INSURANCE INDUSTRY ACTIVITY AND ECONOMIC DEVELOPMENT IN THE ASIA-PACIFIC REGION

Yoshihiko Suzawa and Masahiro Inoguchi*
Faculty of Business Administation, Kyoto Sangyo University, Japan

Abstract

This study examines the relationships exhibited between the financial development and insurance activities in the Asia-Pacific region. Insurers undoubtedly contribute to the economic growth and stability through their primary operations as providers of risk transfer and indemnification schemes for business entities and households. In addition, insurers can administer to the economy as financial intermediaries by supplying funds generated from the time-lag between the premiums earning and payment of losses. For more than a decade, the global insurance market has grown, and such trends have been accelerated especially in emerging markets of the Asia-Pacific region. Growing countries in this region have recently experienced significantly faster real growth in their insurance sectors than industrialized countries, given the process of financial liberalization and integration. This study tests whether there is a causal relationship between insurers' indemnity and investment activities and the economy's financial development in the Asia-Pacific region, using the Generalized Method of Moments (GMM) for a unique set of panel data based on market data of thirteen countries in this region from 2000 to 2009. From the estimation results, we find a positive relationship between non-life insurance density (premiums earned per capita) and financial development. These findings are consistent with our anticipation that insurers would directly contribute to the promotion of a nation's economy by protecting organizations and households from property and casualty risks through their underwriting operation. By contrast, we observe no definitive tendency for life insurance, which implies that the insurers' function as providers of life insurance products and long-term investment capital has no significant impact on the financial development.

Keywords: insurance activities, financial development, Generalized Method of Moment, Asia-Pacific region

บทคัดย่อ

การวิจัยเพื่อศึกษาความสัมพันธ์ระหว่างการพัฒนาทางด้านการเงินและการดำเนินการ

*Yoshihiko Suzawaand Masahiro Inoguchi are associate professors of the Faculty of Business Administration, Kyoto Sangyo University, Japan. The authors wish to thank Professor Nat Pope at Illinois State University USA for his ungrudging support to complete the paper. All remaining errors are the authors' own. Authors can be contacted at suzawa@cc.kyoto-su.ac.jp. This study is financially supported by the Institute of Comprehensive Academic Research, Kyoto Sangyo University.

ประกันภัยในเขตเอเชียแปซิกฟิก ผู้รับประกันภัยให้การสนับสนุนการเจริญเติบโตทางเศรษฐกิจและความมั่นคงโดยการรับโอนความเสี่ยงภัยและการชดใช้ค่าสินไหมทดแทนให้ภาคธุรกิจและครัวเรือนอย่างเคลือบแคลง อีกทั้ง ผู้รับประกันภัยให้การสนับสนุนทางด้านเศรษฐกิจโดยเป็นตัวกลางทางการเงินเพื่อสนับสนุนเงินทุนที่มีอยู่ระยะเวลาระหว่างการรับเบี้ยประกันและการจ่ายค่าความเสียหาย ตลาดการประกันภัยโลกได้เติบโตขึ้นมากว่าศตวรรษ และมีแนวโน้มในการเร่งการเจริญเติบโตโดยเฉพาะตลาดในเอเชียแปซิกฟิก เศรษฐกิจที่เจริญเติบโตในภูมิภาคนี้มีการเปลี่ยนแปลงที่รวดเร็วอย่างเห็นได้ชัดในภาคประกันภัยมากกว่าภาคธุรกิจอื่น ๆ ซึ่งทำให้เกิดกระบวนการเสรีและการรวมเป็นหนึ่งเดียวกัน การศึกษานี้ทดสอบว่าความสัมพันธ์ที่เกิดขึ้นโดยบังเอิญระหว่างการชดใช้ค่าสินไหมทดแทนและการลงทุนของผู้รับประกันภัยและการพัฒนาทางด้านการเงินของเศรษฐกิจของภูมิภาคเอเชียแปซิกฟิกโดยใช้วิธีการ Generalized Method of Moments (GMM) สำหรับหน่วยข้อมูลที่ขึ้นอยู่กับข้อมูลทางการตลาดของ 30 ประเทศในภูมิภาคนี้ ระหว่างปี ค.ศ. 2000 ถึง ค.ศ.2009

จากผลการประเมินพบว่า มีความสัมพันธ์เชิงบวกระหว่างพิกัดการประกันวินาศภัย (เบี้ยประกันรับต่อเงินทุน) และการพัฒนาทางการเงิน การค้นพบนี้ตรงกับการคาดการณ์ของผู้รับประกันที่จะสนับสนุนโดยตรงต่อการส่งเสริมเศรษฐกิจชาติโดยการป้องกันองค์กรและครัวเรือนจากความเสี่ยงทางด้านทรัพย์สินและความรับผิดชอบโดยผ่านกระบวนการพิจารณารับประกันภัย ในทางตรงกันข้าม จากการสังเกตไม่พบแนวโน้มที่ชัดเจนในการประกันชีวิต ซึ่งแสดงให้เห็นว่าหน้าที่ของผู้รับประกันภัยที่เป็นผู้บริการทางด้านการประกันชีวิตและการให้เงินลงทุนระยะยาวไม่มีนัยสำคัญต่อผลกระทบของการพัฒนาทางด้านการเงิน

Purpose and Contribution of This Study

The objective of this study is to test the causal relationship that is assumed to exist between insurers' activities and financial development in the Asia-Pacific region. The last two decades have witnessed a great deal of growth in the global insurance market. Such trends have especially accelerated in emerging markets in the region of our interest, reflecting market growth, liberalization and financial integration, as well as capital influx from industrialized economies.

Insurers' activities obviously promote financial development and stability as providers of risk transfer and indemnification, by allowing different risks to be managed more efficiently (Arena, 2008). In addition to the risk management function, insurers in industrialized markets have significantly contributed to the economy by supplying capital as financial intermediaries. As a result of their underwriting operation, insurers accumulate large amounts of fund for the payment of claims in the future. As Skipper and Kwon (2007) point out, insurers, especially life insurers, manage significant investment portfolios. They are key institutional investors in capital markets worldwide. Because a portion of their invested funds must go to meet future claims, the primary requisite of insurers' investments is safety of principal. However, insurers

have strong incentives to maximize investment returns, as this can be a major factor in determining product competitiveness and profitability. Vaughan and Vaughan (2008) state that the return earned on investment is an important variable in the rating process, i.e. life insurers assume some minimum rate of interest earnings in their premium calculations, and non-life insurers are also increasingly required to include investment income in their price computations.

According to *Sigma* complied by Swiss Re (2010a), in the U.S. for instance, more than 90% of the assets of life insurers (separate account) are allocated to bonds, common and preferred stocks, and a little less than 80% of those of non-life insurers were invested in such securities in 2008. Similarly, in 2010, Japanese life insurers allocated 76% of their asset portfolios to domestic government bonds, non-government debt and equity, while non-life insurers invested 64% of their assets in domestic government bonds, non-government debt and equity. Insurers in the U.K. also have a great commitment to government securities, bonds, shares and equity trusts which account for 86% for life insurers and 79% for non-life insurers.

Most Asian countries have improved their financial systems since the crisis of 1997. In response, the insurance markets in this region continue to grow. The market share based on premiums earned in this region as a whole increased to 16.7% in 2010 from 10.5% in 2007 (Swiss Re, 2010b). Although the security market is becoming worldwide, knowledge of local investment situations obviously is important for safety and soundness of insurers' financial condition. As Skipper and Kwon (2007) state, foreign investment can exacerbate the investors' problem of information asymmetry, as judging the quality of such investment can be difficult. Accordingly, the national insurance regulation typically places severe limits on foreign investments by domestic insurers, and a local presence is required for insurers' investment management.

Despite the accelerated growth of insurance industries in the Asia-Pacific region, what has not been clearly articulated are the activities of domestic insurers and their contribution to the economy, partly because the above-mentioned limitation for insurers' foreign investments. This study tries to reveal how the insurers' activities would impact on financial development in the Asia-Pacific region with a variety of market characteristics.

Summary of the Literature Motivating the Study

A number of theoretical works have pointed out that financial intermediation can be conducive to economic development. Levine (2005) emphasizes that financial systems influence savings and investment decisions and hence long-term growth, by lowering the costs of researching potential investment, exerting corporate governance, trading and diversifying risk, mobilizing and pooling savings, conducting exchanges of goods and services, and mitigating the negative consequences that random shocks can have on capital investment. Greenwood and Jovanovic (1990) and Pagano (1993) model the effect of financial intermediaries on economic development, and discuss how financial intermediaries have an impact on economic growth by transforming savings into investment, i.e. funneling savings to firms by improving the allocation and

productivity of capital and by altering the savings rate.

Looking at research focusing on insurance activity, Outreville (1990) mentions the possible relationship between insurance market growth and economic development. Skipper (1997) dwells on this issue more deeply and states that insurance activity may contribute to economic growth by improving the financial system function as not only a provider of risk transfer but also as an institutional investor. He analyzes six ways by which insurers can do so: (1) promoting financial stability, (2) facilitating trade and commerce, (3) mobilizing domestic savings, (4) allowing different risks to be managed more efficiently by encouraging the accumulation of new capital, (5) fostering a more efficient allocation of domestic capital, and (6) helping to reduce or mitigate losses. Webb, Grace and Skipper (2002) model the financial intermediaries' (including life and non-life insurers) effect on economic growth in the context of a neoclassical Solow-Swan model, predicting that insurance and banking spur capital stock productivity, which drives the level of output and investment. In addition, Arena (2008) points out the different effects of life and non-life insurance on economic growth, i.e. these two types of insurance protect households and corporations from different kinds of risks that affect economic activities in diverse ways, and moreover, life insurers facilitate long-term investments rather than short-term ones as is the case for non-life insurers.

As empirical studies, most of the previous works assess the impact of the banking sector on the economy. Levine (1998) and Levine and Zervos (1998) demonstrate evidence of the economic importance of banks by examining relations between stock markets, banks and economic development. Levine, Loayza and Beck (2000) also find a positive causal relationship between banking sector development and economic growth. Beck and Levine (2004) show that stock markets and banks have a positive causal relationship with economic growth. In the macroeconomic growth literature, Demetriades and Hussein (1996) and Arestis and Demetriades (1997) point out the importance of accommodating the potential for causal relationships to differ in size and direction across countries.

Despite the apparent lack of literature on the role of insurance, Outreville (1996) tries to identify links between the economy's financial development and life insurance market development. More recently, we can notice several works attempting analyses of the insurance market and economic development. Ward and Zurbruegg (2000) examine the short- and long-term dynamic relationships exhibited between economic development and growth in the insurance industry for nine OECD countries by using annual real GDP as a measure of economic activity and annual real total written premiums as a measure of insurance activities for 1961-1996, and find that insurance activities cause economic growth in some countries but the reverse is true in others. Arena (2008) examines a causal relationship between life and non-life insurance market activities and economic development for 55 countries in 1976-2004, by utilizing the Generalized Method of Moments (hereafter referred to as GMM) and finds a positive and significant causal effect of insurance activities on economic growth.

These works are doubtlessly important. Nonetheless, the impact of insurance activities on development in financial markets has not been studied as extensively as the role of the banking

sector and the stock market. In this study, we focus on the activities of life and non-life insurers and try to clarify their impact on financial development in the Asia-Pacific region, consisting of a variety of markets in respect to the insurance regulatory framework, market size, stage of market development, etc.

Data and Research Approach

Data

We construct a panel data consisting of 13 countries for the 10 year period 2000-2009 (as tabled in Appendices). The countries include Japan, South Korea, China, Taiwan, Hong Kong, Malaysia, Singapore, Thailand, Indonesia, Philippines, Vietnam, Australia and New Zealand. Following previous works focusing on the relationship between financial developments and insurance activities, we choose the ratio of quasi money (M2-M1) to broad money (M2).[1]

The explanatory variables in which we are interested are measures of insurance market development. We choose the premiums earned per capita as measures of insurance density in the market, and the ratios of premiums earned to GDP as a measure of insurance penetration in the economy. All variables are calculated for life and non-life insurance individually on a U.S. dollar base. We also add macro economic variables including the real interest rates, real GDP growth and inflation rates.[2]

Research Methodology

In this study, we follow the approach of Webb, Grace and Skipper (2002) and Arena (2008), as referred above, and evaluate the effect of insurance variables on financial development within the context of the standard growth regressions specification.

Since both the insurance density (premiums earned per capita) and the insurance penetration (ratios of premiums earned to GDP) have the same numerator i.e. premiums earned and thus possibly indicate a high correlation coefficient, we conduct analyses separately for these two variables in order to avoid multicollinearity. The estimation is conducted based on the following general regression equation:

$$Q_{it} = Q_{it-1} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + a_{it}$$

where:

Q is the dependent variable of interest i.e. financial development derived by (M2-M1)/M2, based on the discussion by Outreville (1996).

β is the vector of coefficients to be estimated

a is the error term

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[1]M1 includes notes and currency in circulation, demand deposits and other checkable deposits. M2 includes savings deposits, time deposits and money-market deposit accounts for individuals in addition to money types consisting of M1.

[2]All insurance-related data are based on the annual issues of *Sigma: World Insurance* from 2000 to 2009 compiled by Swiss Reinsurance Company, Ltd. Macro economic data are based on *Datastream*, a data base provided by Thomson Reuters, *International Financial Statistics*, and *CEIC database*.

The subscripts I and t denote country and time period, respectively. (Due to constraints of data availability, the regression for (M2-M1)/M2 does not include the Philippines).

X_1 is the explanatory variable as proxy for insurance activities that vary among time periods and countries.

We use insurance density (premiums earned per capita) for X_1 in the first estimation, and then replace it with insurance penetration (ratios of premiums earned to GDP) in the second estimation. If insurance market development could contribute to financial development, the sign of the coefficients of insurance-related variables would be positive.

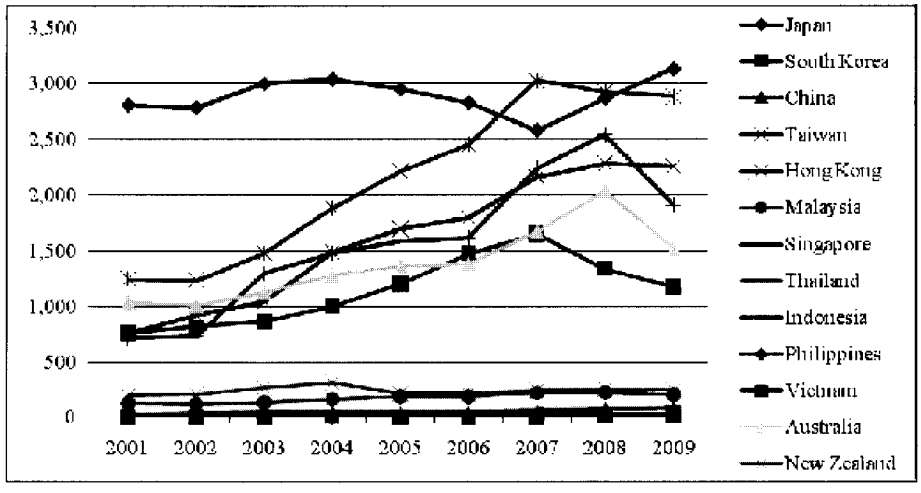
As control variables, X_2, X_3, and X_4 are the set of macro-economic variables that denote real interest rates, real GDP growth rates and inflation rates, respectively.

We utilize a GMM-type method for the estimation. Because the regression equation is a dynamic equation, this estimation employs the dynamic panel regression method of Arellano and Bond (1991) utilizing the equation in first differences and the orthogonality condition.[3] As Arena (2008) mentions, this system enables us to deal with dynamic regression specifications and account for some endogeneity in the explanatory variables.

Trends of Major Variables

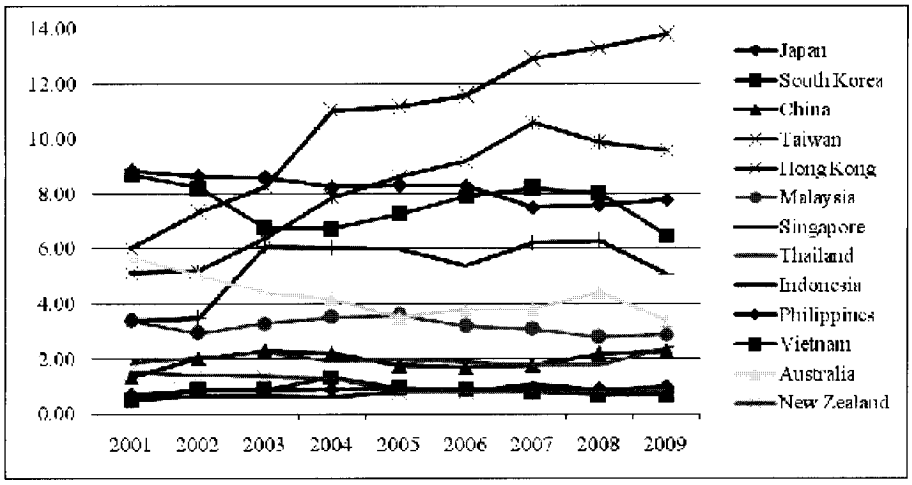
Figures 1 and 2 illustrate the trends of life insurance premiums earned per capita and percentage of premiums earned to GDP, respectively, from 2001 to 2009. Some emerging markets including Taiwan, Hong Kong and Singapore, generally indicate significant increase throughout the subject period. Similarly, other growing countries such as China, Malaysia, Thailand, Indonesia, Philippines and Vietnam show gradual upward trends for the same period, although the numbers for these countries have been still small. Life insurance business in these markets appears to have grown rapidly resulting in rising levels of insurance density and penetration in

Figure 1: Life Insurance Premiums Earned per Capita in U.S. Dollars



[3]We utilize second lagged variables as instruments for explanation variables, because we deal with the endogenous problem. Although Brundell and Bond (1998) also suggest another dynamic panel regression method, we do not use it as their method needs a number of instrument variables and our sample size is not sufficient.

Figure 2: Life Insurance Premiums in Percentage of GDP



the economies, which is consistent with the growing economy and income level in emerging markets of the Asia-Pacific region. By contrast, relatively mature markets including Japan, South Korea, Australia and New Zealand, have stayed flat compared with other developing countries.

Non-life insurance variables show slightly different trends from life insurance as described in the following figures. Non-life insurance premiums earned per capita show two different trends as described in Figure 3. Such countries as Japan, South Korea, Taiwan, Hong Kong, Singapore, Australia and New Zealand, represent a constantly higher level of numbers, conforming to higher diffusion rates of non-life insurance coverage in these countries. The numbers for developing economies are still small, although they have gradually increased over time.

Figure 3: Non-life Insurance Premiums Earned per Capita in U.S. Dollars

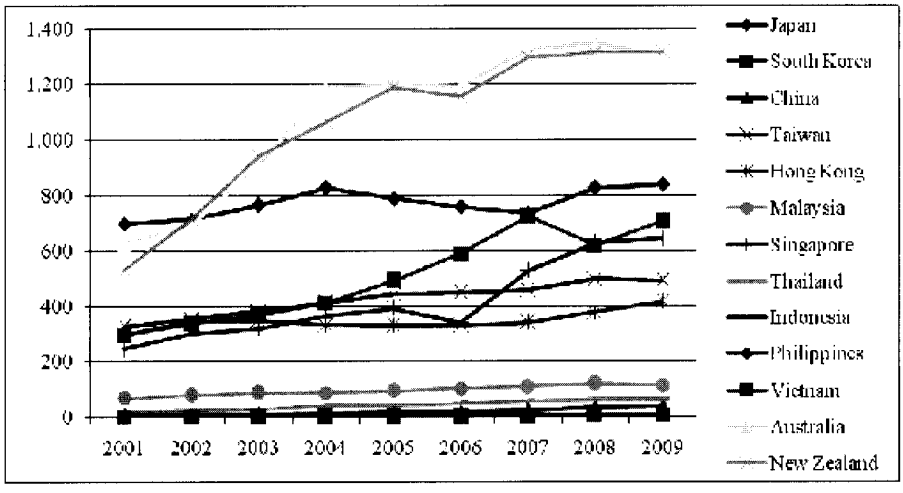
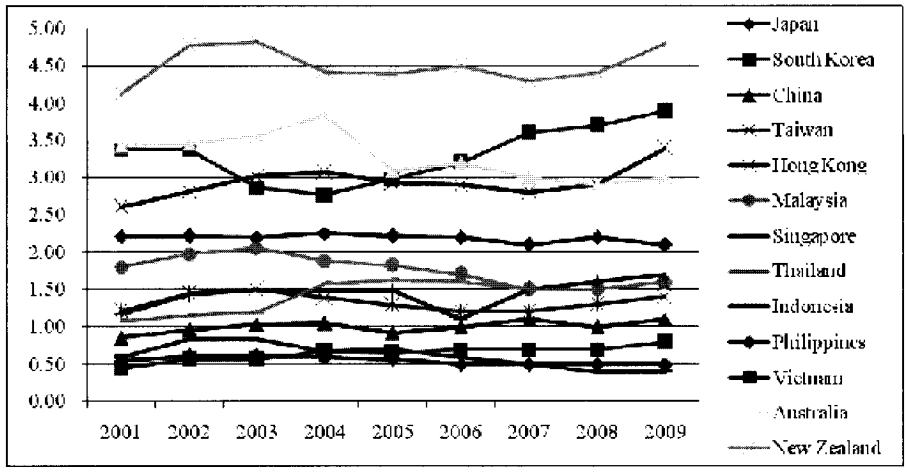


Figure 4: Non-life Insurance Premiums in Percentage of GDP



Moreover, ratios of premiums to GDP appear to be hovering at a low level except South Korea, Taiwan, Australia and New Zealand. There may be still more rooms for growth in the non-life insurance sectors in most markets of the Asia-Pacific region, as illustrated in Figure 4.

Research Results

Financial Development and Insurance Business

We first obtain the outputs described in Table 1 from the data of all insurance lines.

Table 1: Outputs from All Line Data

Financial Development Lagged Value			
	Coefficient	0.582***	0.569***
	Std. Error	0.057	0.060
	z-value	10.170	9.520
Insurance Density			
	Coefficient	0.011***	
	Std. Error	0.007	
	z-value	1.690	
Insurance Penetration			
	Coefficient		-0.099
	Std. Error		0.232
	z-value		-0.430
Interest Rate			
	Coefficient	0.565***	0.619***
	Std. Error	0.149	0.149
	z-value	3.790	4.170

Real GDP Growth			
	Coefficient	-0.012	-0.043
	Std. Error	0.078	0.079
	z-value	-0.150	-0.550
Inflation			
	Coefficient	0.566***	0.620***
	Std. Error	0.149	0.149
	z-value	3.790	4.180
Constant			
	Coefficient	0.209***	0.292***
	Std. Error	0.056	0.048
	z-value	3.750	
Sargan Test Statistic		84.174	84.882
Number of Observations		84	84

In explanation, variables *, **, and *** indicate that the statistic is significant at the 10%, 5%, and 1% levels, respectively. In the Sargan test, * indicates that the null hypothesis is rejected at the 10% level and the overidentifying condition is satisfied.

The positive values of the coefficients of the explanatory variables indicate the existence of positive relationships between the variables and financial development, i.e. an increase in the coefficient number implies positive contribution to financial development, and vice-versa. From the outputs tabled above, we mainly find the following:

1. The insurance density slightly indicates positive contribution to the financial development with a high significance level of 1%.
2. No significance is observed between financial development and insurance penetration.
3. The dependent variable tends to have positive relationships with variables representing the interest rate and the inflation rate.

The first observation denotes that larger premiums earned per capita for all lines of insurance positively contribute to financial development in the market, implying that active purchase of insurance by households and corporations has a positive relationship with the economy. In the meantime, the ratios of premiums earned to GDP representing insurance penetration into the economy exhibit no relation to the dependent variable, as indicated in the second observation. This implies that the expansion of the insurance industry as a whole has no impact on the nation's financial development. In addition, we need to take notice that the financial development is affected by other market factors such as interest rate and inflation levels more directly and strongly than by the insurance activities, as shown in the third observation.

We then separate the data into life and non-life insurance sectors in order to conduct a comparative analysis between life and non-life insurance lines.

Life Insurance and Financial Development

From the life insurance database, we obtain the outputs described in Table 2 and find the following:

1. There is no significance observed between insurance-related variables and financial development for life insurance.
2. Both the interest and inflation rates have positive relationships with the dependent variable.

Contrary to our expectations that the life insurance industry possibly contributes to the economy by supplying long-term capital as financial intermediaries, there is no significant relationship observed between financial development and life insurance activities. Meanwhile, the rise in interest rates and inflation levels appears to strongly contribute to financial development, similarly to the outputs from the data of all insurance lines. The active purchase of life insurance policies and the growth of the life insurance industry may have no direct relevance to financial development in the Asia-Pacific region.

Table 2: Outputs from the Life Insurance Data

Financial Development Lagged Value			
	Coefficient	0.588***	0.564***
	Std. Error	0.058	0.059
	z-value	10.080	9.520
Insurance Density		0.006	
	Coefficient	0.006	
	Std. Error	0.960	
	z-value	0.006	
Insurance Penetration			-0.217
	Coefficient		0.238
	Std. Error		-0.910
	z-value		-0.217
Interest Rate		0.603***	0.631***
	Coefficient	0.149	0.149
	Std. Error	4.040	4.240
	z-value	0.603***	0.631***
Real GDP Growth			
	Coefficient	-0.039	-0.050
	Std. Error	0.080	0.078
	z-value	-0.490	-0.640
Inflation			
	Coefficient	0.604***	0.631***
	Std. Error	0.149	0.149
	z-value	4.050	4.250

Constant			
	Coefficient	0.239***	0.298***
	Std. Error	0.056	0.046
	z-value	4.280	6.470
Sargan Test Statistic		85.930*	86.252*
Number of Observations		84	84

Non-life Insurance and Financial Development

Table 3 describes non-life insurance outputs, from which we observe the following:

1. Insurance density has a positive relationship with the dependent variable, although the coefficient is not very high and the significance level is moderate.
2. We observe no significance regarding insurance penetration of non-life insurance.
3. There is relatively high significance between the dependent variable and inflation with positive coefficient value.

Purchasing activities of non-life insurance policies appear to have a positive impact on the economic financial development of the market, as implied in the first observation. Insurers possibly facilitate the development and stabilization of the economy by providing risk transfer and indemnification tools relating to property and casualty risk exposure in households and corporations. The underwriting function of insurers may support economic activities by insuring individuals and organizations against possible property/casualty losses in this region.

Table 3: Outputs from the Non-life Insurance Data

Financial Development Lagged Value			
	Coefficient	0.544***	0.553***
	Std. Error	0.060	0.061
	z-value	9.120	9.110
Insurance Density			
	Coefficient	0.016**	
	Std. Error	0.007	
	z-value	2.210	
Insurance Penetration			0.794
	Coefficient		1.020
	Std. Error		0.780
	z-value		0.794
Interest Rate			
	Coefficient	0.543***	0.648***
	Std. Error	0.150	0.149
	z-value	3.610	4.350

Real GDP Growth			
	Coefficient	0.001	-0.062
	Std. Error	0.081	0.077
	z-value	0.010	-0.800
Inflation			
	Coefficient	0.544***	0.649***
	Std. Error	0.150	0.149
	z-value	3.620	4.360
Constant			
	Coefficient	0.222***	0.280***
	Std. Error	0.050	0.046
	z-value	4.430	6.140
Sargan Test Statistic		82.609	85.369
Number of Observations		84	84

Summary and Conclusion

This study investigates the impact of insurance activities on financial development in the Asia-pacific region. Insurers obviously contribute to the development and stability of the economy by providing insurance coverage to protect risk-exposed organizations and individuals and by supplying capital to the market as financial intermediaries. For the analysis, we constructed panel data consisting of 13 countries for the period 2000-2009. We then performed quantitative analysis based on GMM, and obtained results summarized on Table 4.

Table 4: Summary of Results

Variables	Insurance Density	Insurance Penetration
Line Total	(+++)	
Life Insurance		
Non-life Insurance	(++)	

*Positive signs denote the existence of positive relationships between financial development and the variables, and their number denotes the significance level, i.e. ++ and +++ denote 5% and 1%, respectively.

From the results of the estimation, we find a positive and moderately significant relationship between non-life insurance density (premiums earned per capita) and financial development. The results reveal that the growth of non-life insurance business has a causal effect on the economy of the Asia-Pacific region. This result is consistent with our intuitive anticipation that insurers possibly contribute to corporate and household activities by providing property and

casualty insurance coverage and by supplying funds through their investment function. By contrast, we observe no definitive relationship between life insurance activities and financial development. This result is contrary to our expectation that insurers would contribute to the economy by supplying funds accumulated through their life insurance underwriting due to the larger volume of premiums earned and longer insurance period compared with non-life insurance.

The results imply that insurers possibly facilitate the growth and stability of the economy though their property/casualty risk transfer and indemnification functions rather than through their investment activities as providers of long-term capital to the market in the region of interest. It is reasonable to expect non-life insurance products to share a more direct relationship with the promotion of a nation's industry, and therefore its financial, economic development, as non-life insurance products cover not only personal but also commercial ventures' risk exposures, i.e. the industry, while life insurance mainly focuses on personal-line products.

This tendency may be true especially for the Asia-Pacific region which consists of many growing markets. The region, however, includes countries with a wide variety of characteristics such as degree of market development, stringency of regulatory framework, size, historical backgrounds, and cultural nature. Therefore, it will be necessary to construct a database and an analytical model to clarify the impact of these factors on financial development, and this represents a source of future research.

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Appendix 1: Insurance Premiums Earned in Millions of U.S. Dollars

	Japan	South Korea	China	Taiwan	Hong Kong	Malaysia	Singapore
2000	503,712	58,350	19,327	22,871	7,801	4,249	3,965
2001	445,845	50,537	25,485	24,253	10,392	4,718	4,005
2002	445,580	55,414	3,688	28,650	10,743	4,855	5,827
2003	478,865	59,758	46,911	32,402	12,494	5,609	8,898
2004	492,425	68,623	52,171	43,236	15,260	6,453	9,696
2005	476,481	82,933	60,131	49,005	17,639	7,227	10,234
2006	460,261	101,179	70,805	51,562	19,842	7,537	10,776
2007	424,832	116,990	92,487	60,446	24,307	8,824	14,179
2008	473,197	97,023	140,818	64,265	24,096	9,335	16,528
2009	505,956	91,963	163,047	63,647	23,201	8,840	14,245

	Thailand	Indonesia	Philippines	Vietnam	Australia	New Zealand
2000	3,095	1,736	1,020	217	35,846	2,978
2001	3,366	1,641	906	315	32,705	2,810
2002	4,095	2,575	1,154	505	33,754	3,619
2003	4,932	3,107	1,192	550	40,385	4,730
2004	5,747	3,381	1,292	904	49,404	5,581
2005	6,376	4,271	1,443	854	51,902	5,673
2006	7,128	4,849	1,751	937	52,561	5,570
2007	8,285	6,938	2,105	1,027	62,233	6,453
2008	9,138	6,903	2,299	1,289	70,951	6,613
2009	10,460	7,285	2,399	1,440	60,317	6,685

Source: Swiss Reinsurance Company, Ltd. (2001-2010), the following annual issues of Sigma: World Insurance: No.6/2002, No.8/2003, No.3/2004, No.2/2005, No.5/2006, No.4/2007, No.3/2008, No.3/2009 and No.2/2010.

Appendix 2: Life Insurance Premiums Earned in Millions of U.S. Dollars

	Japan	South Korea	China	Taiwan	Hong Kong	Malaysia	Singapore
2000	400,993	44,237	10,476	15,771	5,969	2,678	2,942
2001	356,731	36,392	15,556	16,953	8,404	3,082	2,914
2002	354,553	39,272	25,054	20,719	8,400	2,911	3,026
2003	381,335	41,998	32,442	23,739	10,117	3,455	5,561
2004	386,839	48,680	35,407	33,851	12,969	4,208	6,459
2005	375,958	58,848	39,592	38,808	15,340	4,795	7,176
2006	362,766	72,298	45,092	41,245	17,482	4,881	7,080
2007	330,651	81,298	58,677	49,813	21,848	5,885	9,958
2008	367,112	66,417	95,831	52,748	21,324	6,105	11,445
2009	399,100	57,436	109,175	52,204	20,269	5,682	9,057

	Thailand	Indonesia	Philippines	Vietnam	Australia	New Zealand
2000	1,883	816	590	91	22,947	813
2001	2,127	773	493	169	20,394	763
2002	2,644	1,138	680	304	19,992	825
2003	3,222	1,373	702	331	22,341	1,059
2004	3,167	1,626	783	601	25,689	1,284
2005	3,516	2,303	885	511	27,602	885
2006	3,887	2,822	1,110	518	28,287	874
2007	4,521	4,728	1,331	565	34,725	1,023
2008	4,966	4,704	1,449	660	42,697	1,067
2009	6,212	5,066	1,563	671	32,468	1,064

Source: Swiss Reinsurance Company, Ltd. (2001~2010), the following annual issues of Sigma: World Insurance: No.6/2002, No.8/2003, No.3/2004, No.2/2005, No.5/2006, No.4/2007, No.3/2008, No.3/2009 and No.2/2010.

Appendix 3: Non-life Insurance Premiums Earned in Millions of U.S. Dollars

	Japan	South Korea	China	Taiwan	Hong Kong	Malaysia	Singapore
2000	102,719	14,112	8,851	7,100	1,832	1,578	1,024
2001	89,114	14,145	9,928	7,299	1,987	1,636	1,091
2002	91,028	16,143	11,834	7,932	2,342	1,944	2,800
2003	97,530	11,760	14,468	8,662	2,377	2,154	3,337
2004	105,587	19,944	16,765	9,385	2,291	2,245	3,237
2005	100,523	24,085	20,539	10,197	2,299	2,432	3,059
2006	97,495	28,881	25,713	10,318	2,361	2,656	3,695
2007	94,182	35,692	33,810	10,633	2,460	2,939	4,221
2008	106,085	30,606	44,987	11,517	2,772	3,230	5,083
2009	106,856	34,527	53,872	11,443	2,931	3,158	5,188

	Thailand	Indonesia	Philippines	Vietnam	Australia	New Zealand
2000	1,212	919	430	126	12,899	2,164
2001	1,239	868	414	146	12,311	2,948
2002	1,451	1,437	474	201	13,763	2,794
2003	1,711	1,733	489	218	18,044	3,671
2004	2,581	1,754	509	302	22,714	4,297
2005	2,860	1,968	558	343	24,300	4,788
2006	3,241	2,027	641	419	24,274	4,696
2007	3,764	2,210	774	463	27,508	5,430
2008	4,173	2,199	850	629	28,254	5,547
2009	4,248	2,219	835	769	27,849	5,622

Source: Swiss Reinsurance Company, Ltd. (2001-2010), in the following annual issues of Sigma: World Insurance: No.6/2002, No.8/2003, No.3/2004, No.2/2005, No.5/2006, No.4/2007, No.3/2008, No.3/2009 and No.2/2010.