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Development of the Banking Sector in CEE Countries – Comparative Analysis[1]

Abstract: This paper discusses trends in the banking sector in the region of Central and Eastern Europe (CEE) in the period from 2005 to 2010. Having in mind the fact that the CEE region includes countries with different development levels (those that are in the process of transition and countries that have already completed reform changes with more or less success), the following countries are analyzed: Serbia, Croatia, Bosnia and Herzegovina, Montenegro, Macedonia, Romania, Bulgaria and Hungary. The aim of this research is to show the negative influence of the first wave of the global economic and financial crisis on the banking sectors in the aforementioned countries. The research will be based on collecting data prepared by the relevant financial institutions and putting those financial indicators in relation to GDP using quantity methods and finding relation by applying the Pearson correlation finding the correlation by applying the Pearson correlation. The main results of the research aim to prove negative effects of the economic crisis on the banking sectors of the selected CEE countries. Some future analyses will investigate into which international financial instruments will cover the lack of equity in those markets.

Keywords: CEE countries, crisis, assets of the banking sector, ownership structure, credit potential and deposit potential

JEL Classification: G21, G01, E02, C22

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Introduction

In recent years, the collapse of the American financial market had the negative effect on the global economic and financial system. The current economic crisis has driven the economics profession to rethink its views about macroeconomic policy in general and monetary policy in particular according to Blanchard at al. (2010).

According to Mishkin (2011), two stages could be distinguished in a global crisis, the first covering the period from August 2007 to August 2008, while the second stage started in mid-September 2008. During the first stage, a small part of the USA experienced losses, which mainly occurred in the field of subprime residential mortgages. In terms of the second stage, there were a few events that marked the financial crises, some of which were: bankruptcy of the investment bank Lehman Brothers, the collapse of AIG, and a run on the Reserve Primary Fund.

In recent years, the collapse of the American financial market had a negative effect on the global economic and financial system. The first signs of possible turbulences on the U.S. housing market started during 2007 and negative effects of the crisis appeared in the second part of the same year (Barjaktarović & Paunović, 2012). The world financial and economic crisis spread very fast to all parts of the world and had negative effects on the global economy (Grubisić & Paunović, 2011). Recession and collapse of the American and European financial markets appeared in the second half of 2008 as a result of sub-prime mortgage market crash which was the main cause of the current crisis.

The financial and economic crisis strongly influenced the entire world, however, Central and Eastern Europe (CEE)[2] was particularly severely affected. The aim of this paper is to present the impact of the global economic and financial crisis on the banking sectors in the CEE countries. The CEE banking sectors were fairly resilient to the global economic and financial crisis until autumn 2008 (Gardo & Reiner, 2010). Gallego et al. (2010) emphasize two stages of the global crisis in emerging European countries: a stage of resilience to global disharmony until September 2008, and a stage after September 2008 when this resilience stopped.

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[2] According to the classification of the International Monetary Fund, the following countries are included in Central East Europe: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Latvia, Lithuania, FYR of Macedonia, Montenegro, Poland, Romania, Serbia, Kosovo and Turkey.

According to Josifidis et al. (2011), emerging countries with smaller pre-crisis vulnerabilities went into recession later and exited earlier, thus suffering less in output decline during the crisis. Expectedly, emerging countries with stronger external linkages, i.e. higher dependence on demand from advanced economies or larger exposure to foreign bank claims experienced larger output losses in the crisis phase. The reason why banking crises have greater and more persistent effects in developing economies is because these countries are more vulnerable to the factors that generally lead to banking turbulences and that amplify their impact such as banks and private agents exposure to currency and maturity mismatch, disruption in international capital markets, banks panic (Furceri and Zdzienicka, 2010) and sudden stop of capital inflows (Calvo, 2006). Furthermore, Živković and Aktan (2009) stress the difference between emerging and developed markets. The authors established that the emerging countries are faced with lower liquidity level, more frequent internal and external shocks, as well as a higher degree of insider trading causes.

Decreased liquidity and a harder way of reforms of financial institutions presented the first visible signs of the global economic crisis in the financial sectors in the CEE countries. More precisely, the crises in the equity markets were identified through a drawdown of foreign investments. Before the crisis and recession, financial system of these countries used to be in developing phase due to the introduction of modern regulation and establishment of new financial institutions that presented the basis for maintaining macroeconomic stability.

From this argumentation the following hypotheses are proposed.

- The main hypothesis (Ho): The world economic crisis had impact on development of the banking sectors in the CEE countries.
- The additional hypothesis (H1) of the paper work is: the CEE banking sector is dependent on foreign equity.

Contribution of this paper is the empirical database concerning the recent effects of the global economic crisis on the development of the banking sectors in the CEE countries and a practical application of the Pearson correlation on selected financial indicators in order to give an answer to whether the authors opted for analyzing the right parameters.

The paper is structured as follows. Section 2 presents a brief description of methodology which will be used including the database, indicators to be considered, the presumptions and the model to be applied in order to quantify the effects of the world economic crisis on the development of the banking sectors in the CEE

countries. In Section 3, the authors give an overview of the negative impact of the first wave of the global economic crisis with a particular focus on the banking sector in the selected CEE countries. Findings and back testing results are presented in Section 4 and further discussed in Section 5. The study concludes with some comments on the results and ideas of banking developments in the CEE countries during the global economic crisis.

The issue addressed in the paper is the influence of the world economic crisis on the banking sectors in the selected CEE countries.

2. Metodological aproach and data

Data used in the analysis are taken from the ECB and IMF publications and publications of national central banks. In addition, the authors research the analyses provided by RZB (Raiffeisen Research) and UniCedit Research Department for the period 2005-2009. These data are connected to the basic indicators of the banking sector such as assets, liabilites, deposits, household deposits, credits, household credits, and equity.

The authors will define which group of parameters will be considered in relation to GDP in order to test the hypotheses.

Also, they will apply descriptive statistics and the Pearson correlation in order to test whether they have chosen the right indicators for testing the hypotheses.

In analyzing the likely structural changes in the banking sectors of the new EU member states and three candidate countries from the South and East European area in the next section, we rely on the basic correlation analysis. The analysis and conclusions are based on the following simple presumptions:

1. We assume that there is a tight connection between the level of economic development in each country and the level of the banking sector development. If we assume that the level of financial intermediation through the banking sector briefly reflects the development stage of the banking sector, then there should be a correlation between the level of GDP and the level of financial intermediation in the economies. Many existing theoretical and empirical studies actually support the existence of the relationship between economic development and development of the financial system. Eschenbach (2004) in his summary of the “finance and growth” comes to a conclusion that the development of the financial sector stimulates eco-

nomic progress in developing countries, whereas in developed countries, according to several studies, the causality goes in both directions.

2. We assume that economic development of the new member states will converge toward economic development levels similar to those in the "old" EU member countries. The economic convergence is expected to progress and it is reasonable to assume that it will be accompanied by the banking sector development, especially due to strong bank financing of firms in new member states economies.
3. We assume that the value of GDP per capita is a sufficient approximation of the achieved economic development level in each country and it is reasonable to expect that the banking sector development parameters will be correlated with the general development level.

Taking into account these assumptions, we compare the development of four banking sector indicators to GDP per capita:

- Volume of total banking assets,
- Volume of loans to non-bank borrowers (loans to non-credit institutions)
- Volume of deposits from non-bank depositors (deposits from non-credit institutions)
- Volume of total bank capital.

In order to assure comparability all four variables are compared to the value of national GDP in each country. On the basis of this comparison some basic conjectures on the likely future developments in banking sectors are made in order to determine the main development fields and directions of these developments.

3. The global crisis and banking sector performance

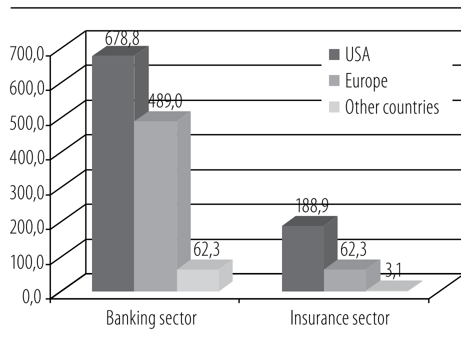
Many commercial and investment banks which perform business on the U.S. financial market invested free funds in sub-prime mortgage and mortgage loans. Favourable but risky loans (loans without real coverage) approved by banks resulted in a decrease in demand for residential property which put a pressure (increase) on the price of mortgage (Stakić, 2010). Commercial and investment banks had the biggest losses in business. At the beginning, financial giants such as City group, Merrill Lynch and USB had the biggest write-off of assets (USD 46.4 billion, USD 36.8 billion, and USD 36.7 billion, respectively). The world economic and financial crisis in the USA resulted in the collapse of Lehman Brothers in September 2008 when the crisis started to spread to the financial market of Europe. Lehman Brothers was not the only financial institution which experienced

problems. In order to avoid bankruptcy of Fannie Mac and Freddie Mac, the USA helped nationalize this financial giant, which controlled more than 50% of total mortgage loans in the country. Many mergers and acquisitions were done during 2008 such as: Bank of America acquired Merrill Lynch; JP Morgan acquired Washington Mutual, while Goldman Sachs and Morgan Stanley changed their status from investment banks into commercial banks (Filipović, 2009).

In January 2011, the U.S. State Commission issued the first official report on the global financial crisis (in the period from 2007 to 2009), which pointed out that the crisis and recession had led to: financial gaps in national legislation, a systematic overlook of responsibility, as well as ethics violations at all levels (Bošnjak, 2011). The report also highlighted the role of the banking sector in the process of recession, bankers' greediness as well as their dependence on high-risk business.

According to the OECD (*Organization for Economic Co-operation and Development*) the banking sector had losses in the amount of USD 1,230 billion (whereby loss of the American banking sector was USD 876.8 billion, and the loss of European banking sector was USD 489 billion), while the insurance companies had five times less losses (USD 261 billion) in comparison to the banking sector (OECD, 2010).

Figure 1: Write downs in financial sector, end of January of 2010 (in USD billion)



Source: OECD (2010)

In 2009, all parts of the world recorded negative GDP growth rates, especially the EU27 member states. Although only a year later, many countries have redefined their attitudes toward economy policies and economic growth forecasts (which was confirmed by reports of international institutions like the *World Bank, European Central Bank, European Bank for Reconstruction and Development, Organization for Economic Co-operation and Development, International Monetary Fund)*, nowadays a new wave of the economic crisis pressures to a deeper recession in developed European countries. In the most developed financial markets, a decline in trading volume was recorded, as well as the turn down in investor valuations at the end of 2011. In late December 2011, the European Central Bank (ECB) reported that the Euro area banks deposited the highest amount ever in deposits, i.e. 452 billion euros, which indicates that banks were unwilling to take risks and

borrow from each other, but preferred ''play it safe'' by offering money at low interest rates at the ECB.

The participation of banks in the world's financial market decreases every year due to mergers and acquisitions or development of the existing financial institutions, such as insurance companies, leasing companies and pension funds. We can say that a decrease in the banks' market share and a decrease of achieved profit are results of increased competition of financial institutions in the financial market. This is the reason why single financial institutions offer banking products, insurance products, leasing products, market intermediation and pension schemes (Paunović, 2011).

4. Impact of crisis on the banking sector in the CEE countries

In comparison to the developed financial systems (which have stable banking sectors), the banking sectors in Central and Eastern Europe (CEE) are still underdeveloped, particularly in countries in transition. In this context, there has been a lack of innovation in the financial system, primarily because of the low and underdeveloped financial markets, political, economic and credit risks, high rates of poverty, underdeveloped segments of stock exchange operations, currency fluctuations, higher levels of inflation and other macroeconomic indicators (i.e. trade deficit, a high level of public debt, a relatively small inflow of foreign direct investment etc.). The experiences of countries that have gone through a transition period (the Hungarian financial market) have shown that the progress of a financial system, particularly of insurance companies, pension and investment funds, continues after development of the banking sector.

In comparison to the Western Europe region, the banking sector in the CEE countries is still highly risky and unstable, despite the fact that in the past few years the financial system in these countries was developing rapidly with modern financial regulations as well as newly established financial institutions. Unlike developed markets (where the appearance of new, or development of the existing, financial institutions: insurance and leasing companies, pension and investment funds, reduces the share of banks), the characteristic of developing countries is dominance of banking sector in the financial system (Mishkin, 2000:552). In addition, this dominance can be seen through the share of total assets of the banking sector in the overall financial system.

The world financial and economic crisis spread very fast in CEE region through financial institutions (primarily banks) that were present in the U.S. market

(Golubović, 2009). The first visible signs of the world economic crisis in the CEE countries were present in the financial sector in the form of lower liquidity and stricter reforms of financial institutions. The growth of interest rates was one of the first signs that pointed to potential problems in CEE. The gap between interest rates under which commercial banks invested free resources and the reference interest rates of the CEE central banks, is getting superior in time. The decrease in the industry activity was influenced by the withdrawal of savings of private individuals from their bank accounts, a gradual stopping of bank lending to corporate customers and private individuals, an increase in the costs of foreign financing, a stronger pressure on the exchange rate, and an increase of credit risk (Bošnjak, 2009).

The negative effects of the first wave of the global economic crisis in 2008 and 2009 the CEE commercial banks absorbed through more restrictive and cautious credit policy, stricter classification of loans outstanding, increasing levels of capital adequacy, maintenance, and careful planning of liquidity. On the other hand, the recent economic analysis indicate that the return of confidence in the financial system in CEE countries is only possible through implementation of actions that are based on deposit insurance in banks, state support to financial institutions, regulatory measures and government guarantees for new loans to businesses and banks. (Bošnjak, 2011)

5. Development indicators of the banking sector in selected CEE countries

Having in mind the fact that CEE region includes countries with different development levels (those that are in the process of transition, and countries that have already completed reform changes with more or less success), the following countries are analyzed: Serbia, Croatia, Bosnia and Herzegovina, Montenegro, Macedonia, Romania, Bulgaria and Hungary. The research mostly covers the period from 2005 to 2010. The comparative analysis of growth and development of the CEE banking sector is observed according to the following criteria: number of banks and ownership structure, total assets and liabilities, credit and deposit potential. In this context, the focus of research is on the potential effects of the first wave of the global financial crisis on the banking sectors in the selected CEE countries. The authors were faced with the research problem related to the availability of data for the analyzed countries, which prevented the full review and comparative analysis of the banking sector in the selected CEE countries.

5.1. Number of banks and ownership structure of banking sector

The West European banking groups (Austrian and Italian banks) were the pioneers in the CEE banking market. In recent years, these banking groups have experienced growth in the size of banking assets. Estimates are that approximately 70% of the CEE banking market in 2008 (Miklaszewska & Mikolajczyk, 2010) was under the control of foreign banking groups. There have been less financial activities of West European credit institutions in this region following the beginning of the global economic crisis and the recession. This trend has continued to date, which is understandable, having in mind that the number of attractive banks for acquisition has reduced and that economic growth has slowed down in the region.

In previous years, there were no significant variations in terms of the number of banks in the CEE market. Before the crisis, the biggest number of banks had been in Romania and Serbia and less in Macedonia. This part of the European banking market has become interesting and attractive to foreign investors, because it provided new business and development opportunities and increased the availability of financial assets.

In 2005, the domestic capital in banking sector in Serbia, Croatia and Macedonia had dominance in the market with a share exceeding 50%. In Serbia, the situation significantly changed in 2006. This year was remembered as the period of Greenfield investments through which foreign banking groups appeared on the domestic financial market. In addition, this is supported by the fact that in 2010 there were 33 banks in the Serbian market, of which 21 had majority (74%) foreign equity (assets) (Barjaktarović & Ječmenica, 2011). Although the number of domestic and foreign banks in Croatia was almost equal, according to the criteria of participation in assets, the Croatian banks with foreign capital had 90% share in assets (Table 1). A similar situation was in Bosnia and Herzegovina, where the share of foreign banks in total assets accounted for approximately 95%. Statistical data confirm the dominance of foreign capital in banking assets in all analyzed countries, with very little variation.

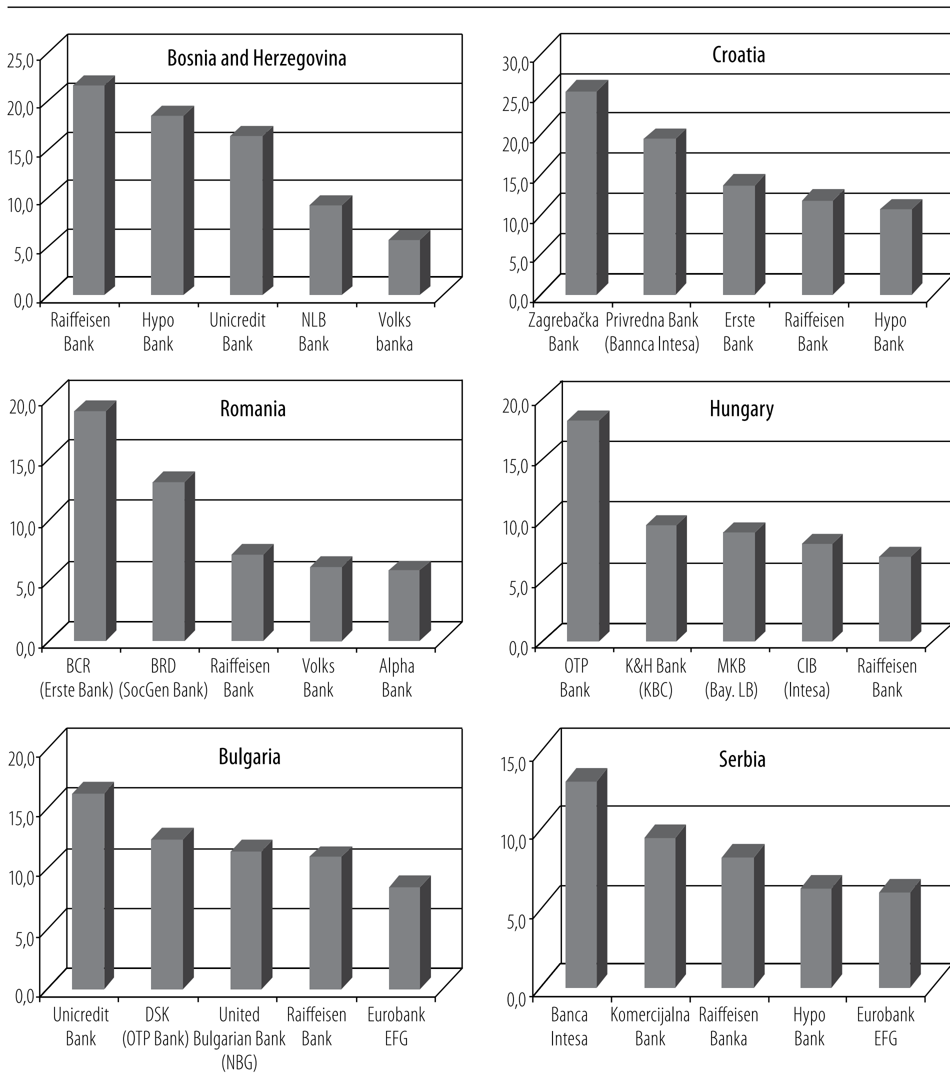
Table 1: Number and ownership structure of banking sector

	2005		2008		2009		2010	
	Number of banks	Share in assets (%)	Number of banks	Share in assets (%)	Number of banks	Share in assets (%)	Number of banks	Share in assets (%)
				Serbia				
Domestic	23	N.A	14	N.A	14	25.7	12	26.0
Foreign	17	N.A	20	N.A	20	74.3	21	74.0
Total	40	N.A	34	N.A	34	100.0	33	100.0
				Croatia				
Domestic	20	8.7	18	9.4	19	9.1	19	N.A
Foreign	14	91.3	16	90.6	15	90.9	15	N.A
Total	34	100.0	34	100.0	34	100.0	34	N.A
				Bosnia and Herzegovina				
Domestic	12	N.A	8	5.0	8	5.5	8	N.A
Foreign	12	N.A	12	95.0	12	94.5	11	N.A
Total	24	N.A	20	100.0	20	100.0	19	N.A
				Macedonia				
Domestic	12	56.3	4	41.0	4	39.0	N.A	N.A
Foreign	8	43.7	14	59.0	14	61.0	N.A	N.A
Total	20	100.0	18	100.0	18	100.0	N.A	N.A
				Romania				
Domestic	10	37.8	6	11.8	7	14.7	7	13.9
Foreign	30	62.2	37	88.2	35	85.3	35	86.1
Total	40	100.0	43	100.0	42	100.0	42	100.0
				Bulgaria				
Domestic	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Foreign	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Total	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
				Hungary				
Domestic	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Foreign	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Total	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
				Montenegro				
Domestic	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Foreign	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Total	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A

Source: Central banks of selected CEE countries

In the analyzed CEE countries, foreign banks (most with Austrian, Greek and Italian capital) had the largest share in total banking sector in 2009 (Miklaszewska & Mikolajczyk, 2010). The following chart shows data relating to the share of five leading banks in the selected CEE countries (where they have their branches – Bosnia and Herzegovina, Croatia, Romania, Hungary, Bulgaria and Serbia).

Figure 2: Market share of top five banking groups in selected CEE countries in 2009 (in %)



Source: Raiffeisen Zentralbank Österreich AG (RZB Group), CEE Banking Sector Report (2010)

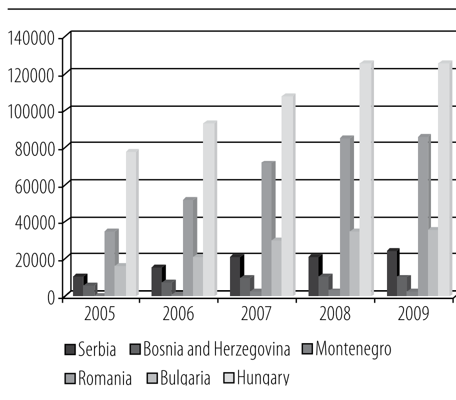
5.2. Balance sum (assets) and structure of liabilities of banking sector

The level of s banking sector development within a financial system can be expressed by indicators connected to the balance sheet i.e. volume of balance sum of banking sector and relation between equity and obligations of the banking sector.

The balance sum of the Serbian banking sector has been above 90% of total balance sum of the local financial sector in the previous 6 years (exceptions were 2005 and 2008). In order to emphasize the dominant position of the banking sector in the local financial system, we would like to add that after only 5 years of operation, Raiffeisen bank (which started operations in Serbia in 2001) had almost 3 times higher volume of balance assets (RSD 144 billion) than the entire insurance sector (RSD 56.1 billion). In comparison with other countries in the region, Serbia had the biggest participation of the banking sector assets (in Macedonia assets were above 90% only in 2007, while in Bosnia and Herzegovina the assets were above 80% only during the crisis).

In all analyzed countries, it is obvious that there is a growing trend of the banking sector assets. The biggest growth rates were recorded during 2006 and 2007, which is logic due to the good position of those banks in local financial markets. In 2006, Serbia and Romania had the largest assets, i.e. 50% and 46.5% respectively. The first wave of economic crisis slowed down the growth of the banking sector assets. However, the majority of analyzed countries in the region managed to survive and keep a positive growing trend. The balance assets of the Hungarian banking sector recorded a growth of EUR 47.6 billion (60.7%) in the period 2005-2009. Romania and Bulgaria recorded a slowdown in assets growth, which peaked at the end of 2009 (in Romania approximately EUR 86.3 billion, and in Bulgaria approximately EUR 36.2 billion). Montenegro, Bosnia and Herzegovina and Serbia had the lowest level of banking sector assets in the same period. Montenegro and Bosnia and Herzegovina recorded a drop in the balance sum in 2009.

Figure 3: Balance sum of banking sectors in the CEE countries (in EUR billion)



Source: Central banks of selected CEE countries

In accordance with the indicator of banking sector assets contribution to GDP, all analysed countries managed to keep the level of assets within GDP above 50% in the period 2005-2009. Also, it is important to emphasize that assets in some countries were above the national GDP, as was the case in Hungary, Croatia and Bulgaria in 2009 with 30%, 14% and 7% above GDP, respectively. At the same time, the lowest level of assets in GDP was in Romania, Serbia, and Bosnia and Herzegovina (74%, 82% and 86% respectively).

The analysis of commercial banks' liabilities whose main components are funds (equity and reserves) and obligations (received deposits from local and foreign individuals and corporates)/ shows that obligations accounted for a higher share in the structure of the CEE banking sector liabilities in the period from 2005 to 2010.

Table 2: The structure of CEE banking sector liabilites, in %

	2005	2006	2007	2008	2009	2010
			Serbia			
Obligations	83.8	81.5	79.0	76.4	79.3	80.3
Equity	16.2	18.5	21.0	23.6	20.7	19.7
			Montenegro			
Obligations	84.7	89.6	92.0	91.6	89.0	89.4
Equity	15.3	10.4	8.0	8.4	11.0	10.6
			Macedonia			
Obligations	84.1	86.6	88.6	88.5	88.6	n.a
Equtiy	15.9	13.4	11.4	11.5	11.4	n.a
			Romania			
Obligations	87.8	88.2	90.1	89.3	87.9	86.3
Equity	12.2	11.8	9.9	10.7	12.1	13.7
			Croatia			
Obligations	N.A	N.A	N.A	N.A	N.A	N.A
Equity	N.A	N.A	N.A	N.A	N.A	N.A
			Hungary			
Obligations	N.A	N.A	N.A	N.A	N.A	N.A
Equity	N.A	N.A	N.A	N.A	N.A	N.A
			Bosnia and Herzegovina			
Obligations	N.A	N.A	N.A	N.A	N.A	N.A
Equity	N.A	N.A	N.A	N.A	N.A	N.A

Source: Central banks of selected CEE countries

If we analyse the level of equity, we can notice that it ranged between 8% (as recorded in Montenegro in 2007) and 23.6% (as recorded in Serbia in 2008). Also, the Serbian banking sector had an increase in equity within the structure of banking sector liabilities. In other countries there were no important changes in equity within liabilities, while the participation of equity within liabilities in Macedonia stood at 11.5%. The level of obligations within the liabilities in the CEE countries was above 80%, except in Serbia. The biggest share of obligations within liabilities was recorded in Montenegro and Romania (above 90%) and Serbia had the lowest share of obligations within the liabilities (76.4%).

5.3. Credit and deposit potential of the banking sector

The ECB statistical data showed that the banking sector of the analysed CEE countries had positive growth rates of credit potential in the period from 2005 to 2008. A drop of credit potential occurred in 2009. The biggest drop of credit potential was in Bosnia and Herzegovina, Montenegro and Hungary. The Hungarian banking sector had the biggest credit potential in the period from 2005 to 2009, while the Montenegrin banking sector had the lowest credit potential in the same period.

Table 3: Credit and deposit potential of banking sectors in CEE countries (in EUR billion)

	Credit potential					Deposit potential				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Serbia	5,769	7,281	10,098	12,262	13,139	4,656	7,085	10,301	10,019	11,440
Croatia	21,409	26,353	30,320	34,499	35,745	23,027	27,319	31,454	33,412	34,742
Bosnia and Herzegovina	3,875	4,759	6,110	7,442	7,209	3,516	4,499	6,187	6,104	6,232
Montenegro	375	847	2,245	2,797	2,397	487	1,075	2,091	1,990	1,824
Romania	16,583	27,928	42,056	50,823	49,811	21,623	30,175	37,779	40,248	41,331
Bulgaria	9,415	11,701	19,389	25,517	26,470	11,210	14,875	20,520	22,302	22,859
Hungary	45,980	56,298	65,565	76,473	73,087	38,480	47,129	51,150	55,152	56,326

Source: ECB (2010), Banking Structures, Annex; Central Bank of Montenegro Statistic Review

If we analyze the deposit potential of the CEE countries, the biggest growth was recorded in the period from 2006 to 2007. The growth rate was between 8.5% and 120.5%. The Hungarian banking sector recorded a growth of EUR 56.3 billion in the period of 2005 to 2009, while the Montenegrin banking sector recorded a growth of EUR 1.8 billion over the same period. In 2008, Montenegro, Serbia and

Bosnia and Herzegovina saw a stagnation of their deposit potentials, while other CEE countries kept slower positive growth rates of deposit potential. In 2009, there was growth in deposit potentials in the CEE countries (except in Montenegro), while Serbia recorded two-digit growth of 14.2%. In other CEE countries, deposit growth ranged between 2.1% (Hungary, Bosnia and Herzegovina) and 4% (Croatia).

According to the loans in GDP indicator (statistical data presented in Table 4), there was an uptrend in the CEE countries in the period of 2005 to 2009. Also, the participation of loans within GDP did not drop below 30%, except in Serbia and Romania during 2005 and 2006. Generally, we can conclude that there was a growing trend of loans in GDP in the CEE countries in 2009. The biggest share of loans in GDP in 2009 was in Bulgaria (79.2%) and Croatia (78.4%). A similar situation was with the indicator of deposits in GDP. There was an increasing trend of share of deposits in GDP, while the value of the indicator per country differed substantially. The Croatian banking sector had the biggest participation of deposits within GDP, while the lowest level was in Serbia and Romania. In 2009, the biggest growth of deposits in GDP had Croatia and Bulgaria, i.e. 76.2% and 65.4% respectively.

Table 4: Share of loans and deposits in GDP

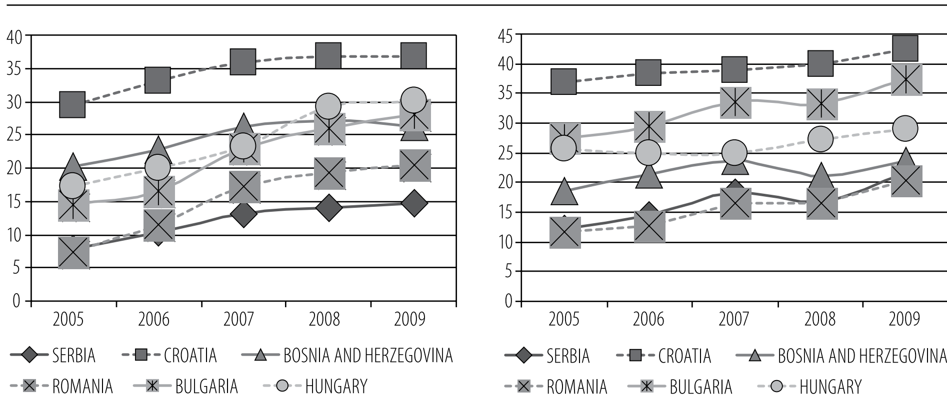
	Credits/GDP					Deposits/GDP				
	2005	2006	2007	2008	2009	2005	2006	2007	2008	2009
Serbia	29.3	29.3	34.8	39.9	44.2	23.6	28.5	35.5	32.6	38.5
Croatia	59.7	67.6	70.7	73.8	78.4	64.2	70.1	73.3	71.5	76.2
Bosnia and Herzegovina	44.0	48.3	54.9	58.9	58.9	40.1	45.7	55.6	48.3	50.9
Romania	20.7	26.8	35.9	38.7	41.0	25.9	28.0	32.4	31.2	36.8
Montenegro	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Bulgaria	41.4	44.8	67.1	75.2	79.2	59.4	67.2	68.7	62.5	65.4
Hungary	44.8	48.6	53.4	60.8	60.8	39.3	40.9	42.3	44.1	45.7

Source: Raiffeisen Zentralbank Österreich AG (RZB Group), CEE Banking Sector Report

Croatia had the leading position in terms of share of retail loans in GDP in the period 2005-2008, i.e. it 29.5% in 2005 and 36.8% in 2008. At the same time, the share of retail loans in Romania was three times higher, while in Serbia it doubled (from 7.4% to 20.5%). In Bosnia and Herzegovina, retail lending did not change dramatically in the same period (from 20% to 27%). The biggest drop in retail lending was recorded during the crisis in 2009, 5.9%, which is the biggest drop in

the CEE countries. The same situation was seen in the Romanian banking market where retail loans dropped 4.8%. Only the Bulgarian banking sector had the biggest growth of retail credit potential of 7.5%.

Figure 4: Share of retail loans (left-hand side) and deposits (right-hand side) in GDP (%) in CEE countries



Source: Raiffeisen Zentralbank Österreich AG (RZB Group), CEE Banking Sector Report

Croatia had the biggest share of retail deposits in GDP that rose from 36.5% (in 2005) to 42.2% (in 2009), while the lowest share of retail deposits in GDP was recorded in Romania and Serbia (in accordance with Figure 5).

Retail deposits in the CEE countries showed an increasing trend, the lowest being recorded in 2009. Serbia was the only CEE country which had a drop in retail deposits in 2008. During 2009, the level of retail deposits was the same as in 2008.

5.4. Pearson correlation

In order to get the statistical relationship between relevant financial indicators of the CEE banking sector, we calculate descriptive statistics (mean and standard deviation) and the Pearson correlation. The calculations were done in SPSS software. Countries that were the subject of analysis are: Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Macedonia, Romania and Serbia. Financial indicators taken into consideration are: total deposits, total loans, total retail deposits, total retail loans and banking sector assets. Time period covered is from 2005 to 2009. Relevant data are disclosed in reports of the CEE central banks, ECB RZB Group, UniCredit Researches Departments and IMF .

Descriptive statistics showed that we cannot use its results because they do not represent a good measure (if we compare it with data in Tables 3 and 4).

Table 5: Descriptive statistics of key CEE banking sector indicators

Indicator of banking sector	Mean	Std. Deviation	N
Deposits	21103.40	17171.396	35
Credits	23772.20	21752.114	35
Household deposits	10870.23	8924.734	35
Household credits	11220.53	8746.871	30
Assets	39409.03	36242.277	35

The Pearson correlation gave better results, which proves that we took into consideration proper indicators (Table 6). The Pearson correlation formula is: 3

$$r = \frac{\sum_{i=1}^{N}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{N}(x_i - x)^2 \sum_{i=1}^{N} (y_i - \bar{y})^2}}$$

The volume of deposits is determined with the volume of household deposits (very strong relation). At the same time, they determine the volume of credit activity of the bank and lending to individuals (very strong relation). It is important to notice that the volume of received household deposits is the crucial source of financing needs of private individuals (household credits).

Also, bank assets are highly dependent on credit activity, i.e. the volume of extended loans and the level of received deposits as the source of financing (very strong relation).

[3] *where* N is the number of indicators in relation; x_i is independent indicator and y_i is dependent indicator; $\bar{x}$ and $\bar{y}$ are averages (of relevant indicators). SPSS software did the calculations. Explanation of Pearson Correlation values:

- +/-0 - +/- 0.2 no relation
- +/-0.21 - +/- 0.4 weak relation
- +/-0.41 - +/- 0.6 mid relation
- +/-0.61 - +/- 0.8 strong relation
- +/-0.81 - +/- 1 very strong relation

Table 6: Pearson correlations of relevant indicators of CEE banking sector

		Deposits	Credits	Household Deposits	Household Credits	Assets
Deposit	Pearson Correlation	1	.984**	.993**	.969**	.979**
	Sig. (1-tailed)		.000	.000	.000	.000
	N	35	35	35	30	35
Credits	Pearson Correlation	.984**	1	.975**	.971**	.995**
	Sig. (1-tailed)	.000		.000	.000	.000
	N	35	35	35	30	35
Household Deposits	Pearson Correlation	.993**	.975**	1	.969**	.967**
	Sig. (1-tailed)	.000	.000		.000	.000
	N	35	35	35	30	35
Household Credits	Pearson Correlation	.969**	.971**	.969**	1	.962**
	Sig. (1-tailed)	.000	.000	.000		.000
	N	30	30	30	30	30
Assets	Pearson Correlation	.979**	.995**	.967**	.962**	1
	Sig. (1-tailed)	.000	.000	.000	.000	
	N	35	35	35	30	35

**. Correlation is significant at 0.01 level (1-tailed).

6. Conclusion

The paper hypotheses have been proved.

H0: The world economic crisis had an impact on development of the banking sector in the CEE countries.

There was decreasing growth in the balance sum of banking sector of CEE countries as a result of the economic crisis after 2008 (Figure 4).

The level of balance sum in GDP in the CEE countries was above 50 percent, which is good.

The level of obligations is higher than the level of equity in the CEE banking sector liabilities (Table 2), which is in accordance with the main activity of banks.

The banking sectors of the CEE countries had increasing trend of their credit potential in the period of 2005 to 2008, while in 2009 they remained stagnant.

In the same period, all CEE countries had increasing deposit potential, except Montenegro (Table 3). Generally, all CEE countries saw an uptrend in the shares of credits and deposits in GDP in 2009 (Table 4).

We can conclude that the banking sectors of the CEE countries managed to properly respond to the negative effects of the economic and financial crisis

H1: The CEE banking sector is dependent on foreign equity. The analysis showed that foreign equity has the dominant place in the selected CEE countries (above 60% of the banking assets is owned by foreign banks - Table 1). In order to amortize the effects of the crisis, the CEE commercial banks implemented more restrictive and conservative credit policies, stronger classification of credit customers and other collections, increased level of equity, and maintaining and planning oftheir liquidity position.

The authors were faced the research problem related to the availability of data for the analyzed countries (Bosnia and Herzegovina, Bulgaria, Croatia, Hungary, Macedonia, Montenegro and Romania) which prevented a full review and comparative analysis of the banking sectors in the selected CEE countries (in the period from 2005 to 2010).

Some future analyses will investigate how the lack of equity in the selected CEE countries will be covered, i.e. whether by cross-border loans, foreign direct investments, portfolio investments, remittances or donations.

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