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FACTORS INFLUENCING STRATEGIC DEVELOPMENT OF INSURANCE BROKERS MARKET İN THE CZECH REPUBLIC

Abstract

The aim of the paper is to recognise the relationship among Gross Premiums Written and Average Gross Nominal Wage (Average Wage) in the Czech Republic. The literature review has characterised insurance market in the Czech Republic. Based on the secondary data of Czech Insurance Association, Czech Statistical Office and Czech National Bank has been created PESTEL analysis, determined the rate of influence of the factors influencing the insurance brokers, evaluated by scale from 1 to 5. The secondary data for regression analysis has been obtained from annual reports of CNB and CSO in period 1996 to 2015. The method of regression analysis has tested the relationship among average gross nominal wage as one of the macroeconomic factor and the "premiums written "which is used for measurement of the overall insurance market level in the Czech Republic. The model was verified through the economic, statistical and econometric verification. The statistical data has been elaborated in software Gretl. Part discussion and conclusion have been focused to the comparison of obtained results and reaction recommendation on upcoming predicted situations on the market.

Keywords: Strategic development, insurance market, brokers

1. INTRODUCTION

Insurance market in the Czech Republic consists of several subjects, the insurance companies, their clients and insurance intermediaries. These intermediaries can be natural or legal person and they facilitate a communication among insurance company and client (Curland, 2004, Samaroo 2011, Dionne, 2012). Surveillance function of this market is guided by Czech National Bank (herein after CNB). According to statistics of CNB , in the Czech republic, there currently operate 54 insurance

companies, 881 foreign insurance companies which provide foreign services, 155 980 domestic insurance intermediaries, 6020 foreign insurance intermediaries and 263 liquidators of insurance event (CNB, 2017). The premiums written is used for measurement of efficiency of the insurance market and each insurance company (Cummins, Doherty, 2006, Niehaus, 2008, Cebul et al., 2011).

The aim of the paper is to recognise the relationship among Gross Premiums Written and Average Gross Nominal Wage (Average Wage) in the Czech Republic. The purpose of this paper was to analyse and assess the main macro environment factors which affect the segment of insurance brokers in the Czech Republic. With usage of PESTEL analysis and synthesis of the individual factors, there were stated the most important factors. Based on the secondary data of Czech Insurance Association, Czech Statistical Office (herein after CSO) and Czech National Bank has been created PESTEL analysis, determined the rate of influence of the factors influencing the insurance brokers, evaluated by scale from 1 to 5.

The secondary data for regression analysis has been obtained from annual reports of CNB and CSO in period 1996 to 2015. The method of regression analysis has tested the relationship among average gross nominal wage as one of the macroeconomic factor and the "premiums written "which is used for measurement of the overall insurance market level in the Czech Republic. The model was verified through the economic, statistical and econometric verification. The statistical data has been elaborated in software Gretl.

2. LITERATURE REVIEW

In the second half of 20th century, insurance market was strongly influenced by political situations. The main change was the monopolization of this market. After Fall of Communism, the monopoly of state insurance company was cancelled and created competitive insurance market as we know. The Join of the Czech Republic to European Union in 2004 meant the integration to EU insurance market. (Karfíková, Přikryl 2010)

The insurance market is focused on insurance protection and creation of reserves with the aim of stabilization of economic subjects, coverage of their potential losses and creation of reserves of insurance companies on the market. (Hungelmann, 2001, Dionne, 2012)

The existence of insurance broker in the Czech Republic started after The Velvet Revolution with the beginning of competitive market. In Western countries, this profession originated much earlier and has a respected position in the insurance market. In Europe, the Directive 2002/92/ES changed the conditions for insurance brokers. It enabled to carry on their business in all of EU countries. Nowadays, segment of insurance brokers has increasing trend and significant influence on insurance market in the world and also in the Czech Republic. (Kutina, 2010, Brar, Singh, 2016) According to Hrubošová (2009), insurance broker represents the highest level of intermediary. It can be natural or legal person. Two basic tasks of broker are risk analysis and offering of proper insurance product. Broker works for the client on the basis of contract and offers him a large quantity of services. Every broker is obliged to be insured for material responsibility with limit of indemnity of 1,2 million EUR in case of each insurance event. (Kutina, 2010, Goulder, Lester, Gonulal, 2012).

The volume of premiums written as an indicator which indicates the amount of premiums on the market in certain year, is influenced by the amount of insurance contracts, the sum of payment and types of risks which are insured. The premiums written is used for measurement of efficiency of the insurance market, each insurance company the gross premiums written has long term increasing trend, which is nowadays more stable. (Niehaus, 2008, Ninova, 2018). Nevertheless, it still means a positive development of whole insurance market in the Czech Republic. Non-life insurance is a long term more popular in population of CR. In 1996, the portion of life insurance was only 26, 6 % in comparison to non-life insurance which reached portion of 73,4 %. Nowadays,

the portion of life insurance is much higher; it reached 40, 7 % and it is approaching the trend of European Union (Clipici, Bolovan, 2012, CNB, 2017).

3. REGRESSION ANALYSIS

The most important factors from PESTEL analysis which influence the insurance brokers have been evaluated. There have also been determined the rate of influence. Individual factors have been evaluated by scale from 1 to 5. Number 1 means low influence, number 5 means high influence. The chosen value have been highlighted by black bold colour.

Table 1 Rate of Influence of Factors from PESTEL

Factors		Rate of Influence				
Political	Legislation of Czech Republic - Insurance Market	1	2	3	4	5
	Legislation of European Union	1	2	3	4	5
Economic	Gross Domestic Product	1	2	3	4	5
	Inflation	1	2	3	4	5
	Unemployment	1	2	3	4	5
	Average Wage	1	2	3	4	5
Social	Number of Inhabitants (Age)	1	2	3	4	5
	Level of Education	1	2	3	4	5
Technological	Computer Technology	1	2	3	4	5
Environmental	Protection of Nature	1	2	3	4	5
Legal	General Legislation of Czech Republic	1	2	3	4	5

Source: author's calculations

From the table, it can be stated that the most important factor for insurance brokers has been the legislation of Czech Republic which regulates the work of insurance brokers. The next important factors have been legislation of European Union, Gross Domestic Product, number of inhabitants and their age and computer technology. The factors, which were in the middle of scope, were inflation, unemployment, average wage and general legislation of Czech Republic. The factor, which does not have strong influence, has been level of education. The least important factor has been the environmental factor, which do not influence insurance brokers almost at all. With usage of Gretl, it has been tested the relationship among Gross Premiums Written and Average Gross Nominal Wage (Average Wage) in the Czech Republic. The secondary data for this analysis were in form of Time Series from years 1996 to 2015 and they were obtained from databases and annual reports of Czech National Bank and Czech Statistical Office.

3.1. Specification of Econometric model

In this model, the Gross Premiums Written has been dependent variable (explained by model). The Average Gross Nominal Wage has been represented independent variable (explanatory variable). The development of Gross Premiums Written in the CR from year 1996 to 2015 can be seen at the figure 1.
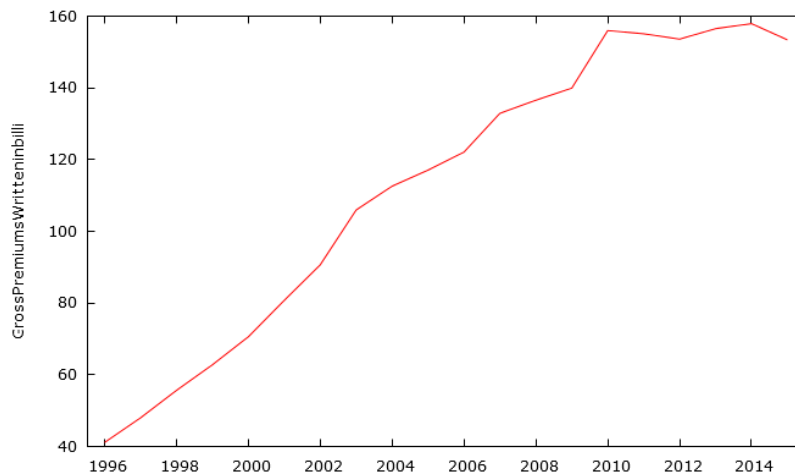
Source: author's calculations

Figure 1 The Development of Gross Premiums Written in Czech Republic (Gretl)

Table 2 Variables in Econometric Model

Variables	Denomination	Description	Unit
Dependent	Y	Gross Premiums Written	in billions of CZK
Independent	X	Average Gross Nom. Wage	in CZK

Source: author's calculations

The expected sign of coefficient β has been positive. It has been assumed that with increasing wage, people will spend more money for life insurance and as well as they will need more and better insurance for their property. In the following table, there have been compared the functions forms in order to choose the most suitable form for our model.

Table 3 Comparison of Function Forms

	Linear	Quadratic	Inverse	Lin-log	Log-lin	Log-log
R2	0.974690	0.990113	0.966273	0.988262	0.919780	0.971558
AIC	134.2601	117.4604	140.0023	118.8921	-24.13323	-44.87149
SIC	136.2516	120.4476	141.9937	120.8836	-22.14177	-42.88002
HQC	134.6489	118.0435	140.3910	119.2809	-23.74448	-44.48273

Source: author's calculations

In the table, there were compared R2 (coefficient of determination) and three Information Criteria. In Log-lin and Log-log form, the information Criteria have been negative thanks to the logarithm of dependent variable. Nevertheless, it has been obvious that Quadratic form have had the highest R2 and lowest Information Criteria. It can be stated that the most suitable model is quadratic. The expected sign of β1 has been still positive, but it has been expected that parabolic model will growth into maximum of this function and then, it will decrease. Thus, the expected sign of β2 has been negative.

3.2. Quantification of Econometric Model Subchapter

For the estimation of coefficients values, there has been used the Ordinary Least Squares method. In the following table, the OLS estimation from Gretl can be found.

Table 4 OLS Estimation of Parameters

	Coefficient	P-value
const	-90.1445	<0.0001
AverageWage	0.0151958	<0.0001
sq_AverageWage	-2.18192*10-7	<0.0001

Source: author's calculations

3.3. Verification of Econometric Model

Economic verification: the sign of β1 in the equation has been positive and the sign of β2 has been, negative, as it was expected.

Statistic verification: for the T-test, has been used the Golden Rule for use of P-value. Table 5 confirms that all p-values have been <0.0001. It means that all p-values in this model have been lower than 0.05, thus, there can be rejected H_0. The regression coefficients have been statistically significant.

Table 5 ANOVA table

Analysis of Variance	Sum of Squares	df	Mean Square	Fstat	Fquantile	P-value
Regression	30868.4	2	15434.2	851.229	0.990113	$9.08*10^{-18}$
Residual	308.239	17	18.1317	-	-	-
Total	31176.7	19	1640.88	-	-	-

Source: author's calculations

For the F-test, there has been used the Golden Rule of P-value. The ANOVA table determines, that the p-value is equal to 9.08*10-18. Thus, there can be rejected H_0. It has been verified that the model is statistically significant. Coefficient of determination and Information Criteria, these values have already been used in specification of econometric model in order to choose the best function form. The best option was the quadratic form with R2= 0.990113, it means that this model explained 99% and prove quality.

Econometric verification:

Classical Assumption 1 – There has been tested the correct specification of model by RESET test and LM test. The hypothesis were: H_0: correct specification, H_1: incorrect specification.

Table 6 Tests of Classical Assumption 1

| Test	P-value
RESET test	0.304
LM test (squares)	0.447742
LM test (logs)	0.137214

Source: author's calculations

All p-values have been higher than 0.05, thus, H_0 about correct specification of our model was not rejected

Classical Assumption 2. This condition has been automatically fulfilled due to usage of OLS.

Classical Assumption 3. According to correlation matrix, this model does not have problem with correlation of errors and regressors.

Classical Assumption 4. There has been tested the serial correlation with usage of Ljung - Box test. There has been used p-value and the hypotheses were as follows: H_0: no serial correlation, H_1: serial correlation. P-value in Ljung – Box test has been equal to 0.374 which is higher than 0.05. Thus, H_0 was not rejected. For the verification of autocorrelation, there has been used also Residual Correlogram. The following figure depicts that none of the values crossed the blue lines, non-rejection of H_0 has been confirmed.
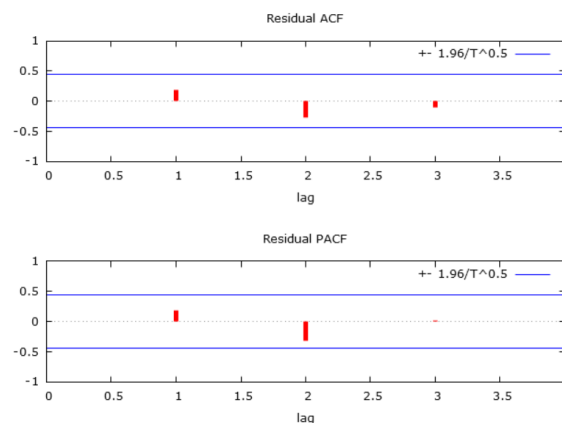
Source: author's calculations

Figure 2 The Residual Correlogram (Gretl)

Classical Assumption 5. There has been tested the heteroscedasticity of this model. The hypothesis were: H_0: Homoscedasticity, H_1: Heteroscedasticity

Table 7 Tests of Heteroscedasticity

Tests	P-value
White´s test	0.708267
Breusch – Pagan test	0.595956

Source: author's calculations

The p-values of both tests were higher than 0.05. H_0 has not been rejected and there was fulfilled also the fifth classical assumption. This result can be confirmed by the following graph of residuals. The figure showed that there were no curvature in the graph of regression of residuals. This confirms the test and the not rejection of H_0.

Regression residuals (= observed - fitted GrossPremiumsWritteninbilli)
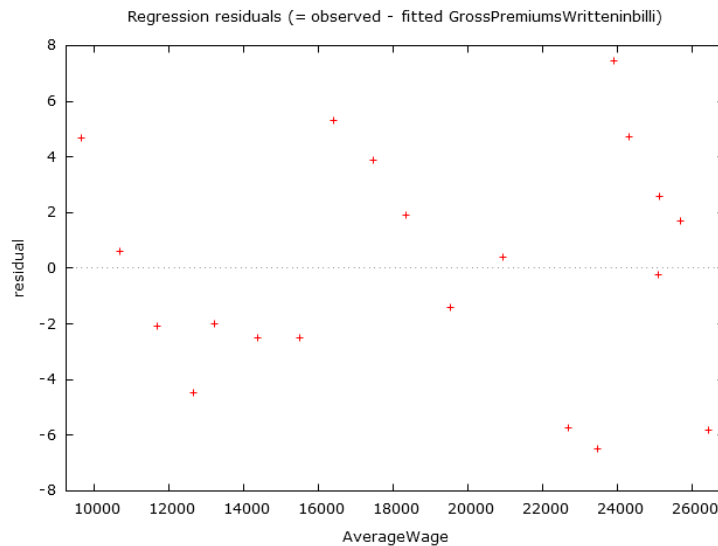
Source: author's calculations

Figure 3 Graph of Residuals (Gretl)

Classical Assumption 6. In this model, there has been used only one explanatory variable, so this assumption cannot be broken. Thus, this assumption has been automatically fulfilled.

Classical Assumption 7. There has been tested the normality of residuals. The hypothesis were: H_0: Error term has normal distribution, H_1: Error term has not normal distribution. The p-value of this test was equal to 0.81866. It can be stated, that the last classical assumption was also fulfilled.

3.4. Summary of results

There were performed the economic, statistical and econometric verification of this model. It was ascertained that all tests were successfully fulfilled. None of the Classical Assumptions were broken, so it can be stated that our model is BUE. The OLS estimations of parameters have been unbiased, consistent, they have minimum variance and normal distribution. It can be proved that there has been the relation among Average Gross Nominal Wage and Gross Premiums Written which is used for measurement of the overall insurance market level in the Czech Republic.

4. DISCUSSION

The insurance brokers segment create important part of insurance market, as they serve as a certain type of mediators among insurance companies and clients. Eckardt states, that the most important factors, which influence the overall insurance market are the general economic conditions, legislation, situation on financial market. (Eckardt, 2007). Vaughans claim that the insurance penetration is one of the basic indicators of insurance industry (Vaughan, Vaughan, 2008). It was stated that it is connected with Gross Domestic Product and gross premiums written. According to insurance penetration, it was described the development of life and non-life insurance (Focht, Richter, Schiller, 2013). Nowadays, the non-life insurance is supposed to be more stable and profitable (Zevnik, 2004). The insurance penetration in the Czech Republic is relatively low so there is a big potential to gain new customers and insurance brokers should use this favourable situation (Mazzeo, 2002, Karaca-Mandic et al, 2016). Janata and Niehaus claim that the

Gross Domestic Product, inflation, wages and other economic conditions influence the insurance industry and also insurance brokers (Janata, 2008, Niehaus, 2008).

5. CONCLUSION

The purpose of this paper was to analyse and assess the main macro environment factors which affect the segment of insurance brokers in the Czech Republic. With usage of PESTEL analysis and synthesis of the individual factors, there were stated the most important factors. Through the regression analysis, it was ascertained, that there is the relationship among average gross nominal wage and gross premiums written. It can be supposed that with increasing wages, the gross premiums written and the overall insurance market will also grows. The current situation on the market of insurance brokers is quite stable. It is obvious, that there still can be some predicted and unpredicted changes. The proper observation of above mentioned factors can significantly influence the success on the market.

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