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ANALYSIS OF THE FINANCIAL POSITION OF THE BANKING SECTOR OF THE EUROPEAN UNION MEMBER STATES IN THE PERIOD 2007–2013

Summary: The banking system is an extremely significant link in the financial system of a given country. This state of affairs results in the financial position of banks forming a given banking sector exerting a considerable impact on the condition of the financial system of a given country. A similar relation is observed in the case of the European Union's financial system. However, if looking at the system from the viewpoint of the EU, it is easily noticeable that the situation is much more complex. This is because the EU banking system is created through cooperation of banks from various EU member states. This results from the fact that when cross-border financial institutions engage in such a situation, the threat to the system can be even more difficult to bring under control. The presented paper is dedicated to the financial position of banks in the EU. Its assessment in the period 2007––2013 was made with the use of the method of development pattern and Bankscope financial data regarding banks operating in the EU. The conducted analyses served as a point of departure for discussions on changes and the condition of banking sectors in individual EU member states and the EU as a whole.

Keywords: financial security of banks, the European Union, the Banking Union, bank financial ratios.

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1. Introduction

Undoubtedly, when assessing the contemporary European financial markets, the analysis of the banking sector cannot be ignored. The sector plays a particularly significant role in the operation of not only the financial sector but also all economies. The financial position of banks as public trust entities affects the situation of all societies and macroeconomic variables. The significance of the role played by contemporary banks has been proved by the recent financial crisis. The economic efficiency of this group of entities implies proper operation of economies within the European Union and those still beyond its structures. What deserves attention here is the role of foreign capital in pursuing activities of EU member states' banks. Despite diverse opinions about foreign capital commitment in banking sectors of new EU member states, it can be stated that it has contributed to reducing costs of banking services, expanding their offer and demand for them [Fries et al. 2006]. This is confirmed also by reports of the World Bank, which say that foreign capital has improved the operation of banking sectors in developing countries. When examining the positon of the banking sector, issues related to the security of operations of banking sector entities, and in this context – to the existence of the Banking Union – seem particularly important. This fact is confirmed by new legal regulations which entered into force on 1 January 2014. Regulation 575/2013 EU, the so-called CRR Regulation, which is a part of the CRD IV/CRR package, should be mentioned here. It considerably changes the approach to capital adequacy and own funds of banks.

What can be noticed in literature studies is fragmentariness of research on the financial condition of credit institutions from the EU member states. In the process of assessing the financial position of the EU banking sector the following variables were taken into account: total assets, deposit & short term funding, equity, net income, cost to income ratio %, return on average assets (ROAA) %, return on average equity (ROAE) %, as well as total capital ratio and capital ratio.

The variables used in the analysis were chosen to describe the overall condition of the financial situation of the banks so that in the study there are presented variables such as total assets, deposit & short term funding, equity. On the other hand, to evaluate the financial position of banks in the EU, it was important also to analyze their effectiveness. For this purpose, we chose the most commonly used variables such as net income margin, cost income ratio, return on average assets (ROAA), return on average equity (ROAE) and the total capital ratio. It should be noted, however, that the material presented is only a fragment of the more extensive studies in which banks' financial situation will be analyzed in more extensive way.

In the research we used a method of development pattern. This method was chosen because it allows us to create a specific rating of banks from a wide variety of variables expressed in different sizes and with different titers. Rating referred to is created taking into account the measure of development m_i which is calculated by a method of development pattern.

Other statistical measure used in the study is a standard measure calculated in this type of analysis. We have made these calculations to allow a comparison of research with studies of other research centers.

This paper aims to present the results of an analysis of the financial position conducted for the EU banking sector. **Research hypotheses:** Banks from the largest EU member states have already made up for most of the losses incurred during the recent financial crisis, while banks from smaller countries are still facing problems. The economic position of the EU banking sector in the period 2007–2013 was influenced by a small group of banks, which also accounted for creating the level of individual values of financial ratios.

2. Analysis of partial financial data of European Union banks from the period 2007–2013

The conducted analysis covered 4,585 banks from EU member states. The research group consisted of a different number of banks from EU-28; the composition of the group is presented in Table 1.

Table 1. Composition of the research group

No.	Country	Number of banks covered by the research	No.	Country	Number of banks covered by the research
1	Germany	1,807	15	Ireland	35
2	Italy	610	16	Croatia	35
3	Great Britain	471	17	Finland	31
4	France	389	18	Hungary	31
5	Austria	268	19	Romania	28
6	Spain	159	20	Bulgaria	27
7	Sweden	102	21	Slovenia	22
8	Denmark	97	22	Latvia	21
9	Luxembourg	91	23	Slovakia	19
10	The Netherlands	80	24	Greece	16
11	Belgium	75	25	Cyprus	16
12	Poland	46	26	Malta	16
13	The Czech Republic	37	27	Estonia	10
14	Portugal	36	28	Lithuania	10

Source: own work based on Bankscope data.

The five financial variables analysed in the sub-study are: total assets, deposit & short term funding, equity, net income, cost to income ratio %, return on average assets (ROAA) %, return on average equity (ROAE) %, total capital ratio.

With reference to the listed variables, the analysis included studying crucial statistical parameters, such as in particular average values of variables in individual studied periods (from 2007 to 2013), median, minimum, maximum value of the variable in the studied period.

2.1. Total assets of banks in the EU in 2007–2013

The first of the analysed variables is assets of individual banking sectors which form the EU banking sector. The value of total assets in the individual analysed years oscillated between EUR 65,000,000,000K and EUR 85,000,000,000K. The lowest level of assets in the EU banking sector was recorded in 2007, which was probably influenced by banks' financial problems related to the financial crisis. After 2007, a slight, although a rather irregular, growth in assets was observable until as late as

2011, when the maximum level of assets in the EU banking sector was recorded. Since 2011, decrease in the value of assets has been noticeable in the EU banking sector. Factors such as the debt crisis in the Eurozone and the related political tensions, the loss of the highest rating by the USA, and conflicts in the Middle East, which contributed to civil wars and coup d'états, have probably been the main causes of the drop in the value of assets. The decrease in the value of assets has been probably influenced also by the drop in the global GDP growth rate to 2.7% YOY, from the level of 4.1% recorded in 2010. The major cause of the reduced growth rate has been the decreased demand reported by Western European countries and higher prices of raw materials.[1]

When referring total assets for the EU-28 banking sector to EU-28 GDP in the individual examined years, it is observable that assets of the EU-28 banking sector do not exceed 1% of GDP for EU-28. The lowest share of total assets of the EU-28 banking sector was recorded in 2007 – its level was 0.56% of GDP. In the period 2008–2010 and in 2013, the share of assets of the EU-28 banking sector in the EU GDP increased insignificantly to levels: 0.64, 0.65, 0.68, 0.63%, respectively. The highest share of total assets in the EU GDP was recorded in years 2011 and 2012, when it reached the level of 0.71%.[2]

As regards the maximum values of assets, one needs to point to the strong leadership of Deutscher Sparkassen-und Giroverband, a German bank which has recorded the highest value of total assets from among 4,585 analysed banks for five consecutive years. In the period 2007–2008, the Royal Bank of Scotland Group, a British bank, was characterised by the highest value of assets.

Banks with the lowest level of assets in the analysed period include:

2007 – Stefan Lehner (DE), 2008 – Credit Lyonnais Rouse (GB), 2009 – Stefan Lehner (DE), 2010 – Bank of Communications (UK) Limited (GB), 2011 – Skandinaviska Enskilda Banken, Vilniaus Filiala (LT), 2012 – Krediet- en Financiële Maatschappij KREFIMA (BE), 2013 – GfK Bank (DE).

In the studied period, average assets amounted to circa EUR 20,000,000K. Average as well as minimum and maximum values of assets in individual years are presented in Table 2.

In the years 2007, 2008, 2009 and 2013, banks with assets above the EU average constituted merely 7% of the examined set. This number slightly increased in 2010, 2011, 2012 and was around 8%. Hence, it can be said that over 90% of the examined group of EU banks disclosed assets definitely below the overall EU average in the analysed six years.

[1] http://www.ifmpl.com/spg056,strona.html# (retrieved: 10.09.2014).

[2] Calculations made on the basis of data on GDP derived from Eurostat website http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do (retrieved: 15.09.2014).

Table 2. Average, minimum and maximum banking assets in the EU in the period 2007–2013

	2013	2012	2011	2010	2009	2008	2007
Average assets in million EUR	21 561	18 430	18 540	18 240	17 950	19 166	17 507
Minimum assets	1,42	1,01	1,34	1,06	1,30	1,15	1,00
Maximum assets (in million EUR)	2 252 689	2 414 261	2 440 114	587 312	2 568 259,	2 515 718	2 586 701

Source: own work based on Bankscope data.

2.2. Deposit & short-term funding (DSTF) in the EU in 2007–2013

Banks had been funding their activities mainly with deposits, with household deposits being predominant, for a very long time. However, the situation dramatically changed in the recent years, which was caused by various structural changes which could be observed also in banking sectors of EU member states in the past decade. This refers particularly to changes consisting in mergers and acquisitions of banks. Financial markets and credit institutions developed strong connections through strategies of various mergers and acquisitions [Boot, Thakor 2010; Borio 2009]. Moreover, banks also improved their abilities to secure themselves against various risks, which allowed them to secure themselves on financial markets more easily. Additionally, new possibilities for funding the activity, such as securitisation, opened. Globalisation, which left its mark also on the EU market, permitted banks to go beyond the national financial market, resulting, among others, in a rapid development of international interbank markets. This referred particularly to the international interbank dollar market, on which banks of EU member states became largely dependent [McGuire, von Peter 2009].

As a result of the structural changes, the bank funding method underwent unprecedented changes during the 2007–2009 global financial crisis. The financial crisis acted as a catalyst for changes in, among others, business models and bank funding [Van Rixtel, Gasperini 2013].

The financial crisis in the Eurozone caused an increasing discrepancy in the deposit growth rate in the entire zone and hence in the EU. Therefore, deposit outflow from the banking system was observable in periphery countries, while new deposit inflow was still recorded in the countries constituting the EU core [Van Rixtel, Gasperini 2013]. When analysing the level of deposit and short-term funding in the EU in the period 2007–2013, it can be noticed that its lowest level was recorded in 2007, when the first symptoms of crisis emerged. The level of deposit and short-term funding in the EU in 2007 amounted to circa EUR 34 trillion. Over the next two years, insignificant further growths by 6 and 10% in 2008 and 2009, respectively, were noticeable. The highest level of deposit and short-term funding was recorded in 2012. Year 2013 ended with a 9% drop in the value of deposit and short-term funding in the EU banking sector. An interesting variable analysed in the research is median, which divides the group of the examined EU banks into two equal parts, one of which has values of deposit and short-term funding lower or equal to the median, and the other half has higher values. When analysing the variable, it can be easily noticed that despite a relatively high average, in the period 2007–2013 at least half of the analysed banks disclosed the value of deposit and short-term funding at a significantly lower level than the average, which is presented in Table 3. The fact that the value of the median grew in successive years is positive and explicitly means that the value of deposits in the EU banking system increased at the level of individual banks.

Table 3. Average, minimum, maximum values, median and total deposit and short-term funding in the EU in the period 2007–2013

	2013	2012	2011	2010	2009	2008	2007
Average for DSTF (in EUR thousand)	12 817 721	10 714 066	10 477 330	10 484 918	10 233 097	9 701 477	9 509 776
Maximum (in EUR billion)	1 635	1 683	1 686	1 776	1 823	1 122	1 566
DSTF in total (in EUR billion)	42 324	46 531	45 230	43 407	40 748	37 030	34 872

Source: own work based on Bankscope data.

The countries that were responsible for a high level of deposits in the EU in the period 2007–2013 to the greatest extent are Germany, Great Britain, France, Spain, the Netherlands and Italy. Deposit and short-term funding of these countries constituted over 66% of their EU total in the period 2009–2013. In the studied period, it was Great Britain that had the highest percentage share in deposit and short-term funding from among EU member states. In the period 2007–2012, the country with the second highest level of deposits in the EU was Germany (a 19% share in 2007 and 2008 and over 20% in 2009–2012), and the third – France (16% in 2007, circa 18% in 2008–2011 and 19% in 2014). Year 2013 brought a slight change: France came to the fore in terms of the value of the deposit and short-term funding portfolio, while Germany fell to the 3rd position.

In the period 2007–2008, the bank with the strongest portfolio of deposit and short-term funding was the Royal Bank of Scotland Group, which yielded the palm to Deutscher Sparkassen- und Giroverband for the consecutive five years.

2.3. EU banks equity in 2007–2013

The majority of banks in the EU have recently restructured their funding to make it more flexible. Solvency ratios have been increased and bank’s reliance on short-term funding has been reduced. However, the financial position of certain banks in the EU has been still very weak since their equity level is insufficient and they are strongly dependent on central bank's funds. The conducted analyses demonstrated that banks with a good financial positon base their operating strategy more on equity than on debt [IMF 2013].

When analysing equities in EU-28, their almost 70% (precisely 69.68%) growth is observed in the period from 2007 to 2013. This positive change is, however, accompanied by an adverse element. In 2013, 32% of the examined banks disclosed negative equities, which probably resulted in the equity value of the sector decreasing by 3.11% in 2013 relative to 2012.

Similarly to the analysis of deposit and short-term bank funding, it is several banks that account for the value of equities in the entire EU-28 banking sector (see Table 4). In the period 2007–2011, circa 80% of equities of the EU-28 banking sector was accumulated in seven states: Germany, Great Britain, France, Spain, the Netherlands, Italy and Luxembourg. Three states with the highest equity of the banking sector in that period were Great Britain, Germany and France. Their total equities constituted over 50% of the total equities for the EU-28 banking sector in the period 2007–2008, while in the years 2009–2011 the value increased further to reach circa 60%, which undoubtedly proves improvement in the financial position of banks is those states. The situation slightly changed in the period 2012–2013. Germany, replaced by Luxembourg, was no longer among the top three states creating the EU-28 equity.

Table 4. The share of selected EU-28 states in the equity of the EU banking sector (in %)

State	2013	2012	2011	2010	2009	2008	2007
Germany	12.60	13.95	15.65	15.94	16.85	13.73	14.08
Great Britain	22.20	21.97	27.10	25.91	24.50	23.10	27.02
France	15.38	15.66	17.95	17.17	16.88	17.27	14.96
Spain	6.51	5.36	7.02	7.07	6.55	7.31	5.77
The Netherlands	5.06	5.56	6.74	6.91	7.22	7.84	8.56
Italy	5.99	6.32	7.56	8.45	9.02	10.14	9.43
Luxembourg	16.72	16.28	0.80	0.82	0.77	0.81	0.89
Poland	0.65	0.63	0.65	0.70	0.64	0.50	0.41

Source: own work based on Bankscope data.

In the entire analysed period, Caisse d'Amortissement de la Dette Sociale – CADES, a French bank, was characterised by the highest negative value of equity. The level of its equities disclosed in Bankscope in consecutive examined years beginning from 2007 is presented in Table 5.

Table 5. The minimum value of equities of the EU-28 banking sector in the period 2007–2013 in million EUR

2013	2012	2011	2010	2009	2008	2007
–132 739,0	–137 463,7	–142 764,7	–86 675,9	–91 810,6	–80 070,6	–72 955,4

Source: own work based on Bankscope data.

2.4. Net income margin for banks in the EU in 2007–2013

Net interest margin (NIM) serves the purpose of measuring banks' operating efficiency. It is calculated as a relation of interest income to average net assets [Stefański 2010]. In the analysed period, this ratio was extremely diverse in the EU, which is presented in Table 6. The highest margin value for the EU banking sector was recorded in 2007 and amounted to EUR 60,445.62K. The British HSBC Holdings was the bank that demonstrated the maximum NIM value in the examined group. The lowest, negative, margin was disclosed in 2007 also by Merrill Lynch International, another bank from Great Britain. In 2007, only 144 banks from the analysed group disclosed a negative interest margin. The number of banks with a negative interest margin increased considerably over the successive six years. In the period 2008–2010 and in 2013, the numbers of banks for which a negative NIM ratio recorded in Bankscope were 449, 447, 447, 443, respectively. In 2011 and 2012, another significant growth in the number of EU banks with a negative NIM was observed. 572 banks with a negative NIM were recorded in 2011 and as many as 580 such banks in 2012.

Table 6. The average, minimum and maximum value for net interest margin in EU banks in the period 2007–2013

	2013	2012	2011	2010	2009	2008	2007
Average NI (in EUR thousand)	21 683	–4 228	3 773	31 080	14 653	–16 837	60 445
Min	–13 583 200	–21 238 500	–12 324 900	–10 162 000	–13 745 375	–36 182 565	–10 470 051
Max	12 906 780	11 949 100	1 3868 917	10 620 544	11 566 710	9 332 400	13 895 082

Source: own work based on Bankscope data.

Low interest margins of EU banks are probably a result of not only the recent banking crisis but also the result of the sector development. Experts handling the issue of the development of banking sectors point to the fact that the interest margin level decreases with the development of the financial market. The probable beginning of this trend can be noticed in the analysed 2009 data, with a serious collapse in 2012.

When analysing the NIM level in banking sectors of individual EU member states, it can be noticed that the highest percentage share of a country's NIM in the EU NIM was disclosed by France, Great Britain and Spain in the examined years. Like in the case of the analysis of earlier ratios, a group of EU member states which account for the formation of NIM for the EU banking sector can be identified here. The mentioned states influencing the NIM value for the EU include France, Great Britain, Spain, the Netherlands, Germany and states with a slightly weaker influence, such as Ireland, Belgium and Greece (specific data are presented in Table 7).

Table 7. The percentage share of NIM of a given country's banking sector in the NIM value for the EU as a whole (in %)

State	2013	2012	2011	2010	2009	2008	2007
Germany	23.16	–67.61	69.91	19.29	0.81	29.84	7.34
Great Britain	–2.56	–13.00	107.22	13.49	23.99	87.15	31.62
France	61.07	–83.42	174.93	36.37	37.33	–0.64	15.91
Spain	18.69	338.64	29.46	13.75	30.69	–32.29	9.61
The Netherlands	11.89	–65.13	89.10	10.56	–6.49	–2.67	14.63
Ireland	–5.88	33.11	–22.23	–9.99	–8.14	1.67	1.64
Belgium	–0.06	8.05	–76.18	4.94	0.41	43.06	5.48
Greece	5.83	31.44	–165.50	–1.48	0.01	–2.39	0.72

Source: own work based on Bankscope data.

2.5. Cost to income ratio (*C/I*)

Cost to income is a ratio illustrating the encumbrance of a given bank with operating costs. From the viewpoint of the assessment of the financial position of EU banks, it is important that the factor is relatively low. *C/I* is calculated as a relation of operating costs (operation and amortisation/depreciation) to the result of the banking activity.

Table 8. Average, minimum and maximum *C/I* values (in %)

	2013	2012	2011	2010	2009	2008	2007
Average	68.62	70.88	70.66	68.86	68.64	70.95	66.62
Maximum	958.82	923.06	813.33	934.54	948.21	984.19	950
Median	66.25	66.965	66.67	66.23	67.61	69.17	66.75

Source: own work based on Bankscope data.

The average value of the analysed ratio for the EU banking sector was within the range from 66.62% in 2007 to 70.95% in 2008. The values of *C/I* ratio averages are presented in Table 8. The median value of the examined group of entities was from 66.23% in 2010 to 69.17% in 2008. The maximum value of the *C/I* ratio over the 7 analysed years was 984.19%. This value was achieved by Altarea from France in 2008.

2.6. Return on average assets (ROAA)

The average value of the ratio fluctuated from 0.36% in 2008 to 1.01% in 2007 in the analysed range. Average values of the variable for the entire time range are provided in Table 9.

Table 9. Average, minimum and maximum ROAA values (in %)

	2013	2012	2011	2010	2009	2008	2007
Average	0.59	0.49	0.47	0.61	0.46	0.36	1.01
Minimum	–43.32	–108.93	–348.07	–116.58	–184.63	–182.33	–133.61
Maximum	113.51	274.54	257.21	185.57	84.28	136.93	96.33
Median	0.27	0.29	0.28	0.31	0.29	0.26	0.42

Source: own work based on Bankscope data.

The lowest ROAA value, at the level of –348.07%, was disclosed by PSA Payment Services Austria, a bank from Austria, in 2011, whereas the highest value – 274.54% was reached by Evolution Group from Great Britain in 2012. The fact that all minimum values are negative figures deserves attention. The median of the examined ratio was within the range [0.26; 0.42]. The highest median value – 0.42 was determined in 2007, which was when the financial crisis began. The value was lower by a few tenth of a percentage point in each successive year. A significant spread between minimum and maximum ROAA values in the analysed time range is worth emphasising.

2.7. Return on average equity (ROAE)

The ROAE ratio was used for measuring the profitability of equities. The average ROAE value was within the range from 2.83% in 2011 to 8.68% for 2007. By analogy to ROAA, the highest median value for the banking sector, which was 5.82%, was generated by the banking sector in 2007. The distribution of the median and average ROAE values for the banking sector is presented in Table 10.

The fact that the spread between the maximum and minimum values of ROAE ratios is even greater than in the case of ROAA in the analysed time horizon is worth noticing. The minimum value at the level of –992.29% was determined for Piraeus Bank from Greece in 2011. The maximum value of 900% was generated by Skandinaviska Enskilda Banken, Vilniaus Filiala from Lithuania in 2010.

Table 10. Average, minimum and maximum ROAE values (in %)

	2013	2012	2011	2010	2009	2008	2007
Average	3.21	3.51	2.83	5.09	4.78	4.16	8.68
Minimum	–766.27	–832.9	–992.29	–300	–487.98	–850.22	–562.57
Maximum	480.03	797.21	441.05	900	924.56	958.15	728.57
Median	3.24	3.59	3.65	4.13	4.09	3.79	5.82

Source: own work based on Bankscope data.

2.8. Total capital ratio (TCR)

Average, minimum, maximum values and medians are presented in Table 11. The average value of the ratio was 16.8 in 2009 to 19.09% in 2013 in the period 2007–2013. The median of the ratio for the EU banking sector was determined by the range [13.7%; 16.59%]. The maximum value was generated by Quilter Cheviot from Great Britain at the level of 610% in 2008.

Table 11. Average, minimum and maximum values of the total capital ratio (in %)

	2013	2012	2011	2010	2009	2008	2007
Average	19.09	18.49	18.21	17.96	16.80	16.69	16.94
Minimum	0.43	0.90	–101.38	1.60	0.10	0.10	0.13
Maximum	417.10	416.30	388.79	540.68	178.00	610.00	505.00
Median	16.59	16.20	15.71	15.40	14.82	14.40	13.70

Source: own work based on Bankscope data.

Furthermore, apart from the total capital ratio, which is expressed in %, the total capital variable expressed in million EUR was subject to analysis as a part of the research. The average total capital value for banks from the EU financial sector was within the range from EUR 849K in 2012 to EUR 1,191K in 2010. The maximum values of the variable in the analysed time horizon grew year by year and amounted to EUR 140.7M at the end of 2013. The fact that the maximum values generated over nearly the entire analysed period were attributable to HSBC Holdings Plc, which is among the five largest banks in the world. The maximum value was generated by the Royal Bank of Scotland Group only in 2008.

3. Analysis of the EU banking sector with the method of pattern

The analysis of the financial position of EU banks involved the method of development pattern. It is one of the methods of linear ordering of a multidimensional comparative analysis, which allowed a specific positioning of individual banks subject to the analysis in the conducted research. The employment of the method of pattern enabled the ordering of individual examined banks (excluding bank groups) in the order from the worst to the best in terms of the financial position.

The procedure for calculating the synthetic variable, called the measure of development, included the following stages [Pawłowicz 1988, p. 10; Dziechciarz (ed.) 2012, p. 261–263]:

1. Creating an observation matrix **X** for the analysed banks, which comprised the group of eight analysed variables, among which only the *C/I* variable was a destimulant. The remaining seven variables were stimulants.

2. Determining the so-called pattern (z_0) characterised by the best values for each of the variables:

$$z_0 = \{z_{01}, z_{02}, z_{03}, z_{04}, z_{05}, z_{06}, z_{07}, z_{08}\},$$

z_{0j} = max z_{ij}, where variable z_j is a stimulant and z_{0j} = min z_{ij}, where variable z_j is a destimulant
and the anti-pattern (z_{-0}) with the worst values for each of the variables:

$z_{-0} = \{z_{-01}, z_{-02}, z_{-03}, z_{-04}, z_{-05}, z_{-06}, z_{-07}, z_{-08}\}$

z_{-0j} = min z_{ij} where variable z_j is a stimulant and z_{0j} = max z_{ij}, where variable z_j is a destimulant.

3. Examining the similarity of objects for the best object determined in the analysed group, that is the pattern, by calculating the Euclidean distance of each object from the pattern.

$$d_i = \sqrt{\sum_{j=1}^{m} (z_{ij} - z_{0j})^2} \qquad i = (1, 2, ..., 8),$$

where: d_i – Euclidean distance of the i-th object from the pattern.

The last stage of the research is determining the so-called measure of development for each bank according to the formula:

$$m_i = 1 - \frac{d_i}{d_0} \qquad i = (1, 2, ..., 8),$$

where: m_i – measure of development of the i-th bank; d_0 – distance between the pattern and the anti-pattern.

The measure of development has the following properties:

1) the better the financial position of a bank, the higher the measure of development,

2) the values of the measure of development fall into the range [0,1], where the measure of development determined for the pattern equals 1 (being the best object in the examined group), and for the anti-pattern equals 0.

After applying the above procedure to the group of banks subject to the research, the results presented in Table 12 were obtained.

Table 12. The values of the measure of development in the individual analysed years for the best 5 EU banks

No.	Bank name	Head office	Country	*M*
1/2007	Deutsche Bank	Frankfurt am Main	DE	0.855
2/2007	HSBC Holdings	London	GB	0.849
3/2007	Barclays Bank	London	GB	0.850
4/2007	Royal Bank of Scotland (The)	Edinburgh	GB	0.810
5/2007	BNP Paribas	Paris	FR	0.809
1/2008	Barclays Bank	London	GB	0.863
2/2008	BNP Paribas	Paris	FR	0.880
3/2008	Deutsche Bank	Frankfurt am Main	DE	0.806
4/2008	HSBC Holdings	London	GB	0.840
5/2008	Royal Bank of Scotland (The)	Edinburgh	GB	0.834
1/2009	BNP Paribas	Paris	FR	0.990
2/2009	HSBC Holdings	London	GB	0.801
3/2009	Barclays	London	GB	0.692
4/2009	Barclays Bank	London	GB	0.692
5/2009	Crédit Agricole	Paris	FR	0.668
1/2010	BNP Paribas	Paris	FR	0.979
2/2010	HSBC Holdings	London	GB	0.927
3/2010	Barclays Bank	London	GB	0.844
4/2010	Deutsche Bank	Frankfurt am Main	DE	0.819
5/2010	Crédit Agricole	Paris	FR	0.726
1/2011	HSBC Holdings	London	GB	0.923
2/2011	BNP Paribas	Paris	FR	0.890
3/2011	Deutsche Bank	Frankfurt am Main	DE	0.858
4/2011	Barclays Bank	London	GB	0.839
5/2011	Crédit Agricole	Paris	FR	0.743
1/2012	HSBC Holdings	London	GB	0.779
2/2012	BNP Paribas	Paris	FR	0.725
3/2012	Deutsche Bank	Frankfurt am Main	DE	0.679
4/2012	Barclays Bank	London	GB	0.694
5/2012	Crédit Agricole	Paris	FR	0.643
1/2013	HSBC Holdings	London	GB	0.770
2/2013	BNP Paribas	Paris	FR	0.715
3/2013	Barclays Bank	London	GB	0.667
4/2013	Crédit Agricole	Paris	FR	0.637
5/2013	Deutsche Bank AG	Frankfurt am Main	DE	0.625

Source: own work based on Bankscope data.

The analysis of the obtained results demonstrates that the best banks from the EU banking sector in terms of financial position are located in six states. The states with the best financial positon of the banking sector and at the same time the strongest influence on the situation of the banking sector in the EU are Great Britain, France, Germany, the Netherlands, Italy and Spain. The dominant role is played by Great Britain, which placed from five banks in years 2007, 2009, 2011, 2012 to seven banks in 2013 among the best banks in terms of financial position in the conducted research in each of the seven examined years. The second most significant banking sector for the financial position of the EU banking sector is France, which placed three to four banks among the best banks in terms of financial condition. Belgium and the Belgian branch of BNP Paribas Fortis, which managed to be among the best banks in 2007, also deserve attention. Interestingly, the highest values of the measure of development were achieved in the period 2009–2011, which is in fact the years when the EU banking sector faced the most serious "crisis" problems. The values of the measure of development at the level of 0.99 (2009 BNP Paribas), 0.97 (2010 BNP Paribas), 0.92 (2011 HSBC Holdings) prove, in our opinion, that the banks that recorded such results responded properly to the adverse changes on the banking market, which allowed them to defend against weakening or a considerable change in their financial position.

4. Conclusions

When conducting the research the results of which are presented in this paper, we posed two hypotheses. One referred to the present financial condition of the EU banking sector and provided that banks from the largest EU member states have already made up for the majority of the losses incurred during the recent financial crisis, while banks from smaller countries are still facing problems. This thesis is confirmed by partial analyses of eight variables, which were allowed for in the research i.a.:

– In the period 2007–2009 and 2013, banks with assets above the EU-28 average constituted merely 7% of the examined group. In the period 2010–2012, the value increased to 8%. Hence, it can be stated that over 90% of the examined group of EU-28 banks disclosed assets significantly below the EU average over the analysed 6 years.
– If allowing for the percentage share of deposit and short-term funding of periphery countries in the EU portfolio, considerable drops are noticeable in comparison to 2007: Luxembourg – drop by 14.83%, Ireland – by 52.22%, Belgium – by 48.74%, Hungary – by 11.34%, Romania – by 40.08%, Cyprus – by 21.23%, Croatia – by 11.28%, Estonia – by 56.62%, Malta – by 19.04%, Lithuania – by 20.86%. In that period, Poland recorded a growth in deposit and short-term funding by 43.25%, from 0.45% in 2007 to 0.64% in 2013.

The other posed hypothesis provided that it was a small group of banks that influenced the economic position of the EU banking sector in the period 2007–2013, one which also accounted for creating the level of individual values of financial ratios. The thesis was confirmed by both analyses of the eight variables adopted for the research and the results of the method of development pattern. It can be easily seen that:

– The countries which accounted for a high level of deposits in the EU-28 in the period 2007–2013 were Germany, Great Britain, France, Spain, the Netherlands and Italy. Deposit and short-term funding of the countries constituted over 66% of the EU total in the period 2009–2013.
– In the period 2007–2011, circa 80% of the equity of the EU-28 banking sector was accumulated in 7 states: Germany, Great Britain, France, Spain, the Netherlands, Italy and Luxembourg. Three states with the highest banking sector equity were Great Britain, Germany and France at that time. Their total equities in the period 2007–2008 were over 50% of the total equities for the EU-28 banking sector, in the period 2009–2011 the value increased to ca. 60%, which undoubtedly proves the improving financial position of banks in those states.
– The best banks in terms of the determined measure of development were banks located in 6 EU member states: Great Britain, France, Germany, the Netherlands, Italy and Spain.

The study give not only the general overview of the financial situation of the banks in the EU but above all allow us to assess the growth rate of the Polish banking sector from the perspective of the other EU countries.

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ANALIZA SYTUACJI FINANSOWEJ SEKTORA BANKOWEGO KRAJÓW UNII EUROPEJSKIEJ W LATACH 2007-2013

Streszczenie: System bankowy stanowi niezwykle istotne ogniwo systemu finansowego danego kraju. Taki stan rzeczy powoduje, że sytuacja finansowa banków tworzących dany sektor bankowy ma istotny wpływ na kondycję systemu finansowego danego kraju. Podobna zależność obserwowana jest w przypadku systemu finansowego Unii Europejskiej. Jednakże jeżeli spojrzymy na ten system z punktu widzenia UE, łatwo zauważyć, iż sytuacja jest dużo bardziej skomplikowana. System bankowy UE tworzony jest bowiem przez współdziałanie banków z różnych krajów wchodzących w skład UE. Ponadto jeżeli dołączymy do tego koszty społeczne wynikające z problemów finansowych banków, które mogą przekładać się na inne przedsiębiorstwa finansowe łatwo wysnuć wniosek, iż zła lub też problematyczna sytuacja finansowa banków tworzących dany system bankowy może stanowić zagrożenie dla całego systemu finansowego. W UE zagrożenie to wzrasta nawet kilkukrotnie. Jeżeli w sytuację taką zaangażowane będą bowiem transgraniczne instytucje finansowe, zagrożenie dla systemu może być jeszcze trudniejsze do opanowania. Prezentowany artykuł poświęcony został sytuacji finansowej banków w UE. Do jej oceny w latach 2007–2013 wykorzystano metodę wzorca rozwoju oraz dane finansowe, zgromadzone w bazie Bankscope, dotyczące banków funkcjonujących w UE. Przeprowadzone analizy posłużyły za punkt wyjścia do rozważań na temat zmian i kondycji sektorów bankowych w poszczególnych krajach UE oraz w UE jako całości.

Słowa kluczowe: bezpieczeństwo finansowe banków, Unia Europejska, Unia Bankowa, wskaźniki finansowe banków.