

Gordana Đuranović<sup>1</sup>  
Sanja Filipović<sup>2</sup>

JEL: G21, G34, K21  
DOI: 10.5937/industrija49-36262  
UDC: 336.71:339.137.2(497.11)  
Original Scientific Paper

## The impact of market concentration on competitiveness of the banking sector in Serbia

*Article history:*

Received: 3 February 2022  
Sent for revision: 22 February 2022  
Received in revised form: 28 February 2022  
Accepted: 1 March 2022  
Available online: 26 April 2022

**Abstract:** *The concentration level is proof of development and tendencies on the observed market. It determines the existence of competition and fair play among competitors and participants. This paper aims to analyse and measure the concentration level within the banking sector in the Republic of Serbia. The concentration level is measured applying the concentration ratio for four and five biggest banks (Cr4 and Cr5) and Herfindal-Hirschman index (HH index) in the period from 2018 to the third quarter of 2020 for the following banks' balance sheet positions: assets, approved loans, and collected deposits. The banking market is reported to be medium concentrated according to CR5 and low concentrated according to Cr4 and HHI in all observed categories. The empirical research shows that there is competition among banks in Serbia (loose oligopoly), which depends on the concentration level. Furthermore, the acquired results contribute in the comprehension and perception of the direction in which the Serbian banking sector, as an example of an industry in a small emerging country, is progressing towards a modern financial market through bank consolidation.*

**Keywords:** *banking sector, concentration, competition, CRn, HHI.*

---

<sup>1</sup> University Singidunum and Otp banka Srbija ad gordana.zezelj.11@singimail.rs

<sup>2</sup> University Singidunum and Institute of Social Sciences.

## Uticaj tržišne koncentracije na konkurentnost bankarskog sektora u Srbiji

**Apstrakt:** Nivo koncentracije je dokaz razvoja i tendencija na posmatranom tržištu koji određuje postojanje konkurentnosti i da li ima fer tržišne utakmice među učesnicima. Cilj ovog rada je da utvrdi uticaj koncentracije u bankarskom sektoru Republike Srbije na nivo konkurentnosti bankarskog sektora. Za te potrebe korišćiće se racia koncentracije za četiri i pet najvećih banaka (Cr4 i Cr5) i Herfindal-Hiršmanov indeks (HH indeks) za vremenski period od 2018. do trećeg kvartala 2020. godine za sledeće bilansne pozicije banaka: aktiva, odobreni krediti i prikupljeni depoziti. Dokazano je da je bankarsko tržište umereno koncentrisano u skladu sa Cr5 i nisko koncentrisano u skladu sa Cr4 i HHI u svim posmatranim kategorijama. Empirijsko istraživanje pokazuje da postoji konkurentnost među bankama u Srbiji (labavi oligopol) koja zavisi od nivoa koncentracije. Dalje, dobijeni rezultati doprinose sagledavanju i razumevanju pravca u kome srpski bankarski sektor, kao primer industrije u maloj ekonomiji u razvoju, napreduje ka modernom finansijskom tržištu kroz konsolidaciju poslovnih banaka.

**Ključne reči:** bankarski sektor, koncentracija, konkurencija, CRn, HHI.

### Introduction

The protection of the competition in the European banking sector and credit institutions started to develop in 1980s, but the European commission (EC) as the authority responsible for the European Union's (EU) competition policy, did not apply the two main competition articles of the Rome Treaty (articles 101 and 102 of the Treaty) to the banking sector until Züchner case in 1980.

In Serbia, the adoption of the Bank Restructuring strategy in 2001 and the Bank Privatization Strategy, with the accompanying Laws (Law on regulation of relations between the FRY and legal entities and banks from the territory of the FRY who are the original debtors or guarantors to creditors of the Paris and London clubs (Official Gazette of the FRY, No. 36/2002 and 7/2003) and the Law on regulation of the public debt of the FRY on the basis of foreign currency savings of citizens (Official Gazette of the FRY, No. 36/2002)) opened the door for reforms in banking sector and establishment of the modern banking market (Filipović, 2003).

From 1996 to 2005, when Antimonopoly Law was in force, competition protection as a significant question was handled only by the Department for Antitrust activities of the Ministry of trade, tourism and services (Antimonopoly

Law, Official Gazette of the FRY, No. 29/96). Then, in 2005, the Commission for protection of competition was established with the adoption of the first Law on protection of competition to enforce the Law and monitor the state of competition.

The current Law on protection of competition ("Official Gazette of the Republic of Serbia," Nos. 51/2009 and 95/2013) governs competition protection on the market of the Republic of Serbia and the position, organization, and competencies of the Commission for protection of competition. It is harmonized with the Council Regulation (EC) No 1/2003 on the implementation of the rules on competition defined in Articles 81 and 82 of the Treaty, adopted on 16.12.2002. as a result of further harmonization with the EU regulations.

The Law on banks ("Official Gazette of the Republic of Serbia," No. 107/2005, 91/2010 i 14/2015) in Article 7 says that the Law on protection of competition should be applied on the competition on the banking market. Further, in article 133, paragraph 3, it sets forth the pre-conditions for merger by acquisition. According to article 19 of the Law on protection of competition, concentrations of undertakings are allowed only if they do not limit or violate competition in the market or if they do not create or strengthen the dominance of market participants ("Official Gazette of the Republic of Serbia," No. 51/2009 and 95/2013).

According to the National bank of Serbia (NBS) 2002 annual report, 50 banks operated on the Serbian market: 7 of them were under the majority control of foreign banks, 6 with predominant capital of other foreign legal entities, 15 with predominantly private capital, 8 with a predominant share of socially owned companies, 11 in the privatization process (out of which 3 banks were in the process of rehabilitation) and 4 banks with a significant state capital share. Two more foreign banks were opened during 2003 (Filipović, 2003). In 2002, large state-owned banks were closed because of the lack of opportunities for financial rehabilitation. Reduction of the number of the state-owned banks continued in 2012, 2013 and in 2014. The bankruptcy proceedings have not yet been completed.

According to the NBS 2020 annual report, 26 banks operated in Serbia, 20 or 76,9% with dominantly foreign capital, 3 or 11.5% with private domestic capital, and 3 or 11,5% state-owned (NBS, 2021). This reduction of the number of banks operating in the Serbian market is a result of mergers and acquisitions ( M&A ) that „describes the consolidation of companies or assets through various types of financial transactions, including mergers, acquisitions, consolidations, tender offers, purchase of assets, and management acquisitions“ (Hayes, 2021).

## 1. Literature review

There are two different approaches in economic theory: first is structural which links concentration and competition and second is non-structural and ignores the impact of the concentration on competition. The structural approach confirms that concentration and competition are positively correlated and that higher concentration means a higher level of competitiveness.

There is plenty of research with empirical evidence favouring the impact of banking concentration and structure on competition, performance, other industrial sectors, bank stability, and economic growth.

Research conducted in Albania during 2008-2015 on 16 banks indicates that concentration is negatively related to bank stability. Findings are in line with the concentration-fragility view (Shijaku, 2017).

Furthermore, analysis of the influence of bank concentration on economic growth in 84 countries during the period 1980-2004 indicates that bank concentration has a negative effect on economic growth and that restrictions of non-traditional bank transactions and bank ownership of non-financial companies decrease the negative impact of bank concentration on the economic growth (Fernández et. al., 2008).

One of many studies of market structures and concentration measuring methods emphasises that as the concentration increases, the number of the market participants decreases, so the concentration causes the participants make mutual agreements or infringe competition. The author determines concentration as an "undesirable situation" because of factors such as "production, price, employment, technology selection and investment, which are caused by the decisions of a few large firms in the industry, resulting in increased distortions in income distribution, disparity in resource allocation, and utilization" (Ukav, 2017).

Bank concentration also impacts other industries, as proven in empirical research on the sample of 35 manufacturing industries in 17 OECD countries. The relationship between bank concentration and industry concentration is significant. Evidence shows that firms in sectors that are more in need of external financing are bigger if they are in countries in which the banking sector is more concentrated (Cetorelli, 2001).

Berger et al. (2004) examined the impact of bank regulations, concentration, and national institutions on bank net interest on a sample of 14000 banks across 72 countries. It was proven that restrictions on bank entry activities, and freedom in business, made net interest margins higher. The authors extended research on credit availability and financial stability, besides traditional measures of conduct and performance. Their findings showed that banks competition was good from a social perspective and that higher concentration

was linked with higher prices for customers, higher measured profitability, and limited company access to credit.

In the research of the concentration and competition within the banking sector in Bosnia and Hercegovina from 1999-2004, Bosnian author Jović emphasized that reduction in the number of banks was connected with higher concentration. The author showed that HHI, Cr1, Cr3, Cr5, Gini coefficient, entropy coefficient implicit interest rate range, and net interest margin decreased despite concentration increases. The conclusion was that there was a direct correlation between indicators of competition and concentration (Jović, 2006).

Analysing the concentration level in B&H in the period from 2008-2016, Bojat and Rebić noticed that concentration level decreased with the reduction of the number of commercial banks on the market. The values of HH and Cr3 indices showed a moderate level of concentration and monopolistic market structure (Bojat & Rebić, 2020).

In the last decade, many studies of the level of the market concentration in the banking sector, bank reduction, and the impact of the concentration on the competition have been carried out in Serbia. Analysing the concentration level in categories of assets, capital, loans, deposits, interest income, and net profit (loss) before tax, Miljković et al. (2013) found that the value of the indices grows with the reduction of the number of banks. The market is low concentrated, as shown by both indices in all categories, except in the category of market share in net profit, where the concentration level is moderate and in the category of market loss where the values of Cr3, Cr5 and Cr8 indices determined moderate concentration, and the values of HHI pointed to high concentration (Miljković et al., 2013).

Measuring level of the concentration from 2003-2012 in the categories of total assets, loans and deposits, and applying HHI and Cr5 it was found that concentration was moderate when it comes to the Cr5 and low for the HHI (Ljumović et al., 2014).

Barjaktarović, Filipović & Dimić made a research of the concentration level of the banking industry in CEE countries (among them is Serbia) from the 2007 to 2012 for the following banks' balance items: assets, approved loans and collected deposits. Cr5 and HHI were applied, and the concentration level for Serbian banking sector is considered in accordance with Cr5 in category of assets low for whole observed period, in category of loans is for first four years low and then it is increasing into the moderate level of the concentration, and in category of deposits it is undefined, increasing and decreasing but with tendency to be low. When it comes to the HHI, the level of the concentration is low. There is no link between the level of the concentration and the level of the competitiveness (Barjaktreović et al., 2013).

Matović-Marinović measured concentration level for the period 2008-2017 using Cr5 and HH indices. In this research is shown that value of the indices is increasing with the decrease in the number of the banks. The value for Cr5 was low in the first half of the observed period and above 50% in the second half, and HHI values are pointing to the low concentration during whole observed period (Matović- Marinović, 2018).

Bukvić applied Cr3, Cr4, Cr8, HHI, Gini coefficient and Linda indices measuring the level of the concentration in the Serbian banking sector for the following balance positions: assets, loans, deposits, capital and operating income. He found that the value of the indices is decreasing with the decline of the number of the banks, and it is generally low comparing all applied indices. However, the level of the concentration has tendency to become moderate (Bukvić, 2020).

In all the papers low concentration is confirmed when HHI is applied. Further, all the authors determined Serbian banking market as non-concentrated market with extremely fragmented structure. Despite many studies, the connection between concentration and competition remains an issue that is not completely resolved.

## 2. Research methodology

In this paper will be analysed the banking market and new development tendencies in the banking sector in Serbia by measuring banking concentration levels in the category of total assets, collected deposits, and approved loans.

The concentration was measured by the Concentration ratio (Cr5 and Cr4) and Herfindahl-Hirschman Index (HHI) for the period from 2018 to the third quarter of 2020, according to the published data of the National bank of Serbia.

The most commonly used indicator for measuring concentration is the Concentration ratio (CR<sub>n</sub> index), representing the share of the largest market participants. In this case, those are banks in the banking sector, and it is calculated as a share of the largest banks in the total market share. Mostly it is applied for 4 to 10 largest market participants, and how many banks will be included in the calculation is an arbitrary decision. The weakness of this method is that small banks are excluded from the calculation.

The Concentration ratio is calculated as follows:

$$CR_k = \sum_{i=1}^k S_i \quad (1)$$

30

In this formula, k represents the number of banks included in calculation and S represents the market share of banks.

The formula for the calculation of market share of each bank on the market is:

$$S = \frac{q}{Q} * 100\% \quad (2)$$

There is a difference between American and European standards when it comes to the results. According to the European rules, the acceptable value for the Cr4 is 25% of total industry, but it can be allowed to 30% (www.europa.eu.int, 2004). According to the Keynesian divide that is mostly applied in the USA, unconcentrated markets have ratio values under 25%, moderate concentrated markets have values between 25% and 50%, and highly concentrated markets have values above 50% (Stojanović et. al., 2010).

In general, the concentration level measured by CRn index can be low, medium, and high according to the range of values of concentration level:

1. values range between 0% to 50% - low concentration (monopolistic competition),
2. values range from 50% to 80% - medium concentration (usually oligopoly),
3. values range from 80% to 100% - high concentration.

This indicator is not as precise as others, for example HHI, since there are more banks present on the market, not just banks included in the calculation.

The values of the concentration ratio indicator can vary from 0 to 1. If the result is equal to 0, it can be concluded that market is in the state of perfect competition and if the value of the indicator is closer to 1 it is a proof of a high level of the concentration in the industry. The concentration ratio is very often expressed in percentages (multiplied by 100) because it is easier for the understanding and presentation of market share of the banks.

The HH index is the most commonly applied concentration level measurement method in the EU and USA, and it is a result of research of two economists, Herfindahl and Hirschman, expressed as a sum of square values of individual shares:

$$HHI = \sum_{i=1}^n S_i^2 \quad (3)$$

Wherein:

- n-number of banks
- S – market share of banks

When it comes to the result, the following approach is mostly accepted, as shown in the table below

*Table 1: Types of the markets by value of HHI*

|                                                    |
|----------------------------------------------------|
| Value of HH index –concentration offer degree      |
| HHI < 1000 unconcentrated (low concentrated) offer |
| 1000 ≤ HHI < 1800 medium concentrated offer        |
| 1800 ≤ HHI < 2600 highly concentrated offer        |
| 2600 ≤ HHI < 10000 Very highly concentrated offer  |
| HHI = 10000 Monopolly concentrated offer           |

*Source: Kostić, (2008).*

Values are in the interval from 0 to 10.000. Above 1000 it is considered that there is no market concentration; medium concentration is below 1800, and high concentration is above 1800.

If the result is 10.000, it means that there is a monopoly of one company, and this value shows there is no competition on the observed market.

The HHI can be expressed in absolute, reciprocal, and relative numbers. Absolute numbers are used if market share is expressed in absolute numbers and index value is in the interval from 0 to 10.000. The indicator can have a value of 10000 if a monopoly is present.

The Federal Reserve has determined the conditions under which, after a merger or acquisition in industry, the value must not exceed 1800 points (0.18). In addition, the change in value must not be greater than 200 points (0.02). If the HHI is less than 1800 points after integration, and if the growth of HHI is less than 200 points, it is considered that integration of banks does not have an adverse effect on the state of competition in the banking sector (Čirković, 2007). Based on this 1800/200 rule, regulatory authorities allow or reject banking integrations.

European rules are milder because individual takeovers and integrations of companies that cause an increase in HHI are acceptable up to 250 points without breaking the 2000 point limit (Stojanović et al., 2010).

The main disadvantage of measuring the concentration by applying HHI is the lack of respect for small market participants, especially those with a market share below 1%, although it is indisputable that market competitiveness is determined by leaders and their followers (Vuković, 2006).



The advantage of this method of calculation is that this index considers all banks in the market, not just the biggest ones, and values change when a new bank enters the market

### 3. Data and discussion

#### 3.1. Market concentration of banking sector measured by CR5

For the purpose of this work, the concentration ratio is measured for the five biggest banks and four biggest banks on the Serbian market, and those are the biggest banks in all accountants' categories observed: total assets, total collected deposits and total approved loans:

1. Banca Intesa ad Beograd
2. Unicredit banka ad Beograd
3. Komercijalna banka ad Beograd
4. Otp banka Srbija ad Beograd
5. Raiffeisen banka ad Beograd

The research covers the period from 2018 to the third quarter of 2020 and results are obtained using data from the official balance sheets and income statements of commercial banks published on the National Bank of Serbia web site.

*Table 2: Top five banks-share in total deposits*

| Banks                 | Market share in percents 2018 | Market share in percents 2019 | Market share in percents 2020 |
|-----------------------|-------------------------------|-------------------------------|-------------------------------|
| Banca Intesa          | 16.3                          | 16.1                          | 15.5                          |
| Unicredit bank ad     | 12.3                          | 11.3                          | 11.2                          |
| Komercijalna banka ad | 11.5                          | 10.0                          | 10.2                          |
| Otp banka Srbija ad   | 8.8                           | 8.4                           | 8.2                           |
| Raiffeisen bank       | 8.1                           | 7.8                           | 8.1                           |

*Source: Authors' calculation based on data from central bank*

The results for the top five commercial banks in category of total deposits (Table 2), show that first three banks are very close to each other by the market strength. Banca Intesa participated with 16% of market share in 2018 and 2019 and 15% in 2020, Unicredit bank ad with 12% of market share in 2018 and 11% in 2019 and 2020, Komercijalna banka with 11% in 2018 and 10% in 2019 and

2020, and OTP with 8% of market share in all 3 years of observed period followed with Raiffeisen, with 8% of market share in 2018 and 2020 and 7% in 2019 deposits and other liabilities to banks, other financial organisations and central bank and deposits and other financial liabilities to clients are included in calculation.

*Table 3: Top five ranking banks –market share in total loans*

| Banks                 | Market share in percents 2018 | Market share in percents 2019 | Market share in percents 2020 |
|-----------------------|-------------------------------|-------------------------------|-------------------------------|
| Banca Intesa          | 16.6                          | 16.7                          | 16.0                          |
| Unicredit bank        | 12.1                          | 11.0                          | 11.5                          |
| OTP Banka Srbija ad   | 10.2                          | 9.7                           | 9.4                           |
| Komercijalna banka ad | 8.4                           | 7.9                           | 7.4                           |
| Raiffeisen bank       | 7.7                           | 7.0                           | 7.6                           |

*Source: Authors' calculation based on data from central bank*

Market shares are different when it comes to granted loans (Table 3). Unicredit bank was with 12% of market share in 2018, 11% in 2019 and 2020, and Banca Intesa ad with 16% of market share in the observed period. OTP banka Srbija ad was among the first three banks with 10% of market share in 2018 and 9% in 2019 and 2020. Komercijalna banka had 8% in 2018 and 7% in 2019 and 2020, followed by Raiffeisen bank with 7% in the observed period.

In this category, both loans and receivables from banks and other financial organisations and loans and receivables from clients are included in the calculation for each bank.

Komercijalna banka ad was not among the first three only in the category of loans where OTP banka Srbija ad prevailed, which can point to better cost-price politics and marketing as well as customer services.

*Table 4: Top five ranking banks-market share in total assets*

| Banks                 | Market share in percents 2018 | Market share in percents 2019 | Market share in percents 2020 |
|-----------------------|-------------------------------|-------------------------------|-------------------------------|
| Banca Intesa          | 16.4                          | 15.7                          | 15.2                          |
| Unicredit bank        | 12.0                          | 11.3                          | 11.3                          |
| OTP Banka Srbija ad   | 11.2                          | 10.7                          | 10.3                          |
| Komercijalna banka ad | 8.7                           | 8.3                           | 8.1                           |
| Raiffeisen bank       | 8.2                           | 7.8                           | 8.1                           |

*Source: Authors' calculation based on data from central bank*

Table 4 shows market share in total assets and confirms that the strongest banks are Banca Intesa with 16% in 2018 and 15% in 2019 and 2020, Unicredit bank ad with 12% in 2018 and 11% in 2019 and 2020, and Komercijalna banka with 11% of market share in 2018, and 10% in 2019 and 2020. In category of total assets, OTP banka Srbija ad has 8% of market share and Raiffeisen bank ad 8 % in 2018 and 2020 and 7% in 2019.

The biggest five banks have more than 50% of banking share in all accounting categories, which confirms that citizens of Serbia have confidence in several banks, and leading bank in all categories is Banca Intesa a.d.

*Table 5: Serbian market CR5 Index*

| Year     | 2018 | 2019 | 2020 |
|----------|------|------|------|
| Deposits | 57%  | 54%  | 53%  |
| Loans    | 55%  | 52%  | 51%  |
| Assets   | 56%  | 54%  | 53%  |

*Source: Authors' calculation based on data from central bank*

As shown in table 5, Cr5 for collected deposits in 2018 was 57%, in 2019 was 54%, and in 2020 was 53%. The slight but constant decrease is obvious. The values of indices also decrease in the category of loans and Cr5 for 2018 was 55%, in 2019 was 52%; and in 2020 was 51%. The same situation is with assets, Cr5 for assets in 2018 was 56%, in 2019 was 54%, and in 2020 was 53%.

Results show that the index value decreases in all balance sheet positions each year with a decrease in the number of commercial banks operating in the Serbian market. This tendency is surprising. Usually, a decrease in the number of banks (Table 6) leads to a higher concentration, but despite the fact that there were 27 commercial banks in 2018, and 26 in 2019 and at the end of the third quarter of 2020, there is a constant decrease in Cr5 index value.

*Table 6: Number of the banks*

| Year | The number of the banks in Serbia |
|------|-----------------------------------|
| 2018 | 27                                |
| 2019 | 26                                |
| 2020 | 26                                |

*Source: Data from Central bank*

The Cr5 value in all observed categories (loans, assets and deposits) is above 50%, indicating a moderate concentration level if we applied European standards and high if we use the Keynesian divide. However, despite that fact, the value of this index has a constant tendency to decrease, which makes us conclude that, the Serbian market is medium concentrated with a tendency to low concentration without threat to endanger competition.

Three banks are dominant among the five biggest banks in each accounting category. The results open a dilemma as to whether it would be more expedient to apply Cr4 instead of Cr5 or even Cr3; having in mind that Cr4 is mostly recommended for smaller markets or markets with few dominant participants. For this reason, the Cr4 for Serbian banks is also calculated.

In theory, the Cr4 index is mostly used, and if  $CR4 < 40$ , the industry is considered very competitive (Naldi et al., 2014).

The values of Cr4 Competition level are shown in table 7 below:

*Table 7: Cr4 Competition level*

|               |                                                            |
|---------------|------------------------------------------------------------|
| Values of Cr4 |                                                            |
| 0             | Perfect competition                                        |
| 0-40          | Effective competition of monopolistic competition          |
| 40-60         | Loose oligopoly or monopolistic competition                |
| >60           | Tight oligopoly or dominant firm with a competitive fringe |

*Source: Naldi & Flamini, 2014.*

Low index values represent a higher competition level, and high values represent an oligopoly system. By the concentration ratio index values, oligopoly market can be divided into 3 categories:

- Loose oligopoly where results are in range from 40 - 60%
- Tight oligopoly where results are in range from 60 - 80%
- Dominant company where results are in range from 50 – 90% (Tadić, 2020.)

If we apply this Cr4 rule on the Serbian banking system, values are in the range of loose oligopoly or monopolistic competition, from 47 % to 43%, in all accounting categories observed, as shown in table 8 below:

Table 8: Cr4 values

| Year:    | 2018 | 2019 | 2020 |
|----------|------|------|------|
| Deposits | 47%  | 45%  | 44%  |
| Loans    | 46%  | 43%  | 43%  |
| Assets   | 47%  | 44%  | 44%  |

Source: Authors' calculation based on data from central bank

A decrease in Cr4 value is obvious in all accounting categories, and each year the value is lower despite ongoing bank consolidation processes. Therefore, according to these findings, concentration values are considered low.

### 3.2. Market concentration in the banking sector measured by HHI

For the calculation of HHI, data for all commercial banks in the Serbian market are used. Since the data for all banks are extensive, only results are presented in the table 9 below.

Table 9: Serbian market HH Index

| HHI      | 2018 | 2019 | 2020 |
|----------|------|------|------|
| Deposits | 853  | 815  | 803  |
| Loans    | 832  | 802  | 786  |
| Assets   | 845  | 805  | 795  |

Source: Authors' calculation based on data from central banks

Data in Table 9 confirms that the HHI of the banking assets in the Serbian market ranged from 845 points to 795 points in the observed period. Slightly but constantly, HHI decreases each year.

When it comes to the collected deposits, values of HHI ranged from 853 points in 2018, to 803 points in 2020.

The same decreasing tendency of the index value exists in this accounting category.

The HHI value for loans was 832 points in 2018, 802 points for 2019, and 786 points for 2020, and HHI values show that concentration was declining and the highest level of banking concentration was in 2018. The tendency of decreasing of the values of applied concentration indices was not expected because of the steady decline in the number of the commercial banks in the Serbian market.

In all categories observed, HHI is less than 1000 points, and it can be concluded that concentration in banking sector in Serbia is low. One of the reasons is large number of commercial banks which are operating in Serbia. The banking market is still fragmented and non-concentrated despite constant consolidation of commercial banks, which is also conclusion of many authors analysing the level of the market concentration in banking sector in Serbia, such as: Miljković at al. (2013), Bukvić (2017), Barjaktarović at al. (2013), Matović-Marinović (2018).

From the competition point of view, bearing in mind the number of market participants and market conditions, markets can be divided into competitive, monopolistic, oligopolistic, and markets of monopolistic competition. (Filipović, S.2019).

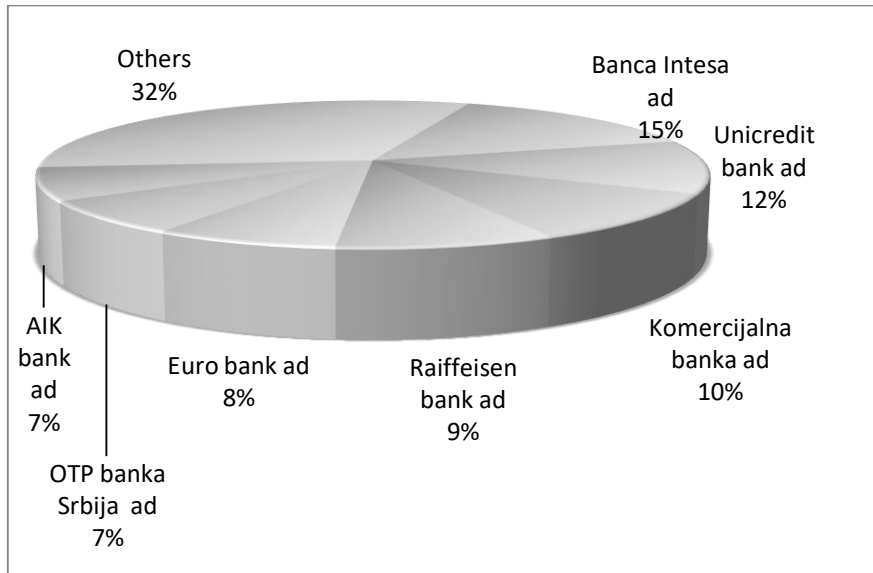
Perfect competition is the state of total competition, with many market participants who have small market share and cannot affect market price forming, while in monopoly, there is one dominant market participant who has real market power. The essence of market power is primarily the ability to change product prices (Veselinović, 2017).

All markets between perfect competition and monopoly have imperfect competition. Examples can be oligopoly and monopolistic competition. In an oligopoly, there are few sellers that offer similar or identical products, and together they can control price and production volume. On the other hand, in monopolistic competition, there are a lot of market participants offering similar but not identical products.

When the top 6-7 firms participate in the market with 70-80% share, it is a so-called loose oligopoly (Bukvić, 2017). According to all the abovementioned data, it is confirmed that competition in Serbia is closer to oligopoly than to monopolistic competition.

The first seven commercial banks participate with a market share of 67.9%, so a loose oligopoly could be present in the Serbian banking sector. In Serbia, there are 26 commercial banks operating in the market which is extremely fragmented and unconsolidated, with a large number of banks making up less than 1/3 of market, and seven banks having almost 70% of the market share. The top seven ranked banks are Banca Intesa ad with 15%, Unicredit bank ad with 12 %, Komercijalna banka ad with 10%, Raiffeisen bank ad with 9 %, Eurobank ad with 8% and OTP banka Srbija ad and AIK banka ad with 7%. The shares of commercial banks in total banking sector capital are shown on Fig. 1.

Figure 1-The shares of commercial banks in total banking sector capital

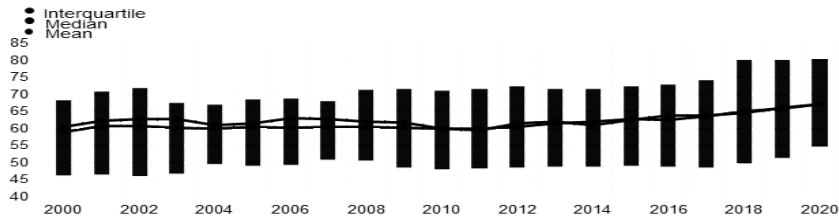


Source: Authors' calculation based on data from central bank

#### 4. Comparison of the results with EU countries

There is rising trend of concentration on the EU banking market. Fig. 2 represents values of the shares of the assets held by five largest EU banks.

Figure 2-The shares of assets held by five largest banks



Source: ECB -EU structural financial indicators, end of 2020

The average concentration level in the EU countries is 67.25%. Obviously, the values of the indices are growing every year and are claiming a moderate level of concentration. There is an opinion that the EU market is monopolistic by its structure and new members have a more competitive market (Staikouras & Koutsomanoli – Fillipaki, 2006). The other is that the EU market is becoming more concentrated without threat to endanger competition (Casu & Girardone, 2009). A steady decline in the number of banks has been a trend from the foundation of the EU. At the end of 2020, there is a further decline in the number of bank branches to 8.6%, and the concentration level varies from 31.60% to 97.03 % (ECB, 2021).

When it comes to the HHI, the situation is a little bit different (Table 10). The values declare low concentration with an average value of Herfindahl - Hirschman index 818 points for 2020.



Table 10- EU 28 values of the HHI

Source: The ECB: EU structural financial indicators-end of 2020 retrieved from <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210526~7469dedaaf.en.html>

| EU COUNTRY       | 2016  | 2017  | 2018  | 2019  | 2020  |
|------------------|-------|-------|-------|-------|-------|
| Belgium          | 1.017 | 1.102 | 1.218 | 1.246 | 1.299 |
| Bulgaria         | 939   | 906   | 939   | 992   | 1.133 |
| Czech Republic   | 1.016 | 1.039 | 1.070 | 1082  | 1.109 |
| Denmark          | 1.224 | 1.123 | 1.069 | 1,170 | 1.250 |
| Germany          | 277   | 250   | 245   | 277   | 325   |
| Estonia          | 2.406 | 2.419 | 2.698 | 2.545 | 2.578 |
| Ireland          | 636   | 658   | 632   | 665   | 811   |
| Greece           | 2.332 | 2.307 | 2.304 | 2.382 | 2.320 |
| Croatia          | 1.405 | 1.387 | 1.554 | 1.564 | 1.582 |
| Spain            | 937   | 965   | 1.138 | 1110  | 1.081 |
| France           | 572   | 574   | 663   | 654   | 688   |
| Italy            | 452   | 519   | 579   | 643   | 675   |
| Cyprus           | 1.366 | 1.962 | 2.379 | 2276  | 2.285 |
| Latvia           | 1.082 | 1.237 | 1.583 | 1.596 | 1.912 |
| Lithuania        | 1.938 | 2.189 | 2.278 | 2.289 | 2.408 |
| Luxembourg       | 260   | 256   | 261   | 277   | 315   |
| Hungary          | 787   | 802   | 801   | 921   | 1.224 |
| Malta            | 1.602 | 1.599 | 1.518 | 1.548 | 1.620 |
| Netherlands      | 2.097 | 2.087 | 2.178 | 2.039 | 2.001 |
| Austria          | 358   | 374   | 369   | 369   | 407   |
| Poland           | 659   | 645   | 683   | 688   | 753   |
| Portugal         | 1.181 | 1.220 | 1.203 | 1.225 | 1.239 |
| Romania          | 903   | 915   | 962   | 971   | 997   |
| Slovenia         | 1.147 | 1.133 | 1.020 | 1.008 | 1.189 |
| Slovakia         | 1.264 | 1.332 | 1.383 | 1.404 | 1.430 |
| Finland          | 2.300 | 1.700 | 2.570 | 2.420 | 2.250 |
| Sweden           | 845   | 914   | 785   | 786   | 791   |
| United Kingdom - | 422   | 453   | 353   | 349   | /     |

Comparing to the rest of the EU members, Germany and Luxembourg have extremely low values of the HH index, lower than HHI in Serbia, between 260

and 325 points in the observed period, but they are progressively growing and pointing to the almost perfect competition scenario.

Low values of the HH index, lower than Serbian banking market have Ireland, France. Italy and Poland with indices between 450-700 points. In this group before Brexit was United Kingdom with values between 350-453 points. Despite continuous growth of the value of the indices, at the end of the 2020, the concentration levels in these countries are still low. On the other hand, Finland, Netherlands, Greece and Estonia with values higher than 2000 points are in danger of monopolistic competition. Although the average concentration level in the EU is moderate, there are countries with extremely high and extremely low values of the indices. Those differences also indicate the differences in the market structure, going from perfect competition and oligopoly to monopolistic competition. It is evident that the EU market is not homogenous, and more actions, primarily actions towards the unification of the antitrust regulations and better implementation are needed.

## 5. Conclusions

The purpose of this paper is to determine the concentration level within the banking sector in Serbia to reveal if there is an impact of the concentration level on the competitiveness of the Serbian banking sector.

The concentration level is measured by applying the concentration ratio for four and five biggest banks (Cr4 and Cr5) and Herfindal-Hirschman index (HH index) in the period from 2018 to Q3 2020 for the following banks' balance sheet positions: assets, approved loans, and collected deposits.

Firstly, it is shown that the banking market is medium concentrated, as seen by Cr5. The banking market is low concentrated or unconcentrated in accordance with Cr4 and HHI. The obtained values of indices show a decrease in concentration with the decrease in the number of banks. At first glance, it is confusing, having in mind that mergers and acquisitions usually lead to a higher concentration. However, it can be concluded that consolidation does not affect concentration and competition.

Secondly, empirical research shows competition among banks in Serbia without threats of monopoly. Although there are plenty of participants (26 banks), the market structure is not oligopolistic; it has more of a so-called loose oligopoly. The top seven banks have 67.9% of the total banking market share, and the market is still fragmented despite the constant reduction in the number of commercial banks.

Serbian financial market is small, undeveloped and bank-centered, and for the perfect market conditions, there is no need for such a large number of banks.

Serbian commercial banks are predominantly foreign-owned, with a market share of 86%, followed by state-owned banks with a market share of 7.1 % and banks with predominant private equity with 6.9% of the market share. The largest market share is possessed by Banca Intesa ad with 15%, then Unicredit bank ad with 12 %, followed by Komercijalna banka ad with a market share of 10%.

In the first half of 2021, two significant mergers occurred in the Serbian banking market: NLB bank ad took over Commercial bank, and Vojvođanska banka ad took over OTP bank Srbija ad Beograd (previously Societe general bank).

Aik banka ad took over Sber banka ad in November, and another acquisition between Direktna banka ad and Eurobanka ad is announced. The market consolidation continues in 2021, and we can conclude that there is a constant tendency in reduction of the number of banks and the trend of mergers and acquisitions. Regardless of the current changes and enlargements of the Serbian banking sector, the market is still fragmented and low-concentrated. There is room for increasing competitiveness by improving products, offerings, and services quality.

The scientific contribution of this research is reflected in the fact that it shows in which direction Serbian banking sector develops. Still, complete information can be provided after the announced takeovers are completed. Constant monitoring of changes in the concentration level and a new market analysis should be the subject of future research that focuses on the impact of implementation of the EU regulations on the development of competition in Serbia using competition measures, and on the examination of the mutual connection between banks consolidation and competition.

It is evident that the issue of competitiveness of the banking sector is becoming more and more significant. We have to pay additional attention to regulations on competition protection, additional harmonization with existing EU rules, and their proper implementation. Training for employees in institutions to the Ministry of Economy and the Commission for protection of competition and training of employees under the auspices of the Association of Banks seem to be reasonable and necessary steps to be taken.

## References

- Balance Sheets and Income Statements of Commercial Banks, National Bank of Serbia, retrieved from [https://www.nbs.rs/sr\\_RS/finansijske-institucije/banke/bilans-stanja/](https://www.nbs.rs/sr_RS/finansijske-institucije/banke/bilans-stanja/)
- Barjaktarović, L., Filipović, S. & Dimić, M. (2013) Measuring concentration level in CEE countries, Vol. 41, No. 03, pp. 39 – 53
- Bikker, J.A. & Haaf, K. (2000) Measures of competition and concentration in the banking industry: a review of a literature, Central bank of the Netherlands, Economic & Financial Modelling, Summer 2002, retrieved from [https://www.researchgate.net/publication/4810038\\_Measures\\_of\\_Competition\\_and\\_Concentration\\_in\\_the\\_Banking\\_Industry\\_a\\_Review\\_of\\_the\\_Literature](https://www.researchgate.net/publication/4810038_Measures_of_Competition_and_Concentration_in_the_Banking_Industry_a_Review_of_the_Literature)
- Berger, A., Demirguc-Kunt, A., Levine, R. & Haubrich, J. (2004) Bank concentration and competition: An evolution in the making. *Journal of Money, Credit and Banking*, 36(3), 433-451.
- Bojat, M. & Rebić, M. (2020) Degree of concentration of the banking sector in B&H and the impact on the prices of banking products; *Economic Themes*, 58(2): 219-234.
- Bruner, F.R. (2004) *Applied mergers and acquisitions*, John Wiley & Sons, 87
- Bukvić, R. (2017) Concentration and Competition in Serbian Banking Sector, Nizhny Novgorod State University of Engineering and Economics, Knyaginino, Russia, retrieved from <https://mpra.ub.uni-muenchen.de/85161/> MPRA Paper No. 85161,
- Casu, B. & Girardone, C. (2009) Competition issues in European banking, *Journal of Financial Regulation and Compliance*, retrieved from [https://www.researchgate.net/publication/46545753\\_Competition\\_issues\\_in\\_European\\_banking/link/553bbdfe0cf29b5ee4b87c8b/download](https://www.researchgate.net/publication/46545753_Competition_issues_in_European_banking/link/553bbdfe0cf29b5ee4b87c8b/download)
- Cetorelli, N. (2001) Does Bank Concentration Lead to Concentration in Industrial Sectors? Working Paper 2001-01, Federal Reserve Bank of Chicago
- Ćirković, M. (2007) *Bankarstvo*, Naučno društvo Srbije, Beograd, 299.
- Council Regulation (EC) No 1/2003 of 16 December 2002 on the implementation of the rules on competition laid down in Articles 81 and 82 of the Treaty (Text with EEA relevance) , retrieved from <https://eur-lex.europa.eu/eli/reg/2003/1/oj>
- European Central Bank, (2021) EU structural financial indicators: end of 2020, retrieved from <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210526~7469dedaaf.en.html>
- Fernández, I.A., González, F. & Suárez, N. (2008) How institutions and regulation shape the influence of bank concentration on economic growth. International evidence, 11<sup>th</sup> Symposium of finance, banking and insurance, University of Karlsruhe, retrieved from <https://www.fbv.kit.edu/symposium/11th/Paper/07FinanceGovernment/suarez.pdf>
- Filipovic, S. (2003) Reform in the commercial banking sector, retrieved from [https://www.researchgate.net/publication/277137336\\_Reform\\_in\\_the\\_commercial\\_banking\\_sector](https://www.researchgate.net/publication/277137336_Reform_in_the_commercial_banking_sector) .

- Filipović, S. (2019) Ekonomija, Univerzitet Singidunum, 136-157
- Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentration between undertakings, SLC31/03,2004 , retrieved from [www.europa.eu.int](http://www.europa.eu.int)
- Hayes, A. (2021) Guide to mergers and acquisitions, Investopedia, retrieved from <https://www.investopedia.com/terms/m/mergersandacquisitions.asp>
- Naldi, M. & Flamini, M. (2014) The CR4 index and the interval estimation of the Herfindahl-Hirschman Index: an empirical comparison <https://hal.archives-ouvertes.fr/hal-01008144>, Preprint submitted on 17 Jun 2014 retrived from [www.sciencedirect.com](http://www.sciencedirect.com) .
- National Bank of Serbia,(2021) Annual Report on Activities and Result, retrieved from <https://www.nbs.rs/en/drugi-nivo-navigacije/publikacije-i-istrazivanja/GIOPRR/>
- Jović, M. (2006) Konkurencija i koncentracija u bankarskom sektoru Bosne i Hercegovine, Bankarstvo, vol. 35, br. 11-12, str. 42-56
- Kostić, M. (2008) Merenje koncentracije ponude grane, Ekonomski horizonti, 10(1), 95
- Kostić, M. (2009) Analiza koncentracije ponude u sektoru osiguranja u Srbiji, Industrija,37 (2), 59-77
- Kostić, M. (2013) Tržišna moć korporacija i koncentracija u grani, Kragujevac, Univerzitet u Kragujevcu, Ekonomski fakultet, Doktorska disertacija
- Law on banks (" Official Herald of the Republic of Serbia ", No 107/2005, 91/2010 i 14/2015)
- Law on protection of competition (" Official Herald of the Republic of Serbia ", No. 51/2009 and 95/2013)
- Ljumović, I., Pavlović, V. & Cvijanovi, J. (2014) Two Aspects of Concentration in Serbian Banking Sector, Industrija, 42 (3), 61–77.
- Matović-Marinović, I. (2018) Creating and Developing Competition in the Banking Sector of the Republic of Serbia, Research association for interdisciplinary studies
- Miljković, M., Filipović, S. & Tanasković, S. (2013) Market concentration in the banking sector – Evidence from Serbia, Industrija, 41 (2), 7-25.
- Naldi, M. & Flamini, M. (2014) The CR4 index and the interval estimation of the Herfindahl-Hirschman Index: an empirical comparison, HAL Id: hal-01008144
- Shijaku, G. (2017) Does Concentration Matter for Bank Stability? Evidence from the Albanian Banking Sector, Journal of Central Banking Theory and Practice, pp. 67-94
- Staikouras, C., Koutsomanoli-Fillipaki, N. (2006) Competition and Concentration in the New European Banking Landscape, retrived from: <http://fmwww.bc.edu/repec/mmfc04/26.pdf>
- Stojanović B., Stanišić T. & Veličković M (2010) The problem of competitor protection in retail trade in Serbia, Škola biznisa, Vol.3, 60.
- Tadić, B. (2020) Hrvatsko tržište cementa i njegova tržišna struktura, Sveučilište u Splitu, Ekonomski fakultet, retrived from: <https://urn.nsk.hr/urn:nbn:hr:124:886922>
- Ukav, I. (2017) Market Structures and Concentration Measuring Techniques, Asian Journal of Agricultural Extension, Economics & Sociology , 19(4): 1-16, Article no.AJAEES.36066
- Veselinović, P. (2017) Ekonomija, Univerzitet Singidunum, Fakultet za turistički i hotelijerski menadžent, 96-103.
- Vuković, V. (2006) The market concentration of domestic banks, Finansije, Vol.1-6, 9.