The Insurance Market of Selected Countries in Central and Eastern Europe Against a Background of the EU Countries-15

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This article concerns the analysis of the insurance market in selected European countries. These countries are divided into two groups. The first group is the first 15 countries that joined the European Union, hereinafter mentioned as the EU-15. The second one is a group of selected countries in Central and Eastern Europe that joined the European Union in 2004. Thus, the first group includes countries such as Austria, Belgium, Denmark, Finland, France, Greece, Spain, the Netherlands, Ireland, Luxembourg, Germany, Portugal, Sweden, United Kingdom, Italy. While the second group contains countries like: Poland, Czech Republic, Slovakia, Hungary, Estonia, Latvia, Slovenia. The study will be based on data from the European Insurance in Figures relating to the years 2003-2012. Analysis of the insurance market will be based on indexes such as gross written premium, density, penetration and claims ratio. In order to compare, the dynamics will be considered. The growth of these indexes is an important element of the study that must be analysed.

The aim of the article is to analyse the insurance market of the Central and Eastern Europe countries and the EU-15 in the last decade. While the research problem is to answer the question: Is there a significant difference between the development of market index in the EU-15 and selected countries of Central and Eastern Europe? The author has enunciate the following thesis: *accession Central and Eastern Europe countries to the European Union will affect the development of the indexes of insurance market at a similar level to what shape the indexes of insurance market of the EU-15.*

The first point presents the analysis of gross written premium, the second point shows analysis of the penetration index, in the third there is density index and the claims ratio in the fourth. Afterwards it will be carried out the comparison of insurance markets in the European countries.
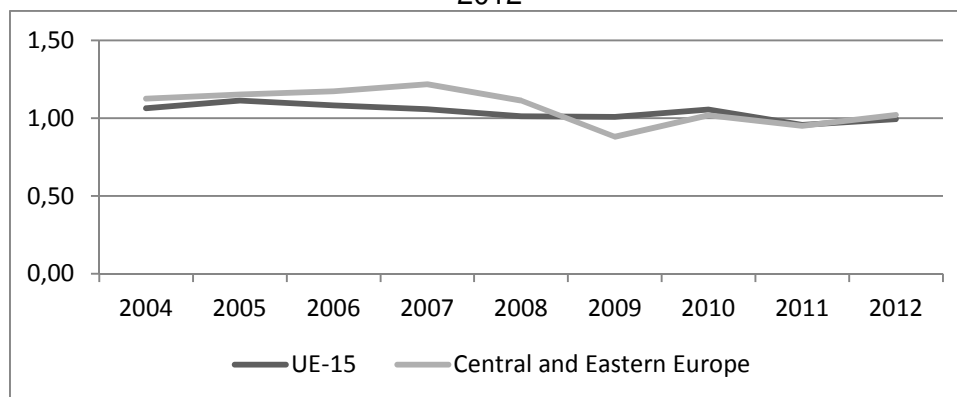
Gross written premium

At the time of conclusion of the contract of insurance the insurer covenants to provide insurance cover, and in the event of happening an insurance accident, the insurance company is to pay the due of indemnity/benefit against for the payment by the policyholder, the insurance premium (Kufel, 2001). Thus, the "*premium is the price for the insurance service*" and "*premium is the primary source of funds necessary to provide insurance coverage*" (Hadyniak &

Monkiewicz, 2010). Therefore gross written premium is extremely important for the assessment of the insurance market (Manikowski, 2013). "*At the conclusion of an insurance contract in each period of cover corresponding premium to this period, is due. Premium due under an insurance contract is called premiums written*" (Hadyniak & Monkiewicz, 2010).

This section analyse the gross written premium. Considering the research problem and enunciate the thesis in order to compare the two groups of countries, analysed the average dynamics of the gross written premium. To use this method of comparative was carried out in a follow study. For each country was created the dynamics of gross written premiums from year to year. Then the homogeneity of each group was studied. To that end it was used the relative measure dispersion, ie the coefficient of variation. "The coefficient of variation is the ratio of the standard deviation or average to the arithmetic mean" (Ignatczyk, 2004). This index for each group was below 20%. This means that each group is homogeneous. You can therefore use the arithmetic mean. Therefore, in the comparative analysis it was used the average dynamics of each group for each year. So, for example, for 2004 was calculated the average dynamics of the EU-15 and the average dynamics of the selected countries of Central and Eastern Europe.

Commercial insurance can be divided into two branches, for life insurance (Branch I) and non-life insurance (Branch II). In this analyse, gross written premium was considered with the division into branches. Graphs 1, 2 and 3 show the results.

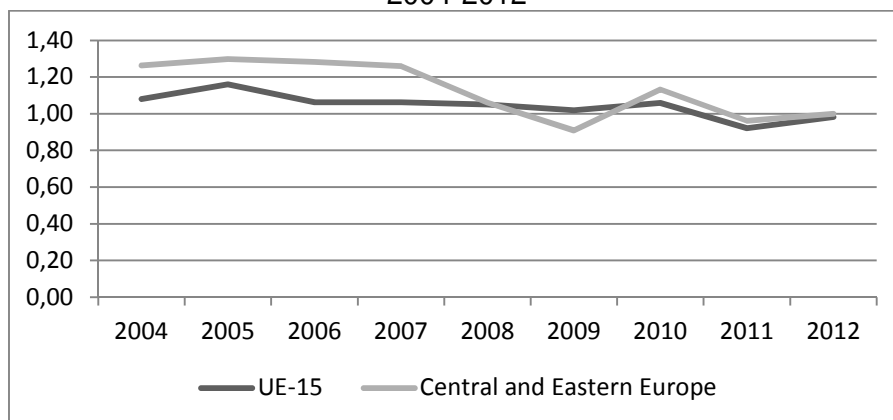Graph 1. The average dynamics of total gross written premiums in the years 2004-2012

Source: Own study based on data from the European Insurance.

The largest gross written premium in the analysed period in the EU-15 occurred in the UK, France and Germany. However, the UK has a much higher insurance gross written premium from other countries. In the second group, the largest gross written premium occurred in Poland. The highest increase in gross written premium in 10 years there is in Luxembourg (143%) and Poland (162%). However, in the UK (up 2%) and Latvia (up 6%) gross written premium is maintained at the same level in the analysed period. In the EU-15 in 2005, the average dynamics of gross written premium was the greatest (up 11 percentage points), while in 2011 this amount was the lowest (down 4 percentage points). In selected countries of Central and Eastern Europe in 2007, the average

dynamics of gross written premium reached the highest amount in the period (an increase of 22 percentage points), while in 2009 the figure was the lowest (down 12 percentage points).
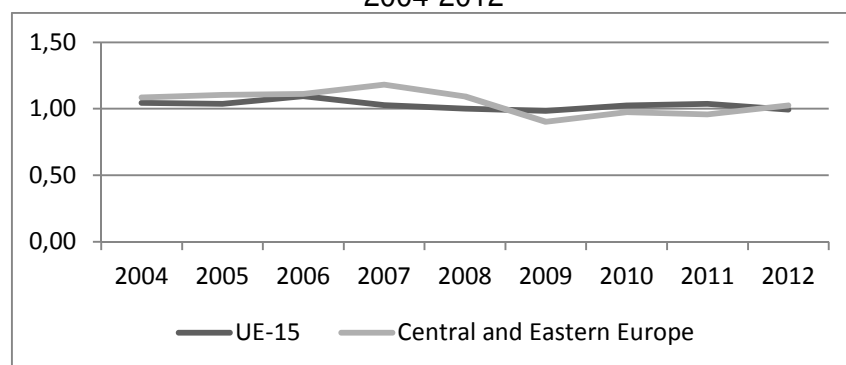
Graph 2. The average dynamics of gross written premiums in branch I in the years 2004-2012

Source: Own study based on data from the European Insurance.

In the life insurance the biggest gross written premium in the analysed period in the EU-15 occurred in the UK and France. However, in Luxembourg in 2009, gross written premium was more than doubled in comparison with previous year and this one has the highest dynamic of this index. In the second group, the largest gross written premium occurs in Poland. As of 2005, the largest increase in gross written premium (by 16 percentage points in the EU-15 and by 30 percentage points in the countries of Central and Eastern Europe). However, in 2009, in the countries of Central and Eastern Europe, the average dynamics of gross written premium decreased by 9 percentage points compared to the previous year. A similar decrease (by 8 percentage points) occurred in 2011 in the EU-15.

Graph 3. The average dynamics of gross written premiums in branch II in the years 2004-2012

Source: Own study based on data from the European Insurance.

In the non-life insurance a largest gross written premium in the analysed period in the EU-15 occurred in Germany, the UK and France. However, the Netherlands shows the highest average dynamics of gross written premium in the analysed period. In 2006, gross written premium in the Netherlands has

doubled. In the second group, the largest gross written premium and its dynamics occurs in Poland. In 2006, the EU-15 took place the strongest growth in gross written premium (by 9 percentage points) compared to other years. However, in selected countries of Central and Eastern Europe, this situation occurred in 2007, where the increase was 18 percentage points compared to last year. The 2009 was a year in which there was the strongest in the period decrease in gross written premium (2 percentage points of the EU-15, 10 percentage points of the countries of Central and Eastern Europe).

In the analysed period in the insurance market was observed an increase in dynamic of gross written premium. This shows that in 10 years, gross written premium, or the premium due under the insurance contract has increased. Growth of analysed index indicates the development of insurance market in the countries surveyed. However, this development is stronger in the countries of Central and Eastern Europe. In the branch I the strongest growth of insurance market was visible in Luxembourg, while in branch II in the Netherlands. Out of all the countries, on the index of gross written premium, it is noticed that the insurance markets in Poland and Luxembourg are developing the most.

Penetration index

For the analysis of the insurance market is also used penetration index. The penetration index is the ratio of premium to Gross Domestic Product (Monkiewicz 2010). The author has designated the penetration index by calculating the index of gross written premiums to GDP in each of the analysed countries.

In this point it will be carried out an analyse of the penetration index for the total insurance market and for life and non-life. Just as in the previous point for each country was created dynamic of penetration index from year to year. Then tested the homogeneity of each group. On the basis of the results there was used comparative analysis of the average dynamics of penetration index. Graphs 4, 5, 6 show the results.

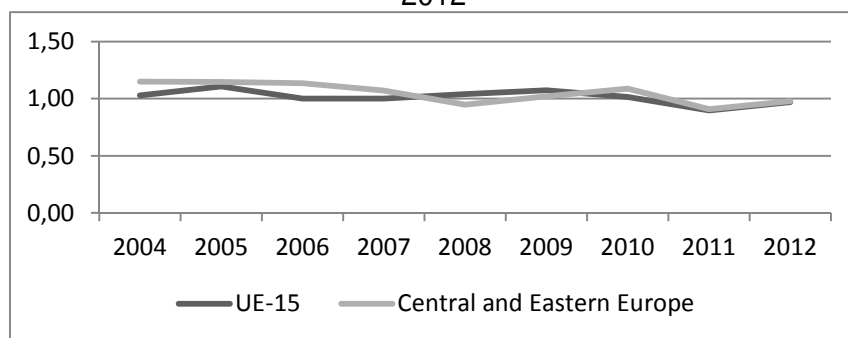Graph 4. Average dynamics of total penetration index in the years 2004-2012
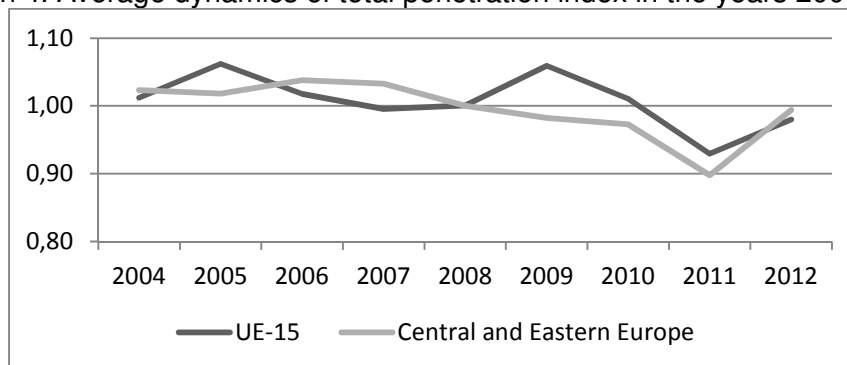
Source: Own study based on data from the European Insurance.

The largest average dynamics of this index occurs in Luxembourg, the Netherlands and Poland. Thus, in these three countries in the analysed year is

the greatest increase in the share of insurance in GDP. However, the difference in comparison to other countries in this group is not large (up 9 percentage points). Since 2009, in selected countries of Central and Eastern Europe, the penetration index decreases compared to the previous year. Countries of EU-15 only in 2011 and 2012 showed a decrease in the share of gross written premium in GDP.
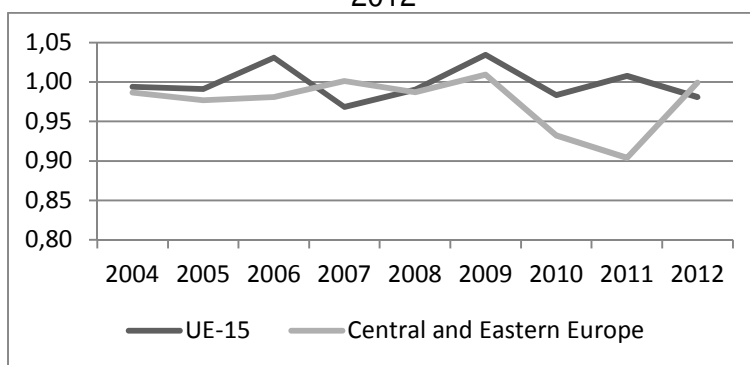
Graph 5. The average dynamics of penetration index in branch I in the years 2004-2012

Source: Own study based on data from the European Insurance.

The average dynamics of penetration index remains at a similar level in the EU-15 and selected countries of Central and Eastern Europe. In 2008 there was the largest increase in Luxembourg (126 percentage points) and Poland (41 percentage points) compared to the group. However, in the Netherlands each year decreased penetration index, indicates a lack of development of insurance in the economy of the country.

Graph 6. The average dynamics of penetration index in branch II in the years 2004-2012

Source: Own study based on data from the European Insurance.

In selected countries of Central and Eastern Europe the penetration index only in 2009 increased in comparison to the previous. In other years, this ratio decreased while comparing to the previous year. The exception is the situation in 2007 and 2012, where the penetration index has not changed. This indicates that within 10 years the share of insurance in GDP decreased sevenfold. This situation is not good for the development of the insurance market in relation to the country's economy. A similar analysis can be carried out for the EU-15, where also seven times the index decreases. The lowest average dynamics of

penetration index occurs in Ireland and Sweden, it amounts to 97 percentage points. While in the second the study group in Latvia was observed the lowest average dynamics of this index, which is 92 percentage points.

The average dynamics of penetration index in the analysed period remains at the same level, with some increases and decreases. In life insurance the average dynamics index is higher than the total insurance. This shows the development of the life insurance market in the whole economy. However, in the non-life insurance can not be said about the increase in the penetration index. In this case, for the most part there are decreases in the amount of index in comparison to last year.

Density index

Another index used to analyse the insurance market is the density index. The density index is a premium calculated on a per capita (Monkiewicz 2010). The author has set the density index by calculating the ratio of gross written premium per capita in each of the analysed countries.

This point is analyse the density index for total insurance and for life and non-life. As in point 1 for each country created dynamic of density index from year to year, and to tested the homogeneity of each group. As before, arithmetic mean can be used. Therefore, there was used the comparative analysis of the average dynamics of density index. Graphs 7, 8, 9 show the results.
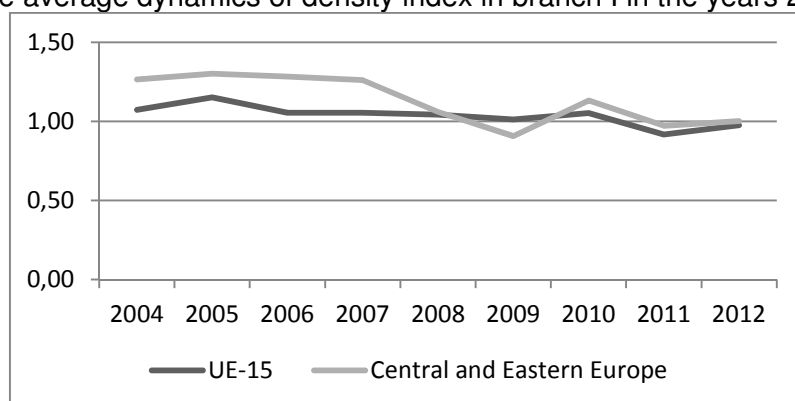
Graph 7. The average dynamics of total density index in the years 2004-2012
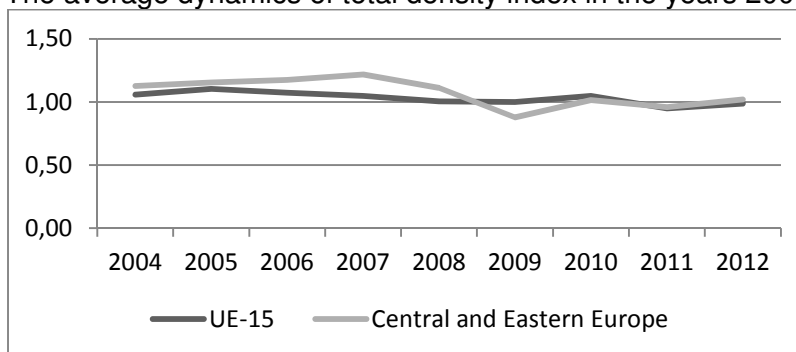
Source: Own study based on data from the European Insurance.

The largest the average dynamics density ratio in the analysed period, occurred in Poland, Luxembourg, Slovakia, the Czech Republic and Estonia. In during 10 years in selected countries of Central and Eastern Europe, the average value of the density index showed an increase in comparison to the previous years, except from the years 2009 and 2011. In the EU-15 only 5 times the average dynamics of this index was positive. Increase in the average dynamics density index indicates an increase in gross written premium per capita, so it can be said that the insurance market is developing.
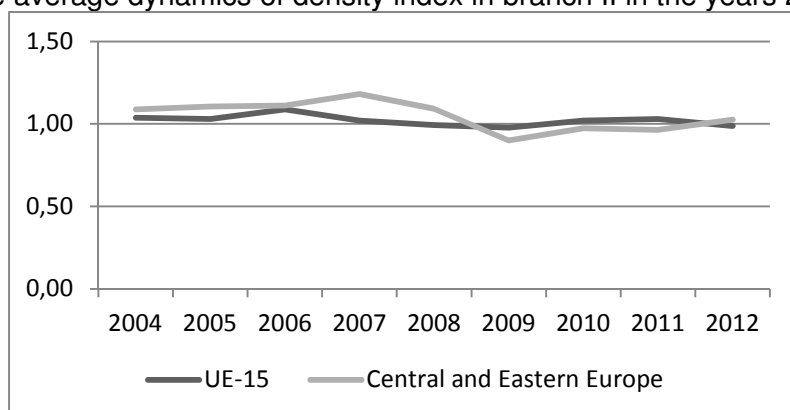
Graph 8. The average dynamics of density index in branch I in the years 2004-2012

Source: Own study based on data from the European Insurance.

In life insurance, there is a similar situation. The largest average dynamics density index occurred in Latvia (22 percentage points), Poland (18 percentage points) and Luxembourg (18 percentage points). In the analysed period, the average dynamics of this index is positive, so we can talk about the growth of gross written premium per capita, and thus the development of this market.

Graph 9. The average dynamics of density index in branch II in the years 2004-2012

Source: Own study based on data from the European Insurance.

In non-life insurance the largest average dynamics density index occurred in the Netherlands (14 percentage points). While the increase of density ratio from year to year was negative in Ireland. In other countries, there is a small increase or decrease of the density index throughout the period.

In conclusion we can say that the density ratio increased in the analysed period. In branch II of this growth is the weakest, and in branch I is the largest. The larger the increase density index the stronger development of the insurance market. Out of all countries on the basis of the density index can be stated that in Poland, Luxembourg, Slovakia, the Czech Republic and Estonia there is the strongest growth.

Claims ratio

The final analysis index for the assessment the insurance market is the claims ratio. Claims ratio is the ratio of the sum of claims and benefits paid and movements on provisions for unpaid claims and benefits to earned premiums. The author claims ratio set by calculating the ratio of gross claims paid to gross written premium in any of the analyzed countries (Manikowski, 2013).

This point analyses claims ratio for total insurance and for life and non-life insurance. As in point 1 for each country created dynamic claims ratio from year to year, and a study the homogeneity of the population. Therefore, there was used the comparative analyse of average dynamics claims ratio. Graphs 10, 11, 12 show the results.
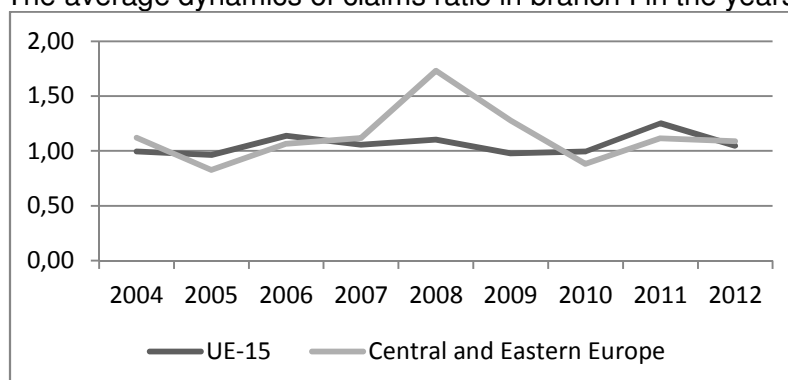
Graph 10. The average dynamics of total claims ratio in the years 2004-2012
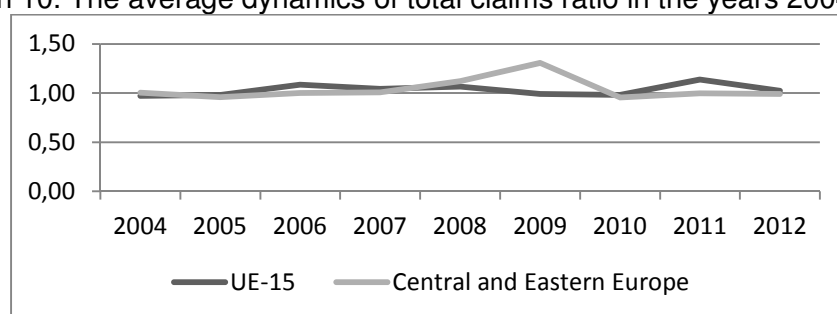
Source: Own study based on data from the European Insurance.

The largest claims ratio in the analysed period in the EU-15 is occurred in Ireland, the UK and Finland. In the second group there are in Hungary, Slovenia and Poland. However, the largest value of the average dynamics claims ratio occurs in Italy (9 percentage points) and Slovakia (9 percentage points). In every country except the Czech Republic, there was an increase in the average dynamics claims ratio. In contrast, these increases are not large. It can be said that the ratio of gross claims paid to gross written premium increased in the analysed period. Not only there is noticed development of the insurance market, in terms of growth ratio of gross written premium, but also great increases in the gross claims paid.
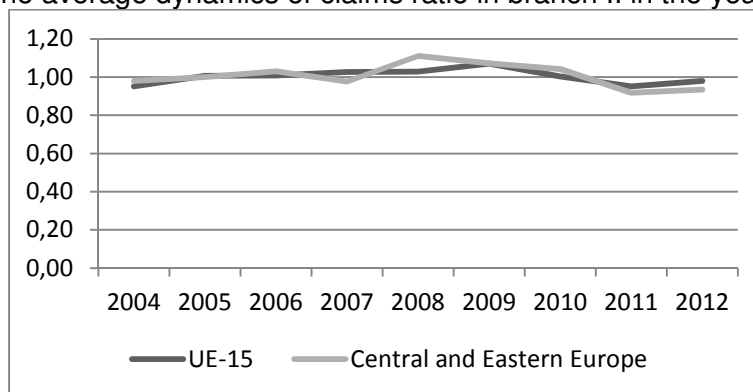
Graph 11. The average dynamics of claims ratio in branch I in the years 2004-2012

Source: Own study based on data from the European Insurance.

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In life insurance, the largest increase in the average dynamics claims ratio took place in 2008 (73 percentage points) in selected countries of Central and Eastern Europe. In the same year in Estonia occurred more than a threefold increase in the claims ratio, which also contributes to the largest average dynamics claims ratio in the analysed period (33 percentage points). In Sweden and Germany the average dynamics claims ratio showed a negative value.

Graph 12. The average dynamics of claims ratio in branch II in the years 2004-2012

Source: Own study based on data from the European Insurance.

In the non-life insurance the largest claims ratio in the analysed period occurred in Denmark, Sweden and the Netherlands. While the largest average dynamics claims ratio in the period occurred in Sweden. In other countries, the average dynamics ratio hovers around 1, which indicates that this ratio does not change significantly.

In conclusion we can say that the largest increase in the claims ratio was in branch I. However, in branch II, the ratio of gross claims paid to gross written premium does not increase considerably. This shows that even in the study period increases the value of gross claims paid. The largest increase occurred in the claims ratio in Italy and Slovakia.

Comparison of insurance markets

This point concerns the response to the stated research problem and verification of the thesis. In order to conduct study that will answer to the above question was conducted the following analysis. In the first step, as it did in the preceding points, tested the homogeneity of the groups each year. The study received a low coefficient of variation, which allowed the use of the arithmetic mean. In the next step examined the distribution of the results obtained using the test of Shapiro-Wilk (if p-value>0.05, it assumes a normal distribution). Therefore created two groups, ie. the average dynamics of study indexes in analysed years in the EU-15 and the average dynamics of the study indexes in each year in selected countries of Central and Eastern Europe. This study was to verify if variables have normal distribution. This information was needed for the next step, which examined hypotheses. These hypotheses were, as follows: the null hypothesis talked about equality of means in the two groups, ie. average dynamics of the indexes examined in the EU-15 are equal to average

dynamics indexes examined in a group of selected countries of Central and Eastern Europe. The alternative hypothesis said that the mean is not equal. To verify the hypotheses used t-Student's test when variables have normal distribution, and the Wilcoxon's test otherwise. Table 1 shows the p-values which where the basis of assessing the distribution of variables and tested the null hypothesis.

Table 1. The test of Shapiro-Wilk, t-Student's test and Wilcoxon's test for analysed indexes of insurance market.

		Test of Shapiro-Wilka			Test t-Student's/Wilcoxon's		
		Total	Life	Non-life	Total	Life	Non-life
Gross written premium	UE-15	0,9114	0,6024	0,4451	0,4095	0,1421	0,5132
	Central and Eastern Europe	0,6702	0,1727	0,6953			
Density index	UE-15	0,8722	0,6005	0,4149	0,3098	0,1065	0,3725
	Central and Eastern Europe	0,7016	0,1889	0,693			
Penetration index	UE-15	0,4795	0,8883	0,287	0,5489	0,3527	0,1386
	Central and Eastern Europe	0,0846	0,3759	0,0452			
Claims ratio	UE-15	0,3063	0,211	0,6432	0,594	0,4226	0,8718
	Central and Eastern Europe	0,0013	0,0565	0,9476			

Source: Own study based on data from the European Insurance.

If the results obtained p-value greater than 0.05, there is no basis for rejecting the null hypothesis in favour of the alternative. A study verifying the hypothesis, it follows that there is no evidence to reject the null hypothesis in each case. Thus, we can say that the differences between the analysed average dynamics indexes are not statistically significant. So the differences we noted in the preceding points can be considered irrelevant or accidental.

In the next step, the study examined the dependence between the two groups. Depending on the distribution of variables were used the Pearson linear correlation coefficient (when the distribution was normal distribution) and the correlation coefficient of Spearman. The results are shown in Table 2, together with the p-value, which talks about the significance of the result obtained.

Table 2. Correlation coefficient and p-value for analysed indexes of insurance market

	Correlation			p-value		
	Total	Life	Non-life	Total	Life	Non-life
Gross written premium	0,7072	0,7870	0,4475	0,0330	0,0120	0,2270
Density index	0,6915	0,7746	0,4487	0,0390	0,0140	0,2260
Penetration index	0,5986	0,5652	0,0064	0,0890	0,1130	0,9870
Claims ratio	0,3833	0,2673	0,7347	0,3030	0,4870	0,0240

Source: Own study based on data from the European Insurance.

On base the Table 2 it can be concluded that the average dynamics index of gross written premium in total and the average dynamics of the total density index in the studied groups are dependent, because the p-value is less than 0.05. Thus, the average dynamics index of these two indexes of the EU-15 only a limited impact on the changes in the average dynamics of these indexes in selected countries of Central and Eastern Europe. The other two indexes of the dependence was non-significant. Analysing the life insurance market as well as for the total market. Dependence exists in the first two average dynamics indexes indicated in Table 2. Thus non-life insurance dependence exists only in the average dynamics claims index.

Conclusion

During 10 years, observed a significant increase in the average dynamics index of gross written premium in each group. A similar situation occurred for the average dynamics index of density and claims (except from the average dynamics claims ratio in branch II). In contrast, the average dynamics penetration index in the study period remained at a similar level. Only in branch I, there was a small increase. In addition to the penetration index that average dynamics indexes in selected countries of Central and Eastern Europe developed on average higher than in the EU-15. This means that the insurance market in the countries of Central and Eastern Europe grow faster. However, the insurance market of the EU-15 can be considered developed, which may pose less potential for further development.

Based on the analysis of insurance markets can be concluded that differences in average dynamics examined indexes are statistically insignificant. It follows that on average dynamics indexes in the studied two groups remain at a similar level. Placed in the introduction thesis turned out to be true. However, there is not always dependence between the analysed indexes. Only in the EU-15 changes in average dynamics of total gross written premium, and calculated on a per capita impact on the changes in average dynamics of these two indexes in the countries of Central and Eastern Europe. The other two indexes for the total insurance market there is not dependence. Thus, share in the economy and insurance claims and benefits paid in selected countries of Central and Eastern Europe are not dependent on changes in these indexes in the EU-15.

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