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Life and non-life insurance demand: the different effects of influence factors in emerging countries from Europe and Asia

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Urbanisation, incomes and their distributions, and the population degree of education are relevant factors for the development of insurance sector. This study estimates the different effects of the previously mentioned factors for life and non-life sector. We used the econometrics of panel data on 17 emerging economies from Asia and Europe over a 10-year period. We showed that urbanisation influenced significantly the life insurance demand in Asia, but not in Europe. Also, education was found to be significant only for the non-life sector in both regions and income was non-significant in Asia for non-life sector.

Keywords: urbanisation; education; Gini index; insurance demand; emerging countries; panel data

JEL classification: C12, C23, G22, I24, O18

1. Introduction

Two generalised tendencies may be observed in emerging countries. The first is the rise in the number of people in urban regions, while the second is the rise in their levels of education. These tendencies come along with the rise in incomes and investments in great urban concentrations. Considering these patterns, we were interested in their influence over the development of the insurance sector, on its two major components: life and non-life insurances. Certainly, there are differences among the different geographical regions because of their cultural differences, different investments behaviours and political regimes. In stating these differences we compared the emerging markets from Europe, characterised by a market economy, to the emerging markets from Asia where we had a planned economy in most cases. The adopted methodology is the econometrics of panel data (fixed and random effects) for the period, 2001–2011 for an emerging Europe, and 2003–2011 for an emerging Asia.

2. Literature review

Among all the factors of influence, income is essential in all the models of insurance demand. Higher income is expected to increase the demand for life insurance, generating a greater affordability of life insurance products. According to Feyen, Lester, and

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Rocha (2011), one reason for this is the need to safeguard the potential income of children against the premature death of the employed parent.

Referring to the life insurance line of business, income is found to have a *significant positive impact* on the insurance demand by all the researchers interested in the subject. The income level of countries is measured by the real gross domestic product (GDP)/capita, and it positively influences the life insurance consumption. In a cross-sectional study for 68 countries, and then in a panel study for the period 1961–1980, Beck and Webb (2003) explained that for higher incomes, the life insurance demand rises because the human capital of an individual increases along with income.

Beenstock, Dickinson, and Khajuria (1988), Browne, Chung, and Frees (2000) and Esho, Kirievsky, Ward, and Zurbruegg (2004) similarly discovered a positive relationship between income and expenses for property liability insurance. Treerattanapun (2011) considered that for higher levels of GDP/capita, non-life insurance becomes more affordable. As a result, the demand for insurance products rises. He also observed that different lines of non-life insurance products dominate in certain countries. Therefore, the consumption of insurance products may vary across the lines of business and across individuals; for example, motor insurance is dominant on the non-life insurance market, especially in emerging markets.

Education is a demographic determinant that is expected to have a positive impact on the insurance demand. In the academic literature, the level of education in a country is used as a proxy for risk aversion, but there are differences in the results obtained for non-life and life insurance sectors.

Concerning life insurance demand, Truett and Truett (1990) showed, in a time series study for the US and Mexico for the period 1960–1982, that a higher level of education represents a stronger desire to protect dependents. Browne and Kim (1993) also found, on a cross-sectional study for 45 countries, a significant positive influence of education over the demand for life insurance. The studies of Duker (1969), Anderson and Nevin (1975) and Auerbach and Kotlikoff (1989) revealed that education is negatively related to life insurance demand.

Zietz (2003) discovered that published research shows conflicting results for certain determinants of life insurance demand, including education. Education is found insignificant for life insurance demand by a large part of the academic literature. Outreville (1996) emphasised, in a cross-sectional study for 48 developed countries, that individuals with higher level of education are more aware of the risk and importance of risk management. Still, he could not prove the relationship with life insurance demand empirically. Li, Moshirian, Nguyen, and Wee (2007) explained this ambiguity by the fact that if more people are involved in the educational process, there will be a smaller labour force, thus reducing the overall GDP of the country. In fact, by increasing the period of dependency, education appears not to have any robust influence on the life insurance consumption (Beck and Webb, 2003). Feyen, Lester, and Rocha (2011) discovered that schooling does not seem to be an important driver of life insurance. Individuals with higher education generally have higher incomes and tend to purchase life insurance. Still, the result must be interpreted with care, due to the strong correlation between schooling and GDP per capita. Hau (2000) analysed 3,143 households from US Survey of Consumer Finances (SCF), and stated that it is unclear if education affects life insurance. Treerattanapun (2011) suggested that tertiary education is not a good proxy for the capacity of a person to understand the complexity of insurance products because the knowledge of these products may not be taught in schools. Ofoghi and Farsangi (2013) suggested that the level of risk aversion for individuals with insurance

knowledge is higher than the level for those without insurance knowledge. Liebenberg, Carson, and Dumm (2012) concluded that, although the results on the effect of education are mixed, many studies indicate that professional, self-employed and managerial people have relatively more life insurance holdings. This sustains the idea that the level of education does not determine life insurance demand, but the level of economic education influenced life insurance demand.

For the non-life insurance sector, the opinions converge towards the idea that education positively influences the demand for such products. Curak, Dzaja, and Pepur (2013) suggested that education increases risk aversion and encourages people to demand life insurance. Treerattanapun (2011) indicated that education increases the awareness of risk and threats to financial stability, facilitating the understanding of insurance benefits. Park and Lemaire (2011a) also found a positive relation between education and non-life insurance demand, considering 82 countries for a period of 10 years. Ofoghi and Farsangi (2013) proved a significant and positive relationship between risk aversion and auto insurance demand, in which individuals with insurance knowledge are more risk-averse.

Another important factor for the development of the insurance industry in emerging countries is urbanisation (Kalra, Fan, and Sinha, 2013). For the life insurance sector, the study of Hwang and Gao (2003) analysing the impact of urbanization, found a positive relation that was explained through the propensity of saving funds for the retirement of the urban population. Sen and Madheswaran (2007) and Sen (2008) discovered, for 13 Asian economies, among which were India and China, a positive relation between urbanisation and the demand for such products. Nesterova (2008), on a study of Central and East European (CEE) countries and some selected countries from the former Soviet Union, found that urbanisation level is not significant for life insurance demand. The findings of Beck and Webb (2003) do not statistically confirm the positive impact of urbanisation on life insurance demand, even if the concentrations of consumers in a geographical area reduce the costs of marketing, underwriting and claims handling.

For the non-life insurance sector, Sherden (1984) stated that urban inhabitants perceive a higher risk of car accidents and thefts. Browne, Chung, and Frees (2000) discovered that the rate of interaction between individuals increases in urban areas, and they used urbanisation as a proxy for loss probability: if the probability of loss increases, the insurance demand increases too. Esho, Kirievsky, Ward, and Zurbruegg (2004) considered that additional sources of security are needed, as consequences of increasing delinquency are caused by the greater concentration of assets in urban area. Hwang and Gao (2003) concluded that urbanisation determines smaller families with no economic security, which makes insurance an efficient tool for providing financial security. Park and Lemaire (2011b) also found a positive relation between urbanisation and non-life insurance demand, while Treerattanapun (2011) discovered the insignificance of urbanisation for the non-life sector.

The decision to purchase life insurance, taken at an individual level, is determined by the average income level of a country (Eck and Nizovtsev, 2006). In considering the distribution of wealth across households, the studies adopted the Gini coefficient, which represents the income distribution of the residents of a nation (a measure of inequality of income).

Beck and Webb (2003) suggested that even if life insurance was a luxury good, the demand for life insurance would still, not be significantly influenced by the income distribution. On a panel of 10 OECD countries for the period 1970–1981, Beenstock, Dickinson, and Khajuria (1986) discovered a negative relationship between the Gini

coefficient and life insurance demand. They deliberated that rich people do not need insurance protection, and poor people have limited demand because they operate under budget constraints. So, they concluded that the middle class has the greatest interest in life insurance products due to having a level of income from which these products became affordable. Eck and Nizovtsev (2006) attributed these differences in opinions to the proportion of high- or low-income households, as a source of inequality in income distribution. They suggested that for the countries with a similar income distribution, the Gini coefficient produces the best results in combination with per capita income, as it positively influences the life insurance demand. Ward and Zurbruegg (2002) observed, on data for OECD and Asian countries, that income elasticity between developed economies and emerging economies are consistent with the S-curve insurance growth findings by Enz (2000).

For non-life insurances, Nakata and Sawada (2007) discovered that wealth elasticity of insurance demand is smaller than unity for the upper, middle and high wealth countries. In low wealth countries, the wealth elasticity of insurance demand is greater than unity.

To have a general view of the influence factors over the life and non-life insurance demand, we present a synthesis of the studies in which these variables appeared (Tables 1 and 2).

After a brief review of the previous studies which focus on insurance demand, we continue by presenting the assumed hypotheses, the econometric model and the methodology used to estimate the different effects of influence factors in emerging countries in Europe and Asia.

3. Research hypotheses, methodology and data

3.1. Research hypotheses

Based on previous studies and personal empirical observations, we constructed the following hypotheses:

Hypothesis 1. *Income positively influences the demand for insurance in CEE countries but it is not significant for the emerging Asian countries.*

Beck and Webb (2003) and Ward and Zurbruegg (2002) also found it difficult to explain this untypical behaviour of Asian countries, which have a low per-capita consumption of insurance reported to their growing population and saving rate. Studies reveal that in China, even if they have growing incomes, people still remain less risk-averse because risk-taking is rewarded with higher gains in this transition period to a market economy (Kamiya, 2013).

Hypothesis 2. *Urbanisation positively influences the demand for insurance in Asian countries, while the factor is not significant for the CEE market.*

The SwissRe report from 31st October 2013 concludes that urbanisation will determine a significant development of the insurance sector in emerging markets. Still, a regional discussion is needed because the evolution is not the same for all the emerging markets. We believed that for Eastern Europe, urbanisation would not greatly affect insurance demand because for the last 20 years, the variation in the urbanisation rate was very small, when compared to that of emerging Asian markets. For a better understanding of the phenomena, we presented the variation of the urbanisation rate for the two emerging areas for the period 2001–2011 (Figure 1).

Table 1. Selected variables and their impact on the demand for life insurance.

Variables	Sign of determinants		Non-significant features
	Positive	Negative	
Income	Fortune (1973), Campbell (1980), Beenstock, Dickinson and Khajuria (1986), Lewis (1989), Truett and Truett (1990), Browne and Kim (1993), Outreville (1996), Ward and Zurbrugg (2002), Beck and Webb (2003), Li, Moshirian, Nguyen and Wee (2007), Feyen, Lester and Rocha (2011) and Kjosovski (2012)		
Level of education	Truett and Truett (1990), Browne and Kim (1993), Gandolfi and Miners (1996)	Duker (1969), Anderson and Nevin (1975), Auerbach and Kotlikoff (1989)	Outreville (1996), Beck and Webb (2003), Li, Moshirian, Nguyen and Wee (2007), Hau (2000), Feyen, Lester and Rocha (2011), Beck and Webb (2003), Nesterova (2008)
Urbanisation	Hwang and Gao (2003), Savvides (2006), Sen and Madheswaran (2007), Sen (2008)	Neumann (1969)	
Gini coefficient	Beck and Webb (2003), Eck and Nizovtsev (2006)	Beenstock, Dickinson and Khajuria (1986)	Beck and Webb (2003)

Source: Author's survey.

Table 2. Selected variables and their impact on the demand of non-life insurance.

Variables	Sign of determinants		
	Positive	Negative	Non-significant features
Income	Sherden (1984), Beenstock, Dickinson and Khajuria (1988), Outreville (1990), Browne, Chung and Frees (2000), Esho, Kirievsky, Ward and Zurbruegg (2004), Treerattanapun (2011), Park and Lemaire (2011a)	Park and Lemaire (2011b) – countries with GDP higher than 20,000\$	
Level of education	Browne, Chung and Frees (2000), Esho, Kirievsky, Ward and Zurbruegg (2004), Outreville (1990), Park and Lemaire (2011a), Ofoghi and Farsangi (2013), Curak, Dzaja and Pepur (2013)		Treerattanapun (2011)
Urbanisation	Sherden (1984), Browne, Chung and Frees (2000), Hwang and Gao (2003), Esho, Kirievsky, Ward and Zurbruegg (2004), Park and Lemaire (2011a)		Treerattanapun (2011)
Gini coefficient	Nakata and Sawada (2007) – low wealth countries		Nakata and Sawada (2007) – upper, middle, and high wealth countries

Source: Author's survey.

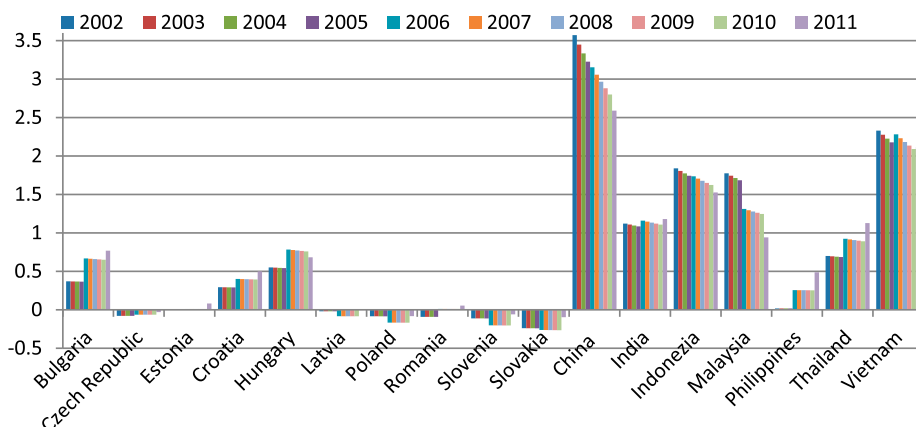


Figure 1. The growth of the urbanisation rate in emerging Europe and emerging Asia.
Source: Own calculation based on data from World Bank Indicators.

This assumption is also sustained by the findings of Nesterova (2008) and Sen (2008). Nesterova (2008) could not prove a significant relationship between life insurance density and urbanisation for CEE and the former Soviet Union countries, while Sen (2008) revealed a positive relation between urbanisation and the demand for such products for 13 Asian economies, among which were India and China.

If we refer to the non-life sector, which is dominated by motor insurance, we may assume that car ownership in emerging markets will continue to grow as a result of increased incomes and higher mobility needs of urban drivers. According to Kalra, Fan, and Sinha (2013), the share of motor insurance from the non-life insurance sector in emerging markets grew from 18% in 1980 to 45% in 2012.

Hypothesis 3. *Education positively influences the demand for non-life insurance, while this factor is not significant for the life sector.*

To better understand insurance consumption, the degree of risk aversion is an important determinant. When people become more educated, they become more aware of their rights and have higher expectations which may represent a provocation for the insurance industry. For the non-life sector the opinions converge towards the idea that education positively influences the demand for such products. For the life sector, published research shows conflicting results for education (Zietz, 2003).

Hypothesis 4. *Income distribution negatively influences the insurance demand.*

The economic theory predicts that insurance demand is smaller when the Gini coefficient is higher. The insurance products' functioning is based on the law of large numbers, so the population size is important: a greater population indicates a fairer premium and a growth in the aggregate insurance demand. It is not only the level and the size of wealth that are important, but also the wealth distribution within a country. This indicates that the aggregate insurance demand should be smaller, when the wealth inequality within a country or region is larger (Nakata and Sawada, 2007).

3.2. Data

The data for the period 2001–2011 consist in the values made public by the World Bank (2013) through its Statistics Bureau in the section Indicators, focus on Economic Policy and External Debt, and Education and Urban Development. The data for the density of life, non-life and total insurances were collected from Insurance Europe in the section's Statistical Series: Ratio Indicators and from SwissRe annual reports.

For the CEE region, we considered the following emerging countries: Bulgaria, Czech Republic, Estonia, Croatia, Hungary, Latvia, Poland, Romania, Slovenia and Slovakia, while for the Asian region, we have considered the following emerging countries: China, India, Indonesia, Malaysia, Philippines, Thailand and Vietnam. The variables used in the model are presented below:

a) Endogenous variables

$Y_{non_life_demand}$ = Density of non-life insurance calculated as the ratio of gross written premiums for the non-life line of business to total population.

Y_{life_demand} = density of life insurance calculated as the ratio of gross written premiums for the life insurance to total population.

b) Exogenous variables

$x1gdp$ = GDP per capita, which is gross domestic product divided by midyear population. Data are in current international millions of US dollars.

$x2education$ = School enrolment, tertiary (% gross). Total is the total enrollment in tertiary education, regardless of age, expressed as a percentage of the total population of the five-year age group following on from secondary school leaving.

$x3urbanisation$ = Urban population (% of total). Urban population refers to people living in urban areas as defined by national statistical offices. It is calculated using World Bank population estimates and urban ratios from the United Nations World Urbanisation Prospects.

$x4Gini_index$ = the Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.

3.3. Methodology

Using time-series in forecasting some macroeconomic aggregates, among which the insurance demand is inappropriate because of the asymmetry of economic waves – Yilanci (2012). For testing the enounced hypothesis, we chose the panel data approach because of the lack of data for longer periods of time for CEE and Asian emerging countries. We considered two models with the dependent variable: insurance density for non-life and life for two emerging regions: CEE and Asia. We used a log normal model because the distribution of insurance density was skewed (non-symmetrical with the mean).

The empirical model for testing the hypotheses can be written in the following form:

$$\ln y_{it} = \alpha_{it} + x_1\beta_{it} + x_2\beta_{it} + x_3\beta_{it} + x_4\beta_{it} + u_{it}. \quad (1)$$

Where, i represents the country, t represents time, α_t represents the time-specific intercept and u_{it} represents the country-specific random error term. The error term u_{it} is

assumed uncorrelated with the explanatory variables of all past, current and future periods of the same country.

To test if heteroskedasticity was present, we adopted Poi and Wiggins test (2001) and we concluded that the panels were heteroskedastic. We also applied the Drukker test (2003) to serial correlation, and we discovered autocorrelation of errors. If heteroskedasticity or serial correlation was present, the variances of the Fixed Effects and Random Effects estimators would not be valid. Hence, we applied the White correction (we reported the robust standard errors). For calculations we used the econometric software Stata- 9.1.

4. Results and discussions

In order to choose between the fixed effects and random effects, we employed the Hausman test. The results of the regressions are reported in Tables 3–6.

If we should refer to the first hypothesis, income would positively influence the demand for insurance in CEE countries but it would not be significant for the Asian emerging countries. We observed that it was confirmed for the non-life sector. The attitude of risk neutrality induced by the planned Chinese economy generates this non-significance of income level over the non-life insurance demand. As alternative in this region, the catastrophic losses are covered by family financial aid, donation from the community and government assistance.

The second hypothesis states that urbanisation positively influences the demand for insurance in Asian countries, while the factor is not significant for the CEE market. For

Table 3. Results of random effects model with robust standard errors for life insurance density in CEE.

Life density CEE	Coefficient	Z
GDP***	0.0001057	8.68
Education	0.0056185	1.09
Urbanisation	0.0053613	0.28
Gini index***	-0.035685	-4.03
Constant	3.253207	2.71
No. of obs. = 110 Overall R ² = 0.5964		

Note: ***, **, * significant at 1%, 5% and 10% level.

Source: Own calculations using STATA 9.1 software.

Table 4. Results of fixed effects model with robust standard errors for non-life insurance density in CEE.

Non-Life density CEE	Coefficient	T-stat
GDP***	0.0000404	4.35
Education***	0.0169444	3.06
Urbanisation***	0.1137998	3.53
Gini index***	-0.076647	-5.58
Constant	-1.246414	-0.68
No. of obs. = 110 Within R ² = 0.7252		

Note: ***, **, * significant at 1%, 5% and 10% level.

Source: Own calculations using STATA 9.1 software.

Table 5. Results of random effects model with robust standard errors for life insurance density in Asia.

Life density Asia	Coefficient	Z
GDP***	0.0001902	3.18
Education	0.0228027	1.62
Urbanisation***	0.0541931	3.03
Gini index***	-0.042950	-2.66
Constant	1.71657	1.47
No. of obs. = 63 Overall R ² = 0.5918		

Note: ***, **, * significant at 1%, 5% and 10% level.

Source: Own calculations using STATA 9.1 software.

Table 6. Results of fixed effects model with robust standard errors for non-life insurance density in Asia.

Non-Life density Asia	Coefficient	T-stat
GDP	0.0000499	1.32
Education***	0.0297645	2.74
Urbanisation***	0.122283	5.80
Gini index***	-0.069650	-7.27
Constant	-0.5888267	-0.69
No. of obs. = 63 Within R ² = 0.8774		

Note: ***, **, * significant at 1%, 5% and 10% level.

Source: own calculations using STATA 9.1 software.

the life sector, the hypothesis is verified, but for the non-life sector, the situation is different. The fact that China has one of the highest savings ratios in the world and a high propensity of urban population to save for retirement, sustains the significance of urbanisation over the life insurance demand in this region. The non-significance of urbanisation for the life insurance density in CEE is a result of the small variation in the urbanisation rate in CEE countries over the last 20 years. We observed that for the non-life sector, urbanisation was significant both for emerging Europe and emerging Asia. This can be explained by the fact that a more urbanised population often leads to higher motor vehicle ownership, which increases the demand for motor insurance.

The third hypothesis states that education positively influences the demand for non-life insurance, while for the life insurance sector, this factor is not only significant but also verified. One credible reason is that tertiary education is not a good proxy for the capacity of a person to understand the complexity of the life insurance products.

The last hypothesis, which states that income distribution negatively influences the insurance demand, is true for both emerging regions. Generally, middle class people have the greatest interest in life insurance products because they can afford them. In the two emerging regions, there exist larger shares of middle-income households, meaning a smaller degree of income inequality.

5. Conclusion

If we refer to the topic of insurance demand and its influence factors, our study will endorse some findings of previous empirical studies, underlining the differences between

countries and insurance sectors. Knowing that income and its distribution, education, and urbanisation are important factors of influence for insurance demand, we estimated their differentiated effects on life and non-life insurances for 17 emerging economies from Asia and Europe. The main insurance opportunity will be in emerging Asia (especially China and India), where the urbanisation rate is lower than it is in Central and Eastern Europe. Our panel data results indicate that the use of tertiary education as a proxy for risk aversion is not appropriate for the life insurance sector because of the complexity of wealth accumulation and distribution of wealth products. A more reliable solution could be the level of financial literacy. In emerging Asia, the dominance of planned economy determines a lower level of risk aversion for the non-life sector, because of alternative solutions offered by the state (governmental aids) in cases of calamities.

The results of this article represent a useful estimation of influence factors for insurance demand, and may have beneficial implications for policymakers in emerging markets, if they want to promote the insurance sector.

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