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The nexus between the demand for life insurance and institutional factors in Europe: new evidence from a panel data approach

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ABSTRACT

We investigate the influence of institutional factors upon life insurance demand for 32 European countries, considering the socio-demographic and economic determinants as control variables. Using a panel data approach, we find that life insurance demand is influenced differently by institutional indicators from the Worldwide Governance Indicators database, in emerging and transition markets compared to developed ones. The sound legal environment of developed countries, where the level of the rule of law is very homogeneous and very high, makes it non-significant for life insurance demand. For developing countries the enforceability of contracts, the independence of justice and the time efficiency of the judicial process positively influence the decision of citizens to buy life insurance contracts. The effect of income distribution over life insurance density varies across these two categories of countries. For transition and emerging markets we find a positive relationship between life insurance density, income distribution and level of urbanisation. In developed countries, because of the high levels of income, life insurance became a common good, not a luxury one, which makes income distribution an insignificant factor. For emerging and transition countries policymakers should concentrate more on strengthening trust in the insurance sector for reducing the gap with developed countries.

1. Introduction

There is a strong link between an institutional framework, insurance development and sustainable economic growth. Since legislative gaps and lack of confidence in the judicial and financial system affect individual perceptions of life insurance, we intend to analyse to what extent the institutional quality of a European country may obstruct or favour the

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life insurance sector. Based on Enz's (2000) findings on the S-curve relationship between insurance penetration and per capita income, we make a distinction between developed and developing countries. The S-curve relationship refers to the relationship between an increased consumption of life insurance and the degree of economic development of the country, which slows down as the country's economic level touches that of developed countries.

The life insurance industry has grown considerably since the early 1990s, and a large part of the literature has been devoted to explaining its determinants. However, the data show disparities that cannot be overlooked between the size of the industry in different European countries. The annual average of life insurance density in developed countries in the period 2002–2012 is around €1400, while for the former communist countries the average level of this indicator for the same period is €100 (Insurance Europe, 2015). This heterogeneity is the starting point for our research.

Previous works on this issue (e.g., Hwang & Gao, 2003; Li, Moshirian, Nguyen, & Wee, 2007; Outreville, 1996; Truett & Truett, 1990) have focused specifically on the financial, socio-demographic and economic factors that drive the size of the life insurance industry. Zietz (2003) provides a summary of the literature in the field, pointing out both the socio-demographic determinants, such as age of the insured person, the desire to bequeath posterity, education, youth dependency ratio and marital status, and also the economic and financial ones, such as income and insured savings, inflation, social security and the level of real interest rate, among others. The results are mixed, in part due to the different degree of development of life insurance markets.

According to Beck and Webb (2003) life insurance demand can be measured using several proxies, such as *life insurance penetration*, *life insurance density*, *life insurance in private savings* or *life insurance in force to G.D.P.* Because we use cross-country analysis, we choose life insurance density as the dependent variable, since we do not need to adjust for levels of economic development (Nesterova, 2008).

Drawing on a sample of 32 European countries we analyse differences in the size of national industries using the ratios of gross written premiums from the life insurance industry scaled by the country's population for the period 2002 to 2012. Because individual perceptions of life insurances can be affected by legislative gaps and a lack of confidence in the legal and financial system, we consider in our analysis the soundness of the institutional environment by using the six dimensions of governance initiated by Kaufmann, Kraay and Mastruzzi (2010). Our effort contributes to the literature by analysing the different influence on institutional factors on life insurance in developing countries[1] compared to the developed ones. We prove that the quality of institutions at the country level boosted the life insurance industry, but the roles of these determinants are more significant for transition and emerging economies. We also explain the different results obtained in these two categories of country with regard to the Gini index of income distribution.

The remainder of the paper is organised as follows. Section 2 reviews previous studies regarding the influence of socio-demographic, economic and institutional determinants on life insurance demand and formulate the hypothesis to be tested. Section 3 describes the methodology and the data used. Section 4 presents and discusses our key results, and section 5 concludes.

2. Literature review and hypotheses development

2.1. Related literature

A large part of the literature has studied the determinants of life insurance development. Using different methodologies or different types of countries – developed, transition and emerging or both – as samples for the empirical analyses, it has already been proved that the demand for life insurance is affected by a wide range of economic, demographic, socio-cultural and institutional determinants.

It has already been proved in many studies that income is a key economic driver of life insurance consumption, with a positive influence, in both developed and transition economies (Beck & Webb, 2003; Browne & Kim, 1993; Chang & Lee, 2012; Outreville, 1996; Truett & Truett, 1990; Ward & Zurbruegg, 2002). Also, an in-depth analysis of this field of literature takes into consideration the level of a country's development (Enz, 2000; Ward & Zurbruegg, 2002). They find evidence for different levels of income elasticity of the demand for life insurance between transition countries and developed ones. For transition countries the elasticity coefficients have greater values than those for the developed ones. Beck and Webb (2003) consider that life insurance policies are required primarily by the middle class, while in poor countries they are required by rich people. International studies with similar conclusions were made by Li et al. (2007) for 30 O.E.C.D. countries. In a recent study, Chang and Lee (2012) prove that the impact of the explanatory variables found as determinants for life insurance do vary with the level of economic development.

The comprehensive study by Elango and Jones (2011) of transition economies finds evidence of the gross national income per capita and the interest rate as economic determinants having a significant positive effect on life insurance density, and of the G.D.P. growth rate and business freedom having a negative impact. For the transition economies from Central and South-Eastern Europe, Kjosevski (2012) also proves that G.D.P. per capita and inflation are economic determinants of life insurance demand.

There are a lot of studies that have already shown evidence of the significant negative impact of inflation on life insurance demand, such as Ward and Zurbruegg (2002), Beck and Webb (2003), Chang and Lee (2012) and Lee and Chang (2015), but not all of the empirical research in this field has the same result. Elango and Jones (2011) on a sample of transition markets, Hwang and Gao (2003) for China or Lee and Chang (2015) find either an insignificant relationship between these two variables or the puzzling result of a positive correlation between them.

Looking to earlier studies, the real interest rate is not a variable systematically included as a possible determinant for life insurance demand. Moreover, when this variable was included, the results are mixed, partially explained by the manner in which it is measured. Theoretically, a positive correlation between interest rate and life insurance demand is expected because a higher real interest rate offers greater profitability for potential purchasers of life insurance policies. In line with this finding we can mention the studies of Beck and Web (2003) and Elango and Jones (2011). On the other hand, Li et al. (2007) obtained a negative correlation between these two variables. They explain this result through the fact that real interest rates measure the preference for immediate as opposed to late consumption or through higher expected benefits for the same invested amount. Higher real rates are therefore associated with a lower demand for life insurance.

Beck and Webb (2003) highlight several arguments for an ambiguous relationship between the Gini index and life insurance consumption. In their empirical research, they find no correlation between these two variables. In countries with less equal income distribution, a negative correlation is expected due to the fact that wealthy people do not need life insurance policies for their protection because they have other resources to be used for this requirement, and poorer groups do not have the financial resources to buy these types of financial products. In a country with a more equal income distribution, with a larger middle class, a greater demand for life insurance policies can be expected (Beenstock, Dickinson, & Khajuria, 1986). Beenstock et al. (1986) find a negative correlation between these two variables. A more recent study by Feyen, Lester and Rocha (2011), using a measure of income inequality as the fraction of income held by the richest 20 percent of the population, find a positive correlation with life insurance consumption.

The protection of dependents can be considered as a driving force for life insurance consumption because the higher the number of dependents, the greater will be the demand for this type of insurance policy (Li et al., 2007). Using the dependency ratio defined as the ratio of dependents – under 15 and over 64 – to the working-age population, between 15 and 64, Browne and Kim (1993), Outreville (1996) and Li et al. (2007) find a significant positive relation.

Previous studies use the ratio of health expenditure to gross domestic product as a proxy for social security expenditure. The relationship between this variable and life insurance demand can be logically explained both in terms of positive and negative correlations. Thus, the results from the empirical research are mixed. The negative correlation is explained through the argument that this type of public expenditure is financed through increased taxation, which reduces the disposable income to be invested in life insurance policies (Beenstock et al., 1986; Li et al., 2007). The positive relationship, identified by Kjosevski (2012) and Alhassan and Biekpe (2016) supports the 'complementarity' hypothesis of social insurance programmes with private insurance consumption.

Among socio-demographic variables, already confirmed by the existing literature as determinants of life insurance demand, the level of urbanisation can also be mentioned. It is expected that having a larger proportion of the urban population in the total is positively correlated with life insurance demand. A higher degree of concentration of the population can reduce the insurers' expenditures for marketing, for the distribution of policies, for underwriting and for claims' administration (Beck and Web, 2003). The positive correlation is proved by Outreville (1996), Hwang and Gao (2003) and Shi and Yan (2015). The hypothesis of a positive correlation is not confirmed in the study by Beck and Web (2003).

The percentage of people with tertiary education can be considered as a proxy for human capital endowment (Baldwin, 1971). A higher level of education is also associated with a higher risk aversion, due to the fact that individuals have a greater ability to understand the risks and benefits of life insurance policies. Educated people are more likely to understand the role of this type of policy for their dependents and for themselves. Based on these arguments, a positive relationship between the level of education and the demand for life insurance is expected; the relationship is proved by the empirical findings of Truett and Truett (1990), Browne and Kim (1993), Hwang and Gao (2003) and Elango and Jones (2011). Empirical findings are, however, mixed. Studies such those of Outreville (1996) and Beck and Webb (2003) offer inconclusive evidence on the effect of education on life

insurance consumption, while Sen (2008) finds a significant negative correlation between these two variables.

The importance of the institutional framework and the political stability of a country have been already evidenced in different lines of business. Many recent empirical studies analyse the impact of institutional quality over different economic aspects such as: exporting and export dynamics (Araujo, Mion, & Ornelas, 2016; Creane & Jeitschko, 2016); employment, wages and research and development (R&D) intensity (Afonso, 2016); economic growth (Góes, 2016); corporate governance (Zagorchev & Gao, 2015); corporate performance (Chen, 2015); entrepreneurship development (Hlavacek, Zambochova, & Sivicek, 2015) and performance of public insurers and of the insurance industry (Fields, Gupta, & Prakash, 2012; Lee & Lin, 2016). Even if the subject of some of these studies are far from the insurance sector, they provide useful ideas for measuring the institutional quality of a country.

Legal rules are important for the life insurance sector, and it is expected that this industry will develop more if those insured feel protected by the legal system and that enforcement of the law is implemented. Moreover, the soundness of this legal environment depends on the control of corruption, which can significantly affect trust in the life insurance sector, due to the long-term engagement. Hence, using an average of six indicators measuring voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption, Beck and Webb (2003) prove that institutional differences can explain some of the variations in life insurance consumption across countries. Also, Chang and Lee (2012) find that these types of institutional determinants have a positive impact on life insurance development, but especially in low-income countries. Lee and Chang (2015) use four of the Worldwide Governance Indicators constructed by Kaufmann et al. (2010): government effectiveness, regulatory quality, rule of law and control of corruption. They prove that the governance environment influences the effect of financial reforms upon the life insurance industry.

Lee, Chang, Arouri and Lee (2016) found that institutions play a passive role in the development of the insurance market. According to them a sound institutional environment does not help the growth effect, but unhealthy institutions are harmful for insurance development. Ward and Zurbruegg (2002) prove that legal system improvements positively influence the life insurance demand forfrom developing countries. For O.E.C.D. countries with sounder legal systems, the marginal effect of any improvements is smaller and non-significant for the insurance sector. This may be due to the fact that information asymmetries and risk-taking behaviours are reduced in a sounder institutional framework (Lee et al., 2016). They also suggest the existence of an institutional quality threshold above which there is an effect of insurance development on economic growth.

2.2. Hypotheses development

In the academic literature there are studies on the influence of different economic, social, demographic and institutional factors over the development of the life insurance industry. Our research focuses mainly on emphasising some of the factors that can act differently in East European countries (former communist countries). For achieving our goal and based on previous studies we consider the following two hypotheses:

Hypothesis 1. *Life insurance demand is influenced differently by the governance indicators in emerging and transitional markets compared to the developed ones.*

In European developed countries, the level of institutional indicators is rather homogene-ous. The stability of economic and fiscal policies and the effectiveness of the judicial system reached a level of maturity after decades or even centuries of democratic experience. In return, the level of economic development is more heterogeneous, so we presume that the economic factors are more important determinants of life insurance demand compared to the institutional ones.

The former communist European countries benefited from a sudden opening of for-eign markets after the fall of the totalitarian regimes. The speed of convergence with the developed countries was very different from one country to another. The results consist of a high variation of the level of institutional factors, mostly concerning the legal regulations and the efficiency of appliance. In response we expect that, besides the economic factors (mostly the level of income), the institutional factors would be of more significance than for the developed countries.

Hypothesis 2. *The effect of income distribution over life insurance density may vary for transition and emerging countries and the developed ones.*

Hammond et al. (1967) classified countries into low-, middle- and high-income countries, and proved that life insurance consumption is inelastic with respect to income for low- and high-income countries, and elastic for middle-income countries. This idea is also supported by the studies of Enz (2000) and Carter and Dickinson (1992), who analysed the S-curve relation. The S-curve approach states that there are two threshold values in which the income elasticity of demand for insurance is smaller outside, but greater within the two thresholds, so the relationship is non-linear (Chang and Lee (2012)).

We suppose two countries with a log-normal distribution of incomes, with equal means (the same average income) but different variances (Figure 1). The continuous curve rep-resents the income distribution for a lower Gini index, while the dotted curve represents the income distribution for a higher Gini index. We also suppose a certain level of income (cut-off) starting from which individuals consistently subscribe to life insurance.
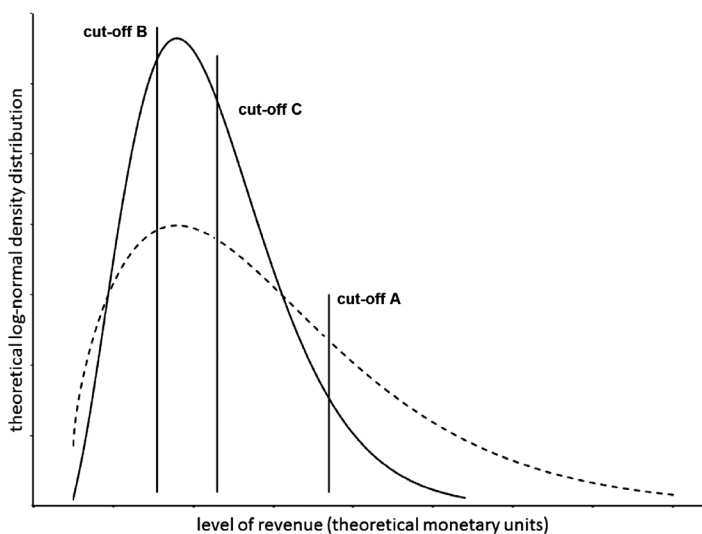
Figure 1. The cut-off of income distribution for different levels of incomes. Source: created by the authors.

For emerging countries, cut-off (A) is significantly higher than the average income. In this case there is a significantly higher proportion of the population who subscribe to life insurance in countries with a higher variance of incomes (a higher Gini coefficient).

For developed countries, this cut-off is much closer to the average income. We may encounter two situations: a cut-off lower than the average (B) or a cut-off higher than the average (C). The proportion of the population subscribing to life insurance policies is comparable in the two countries.

Nevertheless, this mechanism has a major limitation. In reality an income cut-off with perfect discrimination power does not exist. We refer to a distribution of income for individuals buying life insurance. For a more pertinent theoretical demonstration we need to know the abovementioned distribution. The presented reasoning can, however, explain possible different results for the two groups of countries regarding the significance of individuals' income distribution.

3. Data and methodology

This paper studies the impact of institutional determinants on the size of the life insurance industry in 32 countries, including 20 developed and 12 transition and emerging countries, for the period 2002–2012. The dependent variable is defined as the gross written premiums in the life insurance sector scaled by the country's population (life insurance density, L.I.D.). The dependent variable and all of the explanatory variables used in our study are presented in Table 1, together with the data sources.

(A) Life insurance density represents total life premiums per capita computed as the gross life insurance written premiums over the total population. In our regression models, this variable is used in the logarithmic form.

Table 1. Dependent and explanatory variables used in the regression models and the sources of data.

Variable	Codification	Source
(A) Endogenous variable		
Life insurance density	LID	Insurance Europe, Statistics No. 49 and No.50, European Insurance for Total Life Premiums and Number of Population, Eurostat
(B) Exogenous variables		
(B1) Control variables		
Income	GDP_cap	World Bank, 2015
Inflation	Inflation	World Bank, 2015
Urban population	Urbanpop	World Bank, 2015
Health expenditure	Health	World Bank, 2015
Age dependency	Agedep	World Bank, 2015
Long-term interest rate	Interest	European Central Bank
Income distribution	Gini	World Bank, 2015
School enrolment tertiary	SchoolEnrol	World Bank, 2015
(B2) Institutional variables		
Voice and accountability	Voice	Worldwide Governance Indicators
Political stability and absence of violence	Polstab	Worldwide Governance Indicators
Government effectiveness	Goveff	Worldwide Governance Indicators
Regulatory quality	Regqual	Worldwide Governance Indicators
Rule of law	Rulelaw	Worldwide Governance Indicators
Control of corruption	Ctrcorrup	Worldwide Governance Indicators

Source: Created by the authors, using data from Insurance Europe, World Bank (2015a), European Central Bank (2015) and Worldwide Governance Indicators World Bank (2015b).

(B1) G.D.P. per capita (constant 2005 US$): G.D.P. per capita is gross domestic product divided by midyear population, representing the sum of gross value added by all resident producers in the economy plus any product taxes, minus any subsidies not included in the value of the products.

Inflation, G.D.P. deflator (annual percentage), as measured by the annual growth rate of the G.D.P. implicit deflator, shows the rate of price change in the economy as a whole. The G.D.P. implicit deflator is the ratio of G.D.P. in current local currency to G.D.P. in constant local currency.

Urban population (percentage of total) refers to people living in urban areas as defined by national statistical offices.

Health expenditure, total (percentage of G.D.P.) is the sum of public and private health expenditure. It covers the provision of health services, family planning activities, nutrition activities and emergency aid designated for health, but does not include provision of water and sanitation.

Age dependency ratio (percentage of working-age population) is the ratio of dependents (younger than 15 or older than 64) to the working-age population (ages 15–64). Data are shown as the proportion of dependents per 100 working-age population.

Long-term interest rate for convergence purposes, with 10 years maturity are provided by the statistics for E.U. member states, and relate to interest rates for long-term government bonds denominated in euros for Euro Area member states and in national currencies for member states that have not adopted the euro at the time of publication.

Gini index (World Bank estimate) measures the extent to which the distribution of income 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.

Gross enrolment ratio, tertiary, both sexes (percentage) is expressed as the percentage of the total population of the five-year age group following on from leaving secondary school.

(B2) Voice and accountability captures the perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media.

Political stability and absence of violence/terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.

Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Regulatory quality captures the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

Rule of law captures the perceptions of the extent to which agents have confidence in and abide by the rules of society and, in particular, the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence.

Control of corruption captures the perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as 'capture' of the state by elites and private interests.

Table 2. Descriptive statistics.

Variable		Minimum	Maximum	Mean	Standard deviation	Coefficient variation
LID	Developed	46	4511	1414	909	0.643
	Emergent	3	320	94	89	0.948
Voice	Developed	68.2	100	92.0	7.03	0.076
	Emergent	40.9	87.0	71.0	11.1	0.157
Polstab	Developed	30.1	100	78.9	17.4	0.221
	Emergent	13.3	92.8	65.4	17.5	0.267
Goveff	Developed	62.1	100	90.4	8.85	0.098
	Emergent	43.5	84.9	70.5	10.1	0.143
Regqual	Developed	68.4	100	90.2	7.26	0.080
	Emergent	51.5	91.7	76.0	9.00	0.118
Rulelaw	Developed	60.3	100	90.8	9.40	0.104
	Emergent	45.0	85.6	66.4	11.1	0.168
Ctrcorup	Developed	51.2	100	89.4	10.5	0.117
	Emergent	32.2	83.4	64.1	9.52	0.148
Gini	Developed	25.5	38.9	31.3	3.06	0.098
	Emergent	23.7	42.2	31.9	4.38	0.137
Urbanpop	Developed	49.9	97.7	70.7	12.6	0.179
	Emergent	59.6	93.8	76.3	9.69	0.127
Agedep	Developed	41.4	56.8	49.6	2.96	0.059
	Emergent	38.1	56.5	45.7	3.91	0.085
Inflation	Developed	−5.20	11.39	2.29	1.97	0.862
	Emergent	−10.2	37.42	4.97	5.61	1.129
GDP_cap	Developed	14,355	87,773	40,505	15,900	0.393
	Emergent	3,157	20,988	9,963	3,969	0.398
Interest	Developed	0.65	22.5	4.42	2.10	0.475
	Emergent	0.62	45.0	6.76	5.33	0.787
Healt	Developed	6.05	12.68	9.41	1.29	0.137
	Emergent	4.59	9.38	6.83	1.10	0.161
SchoolEnrol	Developed	10.3	116.6	62.3	18.3	0.293
	Emergent	26.2	88.5	59.7	14.8	0.248

Source: Created by the authors.

Table 2 displays the summary statistics for our sample of 32 European countries.

The summary statistics suggest that, if we consider life insurance density, there is a great difference between developed (from €46/inhabitant to €4511/inhabitant) and emerging countries (from €3/inhabitant to €320/inhabitant). For some institutional factors (rule of law and regulatory quality) the differences between the average value for developed and emerging countries varies significantly, implying a different significance of these factors for the two categories of countries.

In order to assess the influence of institutional variables upon life insurance density for 32 European countries, we apply a panel data analysis. We used a log normal model because the distribution of insurance density was skewed (non-symmetrical with the mean) and the variation of L.I.D. is significantly higher than the variation of the other independent variables. As the institutional proxies are positively correlated, we have constructed six regression models, one for each of the six institutional factors from the Worldwide Governance Indicators database. For each regression model we use the economic and socio-demographic variables described in Table 1 as control variables. The starting model is described below

$$E(LID_{it}/X) = \beta \times Institutional\ variable_{it} + \sum_{j=1}^{Nc} \alpha_j \times control\ variable_{jit} + c + \lambda_i + \lambda_t \quad (1)$$

where X = all of the independent variables used (institutional and control); Nc is the number of control variables considered; λ stands for the effects; i denotes the country effects and t the time effects.

The model in Equation (1) was specified both with fixed effects and in the G.L.S. form with random effects, for each of the six governance indicators used. Results were compared using the Hausman test. Additionally, to correct for heteroskedasticity, the model was estimated with the *robust* option for standard errors. The Hausman test and the robust option are also methods for dealing with endogeneity problems. For each of the models obtained we specify the proper form (F.E. for fixed effects and R.E. for random effects), the probability returned by the Hausman test, the overall significance test (F for fixed effects and Wald for random effects) with their probabilities and the values of the three types of R^2. Moreover, as our database is formed by developed countries and transition and emerging countries, in the second part of our analysis we intend to see if there are any differences between these two types of countries. For this, we have constructed a dummy variable taking the value 1 if the country is an emerging or a transition country and 0 otherwise. Its effect was introduced in the analysis by creating six new variables by multiplying each institutional variable with the value of the dummy variable, as defined above ($D \times$ institutional variable). Thus, Equation (1) became

$$E\left(LID_{it}/X\right) = \beta \times Institutional\ variable_{it} + \gamma \times (Dummy \times Institutional\ variable)_i$$
$$+ \sum_{j=1}^{Nc} \alpha_j \times control\ variable_{jit} + c + \lambda_i + \lambda_t \tag{2}$$

The effect of belonging to the transition and emerging economies group is given by the coefficient of this product (γ), while the overall effect of the governance indicator for the two groups of countries is given by the sum of the coefficients ($\beta + \gamma$). If the sum increases in absolute values, then the effect of the governance indicators on the demand for life insurance is higher in transition and emerging countries than in developed ones. If the sum is lower than the original β coefficient, it means that governance indicators show a lower intensity of influence of governance aspects upon the development of the life insurance market in European transition and emerging economies.

For these interpretations to be true, the sum $\beta + \gamma$ must be tested for statistical significance using coefficients testing procedures, but only when γ is significant.

But, as the analyses proved that Equation (1) should be specified with fixed effects in the case of two governance indicators (voice and accountability – model 1 and government effectiveness – model 3), Equation (2) was finally estimated just for the remaining ones, characterised by random effects.

4. Results and discussion

Each of the six key dimensions of governance from the Worldwide Governance Indicators together with the control variables were considered in order to evaluate the degree in which these factors influence the life insurance demands of a sample of 32 European countries (developed, emerging and transition countries).

The results presented in Table 3 show that, when taken individually, voice and accountability, political stability, government effectiveness and control of corruption have no

Table 3. Estimated impact of the institutional variables on life insurance density.

Variable	Model 1 F.E.†	Model 2 R.E.‡	Model 3 F.E.	Model 4 R.E.	Model 5 R.E.	Model 6 R.E.
Voice	−0.006 [0.0077]	–	–	–	–	–
Polstab	–	0.0001 [0.0053]	–	–	–	–
Goveff	–	–	0.0170 [0.0112]	–	–	–
Regqual	–	–	–	0.0348*** [0.0094]	–	–
Rulelaw	–	–	–	–	0.0407*** [0.0131]	–
Ctrcorrup	–	–	–	–	–	0.0172 [0.0110]
Gini	0.0073 [0.0117]	0.0050 [0.0125]	0.0084 [0.0117]	0.0035 [0.0118]	0.0065 [0.0118]	0.0035 [0.0121]
Urbanpop	0.0663 [0.0510]	0.0226 [0.0252]	0.0852* [0.0501]	0.0256 [0.0228]	0.0323 [0.0225]	0.0266 [0.0258]
Agedep	−0.0132 [0.0312]	−0.0088 [0.0270]	−0.0056 [0.0324]	0.0046 [0.0281]	−0.0036 [0.0290]	−0.0020 [0.0289]
Inflation	0.0011 [0.0074]	−0.0023 [0.0085]	0.0020 [0.0077]	0.0042 [0.0057]	0.0014 [0.0065]	0.0009 [0.0075]
GDP_cap	0.00007*** [0.00002]	0.00007*** [0.00002]	0.00006*** [0.00002]	0.00006*** [0.00002]	0.00005*** [0.00002]	0.00006*** [0.00002]
Interest	−0.0064 [0.0055]	−0.0043 [0.0063]	−0.0027 [0.0058]	0.0004 [0.0053]	−0.0015 [0.0069]	0.0047 [0.0092]
Health	0.0448 [0.0661]	0.0724 [0.0612]	0.0419 [0.0627]	0.0481 [0.0494]	0.0271 [0.0527]	0.0672 [0.0595]
SchoolEnrol	0.0072 [0.0049]	0.0085* [0.0049]	0.0084* [0.0046]	0.0119*** [0.0038]	0.0090** [0.0040]	0.0105** [0.0042]
Constant	−0.7831 [3.9352]	1.2278 [2.0963]	−4.4802 [4.3241]	−2.3064 [2.3995]	−2.2434 [2.7197]	−0.6190 [3.0677]
Hausman (p)	0.018	0.251	0.002	0.185	0.600	0.764
R^2 within	0.351	0.331	0.365	0.426	0.445	0.348
R^2 between	0.320	0.568	0.324	0.597	0.607	0.590
R^2 overall	0.342	0.570	0.349	0.610	0.600	0.588
F	6.37		10.26			
Prob > F	0.000		0.000			
Wald Chi²		116.87		454.94	203.09	115.83
Prob > Chi²		0.000		0.000	0.000	0.000

Notes: This table reports the results of panel regressions (the models from Equation (1)) for the impact of institutional indicators on life insurance industry size across countries for the period 2002–2012, controlling for socio-demographic and economic development.
Coefficient [Robust standard errors].
*** significant at 1%.
** significant at 5%.
* significant at 10%.
†Fixed effects.
‡random effects.
Source: authors' computations in STATA 14 (StataCorp LLC, Texas, USA).

significant influence upon the insurance density for the analysed sample. The other two factors, regulation quality and rule of law, have positive highly significant regression coefficients, showing an increase in the life insurance density if their values increase. This means that a sound insurance market is based on high regulation quality and rule of law.

According to the definition of the regulatory quality indicator, life insurance demand is positively influenced by the efficiency of competition regulation in the market sector, the ease of starting a new business, and investment and financial freedom. Tax inconsistency, meaning the risk of a tax code being manipulated by political forces, and the regulatory burden, which includes bureaucratic inefficiency, negatively affect the consumption of life insurance products.

Enforcement of legal rules can lead to an increase in life insurance demand because the policyholder feels that its property rights are protected. Rule of law also refers to judicial independence, confidence in the police and judicial system, and the ability of the state to limit tax evasion. If the judicial system does not enforce contractual agreements between private entities due to corruption or inefficiency, the life insurance sector will be negatively affected.

If the legal environment is favourable and the contracts are enforceable, life insurers can invest in the stock market and can better control the prices of their products because their transaction costs are smaller (Guerineau & Sawadogo, 2015). Our results are in line with those of Chui and Kwok (2008) and Beck and Webb (2003), proving that financial intermediaries are better developed in countries with robust regulatory systems, strong protection of property rights and contract enforcement.

Among the control variables, only two are statistically significant in all models: the G.D.P. per capita and the share of citizens enrolled in tertiary education. In all six models, for both control variables, the positive coefficients show a direct relationship between them and the life insurance density. These results are in line with previous findings of Truett and Truett (1990), Browne and Kim (1993) and Elango and Jones (2011). This industry is larger in countries with a high level of G.D.P. per capita, and with a higher percentage of people with tertiary education.

To test our first hypothesis regarding the existence of differences between developed and emerging and transition economies we consider the influence of governance indicators on life insurance density. As already stated in the methodological section, for this we have constructed a dummy variable grouping the sample based on the development criterion. These influences then were accounted for by introducing the product between the dummy and each governance indicator in the regression model.

Table 4 shows the relationship between life insurance density and each of the four institutional variables from the Worldwide Governance Indicators database allowing the use of the dummy variable for transition and emerging European countries (random effects models).

When introducing the dummy variable in the specified models, the results are different as regards the significance of the four institutional variables on the size of the life insurance industry. The simple coefficient political stability is not significant. The three other variables have significant coefficients. However, the coefficient for the dummy influence (dummy × variable) is statistically significant only for regulatory quality. These results prove that there are differences between developed countries and transition and emerging European countries regarding these indicators. The negative coefficient states the fact that, due to

poorer governance levels, the development of the life insurance market in emerging and transition economies is less intense.

In the case of regulatory quality, the simple coefficient is positive, while the dummy coefficient is negative (see Table 4). Thusly, by summing the two types of coefficients (to assess the overall effect) we can conclude that belonging to the group of transition and emerging countries diminishes the effect of this governance indicator upon the volume of the life insurance market or that the life insurance market is negatively influenced by a poor quality of the governance process. The final significance of these results must be evaluated carefully. The results are presented in Table 5.

Analysis proves that the overall effect of regulatory quality is significant. The sum of the coefficients is positive, but lower than the simple coefficient. Thus, belonging to the group of transition and emerging countries diminishes the effect of regulatory quality on the development of life insurance density. Our results validate hypothesis H1 stating that governance indicators influence life insurance demand with a lower significance in emerging and transitional markets.

Table 4. Estimated impact of the institutional variables on life insurance density using a dummy variable for transition and emerging countries.

Variable	Model 2 R.E.[†]	Model 4 R.E.	Model 5 R.E.	Model 6 R.E.
Polstab	0.0043 [0.0040]	–	–	–
Regqual	–	0.0396*** [0.0100]	–	–
Rulelaw	–	–	0.0404*** [0.0125]	–
Ctrcorrup	–	–	–	0.0221** [0.0100]
$D \times$ Polstab	−0.0098 [0.0076]	–	–	–
$D \times$ Regqual	–	−0.0132** [0.0053]	–	–
$D \times$ Rulelaw	–	–	0.0006 [0.0057]	–
$D \times$ Ctrcorrup	–	–	–	−0.0125 [0.0077]
Gini	0.0027 [0.0128]	0.0009 [0.0119]	0.0066 [0.0116]	0.0029 [0.0124]
Urbanpop	0.0226 [0.0239]	0.0307 [0.0202]	0.0313 [0.0210]	0.0313 [0.0239]
Agedep	−0.0146 [0.0267]	−0.0040 [0.0290]	−0.0035 [0.0298]	−0.0103 [0.0310]
Inflation	−0.0013 [0.0085]	0.0043 [0.0059]	0.0013 [0.0062]	0.0010 [0.0077]
GDP_cap	0.00006*** [0.00002]	0.00005*** [0.00002]	0.00005*** [0.00002]	0.00005*** [0.00002]
Interest	−0.0027 [0.0065]	0.0010 [0.0051]	−0.0015 [0.0070]	0.0025 [0.0099]
Health	0.0763 [0.0597]	0.0413 [0.0479]	0.0281 [0.0528]	0.0614 [0.0588]
SchoolEnrol	0.0101** [0.0045]	0.0139*** [0.0038]	0.0089** [0.0043]	0.0122*** [0.0045]
Constant	1.6277 [2.0027]	−1.9503 [2.3976]	−2.1837 [2.6907]	−0.3502 [3.1218]
R^2 within	0.333	0.427	0.445	0.349
R^2 between	0.617	0.665	0.606	0.6423
R^2 overall	0.606	0.664	0.599	0.633
Wald Chi^2	143.8	574.19	203.27	151.29
Prob > Chi^2	0.000	0.000	0.000	0.000

Notes: This table reports the results of panel regressions (the models from Equation (2)) for the impact of institutional indicators on life industry size across countries for the period 2002–2012, controlling for socio-demographic and economic development.
Coefficient [Robust standard errors].
***significant at 1%; **significant at 5%; *significant at 10%;
[†]Random effects.
Source: authors' computations in STATA 14.

Table 5. Evaluation of the ad-joint effect of regulatory quality and the degree of economic development on life insurance density.

Effect tested	Chi^2	p-value
Regqual $+ D \times$ Regqual	8.49	0.004

Source: authors' computations in STATA 14.

The control variables G.D.P. per capita and the share of tertiary school enrolment remain significant after the introduction of the dummy variables (see Table 4). Moreover, the significance level of the latter increases. The positive coefficients show that higher national incomes and a higher education level lead to greater development of life insurance markets.

Because we found that for transition and emerging countries the effect of the institutional factors (regulatory quality) over life insurance demand is diminished compared to the developed countries, we want to see if the significance of control variables is valid for this group of countries. We consider the same regressions from the first model but only for the transition and emerging countries (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia and Turkey).

The results presented in Table 6 show that the same two institutional factors are significant, namely regulatory quality and rule of law, the influence of regulatory quality being diminished (for all 32 countries the level of significance was 1% while for transition and emerging markets the level of significance became 10%). So, the life insurance density is less influenced by regulatory quality in the European transition and emerging economies compared to the developed ones. In developed countries there are more financial instruments that compete directly with life insurance products. So, the effects of taxation are more susceptible to change the relationship between these financial instruments. In exchange, in developing countries, life insurance is more rigid in relation to the effects of taxation, being more sensitive to other factors: purchasing power, income distribution and accessibility of insurance products.

For developed countries (see Table 7) rule of law is not significant, while for transition and emerging economies this is a highly significant factor (1% level of significance). This means that a sound legal environment (from developed countries) does not significantly influence life insurance demand, while for developing countries an improper enforceability of contracts can hinder the development of the life insurance market. In emerging countries tax evasion is a common practice, as is a parallel economy, justice is not independent and fairly administrated, and private property and copyright protection are not properly protected. These are realities that, along with the risk of expropriation, negatively influence the demand for life insurance contracts.

In developed countries the level of rule of law is very homogeneous and very high (between 90 and 100), excepting Italy and Greece. As a consequence the low variation of this indicator determines its lack of significance as a factor for life insurance. In these countries, because of the relative institutional homogeneity, the economic factors (such as inflation or interest rate) are more important in explaining the level of life insurance.

In exchange, in emerging countries we have a very high variation of rule of law, from 45 to 85.6. Starting from a past resembling communism, some countries have made much more progress in justice independence, time efficiency of the judicial process or enforceability of contracts. All these components of the rule of law indicator influence the decision of citizens to buy life insurance contracts.

Among the control variables that are proved to be statistically significant in previous regression models, G.D.P. per capita remains highly significant in all specifications. This can be the result of the fact that during the communist period a smaller part of the population attended higher education. For transition and emerging countries the percentage of university degrees has grown significantly in the last 15–20 years. This growth is still not significant for life insurance density because it refers to younger people, who do not represent the target

Table 6. Estimated impact of the institutional variables on life insurance density for transition and emerging countries.

Variable	Model 1 F.E.†	Model 2 R.E.‡	Model 3 R.E.	Model 4 R.E.	Model 5 R.E.	Model 6 R.E.
Voice	−0.0035[0.0078]	–	–	–	–	0.0065 [0.0089]
Polstab	–	−0.004 [0.0043]	–	–	–	–
Goveff	–	–	–	–	–	–
Regqual	–	–	−0.0069 [0.0134]	–	–	–
Rulelaw	–	–	–	0.0126* [0.0070]	–	–
Ctrcorrup	–	–	–	–	0.0246*** [0.0096]	–
Gini	0.0161 [0.0094]	0.0174 [0.0078]**	0.0177 [0.0085]**	0.0183 [0.0074]**	0.0169 [0.0062]***	0.0159 [0.0070]**
Urbanpop	0.1096 [0.0264]***	0.0664 [0.0244]***	0.0661 [0.0287]**	0.0576 [0.0228]**	0.0666 [0.0224]***	0.0652 [0.0239]***
Agedep	0.0199 [0.0394]	0.0092 [0.0377]	0.0121 [0.0383]	0.0173 [0.0384]	−0.0004 [0.0333]	0.0160 [0.0426]
Inflation	0.0033 [0.0054]	−0.0010 [0.0046]	−0.0014 [0.0041]	0.0003 [0.0050]	0.0009 [0.0037]	−0.0004 [0.0040]
GDP_cap	0.0003*** [0.00007]	0.0003*** [0.00007]	0.0003*** [0.00007]	0.0003*** [0.00007]	0.0003*** [0.00006]	0.0003*** [0.00007]
Interest	−0.0012 [0.0065]	0.0041 [0.0068]	0.0021 [0.0066]	0.0025 [0.0069]	0.0030 [0.0069]	0.0075 [0.0053]
Health	−0.0025 [0.0537]	−0.0025 [0.0576]	0.0028 [0.0656]	−0.0104 [0.0552]	−0.0400 [0.0457]	−0.0117 [0.0627]
SchoolEnrol	−0.0062 [0.0094]	0.0002 [0.0089]	−0.0005 [0.0090]	−0.0010 [0.0094]	−0.0009 [0.0088]	0.0011 [0.0085]
Constant	−8.3537 [3.5942]**	−5.0100 [3.0010]*	−4.9007 [4.1350]	−5.8279 [3.2704]*	−5.7921 [3.1431]*	−5.8198 [3.7516]
Hausman (p)	0.020	0.249	0.403	0.166	0.359	0.172
R^2 within	0.789	0.785	0.782	0.785	0.806	0.783
R^2 between	0.197	0.4692	0.486	0.532	0.498	0.489
R^2 overall	0.329	0.536	0.557	0.598	0.568	0.559
F	3268.4					
Prob > F	0.000					
Wald Chi²		789.89	359.63	611.19	1210.07	281.86
Prob > Chi²		0.000	0.000	0.000	0.000	0.000

Notes: This table reports the results of panel regressions (the models from Equation (1)) for the impact of the level of institutional indicators on life industry size across transition and emerging countries for the period 2002–2012, controlling for socio-demographic and economic development.Coefficient [Robust standard errors].
***significant at 1%.
**significant at 5%.
*significant at 10%.
†Fixed effects.
‡random effects.
Source: authors' computations in STATA 14.

Table 7. Estimated impact of the institutional variables on life insurance density for developed countries.

Variable	Model 1 F.E.[†]	Model 2 F.E.	Model 3 F.E.	Model 4 R.E.[‡]	Model 5 R.E.	Model 6 F.E.
Voice	−0.0072 [0.0091]	–	–	–	–	–
Polstab	–	−0.0030 [0.0038]	–	–	–	–
Goveff	–	–	0.0095 [0.0079]	–	–	–
Regqual	–	–	–	0.0252** [0.0117]	–	–
Rulelaw	–	–	–	–	0.0057 [0.0109]	–
Ctrcorrup	–	–	–	–	–	−0.0023 [0.007]
Gini	0.0422 [0.0236]*	0.0427 [0.0231]	0.0433* [0.0225]	0.0333 [0.0230]	0.0371 [0.0250]	0.0410 [0.0236]
Urbanpop	0.0161 [0.0435]	0.0169 [0.0403]	0.0315 [0.0414]	0.0071 [0.0093]	0.0007 [0.0117]	0.0179 [0.0495]
Agedep	0.0118 [0.0327]	0.0129 [0.0341]	0.0166 [0.0329]	0.0216 [0.0287]	0.0215 [0.0300]	0.0140 [0.0334]
Inflation	−0.0201 [0.0136]	−0.0186 [0.0129]	−0.0199 [0.0131]	−0.0176 [0.0101]*	−0.0180 [0.0110]	−0.0191 [0.0132]
GDP_cap	0.00005*** [0.00001]	0.00005*** [0.00001]	0.00005*** [0.00001]	0.00002*** [0.00001]	0.00003*** [0.000009]	0.00005*** [0.00001]
Interest	−0.0122 [0.0120]	−0.0115 [0.0106]	−0.0059 [0.0101]	−0.0128 [0.0110]	−0.0189 [0.0137]	−0.0092 [0.0087]
Health	0.0163 [0.0532]	0.0131 [0.0535]	0.0212 [0.0524]	−0.0010 [0.0372]	0.0080 [0.0388]	0.0181 [0.0534]
SchoolEnrol	−0.0033 [0.0053]	−0.0032 [0.0053]	−0.0027 [0.0051]	0.0048 [0.0033]	0.0007 [0.0043]	−0.0032 [0.0057]
Constant	2.8018 [1.9852]	2.3836 [1.2901]*	−0.1597 [2.2143]	0.7540 [1.4002]	2.9605 [1.5705]*	2.1735 [2.8197]
Hausman (p)	0.000	0.002	0.000	0.387	0.176	0.049
R² within	0.213	0.215	0.219	0.256	0.182	0.209
R² between	0.090	0.097	0.082	0.226	0.176	0.090
R² overall	0.068	0.075	0.059	0.203	0.152	0.068
F	4.22	6.61	4.76			3.64
Prob > F	0.004	0.0003	0.002			0.008
Wald Chi²				183.57	64.67	
Prob > Chi²				0.000	0.000	

Notes: This table reports the results of panel regressions (the models from Equation (1)) for the impact of the level of institutional indicators on life industry size across developed countries for the period 2002–2012, controlling for socio-demographic and economic development.

Coefficient [Robust standard errors].

*** significant at 1%.

** significant at 5%.

* significant at 10%.

[†]Fixed effects.

[‡]random effects.

Source: own computations in STATA 14.

group for life insurance. Also, the lack of an organised competitive environment during the communist period generated a gap between transition and developed countries regarding the development of the life insurance industry.

Income distribution, expressed through the Gini coefficient and the degree of urbanisation, becomes statistically significant in almost all of the regression models regarding transition and emerging countries. In all cases, for both variables, the positive coefficients show a direct relationship with life insurance density. In these developing markets the main sources of evolution for the life insurance industry are the potential of growing urbanisation and the higher standard deviation of income. For a luxury product – as life insurance is for transition and emerging countries – a high disparity of incomes (high Gini Index) means a higher proportion of rich people buying the product. Our results partially validate hypothesis H2. The positive sign shows that life insurance is seen as a luxury product for high income persons. We prove that the Gini index of income distribution is statistically significant for life insurance demand for emerging and transitional countries.

5. Conclusions

Using a sample of 32 European countries for the period 2002–2012, this article examines whether the effect of institutional environments on life insurance development varies between transition and emerging countries and developed ones. The soundness of the institutional environment was considered through the six Worldwide Governance Indicators. Using as control variables several economic and socio-demographic determinants, we prove that regulatory quality is a significant institutional factor for both developed and developing countries (with a greater significance in the developed ones), while rule of law influences significantly life insurance demand only in transition and emerging countries.

For countries with a high degree of confidence in the legal system, which helps to settle disputes and to enforce contracts (developed countries), there is no significant influence of rule of law over life insurance demand. For countries with improper enforceability of contracts, where tax evasion and a parallel economy are a common practice and justice is not fully independent (transition and emerging countries), we found a significant influence of rule of law over life insurance demand. Using G.D.P. per capita as the measure of economic development, we find, as expected, that national income is the main driver of life insurance consumption. We also find that a greater percentage of people enrolled in the tertiary system leads to a higher life insurance density. A higher level of education increases the awareness of the risks associated with every life insurance policy. Additionally, these results are also in line with the fact that life insurance products are quite complex and difficult to understand, so a better understanding by more educated people justifies the growth of the demand for such products.

For transition and emerging countries we find positive effects of urbanisation and Gini index on life insurance density. For these countries a more heterogeneous income distribution (meaning a high Gini index or a higher concentration of income) positively influences life insurance demand. A higher level of urbanisation is associated with economic development, which also implies fewer children per family. In this context, parents need to prepare for their retirement to some extent without their children's financial support, which can increase the demand for life insurance policies.

The findings of this study are important for public policymakers to find the most appropriate instruments for developing the life insurance sector.

For emerging and transition countries policymakers should concentrate more on strengthening trust in the insurance sector by improving the efficiency of the legal system and contract enforceability. There are countries in which the impact of political factors differs from one financial sector to another. For example, the banking and capital market sectors can function more effectively than the insurance sector because the insurers interfere through political controls within insurance regulation systems. The insurers must be aware that their interference brings them only short-term advantages, generating oligopoly or cartel structures. Instead, the independence of the regulatory and supervisory bodies would bring long-term advantages to the insurers and to the market, by increasing the trust of the population. The distrust of the population is also generated by a changing market with many mergers and acquisitions. In some transitional countries, the pathway from communism to a market economy does not yet allow a concentration of domestic capital and the achievement of a state of balance between this capital and that of the international financial corporations, which would lead to market stability.

In former communist countries (with only Turkey being an emerging economy), a financial culture was missing for a longer period of time, and people cannot fully understand the importance of life insurance products, so the financial education of the population can increase their awareness of the risks associated with these products.

Note

1. We also use the term 'developing countries' to refer to emerging and transition countries.

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