent variable. The independent variables are the same, so that the regression equation is still (3). The results are listed in Table7.

The sign of the coefficient of the taxable income per capita is significantly positive while it is negative in Table5 and Table6. Since the share of age 60 and over in those who contract the individual insurance is lower than that in the case of the individual annuity, the amount of contracts is proportion to the sum of the taxable income. The estimated coefficient on the number of offices or branches of banks per square kilometer of inhabitable land is positive in this case. Although the business results of insurance companies are strongly affected by sales of the individual annuity through banks, the present results suggest that the density of banks is positively related to the sales of individual insurance rather than individual annuity.

Table7

	TXTP		HOS	BBRS		POS	dBD		dPD		ρ	
Coef.	5.507		1.609	7199.580		3597.380	−0.040		−0.115		0.415	
S. E.	0.280	***	1.097	1814.700	***	9912.110	0.011	***	0.013	***	0.042	***
p−values	0.000		0.142	0.000		0.717	0.001		0.000		0.000	

4. Conclusions

There still exist a number of small villages and towns without establishment of financial institutions in Japan. The accessibility of insurance services is also different among regions.

Deregulation and competition diversified service channels in the insurance markets. Nevertheless regional disparity of accessibility has not diminished yet.

In the aspect of insurance companies, they may make their best effort to acquire a customer through various channels. Although bancassurance is expected to be one of the major sales channels, the number of establishments of financial institutions is decreasing. We presume that regional disparities will remain hereafter. Accordingly, if an insurance company develops a delivery channel to improve accessibility, it can have a dominant position in the market.

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