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Non-life insurance markets in CEE countries – part II: Polarisation and concentration

Abstract

The paper discusses the performance of non-life insurance markets in the eight CEE countries that overcame transition in the 1990s and accessed European Union in May, 2004. A closer attention is given to the evaluation of two aspects of the general performance of non-life markets – polarisation and concentration. It was found that the polarisation of non-life markets between the analysed countries and other European Union members diminishes slowly. However, the concentration of non-life markets still remains high or moderate.

Keywords: insurance market, non-life insurance, CEE countries, insurance polarisation, market concentration.
JEL Classification: G22, P34.

Introduction

Since the European Union accession in May, 2004, the non-life insurance markets in CEE countries faced many opportunities for growth. In the academic debate, however, an attention was given to the performance of insurance sector as a whole or to other segments of financial system (banking and capital markets in particular). Studies addressing the tendencies on selectively the non-life segment of insurance market remain scarce. In this context, there is an obvious research gap. Moreover, there are virtually no studies that compare the insurance markets performance in cross-country perspective, in this with a focus on CEE

countries. This study may contribute to fill in the identified research gap, as it aims at evaluating the general tendencies of the development of non-life insurance markets in the eight CEE countries, that overcame transition at similar period of time (the 1990s) and accessed European Union on the 1st May 2004. Thus, these countries are regarded as a relatively unified sample of European Union member countries.

The first part of this study[1] gave the background of the general tendencies observed on non-life markets of the CEEs countries. In the overview of previous studies, the available works and researches were discussed and led to the distinction of three important periods of non-life market development in these countries. The first was pre-transition period when the markets were operating under the regime of command economy. The second was the transition period when the rapid changes began, mostly due to the high pace of foreign direct investments. The third period was the accession period which began with the European Union accession in 2004. This period was in focus of the empirical evaluations of non-life market tendencies in the first part of this study, where the problem of products' structure of the non-life markets was addressed. It was found that in many cases there was still a strong domination of MTPL (motor third party liability) insurance. In this paper (as the continuation of the study and its second part) the trends within non-life markets polarisation and concentration were analysed.

The paper is structured as follows. The first section explains the adopted research design and methodology. The second section presents and discusses the results and is broken to subsections referring the polarisation of gross premiums written, insurance penetration and density ratios, and finally market concentrations ratios. The fourth section concludes the study.

1. Research design and methodology

The study of concentration and polarisation of non-life insurance markets presented in this paper refers to the situation of eight CEE countries: Czech Republic, Hungary, Slovak Republic, Slovenia, Poland and three Baltic states: Latvia, Lithuania and Estonia (further referred to as the EU-8 countries). These countries formerly performed in terms of command economy and overcame transition in similar period (in 1990s). Moreover, these countries joined together the European Union on 1st May 2004, which created certain conditions of further insurance market development (due to the required harmonisation).

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[1] First part was presented in Wieczorek-Kosmala [2016].

The evaluation of concentration and polarisation performed in this paper was focused on observations for four years: 2004, 2008, 2012 and 2015[2]. The four-year time frame was adopted with the aim to capture 2004 as the initial observation and the beginning of accession, then 2008 to capture the year of the global financial crisis emergence and 2012 to capture the post-crisis state. In order to show the recent trends, 2015 was added to observations.

The data analysed in this paper was derived from the official statistics provided by the EU-8 national supervisory bodies or national associations of insurers. In some cases the statistics offered by Swiss Re were used as well. Additionally, some aspects of the research were based on the data provided by the federation of European insurers' associations. However, in the data context, the study faced some limitations due to the availability of comparable data. It was particularly difficult in the case of the Baltic states. Nevertheless, an attention was given to maintain accuracy and comparability of the data in the cross-country level, as well as to highlight precisely the source of the data examined in the paper.

With the European Union accession in May, 2004, the EU-8 countries became a part of a large European insurance market. However, the contribution of the 10 newly accessed countries to the European insurance market was very low. According to Szewieczek and Wieczorek [2005], the sum of gross premiums written for 2004 calculated for all European Union member countries, including the newly accessed countries (the EU-25), was only ca. 1.77% higher as compared to the sum of gross premiums written for 2004 calculated for old EU members (the EU-15). These figures indicated the scale of polarisation of the European insurance market at that time. Appropriately, regarding the situation in the non-life segment of insurance market, the first two research questions asked in this paper are as follows:

Q1. *Does the scale of polarisation of the non-life insurance market between the EU-8 and the EU-15 constantly diminish, or remain comparable since 2004?*

Q2. *Is the polarisation of non-life insurance markets observable in the internal context, that is between the EU-8 countries?*

In order to answer the first question, the volume of gross premiums written was compared over time. However, there are two other relevant ratios that are interpretable in the context of the scale of market polarisation and are suitable for cross-country comparisons. The first is the insurance penetration ratio, computed as the relation of gross premiums written to GDP and expressed as a percentage. The ratio is considered as the indicator of the contribution of the insur-

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[2] The approach to research time-frame and sample is unified for the whole study and is here consistent with the first paper addressing non-life markets products' structure (published in: [Wieczorek-Kosmala, 2016]).

ance industry to the economy. Generally, the higher the penetration ratio, the more important and strong is the insurance industry in a given country. The second is the insurance density ratio, calculated as gross premiums written per capita. Insurance density ratio provides a clear information on the average spending on insurance by one citizen of the country. Thus, the height of insurance density ratio may be perceived as the indicator of the importance of insurance in a given country, regarding the willingness to buy insurance protection by a country inhabitants. To some extent, insurance density highlights the customs and needs within insurance protection. In this paper insurance penetration and insurance density ratios are the subject of analysis in the context of non-life market polarisation. Accordingly, the polarisation of the market is assessed as declining if the differences between the height of these ratios on cross-country levels are diminishing. In a similar context, insurance penetration and density ratios were used for cross country comparisons in insurance-market oriented studies by Venard, Halek & Dorfman [2008].

The second problem evaluated in this paper is market concentration. The problem is compelling as it echoes the insurance markets performance in terms of the centrally planned economy. Market concentration is here associated with the domination of one or more insurance companies, regarding the percentage share in gross premiums written for a given national (domestic) non-life market. In many transition economies the domination of one insurer was common. Usually, it was an insurance company operating formerly in a centrally planned economy as the state insurer. Thus, its further domination on the non-life market may be partially explained by the recognition of its brand name. In order to verify whether market concentration is still a relevant issue, the obtainable data was analysed with the intention to answer a third research question:

Q3. *Is there still a visible market concentration in the non-life insurance markets of the EU-8?*

The problem of non-life insurance market concentration is analysed in this paper by the application of two traditional measures of market concentration, based on insurance companies market shares. The first measure is the concentration ratio (CR_m) which represents a sum of the share of m largest non-life insurance companies in the given domestic non-life insurance market:

$$CR_m = \sum_{i=1}^{m} S_i$$

where: S_i is the market share of the ith non-life insurance company.

Higher values of concentration ratio indicate a higher degree of market concentration and, respectively, lower degree of competitiveness. The concentration ratios were used in the study of insurance market concentration by Pervan, Pavic Kramaric and Pavic [2011], Pavic Kramaric, Galetic and Pavic [2012] or Handschke [2009]. According to Bikker and Haaf [2000], concentration ratio is also one of the most common measures used for the analysis of market concentration in the banking industry. In this paper three concentration ratios are the subject of analysis: CR_1, CR_3, and CR_5, which means the market share of respectively one, three and five largest non-life insurance companies.

The second measure of market concentration applied in this paper was the Herfindahl–Hirschman index (HHI). HHI represents the market share of all companies operating on the market and gives greater significance to market shares of leading companies. HHI is calculated as follows:

$$HHI = \sum_{i=1}^{n} S_i^2,$$

where S_i is the market share of the ith non-life insurance company and n is the number of the non-life insurance companies operating in the given domestic non-life market.

The value of HHI can vary from 0 (which indicates perfect market competition, no dominant players and all companies with a similar market share) to 10,000 (monopoly). The lower the HHI, the more competitive and less concentrated the market. As a measure of insurance market structure, HHI was implemented for example by Pervan, Pavic Kramaric and Pavic [2011], Pawłowska and Kozak [2008] or Handschke [2009].

2. Results and discussion

2.1. Polarisation of non-life insurance markets

Non-life gross premiums written

The non-life insurance markets in transition economies perform for a relatively short period of time in terms of market economy. Thus, it is not surprising that there are obvious differences between the values of the basic ratios characterising the non-life markets achieved by transition countries and those of the "old" European Union members. This indicates a relatively high level of the polarisation of non-life insurance markets.

Among the EU-15 countries, in the non-life segment of the insurance market, the highest volume of gross premiums written in 2015 was reached in Germany, the United Kingdom and France (with premium volumes of respectively

116,538, 105,865 and 80,402 million of USD) [Staib, Puttaiah 2016, p. 44]. Among the EU-8 countries, the highest volume of gross premiums written in 2015 in the non-life segment of the market was reached by Poland (8,287 million of USD) and the Czech Republic (3,699 million of USD)[3]. In the aggregated context, the scale of polarisation between non-life insurance markets is visible in the data provided in Figure 1. The contribution of "old" EU member countries (EU-15) in 2015 to the aggregated volume of non-life gross premiums written for all EU members was of 83%. The remaining EU member countries contributed of purely ca. 4.17%, in which the contribution of the EU-8 countries was of 3.22%. However, the scale of polarisation in 2015 and 2008 was slightly lower, as compared to 2004, when the contribution of all new 10 EU member countries was of ca. 2.68%, with the EU-8 contribution of 2.58%. It is worth to note that gross premiums written were lower in 2015 as compared to 2012 (compare Annex 1 and Seiler, Staib and Puttaiah [2013, p. 39]).

Figure 1. The structure of gross premiums written in non-life insurance market of the European Union member countries
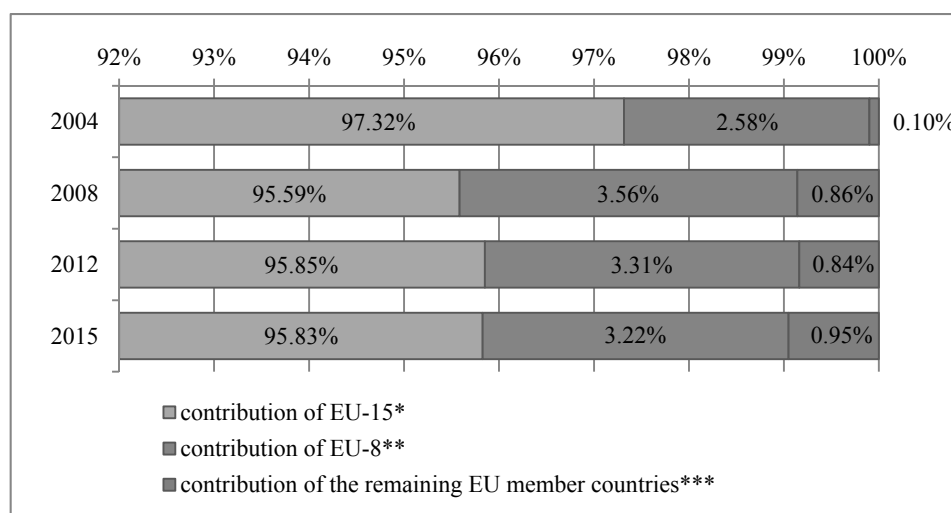
Notes:
* EU-15: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.
** EU-8: Latvia, Lithuania, Estonia, Czech Republic, Hungary, Slovak Republic, Slovenia, Poland
*** The remaining EU countries: for 2004 – Malta and Cyprus, for 2008 and 2012 – Malta, Cyprus, Bulgaria and Romania
**** Figures for the Baltic states in 2015 were not available, thus for this graph figures for 2015 were estimates equal to the values in 2012.

Source: Own study and computations based on data provided in Annex 1.

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[3] Detailed data is provided in Annex 1.

The scale of non-life insurance market polarisation between the EU-15 and the EU-8 declined in 2008, as compared to 2004. However, in 2012 compared to 2008, the scale of polarisation grew slightly, as the contribution of the EU-8 declined from 3.56% to 3.31%. It probably echoes a negative impact of the global financial crisis, as well as the consequences of the hardening of global insurance markets.

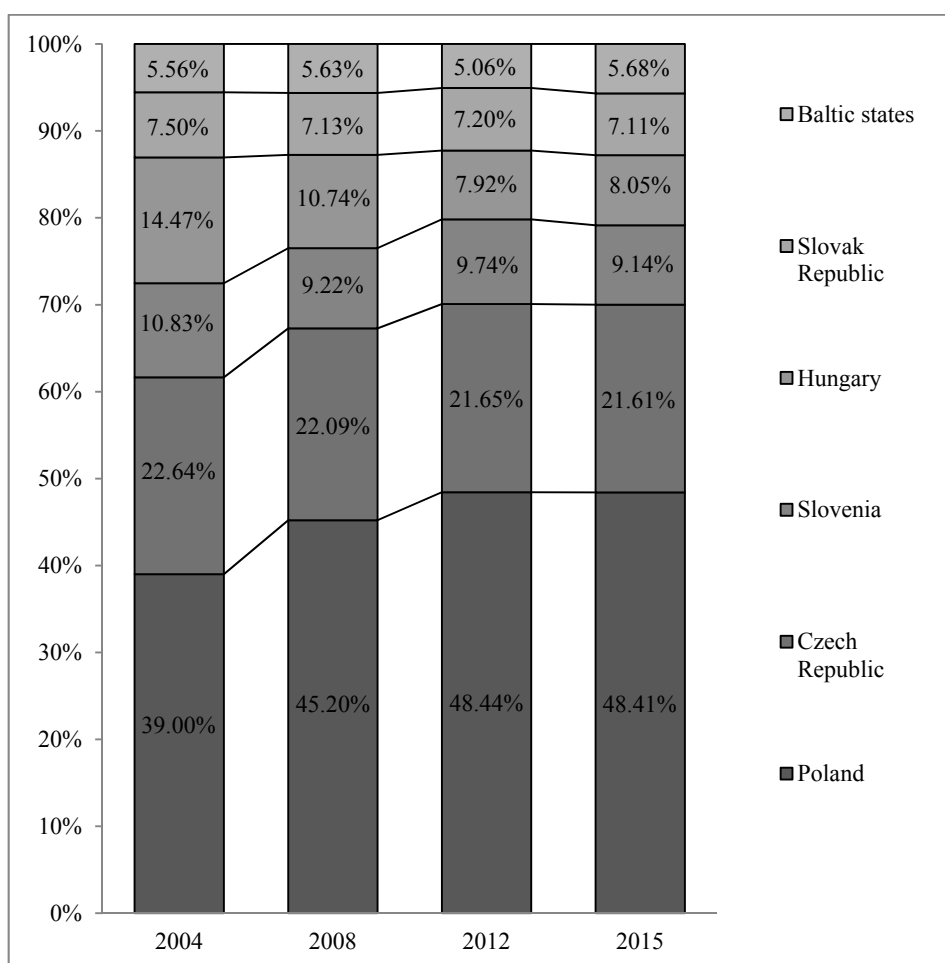**Figure 2.** The structure of gross premiums written in non-life insurance market of the EU-8 countries

Notes:
* Figures for the Baltic states in 2015 were not available, thus for this graph figures for 2015 were estimates equal to the values in 2012.

Source: Own study and computations based on data provided in Annex 1.

The problem of polarisation of the non-life insurance markets was also observable, to some extent, between the EU-8 countries. The differences seem to be connected with the different paths of evolution and changes of given domestic non-life markets. Among the EU-8 non-life insurance markets, there are markets that seem to be more developed and stronger. The data provided in Figure 2 indicates, that the biggest contributors to the aggregated EU-8 non-life gross premiums written were Poland and the Czech Republic. It should be noted, that since 2004 the contribution of Poland has constantly grown, with a relatively stable contribution of the Czech Republic, Slovenia, Slovak Republic and the Baltic States. The contribution of the Hungarian market dropped significantly in the period 2004-2012. These trends continued in 2015.

Insurance penetration and insurance density of non-life markets

The polarisation of non-life insurance markets may also be analysed by the changes of insurance penetration and insurance density ratios. Table 1 displays the non-life insurance penetration ratios for each of the EU-8 countries (if available) and the two highest penetration rations of reached by EU-15 countries.

Table 1. The penetration of non-life insurance markets for the EU-8 countries and selected EU-15 countries

Countries	2004			2008			2012			2015		
EU-8	1	SI	3.96%	1	SI	3.70%	1	SI	3.98%	1	SI	3.57%
	2	CZ	2.53%	2	CZ	2.10%	2	CZ	1.98%	2	CZ	1.94%
	3	SL	2.15%	3	LA	1.90%	3	PL	1.87%	3	PL	1.72%
	4	PL	1.90%	4	PL	1.90%	4	SL	1.44%	4	SL	1.33%
	5	EE	1.71%	5	SL	1.70%	5	HU	1.13%	5	HU	1.13%
	6	HU	1.67%	6	EE	1.60%		EE	n.a.	6	EE	n.a.
	7	LI	1.10%	7	HU	1.50%		LA	n.a.	7	LA	n.a.
		LA	n.a.		LI	n.a.		LI	n.a.		LI	n.a.
EU-15	1	NL	4.67%	1	NL	8.50%	1	NL	9.19%	1	NL	8.35%
	2	DE	3.86%	2	DE	3.50%	2	DE	3.62%	2	DE	3.36%

Notes:
'n.a.' stands for 'not available'.
Abbreviations: CZ – Czech Republic, EE – Estonia, DE – Germany, HU – Hungary, LV – Latvia, LI – Lithuania, NL – Netherlands, PL – Poland, SL – Slovak Republic, SI – Slovenia.

Source: Own study based on data provided by [Lorenzo & Lauff 2005, p. 41; Staib & Bevere 2009, p. 43; Seiler, Staib & Puttaiah 2013, p. 41; Staib & Puttaiah 2016, p. 46].

Data provided in Table 1 indicate, that among the EU-8 countries, the highest non-life insurance penetration rate was reached by Slovenia. The contribution of Slovenian non-life insurance market to the economy was relatively stable in the analysed period. It is worth to note that the penetration ratio for non-life markets in Slovenia was even higher than the ratio reached by the EU-15 coun-

tries, which was slightly declining from 3.59% in 2004, 3.20% in 2008 and 3.05% in 2012 [OECD.Stat 2014]. In addition, the Slovenian non-life penetration rate was higher than the German rate and gave Slovenia the second place in ranking among the European Union countries. Taking into account the Slovakian non-life penetration rate, a slight polarisation between the EU-8 countries was observable. Interestingly, the non-life penetration ratios for Poland were of significantly lower scale, remaining relatively stable in the analysed period (ca. 1.7%). It means that although Poland was the biggest contributor to the aggregated non-life insurance premium for the EU-8 countries, the importance of non-life insurance sector to the Polish economy was of a significantly lower scale as compared to Slovenia. In the remaining EU-8 countries, the non-life insurance penetration ratios dropped in 2012 as compared to the levels in 2008 and 2004, with the most significant drop in the Czech Republic and Slovak Republic. This trend was observed also in 2015. The situation in the Baltic States was difficult to estimate, as neither the OECD nor Swiss Re provide the data for 2012 and 2015, and the data for 2004 and 2008 did not allow reliable time comparisons. However, there was available data on non-life markets penetration, provided by the Insurance Europe federation. These figures have some limitations, as the reports represent more than 90% of the market for most countries [IE 2014, p. 6]. Nevertheless, the obtainable data gave some insight to the situation in the Baltic states. According to statistics provided by IE [2011, 2016], the penetration of non-life markets in Estonia and Latvia declined, whereas in Lithuania increased (see Annex 2).

Table 2. The density of non-life insurance market (in USD per capita) for selected EU-15 and EU-8 countries

Countries	2004			2008			2012			2015		
EU-8	1	SI	694,5	1	SI	1011,6	1	SI	908,2	1	SI	755,0
	2	CZ	261,9	2	CZ	478,0	2	CZ	396,4	2	CZ	351,0
	3	HU	170,0	3	EE	299,0	3	SL	255,7	3	SL	224,8
	4	SL	164,2	4	SL	292,2	4	PL	241,7	4	PL	217,8
	5	EE	140,2	5	LA	291,3	5	HU	153,1	5	HU	140,1
	6	PL	119,4	6	PL	261,7		EE	n.a.	6	EE	n.a.
	7	LI	71,1	7	HU	235,3		LA	n.a.	7	LA	n.a.
		LA	n.a.		LI	n.a.		LI	n.a.		LI	n.a.
EU-15	1	NL	1663,1	1	NL	4483,5	1	NL	4235,1	1	NL	3712,1
	2	LU	1555,8	2	LU	2191,7	2	LU	2012,0	2	LU	1866,1

Notes:
'n.a.' stands for 'not available'
Abbreviations: CZ – Czech Republic, EE – Estonia, HU – Hungary, LV – Latvia, LI – Lithuania, LU – Luxembourg, NL – Netherlands, PL – Poland, SL – Slovak Republic. SI – Slovenia.

Source: Own study based on data provided by [Lorenzo & Lauff 2005, p. 40; Staib & Bevere 2009, p. 42; Seiler, Staib & Puttaiah 2013, p. 40; Staib & Puttaiah 2016, p. 45].

Table 2 presents non-life insurance density ratios for the EU-8 countries and for two leading EU-15 countries. There was a visible polarisation between the EU-15 and EU-8 countries, in the context of non-life insurance density. Among the EU-15 countries, the Netherlands and Luxembourg remained the countries in which the spending on non-life insurance per person remained the highest. Among the EU-8 countries, the highest density ratio in the non-life market was reached by Slovenia, whose citizens spent ca. 755 USD per person on non-life insurance purchases in 2015. However, in 2015 the Slovenian non-life insurance purchases per person represented only ca. 20% of the purchases in the Netherlands.

In the years 2004 and 2008 the Slovenian non-life insurance density ratio was also the highest among the EU-8 countries, with the Czech Republic in second place, followed by Slovak Republic. The non-life insurance density ratios in 2008 were significantly higher in the all EU-8 countries, as compared to 2004. However, in 2012 as compared to 2008, the density ratios declined, but their levels in 2012 were visibly higher as compared to levels in 2004 (with the exception of the Hungarian non-life market). This trend was also observable for the aggregated non-life insurance density ratio for the EU-15 countries (with the levels for 2004, 2008 and 2012 of respectively 1,164.17; 1,372.39 and 1,170.05 USD per capita, according to OECD.Stat [2014]). It is worth to note that the density ratios in 2015 were visibly lower in the EU-8 countries, as compared to figures in 2012.

Reliable comparison of insurance density ratios in the Baltics States was difficult due to lack of data (similarly as in the case of insurance penetration). Comparisons with the remaining EU-8 countries were impossible, as Insurance Europe federation data was provided in EUR per capita (not USD per capita). Insurance density increased visibly in all Baltic states in 2008 as compared to 2004. However, this trend was not continued in 2015 in Latvia (see Annex 2).

2.2. Market concentration on non-life insurance markets

The analysis of non-life markets concentration of the EU-8 is based here on the changes of three concentration ratios: CR_1 CR_3, and CR_5, which represent the sum of the market share of respectively one, three and five leading non-life insurance companies. Additionally, the HHI ratio was calculated. Data for market concentration analysis in Estonia, Lithuania, Poland and Slovenia were sourced from the official statistics provided by the insurance supervisory authorities. Data about market shares of non-life insurance companies in Latvia, Czech Republic, Hungary and Slovakia were extracted from the statistics provided by

the national insurers' associations[4]. In some cases, the data provided by insurers' associations included market shares of the member insurers only. However, as the omitted non-members represented less than 10% of the market share. It was assumed in this paper that these samples are representative for the general comparisons of market concentration trends.

The first observation was that the EU-8 countries differed with the number of non-life insurers operating in the market. As presented in Figure 3, in Estonia, Latvia and Slovenia the number of operating non-life insurers was much lower than in the remaining EU-8 countries. It should be noted that the relatively lower number of observations (insurers) influences the results obtained in the analysis of concentration ratios, but not the HHI. The highest number of non-life insurers operated in 2004 in Poland and in the Czech Republic, however in the Czech Republic, since 2004, this number has reduced significantly till 2015, as compared to Poland.

Figure 3. Number of non-life insurance companies operating in the EU-8 countries
(number of observations)
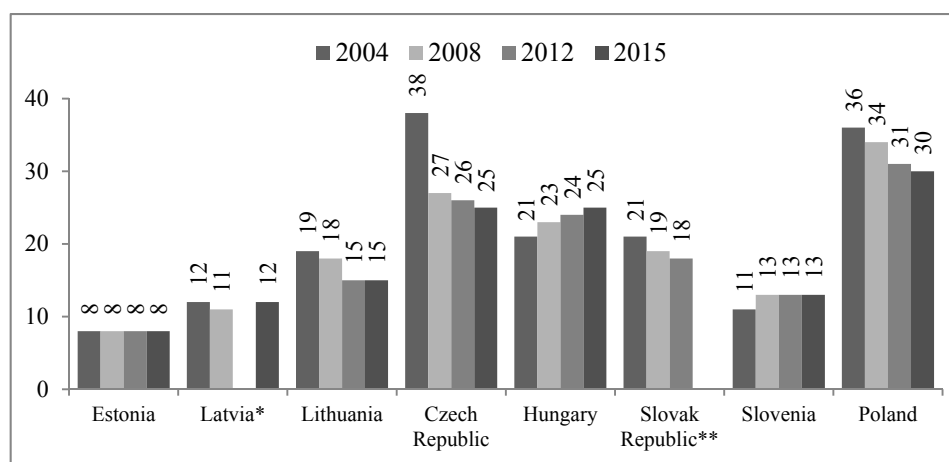
* Figures for Latvia for 2012 were not available.
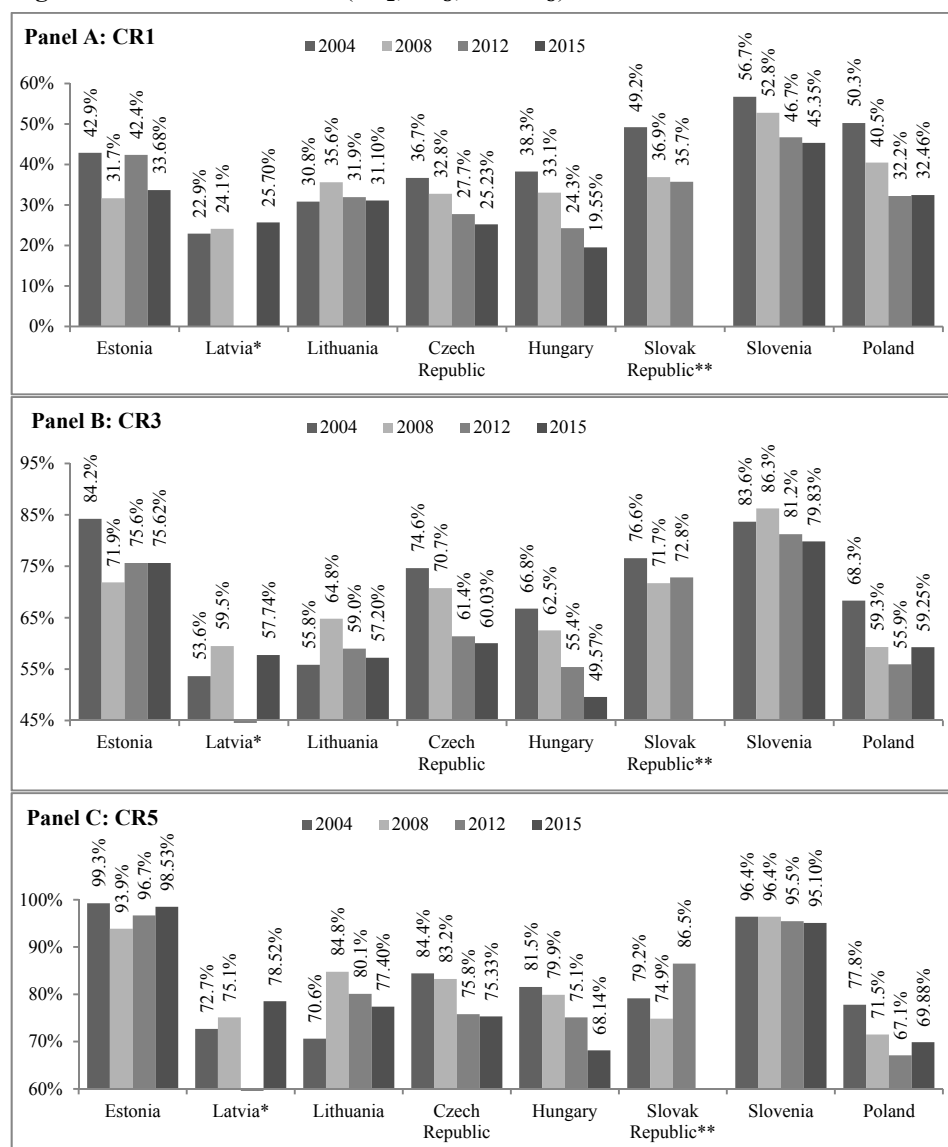** Figures for Slovak Republic for 2015 were not available.

Source: Own computations based on data provided in Annex 3.

Figure 4, panels A, B and C present the concentration ratios of the one, three and five largest non-life insurers in the EU-8 countries. With the exception of Latvia, in 2004 in all EU-8 countries the share of the largest insurer was high,

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[4] In the case of Latvia figures for 2012 were not obtainable. The reasons behind were explained by the LAA (Latvian Insurers Association) for individual e-mail request (in October, 2014). Since 2010, the LAA did not collect data broken down by insurance companies because of a decision by the Latvian Competition Council. However, data for 2015 were obtainable.

reaching values ranging from ca. 31% in Lithuania to ca. 58% in Slovenia. In the Baltic countries, the CR_1 was not clearly declining, as in Latvia it remained relatively stable, and in Estonia and Lithuania the CR_1 in 2012 was on a comparable level to 2004. In the remaining EU-8 countries, the CR_1 was constantly declining. The ratio remained the highest in Slovenia.

Figure 4. Concentration ratios (CR_1, CR_3, and CR_5) for the EU-8 countries

* Figures for Latvia for 2012 were not available.
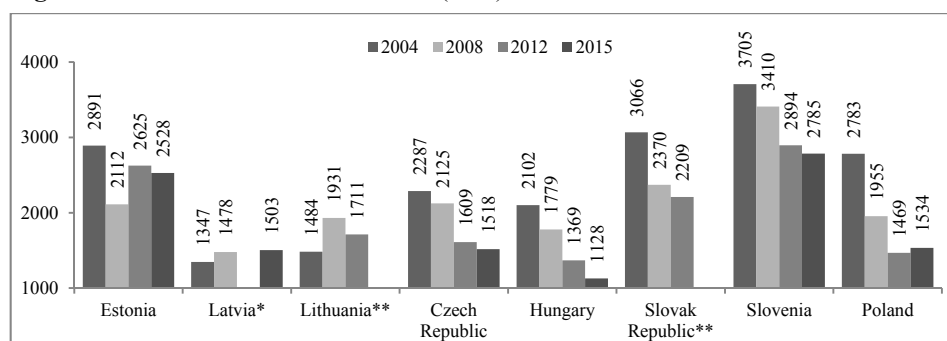** Figures for Slovak Republic for 2015 were not available.

Source: Own computations based on data provided in Annex 3.

Taking into account the share of three largest non-life insurers (CR_3), presented in Figure 4, panel B, the highest concentration in 2004 was observed in Estonia and Slovenia (ca. 84%). However, since then the ratio significantly dropped in the Czech Republic, Hungary and Poland. In the case of the Slovak Republic and Slovenia it remained relatively stable. In the Baltic states the level of CR_3 varied in the observed years. However, in Estonia in 2008 it was visibly lower when compared to 2004, whereas in Lithuania in 2012 it was lower when compared to 2008.

The results of CR_5 confirm the trends observed with CR_3 analysis (Figure 4, panel C). Market concentration declined visibly in the Czech Republic, Hungary and Poland. In the case of Slovenia and Estonia the CR_5 remained the highest, indicating high market concentration. In the countries with larger number of insurers, the CR_5 ratio should also be judged as high. The CR_5 visibly dropped in 2015, as compared to 2008 and 2004.

The HHI (Herfindahl–Hirschman Index) for the EU-8 countries is presented in Figure 5. In the case of Baltic states, market concentration measured with HHI was fluctuating. In the remaining EU-8 countries there was a visible decline of market concentration, as HHI declined over time. These findings are partially consistent with the observations of the changes of concentration ratios. However, in the case of HHI a more objective assessment of market concentration is possible. According to a widely accepted interpretation of HHI, provided in the Horizontal Merger Guidelines [2010, par. 5.2], HHI below 1500 indicates no market concentration and HHI above 2500 indicates high market concentration. The values in the interval 1500-2500 should be interpreted as a moderate concentration of the market. The HHI values obtained for the analysed EU-8 countries are expressed in this context in Table 3.

Figure 5. Herfindahl–Hirschman Index (HHI) for the EU-8 countries

* Figures for Latvia for 2012 were not available.
** Figures for Lithuania and Slovak Republic for 2015 were not available.

Source: Own computations based on data provided in Annex 3.

Table 3. Changes of market concentration of the EU-8 countries with regard
to the observed levels of HHI

Country	Initial observation (2004)	Last observation* (2015)	Change
Hungary	M	L	↓
Slovak Republic	H	M	↓
Poland	H	M	↓
Czech Republic	M	M	↔
Estonia	H	H	↔
Slovenia	H	H	↔
Latvia	L	M	↑
Lithuania	L	M	↑

Legend:
'L' – HHI < 1500 '↓' – decline of market concentration
'M' – 1500 < HHI < 2500 '↔' – no change of market concentration
'H' – HHI > 2500 '↑' – increase of market concentration

* For Slovak Republic and Lithuania last observations are based on figures for 2012.

Source: Own study based on data provided in Annex 3.

In the direction of the HHI changes in the EU-8 countries, three different
patterns of the evolution of market concentration were observable. In Hungary,
Poland and the Slovak Republic there was an obvious decline of non-life insur-
ance market concentration. However, the Slovak and Polish markets in 2015
were still moderately concentrated. In Czech Republic, Estonia and Slovenia the
level of market concentration remained comparable for 2015 to 2004. However,
in Estonia and Slovenia non-life markets remained highly concentrated. Latvian
and Lithuanian non-life markets increased on concentration.

Conclusions

This paper is the second part of the study of the changes of non-life insurance
markets in the eight CEE countries, that joined the European Union in May, 2004.
It has asked three questions addressing the general trends of non-life insurance
markets polarisation and concentration.

Within the market polarisation, the study has led conclusion that the scale of
polarisation between the EU-8 countries and the EU-15 (the 'old' EU member
countries) was still significant. Moreover, to some extent an 'internal' polarisation
between the EU-8 countries was observable. In particular, the data about insurance
penetration and insurance density indicated that there were visible differences be-
tween the examined countries. However, the scale of polarisation seems to con-
stantly diminish, if taking into account the contribution of each country to the non-
life gross premiums written. Regarding the changes of insurance penetration and
insurance density ratios, the scale of polarisation between the EU-8 and the EU-15

countries was not shrinking. Moreover, it was observed that penetration and density ratios declined slightly in most of the EU-8 countries in the adopted research time-frame.

The second problem revised in this paper referred to market concentration on non-life insurance markets of the EU-8 countries. The analysis of market concentration ratios indicated that in many countries there was still a domination by a few important market players. An application of HHI (Herfindahl–Hirschman Index) allowed verification of the scale of market concentration with regard to the market share of all non-life insurance providers. This data indicated that in some countries there was still a high or moderate market concentration. A general conclusion was that the decline of market concentration in the EU-8 countries, in the non-life segment of the insurance market, was not so obvious. In this context, further studies should be conducted.

The important limitation of this study was the availability of comparable data. The obtainable figures were often lacking data for the Baltic countries. At the same time, the supplementary source of data, the statistics provided by European Insurers federation, remained incomparable in some areas due to covering data only for the member insurers, which in some cases excluded observations for ca. 10% of the market. The analysis of market concentration was based on national databases. It should be noted that these data may not be fully comparable, as the methodologies of presentation may differ between the countries. However, the obtainable data were regarded here as appropriate to indicate the general non-life market tendencies. This should be regarded as one of important contributions of this paper to the existing academic debate, as this kind of non-life market studies with cross-country comparisons of the CEEs remains scarce.

In general, this study has shown that there was a progress of non-life insurance markets development of the EU-8 countries. Moreover, the tendencies on non-life markets are similar to those observed in the case of 'old' EU-member countries (the EU-15), where non-life insurance markets are regarded as mature. However, further inquiries are needed both for the observation of market concentration trends, as well as the polarisation of the non-life markets (in this the internal polarisation between the EU-8 countries). This study may contribute to further research by providing the initial observation of some tendencies, as well as by providing the theoretical background (published earlier in the first part of this study).

Annex 1. Gross premium written in the non-life insurance markets of EU member countries (in millions of USD)

No.	Specification	2004	2008	2012	2015
	Baltic states in total	656	1237	973*	*n.a.*
1	*Estonia*	*188*	*398*	*n.a.*	*n.a.*
2	*Latvia*	*223*	*660*	*n.a.*	*n.a.*
3	*Lithuania*	*245*	*179*	*n.a.*	*n.a.*
4	Czech Republic	2673	4854	4165	3699
5	Hungary	1708	2360	1524	1379
6	Slovakia	885	1566	1385	1218
7	Slovenia	1278	2025	1873	1564
8	Poland	4604	9933	9318	8287
	EU-8 in total	**11804**	**21975**	**19238**	**17120**
9	Malta	144	789	1591	1990
10	Cyprus	317	528	580	471
	EU-10 in total	**12265**	**23292**	**21409**	**19581**
11	Bulgaria	–	1169	886	881
12	Romania	–	2824	1812	1710
	EU-12 in total	**12265**	**27285**	**24107**	**22172**
	EU-15	444617	590724	557030	509254
	EU in total	*456882*	*618009*	*581137*	*531426*

* For the Baltic countries only the aggregated data was obtainable for 2012.

Note: 'n.a.' stands for 'not available'.

Source: Own study and computations based on data provided by [Lorenzo & Lauff 2005, pp. 33,39; Staib & Bevere 2009, pp. 35 & 41; Seiler, Staib & Puttaiah 2013, pp. 33, 39; Staib & Puttaiach 2016, p. 44].

Annex 2. The penetration and density of non-life insurance markets in Baltic states, as provided in Insurance Europe federation statistics

Country		Insurance penetration				Insurance density (in EUR per capita)			
		2004	2008	2012*	2015	2004	2008	2012*	2015
1	Estonia	1.56%	1.51%	1.29%	1.36%	111	183	174	212
2	Latvia	1.68%	1.96%	4.46%	0.72%	82	205	156	89
3	Lithuania	1.1%	1.4%	2.15%	2.15%	59	130	n.a.	n.a.

* Figures for 2012 were verified as provided in the recent IE database [2016], for some countries there are significant differences between figures provided in earlier IE databases and publications for 2004 and 2008.

Notes: 'n.a.' stands for 'not available'.

Source: Own study based on statistics provided by [IE 2011; 2016].

Annex 3. The market share of insurance companies operating in non-life insurance markets of the EU-8 countries

No.	Estonia				Latvia*			Lithuania**			
	2004	2008	2012	2015	2004	2008	2015	2004	2008	2012	2015
1	42.9%	31.7%	42.4%	33.7%	22.9%	24.1%	25.7%	30.8%	35.6%	31.9%	31.1%
2	26.0%	24.1%	17.6%	30.6%	18.3%	20.1%	16.2%	14.4%	14.7%	13.6%	13.3%
3	15.4%	16.1%	15.6%	15.1%	12.4%	15.3%	15.8%	10.6%	14.5%	13.4%	12.8%
4	11.2%	12.9%	15.4%	14.3%	11.0%	8.3%	14.0%	8.1%	10.2%	13.1%	12.8%
5	3.8%	9.1%	5.7%	4.8%	8.1%	7.3%	6.8%	6.7%	9.8%	8.0%	7.4%
6	0.6%	3.2%	2.3%	0.6%	7.6%	7.1%	5.5%	5.9%	4.4%	7.7%	6.6%
7	0.1%	2.9%	0.6%	0.5%	6.2%	6.3%	5.0%	5.2%	2.8%	3.6%	4.8%
8	0.0%	0.0%	0.5%	0.4%	5.3%	4.6%	3.6%	3.3%	2.4%	3.5%	3.2%
9					3.2%	4.4%	3.3%	3.2%	1.1%	1.1%	1.2%
10					2.6%	2.5%	2.2%	2.3%	1.1%	1.0%	2.5%
11					2.2%	0.0%	1.9%	1.9%	0.8%	1.0%	
12					0.1%			1.8%	0.7%	0.8%	
13								1.4%	0.7%	0.7%	
14								1.4%	0.5%	0.4%	
15								1.2%	0.5%	0.0%	
16								1.1%	0.3%		
17								0.4%	0.0%		
18								0.2%	0.0%		
19								0.1%			
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No.	Czech Republic				Hungary				Slovenia			
	2004	**2008**	**2012**	**2015**	**2004**	**2008**	**2012**	**2015**	**2004**	**2008**	**2012**	**2015**
1	36.7%	32.8%	27.7%	25.2%	38.3%	33.1%	24.3%	19.6%	56.7%	52.8%	46.7%	45.3%
2	27.4%	29.0%	23.0%	22.8%	20.4%	20.0%	19.5%	18.1%	17.8%	18.8%	19.2%	19.5%
3	10.6%	8.9%	10.6%	12.0%	8.1%	9.4%	11.6%	12.0%	9.1%	14.7%	15.3%	15.0%
4	5.6%	7.4%	7.7%	7.7%	8.1%	9.2%	11.4%	11.3%	7.5%	5.8%	7.5%	8.0%
5	4.3%	5.1%	6.7%	7.6%	6.6%	8.1%	8.3%	7.3%	5.3%	4.3%	6.8%	7.3%
6	3.9%	5.0%	6.4%	6.8%	4.2%	4.3%	4.8%	5.6%	1.8%	1.4%	2.1%	1.7%
7	3.3%	4.0%	6.1%	6.4%	3.8%	2.7%	4.5%	5.2%	0.9%	1.2%	1.4%	1.7%
8	1.6%	1.6%	3.0%	2.8%	2.0%	2.0%	2.1%	3.3%	0.7%	0.6%	0.7%	0.8%
9	0.9%	1.1%	1.1%	1.4%	1.8%	1.8%	1.9%	2.5%	0.2%	0.2%	0.2%	0.4%
10	0.8%	0.9%	1.1%	0.9%	1.7%	1.8%	1.9%	2.3%	0.0%	0.2%	0.1%	0.4%
11	0.8%	0.5%	1.0%	0.9%	1.5%	1.7%	1.3%	2.2%	0.0%	0.0%	0.0%	0.2%
12	0.5%	0.5%	0.7%	0.8%	0.8%	1.3%	1.3%	1.7%		0.0%	0.0%	0.0%
13	0.4%	0.4%	0.7%	0.7%	0.6%	0.9%	1.2%	1.3%		0.0%	0.0%	0.0%
14	0.4%	0.4%	0.5%	0.6%	0.6%	0.6%	1.1%	1.3%				
15	0.3%	0.4%	0.5%	0.6%	0.4%	0.6%	1.0%	1.1%				
16	0.3%	0.3%	0.5%	0.6%	0.4%	0.6%	0.9%	0.9%				
17	0.3%	0.3%	0.4%	0.5%	0.2%	0.6%	0.8%	0.9%				
18	0.3%	0.3%	0.4%	0.4%	0.2%	0.3%	0.7%	0.9%				
19	0.2%	0.3%	0.4%	0.3%	0.2%	0.3%	0.6%	0.7%				
20	0.2%	0.2%	0.4%	0.3%	0.1%	0.3%	0.2%	0.6%				
21	0.2%	0.2%	0.4%	0.2%	0.0%	0.2%	0.2%	0.6%				
22	0.2%	0.1%	0.3%	0.2%		0.1%	0.2%	0.4%				
23	0.1%	0.1%	0.2%	0.2%		0.0%	0.1%	0.3%				
24	0.1%	0.1%	0.2%	0.1%			0.0%	0.1%				
25	0.1%	0.0%	0.1%	0.0%				0.0%				
26	0.1%	0.0%	0.0%									
27	0.1%	0.0%										
28	0.1%											
29	0.1%											
30	0.1%											
31	0.1%											
32	0.0%											
33	0.0%											
34	0.0%											
35	0.0%											
36	0.0%											
37	0.0%											
38	0.0%											

No.	Slovak Republic***			Poland			
	2004	2008	2012	2004	2008	2012	2015
1	49.2%	36.9%	35.7%	50.3%	40.5%	32.2%	32.5%
2	23.0%	27.8%	26.3%	11.6%	9.9%	13.3%	13.6%
3	4.4%	7.1%	10.7%	6.4%	8.9%	10.4%	13.1%
4	1.7%	2.2%	7.5%	5.9%	8.0%	6.8%	6.3%
5	0.9%	1.0%	6.2%	3.6%	4.2%	4.4%	4.4%
6	1.9%	2.4%	3.3%	2.3%	3.5%	4.3%	3.7%
7	8.2%	5.4%	2.7%	2.3%	3.3%	4.2%	3.3%
8	3.7%	0.9%	2.5%	2.2%	3.0%	4.0%	3.0%
9	1.0%	2.3%	1.3%	2.0%	2.9%	2.9%	2.3%
10	0.1%	0.5%	1.3%	1.8%	2.1%	1.9%	2.2%
11	1.2%	0.1%	0.7%	1.8%	1.8%	1.7%	1.8%
12	0.3%	12.0%	0.7%	1.6%	1.5%	1.4%	1.8%
13	0.2%	0.0%	0.4%	1.4%	1.3%	1.4%	1.6%
14	2.6%	0.3%	0.3%	0.9%	1.2%	1.4%	1.5%
15	0.0%	0.0%	0.2%	0.8%	1.0%	1.4%	1.5%
16	0.2%	0.7%	0.1%	0.6%	0.9%	1.2%	1.2%
17	0.9%	0.5%	0.1%	0.5%	0.9%	1.1%	1.2%
18	0.0%	0.0%	0.0%	0.5%	0.8%	1.1%	1.1%
19	0.4%	0.1%		0.5%	0.8%	0.8%	1.0%
20	0.1%			0.4%	0.7%	0.8%	0.8%
21	0.0%			0.3%	0.6%	0.7%	0.7%
22				0.3%	0.5%	0.7%	0.4%
23				0.3%	0.4%	0.6%	0.3%
24				0.2%	0.4%	0.4%	0.2%
25				0.2%	0.3%	0.2%	0.2%
26				0.2%	0.2%	0.2%	0.2%
27				0.2%	0.2%	0.2%	0.1%
28				0.2%	0.1%	0.1%	0.1%
29				0.1%	0.1%	0.1%	0.0%
30				0.1%	0.1%	0.1%	0.0%
31				0.1%	0.1%	0.0%	
32				0.1%	0.1%		
33				0.1%	0.0%		
34				0.0%	0.0%		
35				0.0%			
36				0.0%			
37							
38							

* Figures for Latvia for 2012 were not available.
** Figures for Lithuania for 2015 were available in detail for 10 leading insurance companies, the
     share of the remaining for insurers was aggregated and was of 4,4%.
*** Figures for Slovak Republic for 2015 were not available.
Notes: '0,0%' stands for the market share below 0,05%.

Source: Own study based on data provided in: [AZN 2004, p. 6; 2008, p. 10; 2012, p. 22; 2015, p. 26; LAA
        2004; 2008; 2015; LB 2008; 2012; 2015; ČAP 2008, p. 69; 2012, p. 76; 2015, p. 2; EFSA 2005; 2008;
        2012; 2015; KNF 2004; 2008; 2012; 2015; MABISZ 2005, pp. 17-18; 2009, pp. 18-19; 2012,
        p. 7; 2015, p. 8; SLASPO 2004, p. 56; 2008, part C, p. 13; 2012].

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