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Concentration Level of the Banking Industry in CEE Countries⁴

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Abstract: *The purpose of the paper work is to determine on the basis of empirical research, if there is a relation between the level of concentration and competitiveness within banking sector of chosen countries of Central and Eastern Europe (CEE): Serbia, Croatia, Bosnia and Herzegovina, Montenegro, Macedonia, Bulgaria, Romania, Hungary and Albania. The level of concentration is measured by applying the concentration ratio of five big banks (CR5) and Herfindal-Hirschman index (HH index) in the period from 2007 to 2012 for the following banks' balance items: assets, approved loans and collected deposits. On the basis of received results, the research shows that there is no relation between the level of concentration and level of competitiveness. Furthermore, it is approved that banking market of analyzed CEE countries is moderate to high concentrated in accordance with CR5 (values of index are in the range of 46% to 85% for mentioned three banks'*

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indicators), i.e. no market concentration to moderate concentration accordingly to HHI (values of index are in the range of 559 to 2070 points).

Keywords: banking sector, concentration, competition, CEE countries.

Nivo koncentracije u bankarskoj industriji u zemljama centralne i istočne Evrope

Apstrakt: Cilj rada je da se na bazi empirijskog istraživanja utvrdi da li postoji veza između nivoa koncentracije i konkurencije u bankarskom sektoru devet izabраних zemalja Centralne i Istočne Evrope (CEE): Srbija, Hrvatska, Bosna i Hercegovina, Crna Gora, Makedonija, Bugarska, Rumunija, Mađarska i Albanija. Merenje koncentracije je izvršeno primenom racio koncentracije za pet najvećih banaka (CR5) i Herfindal-Hiršmanov indeks (HH indeksa) za vremenski period 2007-2012. godine za sledeće bilansne pozicije banaka: aktiva, odobreni krediti i prikupljeni depoziti. Na osnovu sagledavanja dobijenih rezultata, empirijsko istraživanje je pokazalo da ne postoji veza između nivoa koncentracije i nivoa konkurencije. Takođe, utvrđeno je da je bankarsko tržište posmatranih zemalja umereno do visokokoncentrisano prema CR5 indeksu (vrednosti indeksa se kreću od 46% do 85% za posmatrana tri bilansne pozicije), odnosno nekoncentrisano do srednje koncentrisano prema HHI (vrednosti indeksa se kreću od 559 do 2070 poena).

Ključne reči: bankarski sektor, koncentracija, konkurencija, zemlje Centralne i Istočne Evrope.

1. Introduction

Concentration is defined as a measure of subject participation in cumulative sales, assets or market share and it is usually determined by the number of companies in an industry and by their relative size (Zingales and Raghuram, 2003). Measurement of concentration in the banking sector is very specific due to the problem of identification of products and services traded (Miljković, Filipović & Tanasković, 2013).

Pioneering analysis of the level of concentration in the banking sector and the behaviour of oligopoly markets was carried out in the 1930s and 1940s of the 20th century. In the scientific literature, there are numerous reasons that may lead to banking concentration. Hawkins and Mihaljek (2001) identify the following groups of motives that encourage banks towards banks' consolidation: i) cost benefits (economies of scale, improvement of

organizational efficiency, risk diversification); ii) revenue benefits; iii) other motives (defence against takeovers, private managerial benefits, etc).

The importance of market concentration in the banking sector is reflected in its impact on competition, efficiency and profitability in the banking sector, as well as on economic development and structure in other sectors. (Miljković et al, 2013). The purpose of the paper work is to determine, on the basis of empirical research, if there is a relation between the level of concentration and competitiveness within banking sector. It will be tested on chosen sample of CEE countries of Central and Eastern Europe (CEE): Serbia, Croatia, Bosnia and Herzegovina, Montenegro, Macedonia, Bulgaria, Romania, Hungary and Albania. In accordance with it, the level of concentration within banking sectors of analyzed group of CEE countries will be determined.

In theory there are two directions to determine the mentioned relation, i.e. authors who proved and authors who didn't prove that relation. In the first group there are authors who believe that concentration and competitiveness are in negative relation, i.e. high level of concentration leads to a decrease of market competitiveness. Chamberlain, Hall and Hitch, and Sweezy showed that oligopoly markets can limit competitiveness (Kraft, 2007). Bikker and Haff (2011) proved on the basis of empirical research that there is high level of correlation between HH index and concentration ratio for n banks. Apart from it, Bikker and Haff (2000) explained banks' competitiveness in two ways:

- The Structure Approach:
 - The Structure-Conduct-Performance (SCP) is empirically approved by Bain (1951), Berger and Hannan (1989), Besanko and Thakor (1992), De Bonis and Fernando (2000) and Elgi and Rime (1999).
 - The efficiency hypothesis is approved by Smirlock, Gilligan & Marshal (1984), Maudos (1998), Jansen and de Hann (2003), Demirguc-Kunt and Levine (2000, 2004), Fuentes and Sastre (1998).
- The Contestable Markets Theory (CMT) is approved by Jansen and de Hann (2003), Gelos and Roldos (2002), Claessens and Laeven (2003) and Vukovic (2006).

The structure approach includes two opposite hypotheses. SCP is based on the following preconditions: 1) there is causal relation between market structure (number of the banks) and market concentration of one country, 2) there is causal relation between market structure and banks' price policy (profitability). Small number of banks often leads to an increase in the price of banks; products, i.e. increase in banks' profit margin (Bain, 1951). SCP was tested on banking sector of USA (Berger & Hannan, 1989). It found out that highly concentrated banking market (measured by HH index and market share of the three biggest banks) achieved higher net interest margins, due to the calculating higher interest rates on assets and lower interest rates on

liabilities. Besanko and Thakor (1992) stressed that stronger market concentration results in increased number of the banks which perform business and increased level of interest rates on liabilities. Researches done in Italy by De Bonis and Fernando (2000) and Switzerland by Egly and Rime (1999) determined positive correlation between the concentration of market power and interest rates on liabilities.

However, the efficiency hypothesis approved that improvement of efficiency of the biggest banks is the most important reason for merger of banking market (Smirlock, Gillgan & Marshal, 1984; Maudos, 1998). In accordance with the efficiency hypothesis, it is approved that there is no direct relation between level of concentration in banking sector and level of profitability (Smirlock et al., 1984; Jansen & de Haan, 2003). Their research confirmed that profitability of banking sector wasn't exposed to risk due to the increase of level of banks' concentration on the market. Moreover, Demirguc-Kunt and Levine (2000) approved that concentration of banking market is not connected with banks' efficiency. Theoretical model developed by Fuentes and Sastre (1998) showed that increase of concentration of banking market, as well as consolidation of banking groups didn't have impact on decrease level of competitiveness and interest rates. Demirguc-Kunt, Laeven and Levine (2004) tested 1,400 banks from 72 countries and stressed the importance of other factors which have impact on concentration level in banking sector, such as barriers for entering into market, limitations of business diversification, quality of institutions in charge for protection of private ownership and individual characteristics of banks.

The Contestable Markets Theory is based on banks' behaviour in accordance with the characteristics of the market, i.e. characteristics of general market competitiveness factors or barriers for enter or exit on it.

In the second group are researches of authors who disapproved opinion that concentration and competitiveness are in negative relation. Jansen and de Haan (2003) disapprove existence of relation by analysing the level of concentration in assets, credits and deposits in European banking sector. Furthermore, Gelos and Roldos (2002) approved on testing sample of 8 European and Latin American countries that banking sector didn't become more competitive with increased of level of concentration. Additionally, Slaessens and Laeven (2003) didn't find negative connection between concentration and competitiveness on the basis of analysis which was done on the sample of banking sector of fifty countries. Moreover, they determined that banking sectors with higher concentration is more competitive, because market with more stronger players don't have to be noncompetitive, under condition of free entrance on the market. Vuković (2006) also stressed that banking concentration is not in direct correlation with the level of competitiveness due to the nature of banking business which is based on

customers' trust, economy scale, technology, experience and required equity. Hawkinsa and Mihaljek (2001) underlined that some central banks considered market share of one bank under 15% as non-desirable, while others are concerned market share of 30%, if the bank is well-managed and banking market is open.

2. Methodology of research

According to the relevant literature, the aim of authors is to determine is there a relation between concentration and competition using empirical research in the banking sector of nine selected CEE countries: (Serbia, Croatia, Bosnia and Herzegovina, Montenegro, FYR of Macedonia, Bulgaria, Romania, Hungary and Albania). Although there are different ways of measuring concentration level in banking sector, the concentration is measured by Concentration ratio (CR5) and Herfindal-Hirschman Index (HHI) in this paper.

Concentration ratio (CR) or evidence of participation to the largest (k) banks in the banking sector is the simplest and most frequently used form of measurement of concentration in the banking industry. In the banking sector concentration ratio is calculated as a share of the largest banks in the total assets of the banking industry, whereby the broadest use has a concentration ratio of the top five banks. In empirical research it can be analysed the different levels of ratios starting from dominante up to the least dominant group. Measurement of the concentration of monopoly or duopoly represents testing of one or two firms with the highest market share, respectively. Concentration ratio is calculated on the following way:

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

where:

- k – number of banks, which market share is calculated
- S – market share of banks

Market participation of any bank (i) on the market is calculating by applying following formula:

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

When it comes to the interpretation of the results obtained by applying this indicator, there is not a unique and widely accepted approach. Concentration ratio ranges from 0 to 1, with values closer to 0 when there are a lot of banks in the market with equal share, and the value of 1 which present the sum of the k number of banks in the market. In other words, if the value of the

indicator is equal to 0, it can be stated that the market share of the largest banks is irrelevant, or that the market is fully competitive. On the contrary, if the value of the concentration ratio is close to 1 there is a high level of concentration in the industry. In the literature concentration ratio is multiplied by 100 because it is easier to understand collected data as well as to present the market share of the banks in percentage.

In the banking sector there is no unique level where the low concentration ends and the high starts and it is correlated to the market situation heavily. Following the European standards, the marginal CR4 is 25% of the total sector, although individual decisions allow banking concentration up to 30% (www.europa.eu.int, 2004). In the U.S. it is used the Keynesian classification (Stojanović, Stanišić & Veličković, 2010):

- Non-concentrated market CR4 under 25%;
- Concentrated market CR4 between 25% and 50% and
- Highly concentrated market CR4 above 50% (Stojanović et al., 2010).

Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration and can be used as a starting point in defining other indicators. It provides information about level of concentration in a particular market, taking into consideration the market share of all companies as well as differences in size of the market share among competitors. Besides the concentration ratio, HHI is a commonly used measure of concentration in European and American economic systems, because it provides specific information about concentration in the observed sector in the process of merger and acquisition of companies.

Herfindahl Hirschman Index (HHI) is calculated as the sum of square values of individual bank shares in the category observed (assets, loans, deposits, etc.) and is calculated in the following way:

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

where:

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

If the market shares are expressed in absolute numbers, HHI can be presented in absolute numbers with value in the interval from 0 to 10,000. HHI up to 1,000 indicates that there is no market concentration, 1,000-1800 indicates moderate concentration, above 1,800 indicates high concentration. HHI up to 10,000 indicates that there is a one company / bank (monopolist) on the market.

There are different approaches when it comes to interpreting the value of HHI. The Federal Reserve's (FED) has defined the policy according to which HHI should not exceed 1,800 points (0.18) after the banks' merger or acquisition i.e. the change in value must not exceed 200 points (0.02). If the index exceeds the arranged value, some banks are allowed to keep prices above the market in a period of time; therefore a competition in the banking sector is compromised. European rules are less stringent. An increase of HHI by 250 points, caused by banking integrations, is acceptable when the limit is of 2,000 points (Stojanović et al., 2010). In some cases, a possibility of an increase by 150 points is provided over the limit of 2,000 points.

In the paper, the concentration level of the five largest banks in selected countries will be measured by CR5 and HHI as a:

- Share of banks in total assets;
- Share of banks in total loans;
- Share of banks in total deposits.

Data used in the analysis are taken from the publications of national central banks of CEE countries for the period 2007-2012. Authors had some obstacles in collecting the data in the case of EU banking sector. Furthermore, authors were not able to give an overview of average concentration level in EU banks. There were some obstacles in collecting the data in the case of Bulgaria, Hungary and Romania, while in the case of Serbia, Croatia, Bosnia and Herzegovina, Montenegro, Macedonia and Albania all the data were successfully collected for the mentioned period. Therefore, there is no unique statistic of average concentration level in CEE banks measured by HHI and CR5.

3. Data and discussion

CEE banking sector has been in transition since last decade of the last century. It coincided with the system and industry transformation of CEE countries. Accordingly, banking sector was the most attractive for foreign direct investments and after liberalization of regulation Austrian, German and Italian banks were the fastest in entering. Expansion of foreign equity is visible in share of foreign owned banking assets (or equity) comparing to the assets (or equity) of total banking sector.

Commercial banks in the region are now predominantly owned by banks from Austria, Italy, Slovenia, Greece and France. Only in Bosnia and Herzegovina there are no Greek banks, while in Albania the Greek banks hold about 35% of banking assets (Filipović, 2012). It is important to note that in all countries

the share of the banking sector in total assets of the financial sector ranged from 65% to 134%.

Table 1. Banking system in selected CEE countries*

| | Total assets as share of GDP | Share in total assets: | |
|------------------------|---------------------------------|------------------------|-----------------------|
| | | State-owned banks | Foreign owned bank |
| Serbia | 84.4 | 16.0 | 75.3 |
| Croatia | 72.7 | 4.1 | 90.9 |
| Bosnia and Herzegovina | 87.2 | 0.8 | 94.5 |
| Montenegro | 97.4 | 0,0 | 87.1 |
| FYR of Macedonia | 65.4 | 1.4 | 93.3 |
| Romania | 72.7 | 7.9 | 84.3 |
| Bulgaria | 103.7 | 2.4 | 84.0 |
| Hungary | 134.0 | 3.9 | 81.3 |
| Albania | 77.0 | 0,0 | 92.4 |

Note: date based on 2009.

Source: Raiffeisen Research (2013) and CEE Banking Sector Report and EBRD Structural change indicators available at <http://www.ebrd.com/pages/research/economics/data/macro.shtml>

Last important acquisitions in the CEE ended in 2007. After effects of the global economic crisis, a drop of foreign equity ownership was evident, varying from 5% to 6% (RZB, 2010). Important European regional players who had invested in CEE countries initiated coordination measures with relevant central banks (of home and daughter countries) known as Vienna' initiative (2008) in order to provide the stability on the banking market. This initiative went in direction of more restrictive liquidity criteria of banks (i.e. loan to deposit ratio) which means that bank can grant maximum loans which are equivalent to the collected sum of money. All serious European regionally active banks had introduced measures for obtaining liquidity on group level, which had impact on increase of interest rates (prices) on liabilities (sources of financing). At the same time there is a lack of possibilities for good investments (which is current situation on EU market) and it might result in equity transfer to headquarters. Furthermore, European regionally active banks initiated appliance of Basel rules in CEE countries, especially in the sample of 9 countries subject of analyses, in order to calculate less provisions on the basis of internal models which are created in accordance with their risk profile. Finally, it resulted in increased concentration level in CEE banking sectors subject of analyses, but it didn't effect in improved competitiveness level of leading domestic banks (foreign owned). In fact, leaders on local

markets have kept prices of their products on the same level, in order to improve own profitability during the crisis.

Being aware that financial shocks quickly spill over the region, all major banks operating in the region hold significant surpluses of liquidity reserves as a "security shield" against potential shocks. By the end of June 2012, the parent banks in the EU will have to increase their capital in relation to weighted assets from 6% to 9%. These measures will affect the reduction of financial inflows into the region, on the basis of significant reduction or complete suspension of new credit lines.

3.1. Market concentration of banking sector in selected CEE countries measured by CR5

A concentration ratio in the total assets of the banking sector may represent an adequate criterion for comparison with the banking sectors in CEE countries despite the differences in the nominal value of assets and the number of banks. Therefore, the following table presents the concentration ratio of the five largest banking assets in selected CEE countries.

Table 2. CR5 of the banking assets of selected CEE countries (in %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|------|------|------|------|------|------|
| Serbia | 46.0 | 46.0 | 46.0 | 45.0 | 47.0 | 48.0 |
| Croatia | 71.6 | 71.9 | 75.0 | 75.0 | 75.5 | 75.9 |
| Bosnia and Herzegovina | 74.4 | 79.0 | 78.2 | 75.8 | 74.7 | 74.2 |
| Montenegro* | 77.0 | 77.0 | 81.7 | 76.9 | 73.8 | 72.3 |
| FYR of Macedonia | 76.6 | 74.7 | 77.4 | 77.2 | 77.0 | 77.0 |
| Romania** | 56.3 | 54.3 | 52.4 | 52.7 | 54.6 | 55.2 |
| Bulgaria | 56.7 | 57.3 | 58.3 | n.a. | n.a. | n.a. |
| Hungary | 54.1 | 54.4 | 55.2 | n.a. | n.a. | n.a. |
| Albania | 72.0 | 74.0 | n.a. | n.a. | n.a. | n.a. |

*In 2007 and 2008 CR4 is calculated in banking assets in Montenegro.

** The end of 1H2012

Source: Authors' calculation based on data from central banks

Data from Table 2 shows that the level of concentration ratio in banking assets of the largest five banks in selected CEE countries ranged from 45% to 82% in the period 2007-2012. In this period, CR5 in banking assets was above 75% in Montenegro, Bosnia and Herzegovina, Croatia, Macedonia and Albania, while Serbia had the lowest level of bank concentration in assets (under 50 %). Serbian banking sector is characterized by a sensible level of concentration and the other characteristics (Barjaktarović & Ječmenica, 2011).

Concentration ratios of loans in five largest banks in selected countries are presented in Table 3. Data shows that this indicator was in a range from 44% to 84%. The lowest level of concentration ratio in loans was in domestic banking sector with the average six-year share of 47%, while the other analyzed countries had concentration ratio above 70% (with the exception of Romania and Albania).

Table 3. CR5 of loans in the banking sector of selected CEE countries (in %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|------|------|------|------|------|------|
| Serbia | 44.0 | 48.0 | 46.0 | 45.0 | 50.0 | 51.0 |
| Croatia | 72.1 | 74.0 | 76.2 | 76.8 | 77.0 | 79.0 |
| Bosnia and Herzegovina | 76.0 | 81.8 | 73.9 | 77.8 | 75.4 | 73.5 |
| Montenegro* | 77.0 | 77.0 | 84.0 | 78.3 | 74.2 | 73.6 |
| FYR of Macedonia** | 80.0 | 76.9 | 81.2 | 79.3 | 79.1 | 79.0 |
| Romania*** | 55.2 | 54.4 | 51.2 | 52.6 | 54.7 | 52.5 |
| Bulgaria | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Hungary | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Albania | 66.0 | 68.0 | n.a. | n.a. | n.a. | n.a. |

*In 2007 and 2008 CR4 is calculated in banking assets in Montenegro.

** CR5 is calculated only for loans of households.

*** The end of 1H2012

Source: Authors' own calculations based on data from central banks

Data from Table 4 shows the concentration level of deposits in selected CEE countries in the analyzed period. Concentration level of deposits of five largest banks was in a range from 48% to 86%. CR5 in total deposits in Serbia was around 50% which is the lowest concentration level in selected CEE countries. On the other hand, CR5 in Croatia in 2007 was above 90% (other 28 banks had a concentration level of deposits around 8%).

Table 4. CR5 of deposits in the banking sector of selected CEE countries (in %)

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|------|------|------|------|------|------|
| Serbia | 48.0 | 50.0 | 51.0 | 50.0 | 48.0 | 49.0 |
| Croatia | 92.1 | 73.0 | 76.4 | 75.8 | 76.0 | 77.0 |
| Bosnia and Herzegovina | 77.5 | 80.1 | 78.4 | 75.8 | 73.7 | 74.5 |
| Montenegro* | 79.6 | 83.1 | 83.0 | 81.5 | 78.7 | 76.4 |
| FYR of Macedonia** | 83.9 | 84.8 | 85.7 | 84.9 | 84.2 | 84.2 |
| Romania*** | 59.4 | 51.9 | 52.0 | 55.0 | 57.0 | 53.1 |
| Bulgaria | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Hungary | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Albania | 76.0 | 78.0 | n.a. | n.a. | n.a. | n.a. |

*In 2007 and 2008 CR4 is calculated in banking assets in Montenegro.

**CR5 is calculated in household credit.

*** The end of 1H2012.

Source: Central banks

3.2. Market concentration in banking sector in selected CEE countries measured by HHI

Market concentration of banking assets measured by HHI in selected CEE countries shows that Serbia, Bulgaria and Hungary are in un-concentrated markets, while the other analyzed countries have concentrated banking sector in the period 2007-2012.

Data in Table 5 confirms that the HHI of the banking assets in selected CEE countries was in a range from 606 points to 1,700 points in the period 2007-2012. Having in mind negative effects of the world economic crisis, domestic banking sector maintained a minimum level of banking concentration in the region. On the other hand, Bosnia and Herzegovina, Albania and Macedonia had the highest HHI of assets.

Table 5. HHI of assets of selected CEE countries

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Serbia | 606 | 627 | 636 | 629 | 660 | 678 |
| Croatia | 1,278 | 1,262 | 1,363 | 1,356 | 1,388 | 1,417 |
| Bosnia and Herzegovina | 1,419 | 1,691 | 1,646 | 1,526 | 1,539 | 1,524 |
| Montenegro | 1,918 | 1,911 | 1,636 | 1,467 | 1,431 | 1,351 |
| FYR of Macedonia | 1,625 | 1,579 | 1,637 | 1,578 | 1,524 | 1,520 |
| Romania* | 1,046 | 926 | 857 | 871 | 879 | 866 |
| Bulgaria | 833 | 834 | 846 | 954 | n.a. | n.a. |
| Hungary | 840 | 819 | 861 | 800 | 850 | n.a. |
| Albania | 1,500 | 1,500 | 1,400 | 1,400 | 1,500 | 1,500 |

*** The end of 1H2012.

Source: Central banks

The concentration level of five largest banks in loans in selected CEE countries shows the same tendency as the HHI of assets. The HHI of loans in select CEE countries was in a range from 559 points to 2,070 points in the period 2007-2012. During the analyzed period, the lowest level was recorded in the domestic banking sector, with values from 559 points to 721 points. In comparison with Serbia, other countries in the region doubled HHI of loans and fit in a group of concentrated markets. This group consists of Macedonia, Montenegro, Bosnia and Herzegovina, Croatia and Albania. Banking sector of Macedonia is in a group of highly concentrated market, because HHI in loans of households exceeds 2,000 points. Furthermore, data confirms that people in Macedonia have confidence in several banks.

Table 6. HHI of loans of selected CEE countries

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Serbia | 559 | 668 | 650 | 629 | 722 | 721 |
| Croatia | 1,296 | 1,313 | 1,407 | 1,405 | 1,433 | 1,437 |
| Bosnia and Herzegovina | 1,544 | 1,745 | 1,585 | 1,520 | 1,497 | 1,422 |
| Montenegro | 1,917 | 1,959 | 1,699 | 1,479 | 1,356 | 1,310 |
| FYR of Macedonia* | 2,001 | 1,953 | 2,064 | 2,050 | 2,011 | 2,000 |
| Romania | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Bulgaria | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Hungary | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Albania | 1,100 | 1,200 | 1,100 | 1,100 | 1,200 | 1,200 |

* HHI is calculated only for loans and deposits of households.

Source: Central banks

Data from Table 7 indicates that the HHI of deposits in selected CEE countries was in a range from 659 point to 2,500 points in period 2007-2012. In the analysed period the lowest level of concentration of the five largest banks in deposits was in the domestic banking sector, ranging from 659 to 731 points. Similar to HHI of loans, HHI of deposits shows that countries in the region doubled this ratio compared to the domestic banking sector. The group of concentrated market consists of Macedonia, Montenegro, Albania, Bosnia and Herzegovina and Croatia. Banking sector of Macedonia is in a group of highly concentrated market, because HHI of deposits of households exceeds 2,100 points. Furthermore, data confirms that people in Macedonia have confidence in several banks.

Table 7. HHI of deposits of selected CEE countries

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------------|-------|-------|-------|-------|-------|-------|
| Serbia | 659 | 705 | 731 | 720 | 714 | 726 |
| Croatia | 1,276 | 1,300 | 1,425 | 1,412 | 1,432 | 1,434 |
| Bosnia and Herzegovina | 1,459 | 1,656 | 1,614 | 1,523 | 1,536 | 1,551 |
| Montenegro | 2,298 | 2,465 | 1,943 | 1,831 | 1,727 | 1,529 |
| FYR of Macedonia* | 2,084 | 2,097 | 2,098 | 2,079 | 2,012 | 2,000 |
| Romania | n.a. | n.a. | n.a. | n.a. | n.a. | 983 |
| Bulgaria | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Hungary | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| Albania | 1,700 | 1,700 | 1,600 | 1,500 | 1,600 | 1,500 |

* HHI is calculated only for loans and deposits of households.

Source: Central banks

4. Conclusions

Concentration in the banking sector has numerous implications, but competitiveness is the most important one. Empirical research applied on the sample of nine CEE countries in the period from 2007 to 2012 approved that there is no relation between the level of concentration (measured by CR5) and level of competitiveness (measured by HHI).

CR5 and HHI were applied in calculation of the following banks' balance items: assets, approved loans and collected deposits.

It is approved that banking market of analyzed CEE countries is moderate to high concentrated in accordance with CR5. Values of index are in the range of 46% to 85% for mentioned three banks' indicators. The lowest concentration level was evident in Serbia, in terms of: banking assets and approved loans (with six year average participation) of 47% and nearly 50% in collected deposits. However, in Croatia in 2007 first big banks achieved the biggest concentration level in collected deposits above 90%, which indicates that the rest of 28 banks managed to acquire only 8% of total market deposits.

HHI of CEE banking sector subject of analysis had values in the range of 559 to 2070 points. Market concentration of banking assets in the period from 2007 to 2012 measured by HHI confirmed that Serbia, Bulgaria and Hungary falls into the category of non-concentrated markets, while other countries can be categorized as moderate concentrated market. HHI in approved loans for the mentioned group of three countries was in the range from 559 to 2070 points. Comparing to Serbia, majority of countries in the region doubled HHI in approved loans and collected deposits, which positioned them in moderate concentrated markets. This group includes Macedonia, Montenegro, Bosnia and Herzegovina, Croatia and Albania.

Having in mind contemporary development of financial and banking market of EU countries, especially those which became EU members in the last phase, it can be expected that CEE banking market will become highly concentrated. Basel Rules have an impact on banks' equity increase in accordance with accepted risks. In accordance with it, credit price i.e. interest rates on liabilities will be increased for standard risk costs (probability of default i.e. probability that credit beneficiary will not repay principal amount, interest or fee). It is determined by creditworthiness of the customer and experience of the bank in risk assessment of any credit in portfolio. Due to the fact that the level of non-performing loans (NPL) has been increasing during the crisis, banks need higher equity level in order to provide stability of own business, i.e. normal functioning in the case that the majority of credit beneficiaries are not in position to repay the loan after work-out process (first of all restructuring). This problem will be solved in the case of big banks, founded

by creditworthy shareholders; while it won't be solved in the case of small privately owned banks which will result in emission of new shares where potential buyers can be bigger banks, which consider it as an opportunity for further increase of market share. In the case of state-owned or small banks equity problem can be solved by state's equity increase in optimistic scenario. But base scenario is that important financial institutions (such as EBRD) will do increase of equity, if they are in position to provide exit strategy (i.e. to sell their ownership to important market player). As research confirmed, the five biggest banks in the sample of nine CEE countries are strong European players from Austria, Italy and Greece, so it can be expected that their taken measures will lead to concentration of banking market (such as Croatia or Romania).

We can emphasise that the motives of mergers of the banks, i.e. strong regional players, represent their wish to expand market share or increase profitability, as well as their readiness to take advantage of collapse of small banks or grab an opportunity to acquire a smaller bank, whereas citizens' wealth (expressed by GDP pc) determines further development of CEE banking sector.

We can conclude that the analysed CEE banking sectors are under strong influence of European regionally active banks, which leads to adopting the revised Basel Rules i.e. earlier testing and implementing internal models for risk quantification, in order to provide lower level of provision comparing to the prescribed level by the regulatory body. Moreover, further increase of concentration can be expected within CEE banking sector, which can be limited by supervisory body in order to avoid creation of monopoly. But it shall not mean increase of competitiveness of the banking market. It is realistic to expect that participation of interest bearing income will decrease (due to NPL increase, which is expressed as an increase in standard risk costs i.e. increase of interest rates on liabilities), while income from fee business will increase (such as payments, cross selling with other connected companies in financial sector).

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