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ANALYSIS OF MARKET CONCENTRATION IN THE INSURANCE SECTOR OF THE REPUBLIC OF SERBIA

REVIEW ARTICLE

Abstract

Analysis and measurement of concentration in insurance market is important since it allows for the estimation of the actual state in the relevant market and/or the assessment of changes that could occur in the future. The subject of this research is the analysis of the level of concentration in the insurance market of the Republic of Serbia through the prism of two indicators: concentration ratio (CR) and Herfindal-Hirschman concentration index (HHI), for the time period as of 2014 to 2020. The results of the research revealed the concentration presence in the local insurance market.

Key words: concentration, insurance market of the Republic of Serbia, concentration ratio, Herfindal-Hirschman concentration index.

I. Introduction

Market concentration is one of the most important measures of industrial competitiveness, given that maintaining a low level of concentration is an important prerequisite for an industry's efficient functioning. Therefore, the analysis of concentration levels, as well as the study and enhancement of methods and techniques that enable the measurement of concentration levels in the market presents a very important task[2]. The analysis of the level of concentration in individual economic sectors

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[2] Dalibor Tomaš, "Lorencova kriva kao pokazatelj tržišne koncentracije u sektoru osiguranja Republike Srbije", *Financing* No. 4 (2), 2013, pp. 22.

is of huge significance for analysing the relationship between competitors and the impact of each of them upon the end users, the industry and the overall economy.[3]

The insurance sector is important for the functioning of a country's economic system, not only from the aspect of safety and protection against various types of risks, but also from that of an impact on the overall economic growth and development, as well as improving the functioning of the entire financial market.[4] The concentration on the insurance sector is observed through the competition between insurance companies operating in the insurance market.

Analysis of competition and competitive position is key for success of any insurance company on the market.[5] There are currently 20 (re) insurance companies operating in the insurance market of the Republic of Serbia. Sixteen (16) companies engage in insurance business and only four companies engage in reinsurance business. Observed in the period 2014 to 2020, there has been a tendency to reduce the number of insurance companies in the Republic of Serbia, with a notice that this number has not changed in the previous three years. The subject of this paper is the analysis of concentration levels in the insurance market of the Republic of Serbia, through the prism of two indicators used to measure concentration levels: concentration ratio (CR) and Herfindal-Hirschman concentration index (HHI). The aim of this paper is to provide an answer to the question of whether the level of concentration in the local insurance market compromises its competitiveness, based on the analysis of the obtained results. The paper is structured in three parts. After the introduction, the first part reviews the relevant literature in the segment of positive / negative implications of the concentration of insurance companies on the competitiveness of the insurance sector. The second part presents the basic indicators for analyzing the market concentration levels: concentration ratio (CR) and Herfindal-Hirschman concentration index (HHI). In the third part of the paper, special attention has been paid to the analysis of the level of concentration in the insurance market of the Republic of Serbia in the period from 2014 to 2020. At the end of the paper, there is a summary and presentation of the key facts.

II. Review of Relevant Literature

Concentration can be defined as a situation where the total volume of sales or supply in one market is concentrated around a small number of market entities.[6]

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[3] Milan Kostić, "Merenje koncentracije ponude grane", *Ekonomski horizonti*, No. 10 (1), 2008, pp. 92.
[4] D. Tomaš, pp. 22.
[5] Boris Marović, Vladimir Njegomir, Dragan Marković, "Competition in insurance markets of the region of former Yugoslavia", *Ekonomika preduzeća, No*. 61(5–6), 2013, pp. 354.
[6] Slobodan Aćimović, Miomir Jakšić, Marko Baćković, Božidar Cerović, Branko Medojević, *Ekonomski rečnik*, Beograd: Publishing Center of the Faculty of Economics in Belgrade, 2006, pp. 327.

Monitoring and measuring the level of concentration in each sector of the economy is a prerequisite for economic policy makers to be able to detect deviations of the market postulates in time and, accordingly, take the necessary measures,[7] all in order to avoid forms of imperfect competition that may occur in the form of monopolies, duopoly or oligopolistic structures in the market.[8] A high level of concentration leads to a decrease in the market competitiveness. Nevertheless, it should be noted that perfect competition in the financial sector is not feasible on the market, due to the threat to profit margins of financial institutions, the problem of information asymmetry and increased moral hazard, as well as the increase in passive rates in the banking sector to attract a larger number of clients.[9]

Furthermore, a part of the scientific public states that a high share of foreign ownership in the total balance sheet amount and insurance premium can be a major problem for economic development in underdeveloped regions (example, the Republic of Serbia), while another part of the scientific community believes that foreign insurance companies entering the financial market have a positive effect on competition.[10] Consequently, the question arises as to the justification of foreign investors entering the insurance market in financially underdeveloped countries. According to the previous studies, there are several key advantages when it comes to the entry of foreign investors, namely: development of life insurance, improvement of corporate governance and business risk management, improvement of service quality, introduction of new and high quality service packages, increased health competition, strengthening business transparency, transfer of technological and managerial knowledge and the emergence of external sources of funding.[11] Observed by the ownership structure of capital, at the end of 2020, out of 20 insurance companies operating in the Republic of Serbia, 15 had a majority foreign ownership. [12]

The insurance sector of the Republic of Serbia is characterized by a medium concentration of insurance proposal. Research has shown that there is currently a group of several insurance companies in the domestic market that are leaders and

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[7] D. Tomaš, pp. 22.

[8] Maja Filipović, Vladislava Avramović, Željko Račić, "Analiza nivoa koncentracije aktive u bankarskom sektoru Republike Srbije", *School of business*, No. 2/2016, pp. 112

[9] Maja Dimić, *Analysis of concentration levels in the banking sector and in the insurance sector in Central and Eastern Europe*, doctoral dissertation, Belgrade: Singidunum University, 2015. pp. 134.

[10] Maja Dimić, Lidija Barjaktarović, Olja Arsenijević, Polona Šprajc, Janez Žirovnik, "Measuring the Concentration of Insurance sector – the Case of Southeastern European Countries", *Organizacija* No. 51 (1), 2018, pp. 52.

[11] M. Dimić, L. Barjaktarović, O. Arsenijević, P. Šprajc, J. Žirovnik, pp. 52.

[12] National Bank of Serbia, Insurance Sector in Serbia - Quarterly Report for the year 2020, Belgrade: National Bank of Serbia, 2021, *https://nbs.rs/export/sites/NBS_site/documents/osiguranje/izvestaji/izv_IV_2020.pdf*, accessed on 15. 7. 2021.

have a significant share in the total market.[13] Therefore, there is an oligopolistic market structure in the insurance sector.[14] By monitoring the level of limited or concentrated offer in the insurance market of the Republic of Serbia, we have considered the behaviour of insurance companies and their attitude towards the end users. The degree of market limitation affects the opportunity for the users to choose the company the services of which they will use. In the case of high concentration and great market constraints, the choice of users is drastically narrowed.[15]

Higher levels of concentration in the insurance market reduce its financial stability, [16]in line with the "concentration - fragility" attitude.[17] Therefore, it is extremely important that the competent authorities control and regulate the level of concentration for the normal functioning of the market, as well as for the adequate fulfilment of the needs of end users.

III. Indicators Measuring Market Concentration

A large number of indicators are used to measure the levels of market concentration. The most significant indicators of market concentration include: concentration ratio, Herfindal-Hirschman concentration index, Lorentz curve, Gini coefficient, entropy coefficient, comprehensive industrial concentration index, Hannah & Kay index, Hall-Tideman index, Hause index.[18] For the purposes of this paper, the values of two indicators were considered: concentration ratio (CR) and Herfindal-Hirschman concentration index (HHI). Concentration ratio (CR) is the indicator most commonly used to measure the level of concentration in the market and it reveals the participation of largest insurance companies in the insurance market. The formula for calculating this indicator is as follows:[19]

$$CR_n = \sum_{i=1}^{n} X_i$$

[13] Tijana Kaličanin, Edin Hanić, "The competitiveness of insurance market in Serbia", *Business and applied economics – book of abstracts* (editors: Ivana Domazet and Jovan Zubović), 2018, pp. 196. 2018, pp. 195–197.

[14] M. Dimić, pp. 102.

[15] M. Kostić (2009), pp. 61.

[16] Muhammed Altuntas, Jannes Rauch, "Concentration and financial stability in the property-liability insurance sector: global evidence", *Journal of Risk Finance,* No. 18(3), 2017, pp. 284.

[17] Jeungbo Shim, "An Investigation of Market Concentration and Financial Stability in Property – Liability Insurance Industry", *The Journal of Risk and Insurance,* No. 84(2), 2017, pp. 567.

[18] Ksenija Dumičić, Anita Pavković, Josipa Akalović-Antić, "Mjerenje koncentracije u bankama u Republici Hrvatskoj", *Proceedings of the Faculty of Economics in Zagreb* (editor-in-chief: Anita Pavković), No. 10(2), Zagreb, 2012, pp. 121.

[19] Ljubodrag Savić, "Tržišne strukture u jugoslovenskoj industriji", *Industrija,* No. 26 (1–4), 2000, pp. 4.

Where:
X_i – individual market share of the *i-th* insurance company.
Individual market share of the *i-th* insurance company is reached at as follows:[20]

$$X_i = \left(\frac{q_i}{Q}\right) 100$$

Where:
q_i – proposal *i-th* insurance company,
Q – proposal of the branch.

This indicator is often called CR5, since the ratio of concentration relates to five leading insurance companies that operate in the insurance market. The table below reveals the reference values of this indicator.

Table 1. Reference values of the concentration ratio

Value of CR index	Level of concentration on the market
CR = 0%	Perfect competition (no market concentration)
CR < 25%	Low concentrated markets
25% < CR < 50%	Moderately concentrated markets
CR > 50%	Highly concentrated markets
CR = 100%	Monopoly (complete market concentration)

Source: Maja Filipović, Vladislava Avramović, Željko Račić, "Analysis of the level of asset concentration in the banking sector of the Republic of Serbia", *School of Business* no. 2/2016, pp. 114; Maja Dimić, *Analysis of concentration levels in the banking sector and in the insurance sector in Central and Eastern Europe*, doctoral dissertation, Belgrade: Singidunum University, 2015, pp. 120.

The advantage and, simultaneously, the major disadvantage of this indicator is its straightforwardness. The concentration ratio reveals the overall market share of the five largest insurance companies, but does not take into account the mutual dispersion of such shares. There is also the problem of market share of other insurance companies, since it, though minor, affects the concentration of the entire offer[21]. To avoid the disadvantages of concentration rations, the Herfindal-Hirschman concentration index is used in the analysis.

The Herfindal-Hirschman concentration index (HHI) provides for the complete information on the level of concentration in a particular market, taking into account the participation of all companies as well as actual variations in the size of the market

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[20] Milan Kostić, "Merenje koncentracije ponude grane", *Ekonomski horizonti,* No.10 (1), 2008, pp. 92.
[21] Boris Begović, Rajko Bukvić, Boško Mijatović, Marko Paunović, Robert Sepi, Dragor Hiber, *Antimonopolska politika u SR Jugoslaviji,* Belgrade: Center for Liberal-Democratic Studies, 2002, pp. 34.

share between competitors[22]. This ratio represents the sum of the squares of market share of all financial institutions present on the market, on the basis of loans, balance sheet total, loans, realized profile, deposits, collected insurance premiums and the like.[23] The formula for calculating this indicator is as follows[24]

$$HHI = \sum_{i=1}^{n} (X_i^2)$$

where:
n - total number of insurance companies,
Xi - market share of the i-th insurance company in the sector.

The value of the HH index ranges from 0 to 10,000. The table below presents the reference values of the HH index and, accordingly, the different levels of market concentration.

Table 2. Reference values of Herfindal-Hirschman concentration index

Value of HHI index	Level on concentration on the market
HHI < 1,000	Unconcentrated market
1,000 < HHI < 1,800	Medium concentrated market
1,800 < HHI < 2,600	Highly concentrated market
2,600 < HHI < 10,000	Very highly concentrated market
HHI = 10,000	Monopoly concentrated market

Source: Boris Begović, Rajko Bukvić, Boško Mijatović, Marko Paunović, Robert Sepi, Dragor Hiber, Antimonopoly Policy in FR Yugoslavia, Belgrade: Center for Liberal-Democratic Studies, 2002, pp. 35.

The main advantage of using the Herfindal-Hirschman index as compared to the concentration ratio reflects in the fact that it considers the market share of all entities in the market. However, the major drawback reflects in the omission from the analysis of those market participants whose market share is below 1%[25]. However, this limitation does not represent a significant obstacle to implementation, so that today the HH index is considered a reliable indicator of measuring market concentration in all markets.[26]

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[22] Lorena Škuflić, Fran Galetić, Branimir Gregurić, "Liberalization and Market Concentration in the Insurance Industry: Case of Croatia", *Economic Review: Journal of Economic and Business,* br, 9(2), pp. 66.

[23] M. Dimić, pp. 122.

[24] Oz Šaj, *Industrijska organizacija – teorija i primena,* Beograd: Faculty of Economics of the University in Belgrade, 2005, pp. 172.

[25] Vlastimir Vuković, "Market Concentration of Local Banks", *Finansije,* No. 1 – 6, 2006, pp. 9.

[26] M. Dimić, pp. 122.

IV. Analysis of the Level of Concentration in the Insurance Sector of the Republic of Serbia

The analysis of the level of concentration in the insurance sector of the Republic of Serbia in this paper covers the time frame from 2014 to 2020. The research is split into two parts, which include the calculation of the concentration using the above indicators. Table 3 provides an overview of the fluctuations in the number of insurance companies in the insurance sector of the Republic of Serbia, for the period from 2014 to 2020.

Table 3 Number of insurance companies in the insurance sector of the Republic of Serbia for the period from 2014 to 2020

Year	Number of insurance companies
2014	25
2015	24
2016	23
2017	21
2018	20
2019	20
2020	20

Source: National Bank of Serbia, Insurance Sector in Serbia - Quarterly Report for the period from 2014 to 2020 (Archive), Belgrade: National Bank of Serbia, 2015–2021, *https://nbs.rs/sr/finansijske-institucije / insurance / report /,* accessed on 15 July 2021.

In the first step of the analysis, the values of CR5 (concentration ratio of the five major insurance companies) were calculated, with regard of total premium earned, the earned life insurance premium and the earned non-life insurance premium of insurance companies. The obtained values are presented in the Tables 4, 5 and 6 below.

Table 4. Concentration ratio (CR5) with regard to total premium earned in the period from 2014 to 2020

Year	Total for first 5 insurance companies (RSD billion)	Total earned premium (RSD billion)	CR5 (%)
2014	53.1	69.4	76.5%
2015	61.6	80.9	76.1%
2016	66.8	89.1	75.0%

Year	Total for first 5 insurance companies (RSD billion)	Total earned premium (RSD billion)	CR5 (%)
2017	71.9	93.1	77.2%
2018	78.4	99.9	78.5%
2019	83.6	107.5	77.7%
2020	85.2	109.9	77.5%

Source: National Bank of Serbia, Insurance Sector in Serbia - Quarterly Report for the period from 2014 to 2020 (Archive), Belgrade: National Bank of Serbia, 2015–2021, *https://nbs.rs/sr/finansijske-institucije / insurance / report /*, accessed on 15 July 2021.

Table 5. Concentration ratio (CR5) with regard to life insurance premium earned in the period from 2014 to 2020

Year	Total for first 5 insurance companies (RSD billion)	Total earned life premium (RSD billion)	CR5 (%)
2014	13.8	15.3	90.2%
2015	16.8	18.7	89.8%
2016	19.0	21.3	89.2%
2017	18.2	24.1	75.5%
2018	19.8	24.4	81.1%
2019	20.9	25.6	81.6%
2020	21.8	27.7	78.7%

Source: author's calculation according to: National Bank of Serbia, Insurance Sector in Serbia - Quarterly Report for the period from 2014 to 2020 (Archive), Belgrade: National Bank of Serbia, 2015–2021, *https:// nbs.rs/sr / financial-institutions / insurance / report /*, accessed on July 15, 2021.

Table 6. Concentration ratio (CR5) with regard to non-life insurance premium earned in the period from 2014 to 2020

Year	Total for first 5 insurance companies (RSD billion)	Total earned non-life premium (RSD billion)	CR5 (%)
2014	43.1	53.4	80.7%
2015	49.1	61.6	79.7%
2016	52.1	66.0	78.9%
2017	57.5	70.4	81.7%
2018	62.2	76.1	81.7%
2019	66.0	82.5	80.0%
2020	66.7	83.8	79.6%

Source: author's calculation according to: National Bank of Serbia, Insurance Sector in Serbia - Quarterly Report for the period from 2014 to 2020 (Archive), Belgrade: National Bank of Serbia, 2015–2021, *https:// nbs.rs/sr / financial-institutions / insurance / report /*, accessed on July 15, 2021.

In the second step of the analysis, the values of the HH index (Herfindal-Hirsch-man concentration index) were calculated according to the total premium earned, life insurance premium earned and according to the non-life insurance premium earned. The obtained values are presented in the Table 7.

**Table 7. Herfindal-Hirschman concentration index in the insurance sector
of the Republic of Serbia for the period from 2014 to 2020**

Year	HHI total premium earned	HHI total life premium earned	HHI total non-life premium earned
2014	1,431	1,924	1,668
2015	1,496	2,092	1,738
2016	1,424	2,029	1,715
2017	1,470	1,395	1,773
2018	1,533	1,629	1,725
2019	1,474	1,615	1,643
2020	1,464	1,449	1,647

Source: author's calculation according to: National Bank of Serbia, Insurance Sector in Serbia - Quarterly Report for the period from 2014 to 2020 (Archive), Belgrade: National Bank of Serbia, 2015–2021, *https:// nbs.rs/sr / financial-institutions / insurance / report /,* accessed on July 15, 2021.

The average value of the CR5 coefficient indicates that the insurance sector of the Republic of Serbia can be described as highly concentrated. CR5 values are above 70%, so that the situation on the insurance market of the Republic of Serbia seriously threatens to compromise competition. The obtained values of the HHI in-dex in all three observed categories (total insurance premium earned, life insurance premium earned, non-life insurance premium earned) speak in favour of the fact that the insurance market of the Republic of Serbia is moderately concentrated, with the exception of 2014, 2015 and 2016 earned life insurance premium, with the values of the HH concentration index in excess of the threshold value of 1,800, and with this segment of the insurance market having shown high concentration.

V. Conclusion

Based on the indicator analysis of concentration ratios (CR) and Herfin-dal-Hirschman concentration index (HHI), the following conclusions can be drawn, as follows. According to the obtained values of the concentration ratios of the five largest insurance companies, it can be concluded that the insurance market of the Republic of Serbia is highly concentrated and seriously threatens to compromise the competition. The value of the HH concentration index, as a more complete indicator of concentration and competition, speaks in favour of the fact that the insurance

market of the Republic of Serbia is moderately concentrated. In 2020, there were 20 insurance companies operating in the Republic of Serbia, which means five less than in 2014. The level of concentration is the result of consolidation, restructuring or entry of insurance companies into the insurance market or their exit from the market, market development and/or the development of the entire financial market. Given the tendency to reduce the number of insurance companies in the insurance market of the Republic of Serbia (although the number has not changed in the previous three years) and/or considering the value of concentration indicators, we can expect a further reduction tendency of the number of insurance companies, whereby the analyzing and monitoring of the concentration and competition levels will gain on importance.

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