Foreign Participation in Life Insurance Markets: Evidence from OECD Countries

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This paper examines the determinants of foreign participation in life insurance markets across 24 OECD countries during the period 1993–2000. The empirical results show that socio-economic and market structure factors influence foreign participation in life insurance markets. More specifically, life expectancy, foreign market share, income, dependency ratio, financial development, level of competition, economic growth and market liberalisation have positive impacts, whereas expense/combined ratios and social security expenditure have negative impacts on foreign participation in life insurance markets. In addition, governance/legal indicators (common law, political stability, government effectiveness, regulatory quality, the rule of law and control of corruption) all show positive impacts on foreign participation in life insurance markets.

The Geneva Papers (2009) 34, 466–482. doi:10.1057/gpp.2009.9

Keywords: foreign life insurance; governance; regulation

Introduction

Foreign participation in domestic life insurance markets has greatly increased during the past decades, following the Uruguay Round international trade agreement and particularly the establishment of the WTO General Agreement on Trade in Services (GATS). Some regional deregulations have also facilitated greater foreign life insurer participation, such as the establishment of the third non-life and the third life directives by the Council of European Communities and the increased deregulations in some Asian financial markets, such as China.¹ In the meantime, increased foreign competition and the resultant enhanced social welfare provide innovative and differentiated life insurance products to customers, which are more attractive, better priced and more suitable for consumer tastes.² Foreign participation also benefits both participating insurance firms. For example, foreign insurers can achieve enlarged risk pooling based on larger geographical diversification. Local insurer risk capacity can be increased due to more capital, expertise and strategic benefits brought by foreign

¹ Sun (2003) examines the impact of WTO accession on China's insurance industry and concludes that foreign insurance companies may quickly build up presence with the removal of insurance business restrictions in China.

² Ma and Pope (2003), Li *et al.* (2007).

insurers. As a consequence, this will bring benefits to the host country's overall economy, including increased financial stability, facilitation of trade and commerce, risk management, loss mitigation and more efficient capital allocation.³ Moreover, recent developments in bancassurance have also contributed to greater participation in the domestic life insurance sector by foreign banks,⁴ due to complementary features between life insurance and bank products, banking facilitation of the sale of life insurance products and potential synergies.⁵

Although substantial research has been conducted on international insurance services, this is the first paper to investigate foreign life insurer participation in light of the rapid deregulation, liberalisation and globalisation of the international life insurance industry. This paper has four significant contributions to current literature. First, this paper extends Li *et al.*,⁶ examining the determinants of life insurance consumption in OECD countries to examine the determinants of foreign life insurance participation in domestic markets. In doing so, international factors are taken into account, such as market liberalisation, in addition to the demand factors documented by Li *et al.*⁷ Second, this paper develops an empirical model to investigate foreign life insurance participation vis-à-vis socio-economic and market structure factors. This paper has policy implications to encourage foreign participation and globalisation of international life insurance markets. In doing so, this paper complements the paper by Ma and Pope.⁸ Third, this paper documents the significant role of governance/legal factors played in foreign insurance markets, which supports previous literature on international life insurance consumption,⁹ international reinsurance¹⁰ and on the location choice of the foreign affiliates of the largest insurance groups.¹¹ Fourth, given that much of the motivation and consequences of international trade and investments in insurance services remain unclear,¹² this paper sheds additional light on this issue.

The empirical results, based on a sample of 24 OECD countries during the period 1993–2000, show that socio-economic and market structure factors influence foreign participation in life insurance markets. More specifically, life expectancy (LE), foreign market share (MS), income (IN), dependency ratio (DR), financial development (FD), level of competition, economic growth and market liberalisation have positive impacts, whereas expense/combined ratios (ECRs) and social security (SS) expenditure have negative impacts on foreign participation in life insurance. In addition, governance/legal indicators (common law, political stability (PS), government effectiveness (GE),

³ Skipper and Klein (2000).

⁴ According to Swiss Reinsurance Company, Sigma, (2002, 7: 5), bancassurance is defined, in its simplest form, as the distribution of insurance products by banks.

⁵ Swiss Reinsurance Company, Sigma (2002) No. 7.

⁶ Li *et al.* (2007).

⁷ *Ibid.*

⁸ Ma and Pope (2003).

⁹ Ward and Zurbrugg (2002); Beck and Webb (2003).

¹⁰ Cole *et al.* (2007).

¹¹ Outreville (2008).

¹² See for example, Moshirian (1997 and 1999).

regulatory quality (RQ), the rule of law (RL) and control of corruption (CR)) all show positive impacts on foreign participation in life insurance.

This study is structured as follows: the first section presents a review of the existing literature. The second section introduces factors influencing foreign participation in life insurer markets. The third section presents data and methodology. The fourth section provides empirical results and their implications, and then the paper concludes.

Review of the existing literature

Foreign participation in life insurance markets can be explained from various streams of literature including foreign direct investment (FDI) in insurance services, international trade in insurance services and demand for life insurance. FDI in insurance services is examined in some studies. For example, Moshirian¹³ concludes that the demand for insurance services as well as the size of the insurance sector of the source country, among other factors, significantly influences the level of FDI in insurance. Li and Moshirian¹⁴ analyse and discuss the determinants of FDI in insurance services in the United States. Their study shows that solid economic fundamentals in the host countries are the major factors that attract FDI in insurance services, although the uncertainty of the international exchange market increases the investment risk and reduces foreign investors' willingness to invest. More recently, Outreville¹⁵ examines the location-specific advantages for foreign affiliates of the largest insurance groups.

In addition, there are a few studies on international trade in insurance services. For example, Sapir and Lutz¹⁶ investigate the sources of comparative advantage in insurance services. Skipper¹⁷ analyses protectionism during international trade in insurance services. The OECD¹⁸ analyses the obstacles to foreign participation in domestic insurance markets, such as deposits or financial guarantees, business records in the home country and official certification of the supervisory authority in a home country. More recently, Li *et al.*¹⁹ analyse and measure the magnitude of intra-industry trade (IIT) in insurance services for the United States. They find that FDI in insurance services is a significant contributor to the volume of trade in insurance services.

Moreover, there are a few studies on demand for life insurance. For example, Campbell²⁰ argues that life insurance consumption is linked to lifetime uncertainty. Browne and Kim²¹ document that the following factors can influence a country's average life insurance consumption: the DR, national IN, government spending on SS, insurance price, inflation rate and religion. Outreville²² analyses life insurance markets in developing

¹³ Moshirian (1997).

¹⁴ Li and Moshirian (2004)

¹⁵ Outreville (2008).

¹⁶ Sapir and Lutz (1981).

¹⁷ Skipper (1987).

¹⁸ OECD (1999).

¹⁹ Li *et al.* (2003).

²⁰ Campbell (1980).

²¹ Browne and Kim (1993).

²² Outreville (1996).

countries and documents a positive impact of FD and a negative impact of a monopolistic market on life insurance consumption, among other factors. More recently, Ward and Zurbruegg²³ investigate law, politics and life insurance consumption in Asia, and document the significance of legal/governance factors (RL, for instance) in determining life insurance consumptions in Asian and OECD countries. Beck and Webb²⁴ investigate life insurance consumptions from 68 economies during the period 1961–2000, and document that economic, religious and institutional/governance indicators can explain the use of life insurance. Li *et al.*,²⁵ examine the determinants of life insurance consumption in OECD countries and conclude that life insurance demand is better explained when product market and socio-economic factors are jointly considered.

There are some papers on foreign participation in insurance markets. Ma and Pope²⁶ examine the importance of foreign market characteristics for the participation of international non-life insurers. Cole *et al.*²⁷ examine foreign reinsurance assumptions based on a sample of 35 reinsurers. Outreville²⁸ examines the location choices of insurers to expand their operations. The purpose of this paper is to investigate foreign life insurer participation by including international factors, governance/legal factors and life insurance demand factors. To do so, several hypotheses are postulated based on socio-economic and market structure analysis.

Factors influencing foreign participation in life insurance markets

Li *et al.*²⁹ document that location-specific variables, such as LE, SS expenditure, IN, DR, anticipated inflation (AI), education, FD and foreign MS are significant in explaining the level of *total* life insurance demand in OECD countries. This paper builds upon that work by separating out total life insurance demand into domestic and foreign insurance companies. In doing so, international factors, such as market liberalisation, are also included to examine foreign participation. This could stem from the fact that foreign insurance companies price their products using a more diversified customer base across different countries. For instance, Ma and Pope³⁰ document that market competition, market liberalisation, among others, are the factors influencing foreign participation in the non-life insurance market. This paper includes factors influencing demand for both life and non-life insurance products, such as education. In doing so, this paper explicitly controls for the impact of risk aversion on life insurance demand. Moreover, following recent literature development in this area, governance/legal factors are incorporated in this study.^{31, 32}

²³ Ward and Zurbruegg (2002).

²⁴ Beck and Webb (2003).

²⁵ Li *et al.* (2007).

²⁶ Ma and Pope (2003).

²⁷ Cole *et al.* (2007).

²⁸ Outreville (2008).

²⁹ Li *et al.* (2007).

³⁰ Ma and Pope (2003).

³¹ Ward and Zurbruegg (2002), Beck and Webb (2003), Li *et al.* (2006), Cole *et al.* (2007) and Outreville (2008).

³² Thanks to two anonymous referees for pointing out these factors.

Consistent with Ma and Pope³³ and Li *et al.*,³⁴ this paper uses premiums per capita in US\$ as a proxy for the level of foreign participation. The following 15 factors are hypothesised to influence how attractive a host country is to foreign life insurance providers.

Socio-economic factors

This section briefly outlines the socio-economic factors that influence the level of foreign participation in OECD countries, all of which are cited in previous literature on demand for life insurance.

(1) *Anticipated Inflation (AI)*: The level of AI is expected to negatively influence life insurance consumption, including the level of foreign participation.³⁵ This stems from the potential erosion effects on the consumption of life insurance products.³⁶ Consistent with current literature,³⁷ AI is defined in this paper as the average inflation rate over the past 5 years.

(2) *Average Life Expectancy (LE)*: Ward and Zurbruegg³⁸ document a positive impact, whereas Beck and Webb³⁹ document a negative impact of LE on life insurance consumption across countries. It is hypothesised that the average LE of residents in the domestic country will affect the level of foreign participation, although the direction of this influence is not clear. A lower LE could lead to increases in the need for protection.⁴⁰ However, should LE proxy the actuarially fair price of insurance,⁴¹ then a longer LE will reflect a lower price of insurance, and consequently a greater demand for life insurance.

(3) *Income (IN)*: Current literature has established that IN can positively influence the level of life insurance demand.⁴² This literature documents the significance of DR in investigating life insurance consumption across countries for two reasons. First, the affordability of life insurance products is increased along with increased IN. Second, the expected loss for the dependants is greater in the event of the premature death of a higher IN earner. It is thus expected that IN will have a positive relationship with foreign participation levels, as greater life insurance demand will result in more incentives for foreign companies to enter a domestic market. In this study, per capita GDP in US\$ is used as a proxy for IN.

³³ Ma and Pope (2003).

³⁴ Li *et al.* (2007).

³⁵ Fortune (1973); Cargill and Troxel (1979); Browne and Kim (1993); Outreville (1996); Ward and Zurbruegg (2002); Beck and Webb (2003).

³⁶ Fortune (1973).

³⁷ Outreville (1990,1996); Browne and Kim (1993).

³⁸ Ward and Zurbruegg (2002).

³⁹ Beck and Webb (2003).

⁴⁰ Browne and Kim (1993).

⁴¹ Outreville (1996).

⁴² Fortune (1973); Campbell (1980); Lewis (1989); Browne and Kim (1993); Outreville (1996); Ward and Zurbruegg (2002); Beck and Webb (2003).

(4) *Dependency Ratio (DR)*: Dependants can be protected financially by life insurance if the wage earner dies prematurely.⁴³ Truett and Truett,⁴⁴ and Browne and Kim,⁴⁵ document a positive relation between DR and life insurance consumption. Ward and Zurbrugg,⁴⁶ and Beck and Webb⁴⁷ document the significance of DR in investigating life insurance consumption across countries. This paper hypothesises that foreign life insurance participation is positively related to the DR, where the DR is taken as the ratio of the population under 15 and over 64 to the working class population aged between 15 and 64 years.

(5) *Social Security expenditure (SS)*: The impact of SS expenditure on foreign participation is unclear. Following Lewis,⁴⁸ Browne and Kim,⁴⁹ and Skipper and Klein,⁵⁰ SS expenditure could substitute for insurance arising from better protection in wealthier countries, which results in a negative impact. On the other hand, SS expenditure could only be available upon the survival of wage earners, thus giving rise to a greater need for life insurance in wealthier countries.⁵¹ This results in a positive impact. To measure SS expenditure, per capita public social expenditure in US\$ is used.

(6) *Human Capital (EDU)*: A higher level of education in a country's population reflects greater risk aversion, which results in an increased awareness of the need for protection through life insurance.⁵² In addition, higher education lengthens children dependency.⁵³ Thus, education is expected to have a positive relationship with foreign insurers' life insurance consumption and is measured by the level of tertiary education.

(7) *Economic growth (GROW)*: It is assumed that higher economic growth leads to higher demand for foreign life insurance. This stems from higher levels of risk involved in a scenario of increasingly interactive individuals in rapidly growing economies. Outreville⁵⁴ includes economic growth in his analysis of the factors influencing the location choice of the foreign affiliates of the largest insurance groups.

Market structure factors

In addition to the above socio-economic factors, this paper incorporates market structure factors to investigate foreign participation in domestic life insurance markets, such as foreign MS, the level of FD, market liberalisation and level of competition.

⁴³ Campbell (1980).

⁴⁴ Truett and Truett (1990).

⁴⁵ Browne and Kim (1993).

⁴⁶ Ward and Zurbrugg (2002).

⁴⁷ Beck and Webb (2003).

⁴⁸ Lewis (1989).

⁴⁹ Browne and Kim (1993).

⁵⁰ Skipper and Klein (2000).

⁵¹ Browne and Kim (1993).

⁵² Browne and Kim (1993); Browne *et al.* (2000); Ward and Zurbrugg (2002); Beck and Webb (2003) and Li *et al.* (2007).

⁵³ Browne and Kim (1993); Ward and Zurbrugg (2002); Beck and Webb (2003); Li *et al.* (2007).

⁵⁴ Outreville (2008).

(1) *Foreign participants' Market Share (MS)*: This paper hypothesises that foreign MS can have a positive impact on foreign participation for two reasons. First, foreign MS represents openness in the domestic economy. Foreign participation is thus expected to be higher in a more open economy with higher foreign MS. For example, Li *et al.*⁵⁵ show that market openness can influence the U.S. IIT in insurance services. Second, foreign participation may be discouraged when facing a highly competitive internal insurance market. Thus, a lower foreign MS could be associated with lower foreign participation.⁵⁶ On the other hand, it is hypothesised in this paper that if foreign MS represents the market position of foreign participants, it should have a negative impact on domestic competitors. This is consistent with Outreville⁵⁷ and Li *et al.*,⁵⁸ who documented a negative relation between foreign MS and life insurance assumptions in domestic markets, though the relation in Outreville⁵⁹ is insignificant. In this paper, foreign MS is defined as the MS of foreign-controlled undertakings and branches and agencies of foreign undertakings compared with total domestic business on a gross premiums basis.

(2) *Financial Development (FD)*: The level of FD can positively influence the level of foreign participation. More developed financial markets are associated with higher transparency in regulatory and reporting requirements and better corporate governance practice, thus attracting more foreign participation. Furthermore, a more developed financial market indicates greater opportunity for foreign life insurers, such as easier financing and larger product markets. Outreville⁶⁰ establishes the importance of FD to insurance consumption. Li and Moshirian⁶¹ show that FD can influence FDI decisions in the U.S. insurance industry. This paper uses the ratio of M2 to GDP as the proxy for FD, consistent with Outreville.⁶²

(3) *Market Liberalisation (international business climate (IBC))*: The level of market liberalisation represents the barriers related to international trade in insurance services. Following Ma and Pope,⁶³ this paper uses the IBC index devised by the Political Risk Services Group as a measure of market liberalisation. The level of liberalisation of a country is gauged on a scale of 0 to 100, where a score of 100 denotes the most favourable climate for foreign traders. IBC is expected to have a positive impact on foreign participation since countries with lower barriers to trade and a more liberalised environment will tend to attract more foreign insurers.

(4) *Level of competition (Herfindahl index (HI))*: In addition to the market liberalisation, this paper also incorporates a variable that accounts for the level of competition in the market. Ma and Pope⁶⁴ find that a more competitive non-life

⁵⁵ Li *et al.* (2003).

⁵⁶ Browne *et al.* (2000).

⁵⁷ Outreville (1996).

⁵⁸ Li *et al.* (2007).

⁵⁹ Outreville (1996).

⁶⁰ Outreville (1990, 1996).

⁶¹ Moshirian (1997).

⁶² Outreville (1990, 1996).

⁶³ Ma and Pope (2003).

⁶⁴ Ma and Pope (2003).

insurance market results in greater foreign insurers' premium levels. This paper hypothesises that for life insurance markets, though a more competitive market with an efficient business and regulatory environment will lead to a greater level of foreign participation, a more non-competitive market with monopolies may also increase the demand for foreign life insurance products, if the foreign life insurance products are differentiated from the insurance products provided by domestic insurers.⁶⁵ The HI⁶⁶ is used to measure the level of competition. In this paper, following the National Association of Insurance Commissioners' (NAIC) criteria for defining a competitive marketplace, HI measurements greater than 1,800 are classified as non-competitive and a dummy value of 1 is assigned. It is hypothesised that there is a positive/negative relationship between the HI and foreign participation levels.

(5) *Expense Combined Ratios (ECRs)*: These two ratios⁶⁷ represent the profitability potential of the foreign life insurers' operation in these countries.⁶⁸ According to Ma and Pope,⁶⁹ a lower loss ratio, representing higher profitability, attracts more foreign life insurers' participation. Thus, it is expected that there is a negative relationship between these two ratios and the demand for foreign life insurance.

Governance/legal factors

(1) *Common law (LT)*: In this paper, common law country is used as a dummy variable to indicate different legal origins. La Porta *et al.*⁷⁰ argue that common law countries have better investor protection in share markets compared with civil law countries. Li *et al.*⁷¹ have documented that governance/legal factors can influence insurance companies' decisions to become large shareholders in the stock markets. It is thus assumed in this paper that a common law legal environment has a positive impact on the demand for foreign life insurance.

(2) *Governance indicators (GOV)*: Ward and Zurbrugg,⁷² and Beck and Webb⁷³ show that legal/governance factors influence life insurance consumption across countries. Cole *et al.*⁷⁴ have shown that governance factors can influence foreign reinsurance assumptions on the basis of 35 reinsurers. Outreville⁷⁵ shows that good corporate governance has a strong impact on the choice of foreign affiliate countries by the world's largest financial groups. Outreville⁷⁶ has documented that governance factors can influence the choice of foreign affiliates' location by the largest insurance groups.

⁶⁵ Li *et al.* (2003).

⁶⁶ Summing the squared market shares of individual insurers in each country and multiplying the result by 10,000 calculate the HI. For a perfectly monopolistic market, the HI obtained would be 10,000.

⁶⁷ Thanks to an anonymous referee for pointing this out.

⁶⁸ Ma and Pope (2003).

⁶⁹ *Ibid.*

⁷⁰ La Porta *et al.* (1998).

⁷¹ Li *et al.* (2006).

⁷² Ward and Zurbrugg (2002).

⁷³ Beck and Webb (2003).

⁷⁴ Cole *et al.* (2007).

⁷⁵ Outreville (2007).

⁷⁶ Outreville (2008).

It is thus assumed in this paper that a good local governance environment has a positive impact on the demand for foreign life insurance. Six country governance factors (voice and accountability (VA), political stability (PS), government effectiveness (GE), regulatory quality (RQ), rule of law (RL) and control of corruption (CR)) are used to proxy for governance quality in one particular host country.

Data and methodology

Cross-sectional data from 1993 to 2000 for the following 24 OECD countries are used in this study: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Japan, Korea, Luxembourg, Mexico, the Netherlands, Norway, Poland, Portugal, Spain, Switzerland, Turkey, the United Kingdom and the United States.⁷⁷

The IBC rating is obtained from the *Country Forecasts*⁷⁸ publication from the Political Risk Services (various issues). Individual insurers' Market Shares are obtained from Axco Insurance Information Services. Data for total foreign premiums are from the OECD's (2002a) *Insurance Statistical Yearbook*. Inflation rates, short-term interest rates and M2 are from the IMF's *International Financial Statistics* CD-ROM. Population is from the OECD's (2003) *Economic Outlook: Annual and Semi-annual data*. Education level, as a proxy for human capital endowment, is from the *UNESCO Statistical Yearbook* (various issues). SS is from OECD's (2001) *Public Expenditure*. Average LE is from the IMD's (various issues) *World Competitiveness Yearbook*. GDP and exchange rates are in nominal terms and from the OECD's (2002b) *Annual National Accounts – Volume I – Main Aggregates*. For consistency, GDP data is on a per capita basis and are expressed in US\$. The exchange rates for countries that switched to the euro in 1999 are adjusted using the fixed exchange rate between the euro and the domestic currency as obtained from the European Central Bank. Legal origin data are from La Porta *et al.*⁷⁹ Six government governance indicators are from Kaufmann *et al.*⁸⁰

The empirical model to be tested is as follows:

$$\begin{aligned} \text{LOG}(\text{FORT}) = & \beta_0 + \beta_1(\text{AI}) + \beta_2\text{LOG}(\text{LE}) + \beta_3\text{LOG}(\text{MS}) + \beta_4\text{LOG}(\text{IN}) \\ & + \beta_5\text{LOG}(\text{DR}) + \beta_6\text{LOG}(\text{SS}) + \beta_7\text{LOG}(\text{EDU}) + \beta_8\text{LOG}(\text{FD}) \\ & + \beta_9\text{GROW} + \beta_{10}\text{HI} + \beta_{11}\text{IBC} + \beta_{12}\text{LT} + \beta_{13}\text{FTGE} \\ & + \beta_{14}\text{ECR} + \beta_{15}\text{GOV} + \varepsilon_1 \end{aligned} \quad (1)$$

The above Eq. (1) is estimated by pooled least squares. We also tried fixed and random effect panel methods. Hausman tests show that the fixed effect panel model is

⁷⁷ Countries excluded due to missing foreign market share data include Greece, Italy, New Zealand and Sweden. Missing inflation data lead to the exclusion of the Czech and Slovak Republics in our sample.

⁷⁸ Country Forecasts (2001).

⁷⁹ La Porta *et al.* (1998).

⁸⁰ Kaufmann *et al.* (2003).

Table 1 Descriptive statistics

<i>Variable</i>	<i>Mean</i>	<i>Median</i>	<i>Maximum</i>	<i>Minimum</i>	<i>s.d.</i>	<i>Skewness</i>	<i>Kurtosis</i>
Foreign participation (FORT)	1.67	1.83	3.97	−0.9	0.96	−0.41	3.59
Anticipated inflation (AI)	0.63	0.47	2.29	−0.39	0.5	1.34	4.51
Life expectancy (LE)	1.88	1.89	1.9	1.84	0.02	−1.27	3.75
Foreign market share (MS)	1.03	1.12	2	−0.47	0.6	−0.47	2.43
Income (IN)	4.2	4.35	4.64	2.35	0.41	−1.81	6.45
Dependency ratio (DR)	−0.29	−0.3	0.29	−0.5	0.13	3.34	15.82
Social security (SS)	3.88	3.91	5.73	−0.76	1.3	−1.46	6.66
Human capital (EDU)	1.63	1.68	1.95	0.96	0.22	−1.3	4.32
Financial development (FD)	−0.16	−0.17	0.56	−0.69	0.22	0.94	5.21
GDP growth (GROW)	3.51	3.40	11.50	−6.70	2.70	−0.19	5.20
Herfindahl index (HI)	0.17	0	1	0	0.37	1.79	4.2
IBC rating (IBC)	87.05	88	100	65	7.83	−0.77	3.22
Free trade dummy* government Effectiveness (FTVGE)	1.02	1.41	2.52	−0.22	0.82	−0.18	1.44
Expense ratio (ER)	0.48	−0.07	5.77	−1.37	1.49	1.83	6.21
Expense/combined ratio (ECR)	−1.7	−1.17	−0.23	−6.5	1.37	−2.07	6.79
Life premium/life in force (LP)	−1.19	−0.55	0.28	−4.46	1.64	−0.53	1.86
Government effectiveness (GE)	1.39	1.55	2.52	−0.34	0.65	−0.9	3.07
Voice and accountability (VA)	1.2	1.37	1.67	−0.92	0.53	−2.24	7.63
Political stability (PS)	0.97	1.12	1.77	−1.06	0.6	−1.87	6.48
Rule of law (RL)	1.48	1.75	2.36	−0.38	0.65	−1.29	3.68
Control of corruption (CR)	1.47	1.68	2.58	−0.46	0.77	−0.83	2.8
Regulatory quality (RQ)	1.08	1.18	1.87	0.24	0.38	−0.51	2.3

“Mean” is the average value of the variables of column 1. “Median” is the middle value of the variables of column 1. “Maximum” is the highest value of the variables of the column 1. “Minimum” is the lowest value of the variables of the column 1. “s.d.” is the square root of the variance of the variables of the column 1. “Skewness” is the measure of oblique asymmetry of the variables of the column 1. “Kurtosis” is the measure of whether the statistical distribution of the variables of the column 1 is peaked or flat, relative to a normal distribution.

more feasible than the random effect panel model. In the fixed effect panel model, empirical results are qualitatively similar to those from pooled least squares. Thus, only the empirical results from the latter are reported in this paper and the empirical results from the former are available upon request from authors.

Table 1 presents the descriptive statistics for the variables used in this paper.

Empirical results

Table 2 presents the empirical results. There is a significantly positive impact of LE on foreign participation. It could reflect the offsetting consequence of these two opposite effects: a lower LE could lead to increases in the need for protection,⁸¹ however should

⁸¹ Browne and Kim (1993).

Table 2 The empirical results

	<i>FORT</i>	<i>FORT</i>	<i>FORT</i>	<i>FORT</i>	<i>FORT</i>	<i>FORT</i>	<i>FORT</i>	<i>FORT</i>
	<i>Estimate</i>	<i>Estimate</i>	<i>Estimate</i>	<i>Estimate</i>	<i>Estimate</i>	<i>Estimate</i>	<i>Estimate</i>	<i>Estimate</i>
Intercept	-33.928** (-2.061)	-36.755** (-2.284)	-9.356 (-1.025)	-19.064** (-2.009)	-19.438** (-2.079)	-18.783** (-2.050)	-20.788** (-2.270)	-26.278*** (-2.953)
<i>t</i>	0.064	0.113	-0.251	-0.207	-0.091	-0.067	-0.101	-0.239
Anticipated inflation (AI)	(0.186)	(0.333)	(-1.566)	(-1.206)	(-0.511)	(-0.383)	(-0.589)	(-1.480)
<i>t</i>	14.411*	15.854*	4.161	8.968*	9.010*	9.082*	10.020**	12.913***
Life expectancy (LE)	(1.643)	(1.857)	(0.849)	(1.754)	(1.780)	(1.830)	(2.013)	(2.663)
<i>t</i>	1.327***	1.311***	0.845***	0.851***	0.801***	0.838***	0.819***	0.821***
Foreign market share (MS)	(9.908)	(10.189)	(10.890)	(9.790)	(8.623)	(10.223)	(9.737)	(10.381)
<i>t</i>	0.961**	1.029***	0.289*	0.398**	0.408**	0.324**	0.375**	0.361**
Income (IN)	(2.554)	(2.712)	(1.781)	(2.140)	(2.359)	(1.869)	(2.224)	(2.272)
<i>t</i>	1.112**	1.301**	0.110	0.414	0.441	0.514	0.363	0.139
Dependency Ratio (DR)	(2.112)	(2.374)	(0.260)	(0.920)	(0.987)	(1.169)	(0.830)	(0.326)
<i>t</i>	0.060	0.060	-0.071	-0.140***	-0.143***	-0.077	-0.077	-0.107**
Social security (SS)	(0.776)	(0.788)	(-1.560)	(-2.894)	(-3.003)	(-1.603)	(-1.576)	(-2.422)
<i>t</i>	0.656	0.779	0.116	0.554	0.718	0.307	0.300	0.350
Human capital (EDU)	(0.751)	(0.914)	(0.262)	(1.191)	(1.577)	(0.664)	(0.647)	(0.803)
<i>t</i>	-0.731	-0.599	0.794**	1.040**	1.001**	0.809*	0.928**	0.743*
Financial development (FD)	(-1.485)	(-1.385)	(2.008)	(2.459)	(2.393)	(1.955)	(2.256)	(1.861)
<i>t</i>	-0.002	-0.004	0.008***	0.008***	0.008***	0.009***	0.009***	0.008***
GDP growth (GROW)	(-0.478)	(-0.767)	(3.151)	(2.967)	(3.041)	(3.427)	(3.261)	(2.967)
<i>t</i>	1.120***	1.112***	0.746***	0.641***	0.594***	0.778***	0.789***	0.854***
Herfindahl index (HI)	(3.365)	(3.416)	(4.854)	(3.785)	(3.462)	(4.808)	(4.840)	(5.403)
<i>t</i>	0.013	0.011	0.010**	0.011*	0.011*	0.006	0.009*	0.008
IBC rating (IBC)	(1.397)	(1.250)	(1.927)	(1.895)	(1.930)	(1.068)	(1.734)	(1.514)
<i>t</i>	0.449**	0.469***	0.237**	0.201**	0.225**	0.233**	0.244**	0.152*
Law type – civil/common (LT)	(2.625)	(2.767)	(2.549)	(2.026)	(2.268)	(2.399)	(2.489)	(1.618)
<i>t</i>	-0.011	-0.006	-0.142***	-0.016	-0.007	-0.035	-0.058	-0.112**
Free trade*government effectiveness (FTGE)	(-0.196)	(-0.107)	(-2.731)	(-0.342)	(-0.152)	(-0.742)	(-1.196)	(-2.258)
<i>t</i>	-0.257***							
Expense ratio	(-3.556)							

Table 2 (continued)

	FORT		FORT		FORT		FORT		FORT		FORT	
	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate	Estimate
Combined ratio		-0.259*** (-3.576)										
<i>t</i>												
Government effectiveness (GE)			0.448*** (4.606)									
<i>t</i>												
Voice and accountability (VA)				0.191 (1.445)								
<i>t</i>												
Political stability (PS)					0.222** (2.024)							
<i>t</i>												
Rule of law (RL)						0.375*** (3.054)				0.234*** (2.929)		
<i>t</i>												
Control of corruption (CR)												
<i>t</i>												
Regulatory quality (RQ)											0.595*** (4.400)	
<i>t</i>												
Number of observations	61	61	144	144	144	144	144	144	144	144	144	144
Degree of freedom	46	46	129	129	129	129	129	129	129	129	129	129
<i>R</i> ²	0.928	0.928	0.900	0.885	0.887	0.887	0.891	0.891	0.891	0.891	0.899	0.899
Adjusted <i>R</i> ²	0.906	0.906	0.889	0.873	0.875	0.875	0.879	0.879	0.879	0.879	0.888	0.888

*Indicates 10 per cent level of significance; ** indicates 5 per cent level of significance; and *** indicates 1 per cent level of significance. For the ER and ECR tests, data from only 22 countries are used; countries excluded are Denmark and the United States. The empirical model to be tested is as follows: $LOG(FORT) = \beta_0 + \beta_1(AD) + \beta_2 LOG(LE) + \beta_3 LOG(MS) + \beta_4 LOG(IN) + \beta_5 LOG(DR) + \beta_6 LOG(SS) + \beta_7 LOG(EDU) + \beta_8 LOG(FD) + \beta_9 GROW + \beta_{10} HI + \beta_{11} IBC + \beta_{12} LT + \beta_{13} FTGE + \beta_{14} ECR + \beta_{15} GOV + e_i$. FORT = total foreign participation (premiums per capita in US\$); AI = anticipated inflation, using the adaptive measure of average inflation rates over past 5 years as a proxy; LE = average life expectancy; MS = foreign participants' market share; IN = income (nominal GDP per capita in US\$); DR = dependency ratio (under 15 and over 64/15–64 years); SS = social security expenditure (per capita in US\$); EDU = human capital; FD = financial development (ratio of M2 to GDP); GROW = economic growth (percentage change of nominal GDP per capita over years); HI = Herfindahl index (dummy of 1 (non-competitive) for HI values > 1800, and 0 otherwise), as a proxy for market competition; IBC = international business climate rating, as a proxy for market deregulation; LT = lawtype dummy variable (it is equal to 1, if common law, or 0 otherwise); FTGE = product of free trade dummy and GE, where the dummy takes the value of 1 if the country belongs to NAFTA and EU, or 0 otherwise; ECR = it is either expense or combined ratio; GOV = government governance indicators (VA, PS, GE, RQ, RL and CR).

LE proxy the actuarially fair price of insurance;⁸² a longer LE will reflect a lower price of insurance, and consequently a greater demand for life insurance. It suggests that the positive effect of the latter dominates the negative effect of the former. The positive effect is consistent with Ward and Zurbruegg.⁸³

Foreign participants' MS has a positive impact on foreign participation. First, foreign participation is expected to be higher in a more open economy with higher foreign MS. Secondly, foreign participation is lower when facing an internally highly competitive insurance market, represented by a lower foreign MS. This is consistent with Li *et al.*,⁸⁴ but in contrast to Outreville⁸⁵ and Li *et al.*,⁸⁶ who document a negative relation between foreign MS and life insurance assumptions in domestic markets, although the relation in Outreville⁸⁷ is insignificant.

As expected, IN has positively influenced the level of life insurance demand, which is consistent with Browne and Kim,⁸⁸ Outreville;⁸⁹ Ward and Zurbruegg,⁹⁰ Beck and Webb,⁹¹ and Li *et al.*⁹² There are two reasons for this positive impact. First, the affordability of life insurance products is increased along with increased IN. Second, the expected loss for the dependants is greater in the event of premature death of a higher IN earner.

It has been found that DR has a positive impact on foreign participation. This is due to the function of life insurance to protect dependants financially if the wage earner dies prematurely, which is consistent with Truett and Truett,⁹³ Browne and Kim,⁹⁴ and Li *et al.*⁹⁵

The impact of SS expenditure is significantly negative on foreign participation. This confirms the studies by Lewis,⁹⁶ Browne and Kim,⁹⁷ and Skipper and Klein,⁹⁸ which state that SS expenditure could substitute for insurance arising from better protection in wealthier countries.

FD, as expected, has a positive impact on foreign participation. More developed financial markets are associated with higher transparency in regulatory and reporting requirements and better corporate governance practice, thus attracting more foreign and domestic participation. Further, a more developed financial market indicates greater opportunity for both domestic and foreign life insurers, such as easier

⁸² Outreville (1996).

⁸³ Ward and Zurbruegg (2002).

⁸⁴ Li *et al.* (2003).

⁸⁵ Outreville (1996).

⁸⁶ Li *et al.* (2007).

⁸⁷ Outreville (1996).

⁸⁸ Browne and Kim (1993).

⁸⁹ Outreville (1996).

⁹⁰ Ward and Zurbruegg (2002).

⁹¹ Beck and Webb (2003).

⁹² Li *et al.* (2007).

⁹³ Truett and Truett (1990).

⁹⁴ Browne and Kim (1993).

⁹⁵ Li *et al.* (2007).

⁹⁶ Lewis (1989).

⁹⁷ Browne and Kim (1993).

⁹⁸ Skipper and Klein (2000).

financing and larger product markets. This result is consistent with Outreville,⁹⁹ Li and Moshirian,¹⁰⁰ and Li *et al.*¹⁰¹

As expected, economic growth has been found to positively influence the demand for foreign life insurance. There are more risks involved in increasingly interactive individuals in rapidly growing economies, and thus, there is more demand for differentiated foreign life insurance products.

Market liberalisation (IBC) has a significantly positive impact on foreign participation. This shows that countries with lower barriers to trade and a more liberalised environment will tend to attract more foreign insurers. This is consistent with the argument in Ma and Pope.¹⁰²

Common law countries (LT), as expected, have a positive impact on foreign participation. This is consistent with La Porta *et al.*¹⁰³ who document that common law countries have better investor protection for shareholders than civil law countries.

Level of competition (HI) has a positive impact on foreign participation. This shows that a greater demand for differentiated foreign insurance products exists whether this host market is competitive or not. This result is in contrast with Ma and Pope.

As expected, both expense and combined ratios have negative impacts on the demand for foreign life insurance. This is consistent with Ma and Pope¹⁰⁴ who argue that foreign insurers are more attractive to lower ECRs, which represent higher profitability.

As expected, governance/legal factors have a positive impact on the demand for foreign life insurance, which is consistent with the findings of Ward and Zurbruegg;¹⁰⁵ Beck and Webb;¹⁰⁶ Cole *et al.*;¹⁰⁷ and Outreville.¹⁰⁸ More specifically, five out of six government governance indicators (political stability, government effectiveness, regulatory quality, the rule of law and control of corruption) all exhibit positive and of significant impacts on the demand for foreign life insurance. The sixth factor, voice and accountability, also exhibits a positive, though not significant, impact.

The interaction item between free trade and government effectiveness shows an unexpected negative impact on the demand for foreign life insurance. One of the most important features for life insurance products is locality proximity. In other words, customers tend to demand the life insurance products provided by local life insurers for reasons of information advantage and the long-term nature of this demand. So even if a free trade agreement exists, and government is effective, the insured may still tend to demand more products from local life insurers, which results in negative demand for foreign life insurers.

⁹⁹ Outreville (1996).

¹⁰⁰ Li and Moshirian (2004).

¹⁰¹ Li *et al.* (2007).

¹⁰² Ma and Pope (2003).

¹⁰³ La Porta *et al.* (1998).

¹⁰⁴ Ma and Pope (2003).

¹⁰⁵ Ward and Zurbruegg (2002).

¹⁰⁶ Beck and Webb (2003).

¹⁰⁷ Cole *et al.* (2007).

¹⁰⁸ Outreville (2008).

Finally, it has been found that two factors (anticipated inflation (AI) and education (HI)) have the expected signs, though not significant.

Conclusion

Foreign participation in domestic life insurance markets has greatly increased due to deregulation, liberalisation and globalisation of the international life insurance market. In the meantime, increased foreign competition and the resultant enhanced social welfare provide customers with innovative and differentiated life insurance products to customers, which are more attractive, better priced and more suitable for consumer tastes.¹⁰⁹

This paper contributes to current literature by Ma and Pope,¹¹⁰ Li *et al.*,¹¹¹ Cole *et al.*¹¹² and Outreville,¹¹³ and sheds additional light on international trade and international investment in insurance services. The empirical results show that socio-economic and market structure factors can influence foreign participation in life insurance markets. In addition, governance/legal indicators (common law, political stability, government effectiveness, regulatory quality, the rule of law and control of corruption) all show a positive impact on foreign participation in life insurance.

There are policy implications. Foreign participation should be encouraged by policy-makers, as it will benefit the host country's overall economy through increased financial stability, facilitation of trade and commerce, risk management, loss mitigation and more efficient capital allocation. In addition, policies for international trade in insurance services should be orientated more towards deregulation, liberalisation and globalisation.

Acknowledgements

Timothy Wee acknowledges the help from Associate Professors Toan Pham and Ah-Boon Sim from the University of New South Wales. Donghui Li acknowledges the financial support from the Natural Science Foundation of China (Fund no. 70831004).

References

- Beck, T. and Webb, I. (2003) 'Economic, demographic, and institutional determinants of life insurance consumption across countries', *World Economic Review* **17**: 51–88.
- Browne, M.J. and Kim, K. (1993) 'An international analysis of life insurance demand', *Journal of Risk and Insurance* **60**: 616–634.
- Browne, M.J., Chung, J. and Frees, E.W. (2000) 'International property – Liability insurance consumption', *Journal of Risk and Insurance* **67**: 73–90.
- Campbell, R.A. (1980) 'The demand for life insurance: An application of the economics of uncertainty', *Journal of Finance* **35**: 1155–1172.

¹⁰⁹ Ma and Pope (2003), Li *et al.* (2003).

¹¹⁰ Ma and Pope (2003).

¹¹¹ Li *et al.* (2007).

¹¹² Cole *et al.* (2007).

¹¹³ Outreville (2008).

- Cargill, T.F. and Troxel, T.E. (1979) 'Modeling life insurance savings: Some methodological issues', *Journal of Risk and Insurance* **46**: 391–410.
- Cole, R., Lee, R. and McCullough, K. (2007) 'A test of the eclectic paradigm: Evidence from the US reinsurance market', *Journal of Risk and Insurance* **74**: 493–522.
- Country Forecasts (2001), The Economist Intelligence Unit, www.eiv.com (accessed 19 May 2001).
- Fortune, P. (1973) 'A theory of optimal life insurance: Development and tests', *Journal of Finance* **27**: 587–600.
- IMD. *World Competitiveness Yearbook* (1994–2002), Lausanne, Switzerland: International Institute for Management Development, various issues.
- Kaufmann, D., Kraay, A. and Mastruzzi, M. (2003) *Governance matters III: Governance indicators for 1996–2002*, World Bank Policy Research Working Paper 3106, World Bank.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A. and Vishny, R. (1998) 'Law and finance', *Journal of Political Economy* **106**: 1115–1155.
- Lewis, F.D. (1989) 'Dependents and the demand for life insurance', *American Economic Review* **79**: 452–467.
- Li, D. and Moshirian, F. (2004) 'International investment in insurance services in the US', *Journal of Multinational Financial Management* **14**: 249–260.
- Li, D., Moshirian, F. and Sim, A.B. (2003) 'The determinants of intra-industry trade in insurance services', *Journal of Risk and Insurance* **70**: 269–287.
- Li, D., Moshirian, F., Pham, P. and Zein, J. (2006) 'When financial institutions are large shareholders – The role of macro corporate governance environments', *Journal of Finance* **61**: 2975–3007.
- Li, D., Moshirian, F., Nguyen, P. and Wee, T. (2007) 'The demand for life insurance in OECD countries', *Journal of Risk and Insurance* **74**: 637–652.
- Ma, Y.L. and Pope, N. (2003) 'Determinants of international insurers' participation in foreign non-life markets', *Journal of Risk and Insurance* **70**: 235–248.
- Moshirian, F. (1997) 'Foreign direct investment in insurance services in the United States', *Journal of Multinational Financial Management* **7**: 159–173.
- Moshirian, F. (1999) 'Sources of growth in international insurance services', *Journal of Multinational Financial Management* **9**: 177–194.
- OECD (1999) *Liberalisation of International Insurance Operations. Cross-Border Trade and Establishment of Foreign Branches*, Organization for Economic Cooperation and Development, Paris, France.
- OECD (2001) *Public Expenditure*, Vol 2001, release 01, Organization for Economic Cooperation and Development, www.sourceoecd.com, Paris, France.
- OECD (2002a) *Insurance Statistical Yearbook*, Vol 2002, release 01, Organization for Economic Cooperation and Development, www.sourceoecd.com.
- OECD (2002b) *Annual National Accounts – Volume I – Main aggregates*, Vol 2002, release 04, Organization for Economic Cooperation and Development, www.sourceoecd.com, Paris, France.
- OECD (2003) *Economic Outlook: Annual and Semi-annual data*, Vol 2003, release 01, Organization for Economic Cooperation and Development, www.sourceoecd.com, Paris, France.
- Outreville, J.F. (1990) 'The economic significance of insurance markets in developing countries', *Journal of Risk and Insurance* **57**: 487–498.
- Outreville, J.F. (1996) 'Life insurance markets in developing countries', *Journal of Risk and Insurance* **63**: 263–278.
- Outreville, J.F. (2007) 'Foreign affiliates of the world largest financial groups: Locations and governance', *Research in International Business and Finance* **21**: 19–31.
- Outreville, J.F. (2008) 'Foreign affiliates of the largest insurance groups: Location-specific advantages', *Journal of Risk and Insurance* **75**: 463–491.
- Sapir, A. and Lutz, E. (1981) *Trade in services: Economic determinants and development-related issues*, World Bank Staff Working Paper no. 410, World Bank.
- Skipper, H.D. (1987) 'Protectionism in the provision of international insurance services', *Journal of Risk and Insurance* **54**: 55–85.
- Skipper, H.D. and Klein, R.W. (2000) 'Insurance regulation in the public interest: The path towards solvent, competitive markets', *The Geneva Papers on Risk and Insurance – Issues and Practice* **25**(4): 482–504.

- Sun, Q. (2003) 'The impact of WTO accession on China's insurance industry', *Risk Management and Insurance Review* **6**: 27–35.
- Swiss Reinsurance Company (2002) *Sigma*, (various editions) Zurich: Swiss Re Co.
- Truett, D.B. and Truett, L.J. (1990) 'The demand for life insurance in Mexico and the United States: A comparative study', *Journal of Risk and Insurance* **57**: 321–328.
- UNESCO. *UNESCO Statistical Yearbook* (1994–2001) United Nations Educational, Scientific, and Cultural Organization, Paris, France.
- Ward, D. and Zurbrugg, R. (2002) 'Law, politics and life insurance consumption in Asia', *The Geneva Papers on Risk and Insurance – Issues and Practice* **27**(3): 395–412.

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