

ECONOMIC AND DEMOGRAPHIC DETERMINANTS OF DEMAND FOR LIFE INSURANCE

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Abstract: The insurance industry, particularly its stronger component life insurance, is increasingly gaining in importance as financial intermediary that facilitate the role of the financial system in economic growth. Important position of the life insurance industry will be explained by economic and demographic determinants on the example of the transition countries of central Europe, applying a static panel model. According to the results of previous studies, hypothesis has been confirmed - a rise in income contributes to the growth of the insurance market and the demand for life insurance is function of bequest motive. The limiting factor in the development of the life insurance market is unemployment, which is becoming very disturbing in the study on a group of countries. As an additional reason for the interest of the study stands out relatively few studies comparing them with the banking sector.

Keywords: Life insurance demand, Transition countries of central Europe, Static panel analysis

1 INTRODUCTION

The growth rates of life insurance significantly exceed the growth rate of world gross domestic product (GDP), which highlights the role of the insurance sector in the economy and determines the increased importance of the insurance sector in the execution of financial intermediation. However, the rate of growth of life insurance differed not only between countries with different levels of development, but also between countries of the same level of development [7]. Therefore, the question arises, what causes occurrence of variations and what determines the demand for life insurance. Previously conducted studies have created a clear view of a group of factors with impact on the demand for life insurance that are justifiably explored. There are different economic, demographic, social and institutional factors of demand for life insurance. Identified core factors used in previous research show often ambiguous result depending on the measure used to describe demand for life insurance. Various measures created a difficulty in presenting general conclusions about the direction of the relationship and the importance of the impact of individual factors on the life insurance industry, which is evident in the work [3] while comparing different models with different measures. Consequently, there is limited understanding of the contribution of life insurance on the real economy. This paper examines the economic and demographic determinants of demand for life insurance in the group of transition countries that are members of the European Union (EU) and which geographically belong to the region of Central Europe. Considered countries; Bulgaria, Croatia, Czech Republic, Hungary, Slovakia and Slovenia constitute a homogenous group according to the criteria of development of the life insurance market measured by the indicator of the density of life insurance or penetration of life insurance. The homogeneous group of countries allows creating model, which is adapted to the characteristics of all the countries, whose estimates reflect the actual properties of each of the observed countries [2]. The empirical confirmation of the drivers of demand is carried out by a panel method that optimizes scope of country, through the criterion of homogeneity, and the volume of data required to present a valid statistical conclusions. The insurance market of selected countries is analysed for the ten-year period from 2003 to 2012. The paper is organized as follows. The second section provides an overview of

the determinants that are included in the model. The third section presents the data and methodology involved in the analysis and presents the results. A concluding section summarizes the main results in the analysis and insights that were obtained on the basis of research.

2 DETERMINANTS OF LIFE INSURANCE

The life insurance can be either “pure insurance” products, savings products, or a combination of both [16]. Based on existing research and data availability, the following factors are abstracted.

2.1 Economic determinants of life insurance

Disposable income is considered as the central variable in the models that explain the demand for life insurance regardless of the level of economic development of the country. The possible loss due to occurrence of the insured event is more significant following the increase in income [8]. As a result of the increase in income, life insurance contract gains value. In addition, the reason for the positive relationship between the level of disposable income and demand for life insurance is the possibility to invest in life insurance product since higher income generally allows settlement necessities of life while retaining surplus funds. Disposable income, which is measured by the ratio of GDP per capita, due to the availability, is most commonly used variable and it can be considered as an appropriate measure for permanent income [3]. Research conducted [5] shows that the life insurance sector starts to grow faster in developing countries with higher income than in developing countries with lower income. **Inflation** reduces the value of the agreed life insurance contract, making a product of life insurance less attractive. The promised future payments have less value, hence it is logical less demand for life insurance. Reduced demand is achieved through two channels; the first is related to reduced consumer confidence; the second refers to the real interest rate [6]. Regardless of the type of insurance, promised payments are guaranteed in a future time period and as such are influenced by changes in the price of money. Inflation will affect the reduction in the purchasing power of future payments dependent by insured event. As a result of the process of adapting to clients' needs, it is enabled the contracting indexed life insurance which in turn can cause the effect inflation being irrelevant. Despite the existence of indexed insurance policy, whose purpose is to neutralize the impact of inflation, the data time series when there is inflation in the country, Brazil; indicate a significant reduction in demand for insurance [1]. **Unemployment** is a position where an individual is unable to compensate for work which is the basic source of all product and service consumption and therefore life insurance products. The total income that an individual gets, does not have to originate only from work, but for the majority of the population, income from work is the main source of consumption and wealth accumulation. Higher unemployment is considered to have negative impact on the demand for life insurance. The evidence on the impact of unemployment on demand are limited, [9] suggests a negative relationship between unemployment and the demand for life insurance. Studies frequently examine the link between unemployment and the rate of non-payment insurance [12]. Theoretically assumed positive relationship empirically confirms in developing countries [10].

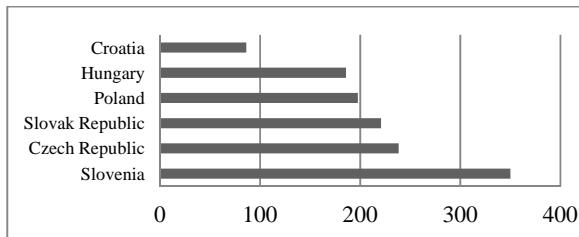
2.2 Demographic determinants of life insurance

It is assumed that a larger **number of dependents** in the population have a positive impact on the demand for life insurance. This will be explained by the fact that the recipient of income is

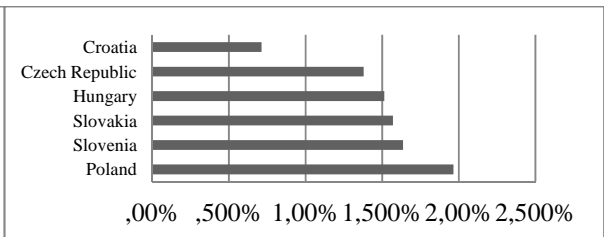
primarily striving to protect dependents of uncertainty, which are part of life. A sense of responsibility towards the dependents is a fundamental driver of demand for life insurance. However, the number of people dependent on the breadwinner can have the opposite effect of what was discussed in terms of income exhausting requirements of each dependent member. The result of insufficient amounts of available income is the cause of the inability of contracting life protection, so the number of dependents may have a negative effect on the demand for life insurance. The ratio of the population younger than 15 and older than 64 years to the working age population is used as a measure of dependents in society, [3] separately consider the share of the young dependent population and the older dependent population in the working age population. The number of dependents is achieving ambiguous impacts since it is manifested in different motive for hedging and the reasons for saving. Separate consideration of the young and old dependent population gains on the meaning in a situation when in the analysis is included a detailed data on demand with respect to the type of life insurance. A higher level of **education** of the individual is positively associated with the desire to protect dependents. It is considered that a higher level of education results in a stronger awareness of the uncertainties of life [4], [11]. Greater aversion to risk and a greater understanding of the risks, which are related with higher education, result in a greater demand for life insurance. The level of education is associated with the need for protection of dependent family members and their standard of living [13]. The education level of the population is usually measured by the total enrolment in tertiary education regardless of age, expressed as a percentage of the total population of the five-year age group following on from leaving secondary school.

3 EMPIRICAL RESEARCH

Considered countries; Bulgaria, Croatia, Czech Republic, Hungary, Slovakia, and Slovenia constitute a homogenous group according to the criteria of development of the life insurance market. The penetration, as an indicator of the share of life insurance in the total product, and density, as the size of the premium allocation per capita, are the measures considered for six transition countries that reveal the same stage of development of life insurance market with common challenges, which is the convergence to the rest of developed Europe (EU). The indicator of the density of insurance is an absolute indicator. Penetration is a relative indicator adjusted for the change in GDP, therefore less resilient to the movement of the income [3]. Penetration reveals the position of the life insurance industry in relation to all other sectors that contribute to GDP value. Indicator of density as an absolute size indicates a change of scale that is not appointed in the context of the national economy and the position of comparison with other sectors of the national economy. Recent studies, in particular the panel included an analysis, predominantly used penetration of insurance as a measure of the demand that due to the insensitivity of the change in the price [4] and insensitivity to the level of economic development [15] created a reason to critique. The insurance market of selected countries is analysed for the ten-year period from 2003 to 2012, using the data from the annual equidistance between the members of the time series, which reduces claim for correction of possible systemic renewal phenomena within a period of one year. The data that includes both temporal and spatial component of the analysed variables are called the panel data, and the whole process is called the panel analysis.



Source: According to data <http://www.insuranceeurope.eu/>
Figure 1: Life insurance market size measured by average density (USD) in selected countries (2003-2012)



Source: According to data <http://www.insuranceeurope.eu/>
Figure 2: Life insurance market size measured by average penetration in selected countries (2003-2012)

Dependent variable, approximated with density or penetration of insurance, is changed to the units of observation (by country) and by the time, so the evaluation of variables, which really determine the variable demand for life insurance, is considered a more precise [2]. Analytical note of the model equations is as follows:

$$LFINS_{it} = \alpha_i + \beta_1 INCOME_{it} + \beta_2 INFLN_{it} + \beta_3 UNEMP_{it} + \beta_4 NBDEPT_{it} + \beta_5 EDUC_{it} + \varepsilon_{it} \quad (1)$$

$$i = 1, \dots, N; t = 1, \dots, T$$

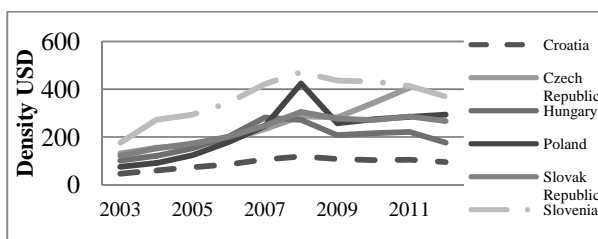
Where N is the number of units of observation, T is the number of periods. Parameter α_i is a constant member, different for each unit of observation, β_1, \dots, β_5 are parameters that are estimated. Furthermore, ε_{it} is the estimation error that is assumed to follow a white noise process.

Table 1: Description of variables and expected impact of independent variables

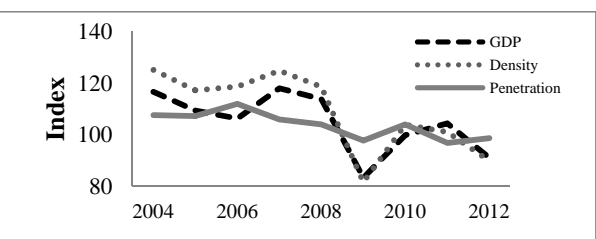
Label	Definition of variable	Expected impact
LFINS	Ratio of gross written premiums to total population (Density)	Dependent variable
LFINS2	Gross written premiums to GDP (Penetration)	Dependent variable
INCOME	GDP per capita (current 000 US\$)	+
INFLN	Inflation, consumer prices (annual %)	-
UNEMP	Unemployment, total (% of total labor force)	-
NBDEPT	Age dependency ratio (% of working-age population)	+/-
EDUC	School enrolment, tertiary (% gross)	+

Source: Author's definition and expectations according to previous research

The movements of the dependent variable, the demand for life insurance, indicates upward trends in the performance till the financial crisis, when positive trends are replaced by a period of stagnation. Poland is the most propulsive market in the period before 2008. The period of financial and economic crisis caused a decrease in the size of the market and stagnation by the end of the period. The least developed market of life insurance among the surveyed countries is Croatia. Indicates the greatest differences compared to other observed countries. General level of the importance of the life insurance market is less influential and trends are less expressed on Croatian example.



Source: According to data <http://www.insuranceeurope.eu/>
Figure 3: Life insurance density in selected countries

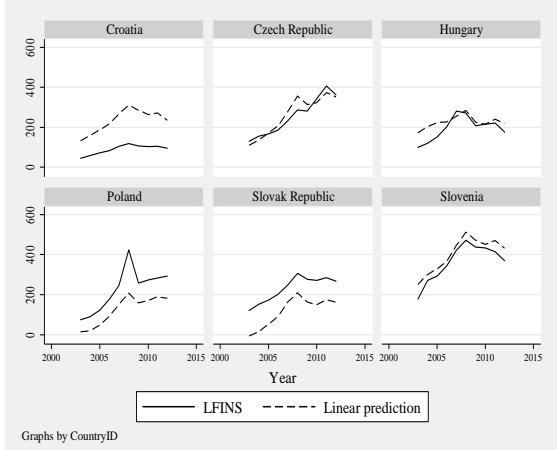


Source: According to data <http://www.insuranceeurope.eu/>
Figure 4: Average indices of all selected countries

Observing average indicators for six countries by years (Figure 3), it has been noted that after 2008 average gross written premium per capita declines from 312.73 USD to 260.96 USD. Hence, the dummy variable is introduced for the period of crisis according to movements of indicators of demand. However, variable crisis shows no statistical significance and does not affect the assessment parameters. The growth rate of demand for life insurance in selected countries exceeds the growth rate of GDP (Figure 4). Hausman test confirms the existence of a correlation between at least one independent variable and the individual intercept, for this reason the model with fixed effects (FE) is accepted as the appropriate model [2]. Despite the presence of a problem of correlation, the estimator of the model with fixed effect is consistent. Furthermore, noted stop of the growing trend in demand for life insurance is the reason of inclusion of the dummy variable crisis which is an adverse effect, but does not show significance in explaining the trends in demand for life insurance regardless of the measure of demand (Table 2). Wooldridge test confirms the absence of serial correlation of residuals. The usual R^2 is valid for comparison of the pooled model estimated by OLS and the FE model, but comparison should be done only within the same class of models and estimators, [14] suggests three measures within, between and overall.

Table 2: Estimated models with graph of forecasting movements of life insurance density compared with real movements in selected countries

	Fixed effect model			
	lfins	lfins	lfins2	lfins2
income	16.38*** (2.997)	16.88*** (3.381)	0.0109 (0.0192)	0.0128 (0.0216)
infln	-2.555 (3.001)	-2.544 (3.029)	-0.00328 (0.0192)	-0.00323 (0.0194)
unemp	-7.862*** (2.609)	-7.958*** (2.650)	-0.0502*** (0.0167)	-0.0506*** (0.0170)
nbdept	13.00** (5.762)	12.80** (5.850)	0.0442 (0.0369)	0.0434 (0.0375)
educ	1.527 (1.345)	1.373 (1.438)	0.0119 (0.00861)	0.0113 (0.00921)
crisis		-4.405 (13.53)		-0.0173 (0.0866)
_cons	-582.4** (238.1)	-569.8** (243.5)	-0.777 (1.524)	-0.727 (1.559)
<i>N</i>	59	59	59	59
<i>Hausman</i>	0.0011	0.0014	0.0003	0.0006
<i>Wooldridge</i>	0.1858	0.1817	0.1823	0.1861
<i>R</i> ²	0.8443	0.8447	0.4767	0.2167



Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Source: Author's estimation according to data <http://www.insuranceeurope.eu/>; <http://www.worldbank.org/>

The results of the analysis are divided depending on the measure of the demand for life insurance. Life insurance is becoming a more attractive way of investing as income rises. A positive relationship is observed in the model where demand is measured by the density of insurance. In the same model, it was confirmed that an increase of the number of dependent members of the population contributes to the development of the insurance market. The latter indicates that the motives for leaving the property in inheritance to dependent family members are expressed in the transition countries. Unemployment as a great problem of the selected countries, the average rate for observed period exceeds 10%, manifests itself as a variable that significant impedes the development of the insurance market. Indicator density of insurance is more sensitive to changes in income, than is the case with an indication of the penetration of the insurance market. Therefore it is said that the model of market penetration is less income elastic, as in the example where significance is lacking. Furthermore, the model contains only

unemployment as significant variable, thus explains the correlation connection and is not used in the assessment of the actual movement of the demand for life insurance. Fixed model best estimates demand for life insurance in the case of the Czech Republic and Slovenia. The presence of inflation shows no significance that can be justified with indexed insurance policies.

4 CONCLUSION

The variables that are estimated by the fixed effect model of demand for life insurance and that showed significance are in accordance with the theory. In conclusion, the conditions in which the economy is with low unemployment rate and households with a stable income, who care about the future of dependents, are the main drivers of economic and demographic growth of the insurance market in the transition countries of Central Europe. If the demand is assumed by indicator of penetration, the conclusion is that higher unemployment rate reduces the share of collected premiums in the total product. The inhibited trend described by variable crisis shows no significance to the assessment parameters. Future research should be consider the impact of the pension system and its long term sustainability, which is the fundamental characteristic considered by demographic indicators, on function and position of the insurance industry.

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