Economic, Demographic and Institutional Determinants of the Insurance Market

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Abstract

Article covers the fundamental social and economic tasks in the area of the insurance market determinants. Insurance market analyses were made by using the gross written premiums as endogenous variable. We can say that we confirm the impact of economic growth on the insurance market. In the area of demographic determinants, we clearly demonstrate that the change in the number of employed people in services significantly affects the insurance market. Institutional determinants and their impact were confirmed in determinant gross national expenditure.

Keywords: *economic determinants, demographic determinants, institutional determinants, insurance market*

JEL Classification: C44, C5, G22 E02

Introduction

The insurance market is one of the key components of the economy. It covers the fundamental social and economic tasks in the area of coverage of personal and business risks. It is the point where the insurance demand curve meets with the insurance supply curve. The insurer (the seller) provides the services for the received value from the policyholder, thus providing cover for the insured (buyer). The most important determinants of insurance market development have been divided into three groups – economic, demographic and institutional. We understand the economic determinants as those which influence the insurance market in the positive or negative way. The selection is chosen due to the definition of insurance as redistributory of risk and the form of collective savings. The reason for the inclusion of demographic determinants is that the average life expectancy,

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literacy, level of urbanization, workforce and population demographics are directly affecting consumer risk aversion. Institutional development, archaically the development of institutions identifies in ordinary practice the development of social, civil or other authorities (Encyklopedický ústav SAV, Encyclopaedia Beliana; Ink-Kal, 2013). The institutional development have been captured in the form of education, gross national expenditures and income, size of the public sector and level of openness and transparency level. The aim is to define these various kinds of determinants and confirm or non-confirm their impact on the insurance market and its development.

1. Review of Literature

Research of the insurance market determinants and their impact quantification is being made in various conceptual levels with the aim to identify the relationships between the determinants of the insurance development and insurance market itself. Research of the determinants of non-life insurance is dealt with Szipiro (1985); Beenstock, Dickinson and Khajuria (1988); Outreville (1990); Browne, Chung and Frees (2000); Esho et al. (2004); Khovidhunkit and Weiss (2005); Nakata and Sawada (2007); Zhang and Zhu (2005); Millo and Carmeci (2011) and Feyen, Lester and Rocha (2011). Beenstock, Dickinson and Khajuria (1988) used the panel data for the twelve countries during twelve years in order to verify the relationship between the insurance premiums in the non-life insurance and income and in order to find a marginal propensity to insurance, and also the impact of wealth on the insurance. He found out that not only wealth but also initial wealth is significant determinant that affects the non-life insurance market. These results were confirmed in by Outreville (1990), who said that the demand for insurance is more affected by the elasticity of gross domestic product (GDP) than by the average of GDP, which can in some way represent the Beenstock, Dickinson and Khajuria (1988) meaning of wealth. Because of these studies we have also included the determinants GDP and Gini coefficient in our research, to measure income inequality, gross national income and wealth. Browne, Chung and Frees (2000) examined 22 OECD countries in the time period from 1987 to 1993. The study focuses on the two types of insurance, namely motor insurance and liability insurance. The panel data regression showed that significant determinants of these kinds of non-life insurance are GDP, wealth, market share, and the form of the legal system (the English or continental system). Esho (2004), on the other hand, found new relationships in the insurance market. He found that the level of protection of property rights, and GDP are significant determinants of non-life insurance. Khovidhunkit and Weiss (2005)

examined the development of the premiums written in the liability insurance for damage caused by driving of the motor vehicle in the U.S. from 1982 to 1994. In the research was used log-linear model. He included household income, price level, and urbanization, the average price of cars, legal status, average age, traffic density and number of cars´ registration into the model. Despite of the relatively low significance of the model (R^2 = 20%), he found that the traffic density, income and the number of registrations of new cars have positive effect on the market of non-life insurance in the United States. The average age and car price negatively influence the written premiums in non-life insurance. Nakata and Sawada (2007) tested more-component model, where they included population, per capita GDP, Gini coefficient, the development of finance sector and legal enforceability as determinants. Only the legal enforceability came out significant this time. Millo and Carmeci (2011) were trying to identify significant determinants in the Italian non-life insurance market. They found a positive impact of wealth, population density and a negative impact of the legal system inefficiency. Legal system inefficiency was measured as the difference between the GDP in the northern part of Italy compared to the southern part. Feyen, Lester and Rocha (2011) found that the non-life insurance market is more important among the OECD countries than among the countries of Central and Eastern Europe. As the significant economic determinants, they found, were inflation, GDP per capita and the degree of development of the credit market. The significant demographic determinants in the research were index of vitality, population size, the life expectancy and the rate of unemployment. They included cultural determinants also. Significant cultural determinants were the average number of years in school, the amount of cars and religion. As the significant institutional aspects, they have identified, were the development of the financial sector, the size of the insurance market, balance of payments, the share of the private sector in the economy and the size of the private sector and the degree of development of the credit market as the significant determinants of the insurance market development. The results in the framework of the non-life insurance market showed a positive effect of GDP, the amount of cars and the balance of payments. The negative impact was demonstrated in the determinants population size and religion. Not significant determinants were inflation and the size of the insurance market. All four groups of determinants were tested separately with the loglinear regression model, which could have affected the results. The aim was not to provide a comprehensive model of the behavior of the insurance market but on the amount of statistical data collected to investigate which determinants are significant in the field of non-life insurance. The area of life insurance determinants has been reviewed by Campbell (1980); Hammond, Houston and Melander

(1987); Browne and Kim (1993); Outreville (1996); Beck and Webb (2003); Li et al. (2009), and many other. Campbell (1980) found that the optimal insurance cover in the life insurance is provided when insurers provide fair insurance coverage, when the profit is equal to zero. Subsequently, after proof of this hypothesis he formulated the equation for the optimum insurance coverage on the basis of the Taylor-Swift equation. Hammond, Houston and Melander (1987) created a linear regression model of the demand for insurance cover in the United States. This model was one of the first models created for the insurance market on this theoretical basement. The specialness of this model was that it has investigated the influence of the determinants at the 99% significance level that can be considered to be important in modeling the demand for insurance. Browne and Kim (1993) examined the factors that lead to differences extent the state of development of the life insurance market using the regression analysis in the years 1980 to 1987 in selected countries of the OECD. They have found out a positive impact of the index of vitality on the insurance market development. The negative impact was measured to be caused by the inflation, the price of insurance and religion. The life expectancy and educational level did not show as significant. Outreville (1996) examined the relationship between economic growth and the life insurance market. In the study are described the negative effects of monopoly markets on the development of the life insurance market. He compares cross-sectional data from 48 countries for the year 1986. He included the level of the insurance market development and the level of the financial market development into the regression model. The research is special because it included new determinants such as the percentage of the population employed in agriculture, the percentage of the population with access to drinking water and the share of population with university education, inflation, and the level of financial development. He noted that emerging markets have a larger problem with the qualified workforce, and thus with the development of the insurance market than a developed markets. Beck and Webb (2003) investigated the determinants of life insurance in 68 countries. These determinants were divided into the economic, demographic and institutional. They identified many significant determinants and have used several types of regression analysis and various different approaches to measure the influence on the insurance market with the knowledge of econometric apparatus. They found many significant determinants as GDP, consumption, education level, the degree of development of the banking sector, gross national income, the estimated age of maturity, population, index of vitality, the inflation, the growth of M2 aggregate and the legislative system. The data, they used, have a panel character and were examined for the period from 1961 to 2000.

T a b l e 1

Division of the Insurance Market Determinants Used in the Research

Group of determinants: Economic determinants			
Determinant	*Type of determinants*		
Inflation	GDP deflator	Inflation	CPI – Consumer price index
Interest rate	M2 growth	Interests	Real interest rate
Household credit	Household credit provided by the financial sector	Household credit from the private sector	Household credit from the private sector provided by the banks
Return on the stock market	Return on the stock market		
Balance of payments	Net trading with goods and services	Export of the goods and services as the % of the GDP/volume	
Foreign direct investments	Foreign direct investments		
Level of economic performance	Consumption	Gross domestic product (GDP), GDP per capita	Unemployment
	Gross national savings	Poverty of the citizens	Gross national product (GNP)
Group of determinants: Demographic determinants			
Determinant	*Type of determinants*		
Average life expectancy	Average life expectancy		
Literacy	Literacy		
Level of urbanization	Growth of the urban population	Urban population	
Workforce	Employment in services	Workforce	Vitality index
Population	Natality		
Group of determinants: Institutional determinants			
Determinant	*Type of determinants*		
Added value of industrial production	Added value of industrial production		
Education	Expenditures on student		
Gross national expenditures and income	Gross national expenditures	Gross national income	
Size of the public sector	Expenditures on public sector		
Level of openness and transparency level	Transparency level	GINI index	Ease of doing business

Source: Own construction based on Beck and Webb (2003).

Li et al. (2007) examined the markets of life insurance OECD countries. In this study he used panel data from the 1993 to the year 2000 for the 30 OECD countries in order to make the life insurance market model including determinants such as disposable income, age of maturity, interest rate, the household credit, the educational level, the development of M2, inflation, social sector expenditure, the index of vitality and the foreign insurers ratio. The positive impact was found to be caused by the determinants: life expectancy, disposable income, educational level and aggregate of M2. Negative effect, in turn, was declared by the share of foreign insurers, the social sector expenditure and inflation. As not significant has been

proven to be the real interest rate. The benefit of this research is the demonstration of the M2 impact and the finding of a positive impact of wealth through disposable income. Also the rate of education is the determinant, which was not proven to be significant in other studies. In this research was used the method of least squares. The studies usually investigate the impact of the determinants on the aggregate insurance market demand. Our research adopted the same approach.

2. Research Environment

As research environment we have chosen the insurance markets of small open economies of the Slovak Republic, Hungary, the Czech Republic, Slovenia, Austria and Portugal. We have chosen this research environment due to selection criterion presented in Table 2 and Table 3.

T a b l e 2

Selection Criteria for Selection of the Research Environment

Selection criteria								
Population and area			GDP Growth			Average values for insurance market		
Country	Population	Area in km^2	Modus	Median	Average	Share of the life insurance	Life insurance premiums / gross domestic product	Growth of the insurance premiums
Austria	8 507 786	83 879	2	2.172	1.918	37.48	2.42	4.23
Slovakia	5 415 949	49 036	4	2.503	2.319	36.10	1.64	3.51
Slovenia	2 061 085	20 273	4	3.305	2.088	56.27	5.77	3.33
Czech Rep.	10 512 419	78 866	2	1.682	1.190	42.72	1.60	3.99
Hungary	9 879 000	93 023	5	4.770	4.039	47.86	2.60	3.13
Portugal	10 427 301	92 211	4	3.408	2.535	23.14	5.36	3.45

Source: <http://europa.eu/about-eu/countries/member-countries/index_sk.htm>.

T a b l e 3

Allocation of the Insurance Market Capital

Country	Bonds	Stocks	Other	Country	Bonds	Stocks	Other
Austria	72.3	8.1	19.6	Czech republic	67.8	12.2	19.9
Slovakia	87.0	1.5	11.5	Hungary	87.3	2.5	10.2
Slovenia	75.5	5.6	18.8	Portugal	76.5	3.7	19.8

Note: Insurance market capital in the selected countries consists mainly of the bonds.

Source: OECD (2014).

The first selection criterion was the similarity in the main demographic and geographic statistics. In this respect, Slovak republic and Slovenia are beyond the average but due to other similarities they can be included in the small open

economies panel. Another selection criterion are changes in the economy. We see significant common trend in this regard. The most important characteristics are the similarities in the context of insurance markets. In this respect, we focused on the similarities related with the changes in the written premium growth of the individual countries, the life and non-life insurance penetration and allocations of written premiums funds. In this section we examined research environment. We found that the biggest variations between the countries are within the demographic group of determinants. In the share of life insurance we recorded 11.3% standard deviation. In the other investigated determinants were standard deviations between countries in values of up to 2%. Due to this fact we can assume the homogeneity of our research environment.

3. Significance of the Individual Determinants

We have selected the premiums per capita as the dependent variable in the analyses. Data covers the period from 1997 to 2014. All the data we used are in current prices. We analyse the insurance market as a whole (both life and nonlife insurance). The insurance market determinants are divided into three groups, namely economic, demographic, and institutional, that are tested by Pearson and Spearman correlation analysis for each selected country. As a dividing line for significance of determinants we have chosen the correlation degree of 0.6, which is higher than in other studies, which are using the 0.5 degree.

For example, we have chosen more types of determinant for the determinant "Level of economic performance" (GDP, GNP in current prices, GDP per capita, GNP per capita), but we selected just the one with the highest correlation coefficient with respect to the dependent variable (GNP). Firstly, we summarized correlation analysis between countries, so that it clearly can be seen that determinants correlate with the dependent variable. The strongest relations are provided in the Table 4.

On the basis of the research of correlation relations between the development of the insurance market and the determinants of the premium market and their types in six small open economies we used these determinants and their types in further research by providing logarithmic regression analysis of the impact of economic, demographic, and institutional determinants on the insurance market. In this log-log model, we recorded the variables that exceed the t-test, are correlated with dependent variable, are not co-integrated with dependent variable and exceed unit root test. The shape of the model with the significant variables is presented in the Formula 1.

Table 4

Significant Type of Determinants of the Insurance Market for Further Research

INSURANCE DETERMINANTS								
Group of determinants	**Determinant**	**Type of determinants**	**Slovakia**	**Hungary**	**Portugal**	**Slovenia**	**Czech Republic**	**Austria**
Economic determinants	*Inflation*	Consumer pricing index	**.8123**	.4752	**.8923**	**.6522**	**.8570**	**.7045**
	Interest rate	Interest on debt	**.6114**	.3376	.4658	.2194	.4907	–.2717
		M2 Growth	–.0627	.3096	**.8267**	–.1324	.2278	–.4335
		Real interest rate	–.0896	–.1500	**–.6701**	–.2676	**.6474**	0.00
	Household credit	provided by bank	.0346	.5789	**.9205**	**.8250**	.5377	**.7611**
		provided by financial sector	.4125	.5575	.5471	**.8250**	**.6477**	.5769
	Balance of payments	Net trade with goods and services	**.6543**	.5309	**.8832**	**.7393**	**.6896**	.5788
		Export of goods and services	**.9212**	–.1450	.4981	**.9106**	**.9285**	**.7164**
	Level of economic performance	GDP deflator	**.7442**	–.3365	**.9068**	**.6364**	**.8226**	**.7530**
		GDP per capita	**.9073**	.5118	**.9681**	**.7729**	**.9888**	**.9328**
		Gross national product	**.9250**	.4789	**.9680**	**.7779**	**.9897**	**.9307**
Demographic determinants	*Level of urbanization*	Growth of the urban population	–.4249	–.3794	**.9313**	–.3040	**–.9321**	**.6659**
	Workforce	Employment in services	.3795	–.5854	**.6341**	.3523	.5820	**.8400**
	Expenditures per student	Expenditure on basic school student	**.6308**	**.6449**	**.6686**	.2047	.5235	**.8214**
Institutional determinants	*Gross national expenditures*	Expenditures on household expenditures	**.9307**	.5991	.4367	**.7884**	**.9888**	**–.8214**
		Gross national expenditures	**.9184**	**.7697**	.4981	**.7712**	**.9875**	**.9278**
		Expenditures on public sector	.2674	.3715	**.8483**	**.7365**	.0015	**.8214**
	Foreign direct investments		**.6568**	.0477	**.6459**	**.8808**	**.6250**	**.6102**

Source: Own calculations.

Formula 1

Prais-Winsten OLS log-log Regression Model

$$
\begin{aligned}
&\boldsymbol{log\ premiums\ written} \\
&\quad = \mathbf{0.04}\ \boldsymbol{household\ credit\ provided\ by\ banks} \\
&\quad - \mathbf{0.05}\ \boldsymbol{foreign\ direct\ investments} + \mathbf{4.38}\ \boldsymbol{gross\ national\ product} \\
&\quad + \mathbf{1.71}\ \boldsymbol{HICP}\ (\boldsymbol{Inflation}) + \mathbf{0.07}\ \boldsymbol{urban\ population\ growth} \\
&\quad - \mathbf{5.77}\ \boldsymbol{share\ of\ employed\ as\ the\ part\ of\ the\ workforce} \\
&\quad + \mathbf{0.11}\ \boldsymbol{total\ expenditures\ on\ government\ consumption} \\
&\quad + \mathbf{0.09}\ \boldsymbol{expenditures\ on\ primary\ school\ student} \\
&\quad - \mathbf{4.31}\ \boldsymbol{gross\ national\ expenditures} - \mathbf{5.59}\ \boldsymbol{employment\ in\ service} \\
&\quad + \mathbf{34.51}(\boldsymbol{constant}) + \mathbf{0.47}(\boldsymbol{rho\ variable})
\end{aligned}
$$

Source: Own calculations.

According to this model, the change in the share of the employed has a negative impact on the change in the insurance market. But, this result does not correspond with the empirical studies in the field of life insurance, Hammond, Houston and Melander (1987), Miller (1985), and Fitzgerald (1987) that have demonstrated a positive impact on the demand for life insurance. The reason may be in the studied countries because during the examined period there have been several shocks in the area of employment. In the context of small open economies, which we have chosen, has occurred during the nineties a huge decline in the share of the employed labor force and as the crisis development was marked by the reduction of the share. At the same time the insurance market showed a steady growth, which in this case suggests a possible negative impact of employment in the insurance market. Employment in services has as well as in the volume model a negative impact on the change of the prescribed premium. Expenditure per student are the same as in the volume model, has a negative impact on the change of the written premium. Loans to households by banks have a positive impact on the growth of the insurance market. This determinant can be explained so that households that are more in debt have a higher probability of occurring risky events which affects their expected future wealth. This effect was also confirmed by empirical studies, for all we can mention for example the study of Beck and Webb (2003).

Urbanization has a positive impact on the growth of the insurance market. The positive impact of determinants confirms the many studies from all we can mention Beck and Webb (2003), Halek and Eisenhauer (2001) and Truett and Truett (1990). Gross national expenditures don´t confirm the assumptions as well as in the volume model. The growth of the gross national product reported in our model decrease significantly positive impact on the development of the insurance market. This effect has been confirmed by a Fortune (1973); Campbell (1980); Beenstock, Dickinson, Khajuria (1988); Lewis (1989); Browne and Kim (1993); Outreville (1996); Ward and Zurbruegg (2002); Beck and Webb (2003) and Li et al. (2009). We have as determinant GNP (gros national product) not GDP, because our correlation analysis has shown as a determinant with the more significant influence as the gross domestic product. Government consumption stimulates aggregate demand. Its impact has not been separately researched yet, but researches in the field of the investigation of consumption and the size of the state sector indicate that increasing government consumption affects growth of wealth and the higher the insurance coverage, what we in our model have confirmed. Foreign direct investment and their negative impact are also not proven as in the result from the point of view of theoretical research. It is possible that within the researched data outweigh the negative impact of inflows of foreign investments over the positive. Inflation in this case shows a positive effect, which does not correspond with the already made empirical studies.

T a b l e 5

Regression Analysis

Type of regression analysis		**Prais-Winsten regression analysis with regulated panels and standard errors (PCSEs)**				**Prais-Winsten regression analysis with regulated panels and standard errors (PCSEs) with Bayesian approach**			
Panels are divided by time and countries		Number of observations:			102	Panels are divided by time and countries		Number of observations: 10 000	
Level of autocorrelation: 1		Number of groups:			6	Sigma			
Expected covariation	= 21	R^2 = 0.9255			Min. = 17	R^2 = 1.0000			
Expected autocorrelation	= 6	Wald ^{chi2} (18) = 1217.48			Aver. =17	Adj. R = 1.0000			
Expected coefficients	= 21	Prob > chi2 = 0.0000			Max. = 17	Prob > chi2 = 0.0000			
Significant variables		Coefficient	Standard deviation	Z	P > |z|	Coefficient	Standard deviation	Z	P > |z|
Economic determinants									
Household credit provided by banks		0.039989	0.0108	3.72	0	.286073	.0080855	35.38	0.00
Foreign direct investments		–0.053399	0.0308	–1.73	0.08	1.908957	.010574	180.5	0.00
Gross national product		4.38345	1.4943	2.93	0.00	1.059913	.0144225	73.49	0.00
Inflation – HICP		1.70826	0.2747	6.22	0	–.756731	.006204	–121.9	0.00
Demographic determinants									
Urban population growth		0.070353	0.0416	2.52	0.09	.148995	.0059622	24.99	0.00
Share of the employed as a part of the workforce		–5.76772	1.3698	–4.21	0	3.567210	.0268521	32.58	0.00
Employment in services		–5.58709	1.1636	–4.80	0	3.256820	.02563	–215.3	0.01
Institutional determinants									
Total expenditures on government consumption		0.106988	0.0124	8.63	0	–.637983	.00363	–175.7	0.00
Expenditures on primary school student		0.091286	0.0388	2.35	0.02	.006232	.00671	119.5	0.00
Gross national expenditures		–4.30673	1.6627	–2.59	0.01	.801783	.00993	–162.4	0.00
Constant and Rho term									
Constant		34.50777	7.8782	4.38	0	34.50777	7.8782	4.38	0.00
Rho		0.469354	0.5161	0.05	0.45	0.46935	0.5161	0.050	0.00

Source: Own calculations.

Rho in this case is the autocorrelation parameter which shows up because you have specified an ar(1) autocorrelation, should be lower than 1. Conclusion with using the Bayesian probability calculation point specifies us the outputs of the Prais-Winsten regression analysis in this case are confirmed. We see that despite the modern approach is model based on residuals and the model volume in the case of a determinant of employment and inflation are separated. This model is characterized by a high significance and its results are significant. Bayesian approach allows us to increase the number of observations using lectures about Bayesian probability by calculation its algorithm amended by the Monte Carlo

method. This makes this model more accurately so it can specify estimation of the coefficients in the regression line in the case, when we don´t have enough data. The amount of data generated by this approach is such, as if we had panel data on an hourly basis. The truth however is that we cannot with certainty exclude the determinants, which do not affect the dependent variable, therefore, we have to estimate this line used the only determinants of that in us the estimated the most probable regression line, which emerged as significant and only by these we then adjusted the estimate of the coefficients. To estimate the determinants of the regression line using the Bayesian coefficients, we used the basic linear regression model estimated by the method of least squares. By comparing the individual determinants, we see confirmation of the coefficients from the previous regression analysis and their adjustment. The changes occurred by reducing the coefficients in the employment and relatively balancing model, with the outputs we have considered as credible. These results provide a clearer picture of the determinants of the premium market, which were confirmed by the Prais-Winsten regression analysis. It shows us their impact more clearly the influence of easily ascertainable Metropolis-Hastings methods for the enlargement of the number of observations.

4. Significance Test of Regression-proved Determinants Using the Panel Vector Autoregressive Methods

In this case, we determinants, which appeared in the regression equation, were applied in a panel vector-autoregressive model, for the purpose of examination of the impacts of sudden changes in the determinant of the dependent variable. This model can be considered as an alternative to regression model and is often used for prediction of the effects of individual independent variables between them (Love and Ziccino, 2006).

Subsequently, we used a basic vector autoregressive model and then estimated the impulse-response effects, which shows us how they will behave insurance market in sudden changes in the individual determinants. A prerequisite for the selection of this method is the assumption that the insurance market is being justified by the lagged values of all of us examined each type of determinant, which at the same time for these variables is also valid in reverse sequence. Demographic determinants, tested as the first, were the share of the employed in the labor force, employment in services and the growth of the urban population. Dependent variable is total gross premiums. Within these variables we are able to a sudden expectation at the 90% significance level described in the framework of the determinant of employment in services. Results are shown on the Table 6.

T a b l e 6

T-test and Standard Deviation of VAR Analysis

T-test and standard deviation of VAR analysis			
Tested group of determinants	**Demographic determinants**	Number of observations	90
Determinants	*Type of determinants*	*Standard deviation*	*t-test*
Workforce	The share of employed in the Workforce	14.27865	–1.4486
	Employment in service	33.57430	**0.102725**
Level of urbanization	Growth of urban population	67.44634	–0.31617
Tested group of determinants	**Economic determinants**	Number of observations	90
Household credit	Household credit provided by banks	$4.11*10^{-9}$	–0.4317535
Foreign direct investments	Foreign direct investments	–1.024110	–1.02411
Inflation	Consumer price index	0.127219	**0.12722**
Level of economic performance	Gross national product	0.102805	**0.10281**
Tested group of determinants	**Institutional determinants**	Number of observations	90
Expenditures on student	Expenditures on basic school student	0.0039208	–0.16163863
Gross national expenditures	Gross national expenditures	$3.864*10^{-9}$	**0.11095408**

Source: Own calculations.

T a b l e 7

Effects of the Random Shock in the Determinant on the Insurance Market

Tested group of determinants	**Demographic determinants**	**Economic determinants**		**Institutional determinants**
Determinants	Workforce	Inflation	Level of economic performance	Gross national expenditures
Type of determinants	Employment in services	Consumer price index	Gross national product	Gross national expenditures
Time lag (in years- as we have yearly data- aftershock change)	Impact on gross premiums	Impact on gross premiums	Impact on gross premiums	Impact on the insurance market development
0	0	0	0	0
1	1.1031	2.86	2.66	2.13
2	2.98	5.84	–2.3667	6.39
3	3.09	8.52	–6.9376	11.66
4	5.273	10.13	–11.4493	18.9348

Source: Own calculations.

Despite the fact that we have a very small set of data we estimated the expectations of the shock of this variable on the insurance market. For the types of the determinants that failed in the t test we were not able to quantify the influence of their shock at the premium. We have found that a 1% shock in the type of demographic determinants employment in the service invokes the 1.1% change in the written premiums in the first year after the shock, which corresponds with empirical studies that had more data than we do using the log likelihood, or log-log OLS method. It was a study Hammond, Houston and Melander, and Miller and Fitzgerald. From the economic determinants we used these methods to test loans

to households provided by banks, foreign direct investments, total consumption expenditure, the consumer price index and the gross national product. The third group of the tested determinants is institutional determinants and that per-student expenditure and gross national expenditure.

Compared we have determinants of which has been confirmed to have a significant effect on the insurance market using a log-log Prais-Winsten model as well as in the economic and demographic determinants. We found that of the three selected factors to estimate the impact of a random shock only at the determinant gross national expenditure. Gross national expenditures show a positive impact in a random shock to dependent variable, which corresponds with our assumptions. In conclusion of this part we can say that we demonstrably have confirmed the impact of economic growth on the insurance market. We have confirmed it in the context of regression analysis, through lectures about Bayesian probability calculation point, and subsequently feedback control according to the vector – autoregressive model. In all these models were the growth of the gross national product significant determinants with a positive impact on the insurance market, thus changing the growth of the gross national product has caused changes in the insurance market. From this it then also follows confirmation of the importance and the impact of economic determinants on the insurance market. In the area of demographic determinants, we have clearly demonstrated through the regression analysis, the regression analysis used with the lectures about Bayesian probability calculation point, and vector autoregressive analysis that the change in the structure of the employed, i.e. the change in the number of employed persons services significantly affects the insurance market. It may be caused by higher felt need to use various services, therefore the insured and the locking service, and thus the greater the need to employ a workforce just for this purpose. Institutional determinants and their impact were confirmed in the one determinant gross national expenditure. This type of institutional determinants shows us the expenses which have been carried out by the national entities, i.e. private and public, which is directly affected by the legislative status and expenditures of the government. It turned out that the gross national expenditure reported a positive impact on the insurance market as in the regression analysis in the regression analysis with Bayesian approach, which we then strengthen by the vector autoregressive model. We noticed the positive impact of the determinant of inflation, which contradicts our Bayesian regression analyses and also the respected by Ward and Zurbruegg (2002), Beck and Webb (2003), Li et al. (2009) and others. We observed a positive effect till the second lag of a gross national product on the insurance market, which corresponds with the empirical studies by Browne and Kim (1993), Outreville (1996), Beck and Webb (2003), Li et al. (2009).

Conclusion

An important finding in this work is that the research based on the macroeconomic approach allows us to bring important outcomes the development of the insurance market as an integral part of the financial market. In the research we use a variety of quantitative methods, supported by a broad theoretical base for filtering out various insignificant impacts. The uses of these methods are in order from the easiest to the most difficult. We can say that we demonstrably confirmed the impact of economic growth on the insurance market. We have confirmed it in the context of regression analysis, through lectures about Bayesian probability calculation point, and subsequently with usage of the panel vector – autoregressive method. In all used models has the gross national product significant positive impact on the insurance market. In the area of demographic determinants, we have clearly demonstrated that the volume of the employed people in services significantly affects the insurance market positively. It may be caused by higher feeling of service need, when the service sector is bigger. It is also sign of more developed countries to have bigger service sector, which can affect financial literacy. Institutional determinants and their impact, we confirmed the in one type of determinants in the basic type of gross national expenditures. This type shows us the expenses which have been carried out by the national entities, i.e. private and public, which is directly affected by the legislative status and expenditures of the government. It turned out that the gross national expenditure reported a positive impact on the insurance market as in the regression analysis in the regression analysis with Bayesian approach, which we then strengthen by vector autoregressive model.

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