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Методика комплексного аналізу ефективності діяльності учасника банківської групи

Банківська група – група юридичних осіб, які мають спільного контролера. Оскільки фінансовий результат банківської групи залежить від фінансового результату кожного учасника групи, виникає необхідність у розробці методики, яка б дозволила оцінити рівень ефективності діяльності учасника групи. Дані такої оцінки необхідні для обґрунтування доцільності включення цього учасника до банківської групи.

В статті запропоновано методику комплексного аналізу ефективності діяльності учасника банківської групи. Дана методика передбачає порівняння відносних змін фінансових коефіцієнтів учасника банківської групи з відносними змінами коефіцієнтів усієї банківської групи та інших учасників. Предметом дослідження є показники фінансової звітності банківської групи та її учасників. В процесі дослідження автором використано метод аналізу структури, метод аналізу динаміки, коефіцієнтний метод, непараметричний критерій Вілкоксона, метод порівняння, метод бальної оцінки. За допомогою запропонованої методики визначено рівень ефективності діяльності банку «BNP Paribas Bank Polska SA» (Польща), який є учасником банківської групи «BNP Paribas Group».

Ключові слова: *банківська група, учасник банківської групи, коефіцієнт рентабельності активів, коефіцієнт рентабельності капіталу, критерій Вілкоксона.*

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Методика комплексного анализа эффективности деятельности участника банковской группы

Банковская группа - группа юридических лиц, имеющих общего контролера. Поскольку финансовый результат банковской группы зависит от финансового результата каждого участника группы, возникает необходимость в разработке методики, которая позволила оценить уровень эффективности деятельности участника группы. Данные такой оценки необходимы для обоснования целесообразности включения этого участника банковской группы.

В статье предложена методика комплексного анализа эффективности деятельности участника банковской группы. Данная методика предполагает сравнение относительных изменений финансовых коэффициентов участника банковской группы с относительными изменениями коэффициентов всей банковской группы и других ее участников. Предметом исследования являются показатели финансовой отчетности банковской группы и ее участников. В процессе исследования автором использован метод анализа структуры, метод анализа динамики, коэффициентный метод, непараметрический критерий Вилкоксона, метод сравнения, метод балльной оценки. С помощью предложенной методики определен уровень эффективности деятельности банка «BNP Paribas Bank Polska SA» (Польша), который является участником банковской группы «BNP Paribas Group».

Ключевые слова: *банковская группа, участник банковской группы, коэффициент рентабельности активов, коэффициент рентабельности капитала, критерий Вилкоксона.*

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Method for Complex Analysis of Banking Group Member Efficiency Rate

Banking Group is a body of legal entities with a common controller. Since the Banking Group financial result depends on financial results of each Group member financial result, the need for methodology arises which would make it possible to evaluate the rate of the Group member efficiency. Such evaluates are required for grounding the appropriateness of including this member into the Banking Group.

The article proposes the methods of comprehensive analysis of Banking Group member efficiency. These methods provide comparison of relative changes of the Banking Group member financial ratios with relative changes of financial ratios of the whole Banking Group and other member banks. The research covers the financial statement data of the Banking Group and its members. In the course of the study the structure analysis method, dynamics analysis method, ratio method, Wilcoxon nonparametric criterion, method of comparison, score method have been used. Owing to the method proposed, the level of efficiency has been determined for BNP Paribas Bank Polska SA (Poland) which is the member bank of BNP Paribas Group.

Keywords: *Bank Group, Banking Group member, 'return on assets' ratio, 'return on equity' ratio, Wilcoxon criterion.*

Introduction. Banking group is a group of legal entities with a common controller. The banking group includes: 1) a parent bank with its subsidiary and/or associated companies being financial institutions; 2) two or more financial institutions where the banking activity prevails. The goal of the parent bank as of any investor is reaching the highest level of profit margin of financial resources invested in banking group members. Since the banking group financial outcome depends on financial result of each group member, the method for the banking group member efficiency evaluation is required to be developed which would focus on making management decisions whether it is appropriate to include this or that bank into the banking group.

Analysis of recent research and publications. The problems of complex analysis of banking group member efficiency rate were considered in scientific works of many Ukrainian and foreign scientists. Among them are O. Gerasimenko [18], V. Kostyuchenko [19], L. Prymostka [21], G. Petukhov [20], E. Volkova [23]. Thus, V. Kostyuchenko has offered the method of group of companies cost evaluation, O. Gerasimenko provides the methods of two-stage ranging of subsidiaries, E. Volkova analyses the group activity according to organizational and economic criteria. Since the above scientists base their calculations on absolute significant rations, the group members with different economic and political ways of development do not fall under similar terms of their activity evaluation. Therefore, in order to put the banking group members in equal conditions while analyzing their efficiency, relative changes in analytical ratios are required.

The objective of the research is to determine the level of efficiency of a particular banking group member based on the proposed method of comprehensive analysis of the banking group member's rate of efficiency.

The investigation results. The developed method of complex analysis enables to estimate banking group member activity efficiency, using the point estimation method for three types of figures: differences between the inflow and outflow information ratios developed by the author; relative changes of the 'return on assets' ratio (ROA) and the 'return on equity' ratio (ROE) indexes; results of the nonparametric Wilcoxon test.

The Complex Analysis Method includes such stages as 1) comparison of inflow and outflow information ratios; 2) comparison of 'return on asset' ratio ('return on equity' ratio) of the group member and relative changes of ROA (ROE) rate of the banking group; 3) comparison of the relative rate of the group member's ROA (ROE) ratio with relative changes in ROA (ROE) of the banking group member located in the same business and territory segments; 4) comparison of relative rate of change of the group member's ROA (ROE) ratio and relative changes in ROA (ROE) of banking group member whose capital is 100% owned and 100% controlled by the parent bank; 5) assessment of stable connection between the banking group ROA (ROE) rates and the banking group member's ROA (ROE) rates under Wilcoxon criterion.

The method of complex analysis has such peculiarities: 1) the stages of the method may have different lengths of research periods; 2) a research period length may not be less than 4 years, since duration of the small economic cycle is 3 years; 3) all stages except the first stage include the steps A and B.

In this study the efficiency rate calculation has been made for *BNP Paribas Bank Polska SA* which shall represent the bank to be researched *(RB)*. Other business objects covered by this article include: *BNP Paribas Banking Group (BG)*; banks to be compared *(CB) – PAT Ukrsotsbank* and *BNP Paribas ZAO*. The duration of the research period for each stage depends on the availability of reporting information on the above business entities activity provided on their websites.

Every monitoring result obtained from comparison of two business objects for a certain year is given a certain point according to the score scale developed by the author (tab. 1). Every monitoring result is the result received in a process of comparison of two economic objects' indexes in a particular year.

Table 1

The scale of points of banking group member efficiency rate

Stage	The scale of points
1	*2*
I	0 – difference between Outflow and Inflow is negative, Outflow is calculated on the basis of profit; difference between Outflow and Inflow is positive, Outflow is calculated on the basis of expense; 1 – difference between Outflow and Inflow is positive, Outflow is calculated on the basis of profit; difference between Outflow and Inflow is negative, Outflow is calculated on the basis of expense.
II	0 – % change of BG index > % change of RB index, their symbols are opposite; 1 – % change of BG index > % change of RB index, their symbols are the same; 2 – % change of BG index < % change of RB index, their symbols are the same; 3 – % change of BG index < % change of RB index, their symbols are opposite.
III	0 – % change of CB index > % change of RB index, their symbols are opposite; 1 – % change of CB index > % change of RB index, their symbols are the same; 2 – % change of CB index < % change of RB index, their symbols are the same; 3 – % change of CB index < % change of RB index, their symbols are opposite.
IV	0 – % change of CB index > % change of RB index, their symbols are opposite; 1 – % change of CB index > % change of RB index, their symbols are the same; 2 – % change of CB index < % change of RB index, their symbols are the same; 3 – % change of CB index < % change of RB index, their symbols are opposite.
V	– discrepancies are not significant: the points of the stage II are multiplied by 1; – discrepancies are significant: the points of the stage II are multiplied by 2.

Source: developed by the author.

The First Stage consists in determining the difference between the inflow and outflow information ratios. *Inflow information ratio (Inflow)* is the share of asset (liability) of RB in the same asset (liability) of BG. *Outflow information ratio (Outflow)* is the share of RB profit (expense), got (made) on the basis of asset (liability) used for Inflow calculation, in the same profit (expense) of BG.

The difference between the information ratios is Outflow minus Inflow (tab. 2).

Table 2

The Inflow and the Outflow, calculated for BNP Paribas Bank Polska SA and BNP Paribas Group in 2012, %

Balance entry	Inflow	Outflow	Difference
1	*2*	*3*	*4*
1. Financial instruments at fair value through profit or loss	0.124	0.207	+0.082
2. Loans and receivables due from credit institutions	0.559	0.649	+0.090
3. Loans and receivables due from clients	0.228	0.441	+0.213
4. Available-for-sale financial instruments	0.082	0.255	+0.173
5. Due to credit institutions	0.452	0.798	+0.346
6. Due to clients	0.124	0.207	+0.082

Source: developed and calculated by the author.

The Second Stage. The Step A consists of:

- 'return on asset' ratio calculation for BG and RB;
- calculation of the 'return on asset' ratio relative change for an each year;
- comparison of the relative changes using the scale of points (tab. 3).

Table 3

'Return on asset' ratio of BNP Paribas Bank Polska SA and BNP Paribas Group during 2004-2012, %

Year	'return on asset' ratio			
	BNP Paribas Group		BNP Paribas Bank Polska SA	
	Value	Relative change	Value	Relative change
1	*2*	*3*	*4*	*5*
2004	0.553		1.496	
2005	0.581	+5.10	1.727	+15.48
2006	0.579	-0.39	1.287	-25.48
2007	0.530	-8.38	1.440	+11.89
2008	0.183	-65.46	0.459	-68.15
2009	0.313	+71.06	-2.133	-565.03
2010	0.452	+44.25	0.219	+110.29
2011	0.348	-23.02	0.107	-51.21
2012	0.378	+8.57	0.147	+36.85

Source: calculated by the author.

The Step B consists of:

- 'return on equity' ratio calculation for BG and RB;
- calculation of the 'return on equity' ratio relative change for an each year;
- comparison of the relative changes using the scale of points (tab. 4).

Table 4

'Return on equity' ratio of BNP Paribas Bank Polska SA and BNP Paribas Group during 2004-2012, %

Year	'return on equity' ratio			
	BNP Paribas Group		BNP Paribas Bank Polska SA	
	Value	Relative change	Value	Relative change
1	*2*	*3*	*4*	*5*
2004	15.95		13.42	
2005	16.50	+3.43	14.57	+8.56
2006	15.49	-6.13	14.53	-6.92
2007	14.55	-6.05	18.19	+34.18
2008	5.83	-59.92	6.60	-63.74
2009	9.29	+59.34	-33.16	-602.68
2010	11.04	+18.81	3.16	+109.52
2011	8.05	-27.09	1.55	-50.78
2012	8.12	+0.90	1.91	+22.80

Source: calculated by the author.

The Third Stage. The Step A consists of:

- 'return on asset' ratio calculation for CB and RB;
- calculation of the 'return on asset' ratio relative change for an each year;
- comparison of the relative changes using the scale of points (tab. 5).

BNP Paribas Bank Polska SA and *Ukrsibbank PAT* are included in the segment 'International retail banking' and in the segment 'Europe Mediterranean'.

Table 5

'Return on asset' ratio of BNP Paribas Bank Polska SA and Ukrsibbank PAT during 2009-2012, %

Year	'return on asset' ratio			
	Ukrsibbank PAT		BNP Paribas Bank Polska SA	
	Value	Relative change	Value	Relative change
1	*2*	*3*	*4*	*5*
2009	-2.32	-360.06	-2.13	-565.03
2010	-6.56	-182.39	0.22	+110.29
2011	-9.53	-45.30	0.11	-51.21
2012	0.22	+102.32	0.15	+36.85

Source: calculated by the author.

The Step B consists of: 'return on equity' ratio calculation for CB and RB; calculation of the 'return on equity' ratio relative change for an each year; comparison of the relative changes using the scale of points (tab. 6).

Table 6

'Return on equity' ratio of BNP Paribas Bank Polska SA and Ukrsibbank PAT during 2009-2012, %

Year	'return on equity' ratio			
	Ukrsibbank PAT		BNP Pariba Bank Polska SA	
	Value	Relative change	Value	Relative change
1	*2*	*3*	*4*	*5*
2009	-24.16	-328.59	-33.16	-602.68
2010	-61.26	-153.58	3.16	+109.52
2011	-102.87	-67.91	1.55	-50.78
2012	2.60	+102.53	1.91	+22.80

Source: calculated by the author.

The Forth Stage. The Step A consists of:

- 'return on asset' ratio calculation for CB and RB;
- calculation of the 'return on asset' ratio relative change for an each year;
- comparison of the relative changes using the scale of points (tab. 7).

Table 7

'Return on asset' ratio of BNP Pariba ZAO and BNP Paribas Bank Polska SA during 2006-2012, %

Year	ROA			
	BNP Pariba ZAO		BNP Paribas Bank Polska SA	
	Value	Relative change	Value	Relative change
1	*2*	*3*	*4*	*5*
2006	1.60		1.29	
2007	-0.02	-101.19	1.44	+11.63
2008	1.48	+7840.42	0.46	-68.06
2009	2.18	+47.47	-2.13	-563.04
2010	0.09	-95.70	0.22	+110.33
2011	0.56	+498.78	0.11	-50.00
2012	0.94	+66.74	0.15	+36.36

Source: calculated by the author.

It should be noted that in this study the parent bank has 100% share in the capital of the *BNP Pariba ZAO* and exercises control over 100% votes of the *BNP Pariba ZAO*. The parent bank possesses 74.9 % of the *BNP Paribas Bank Polska SA* capital and controls 99.9 % of the *BNP Paribas Bank Polska SA* votes.

The Step B consists of:

- 'return on equity' ratio calculation for CB and RB;
- calculation of the 'return on equity' ratio relative change for an each year;
- comparison of the relative changes using the scale of points (tab. 8).

Table 8

'Return on equity' ratio of BNP Pariba ZAO and BNP Paribas Bank Polska SA during 2006-2012, %

Year	'return on equity' ratio			
	BNP Pariba ZAO		BNP Paribas Bank Polska SA	
	Value, %	Relative change	Value	Relative change
1	*2*	*3*	*4*	*5*
2006	12.00		14.53	
2007	-0.21	-101.78	18.19	+25.19
2008	25.79	+12189.00	6.60	-63.72
2009	27.78	+7.72	-33.16	-602.42
2010	1.01	-96.38	3.16	+109.53
2011	8.11	+706.10	1.55	-50.95
2012	11.96	+47.54	1.91	+23.23

Source: calculated by the author.

The Fifth Stage. The Step A consists of:

- calculation of the Wilcoxon test for 'return on asset' ratio of BG and RB [22];
- estimation of the Wilcoxon test result using the scale of points (tab. 9).

Table 9

The database of the Wilcoxon test calculation for 'return on asset' ratio of BNP Paribas Bank Polska SA and BNP Paribas Group during 2004-2012, %

Year	BNP Paribas Group	BNP Paribas Bank Polska SA	Absolute difference	Rank
2004	0.553	1.496	-0.943	7
2005	0.581	1.727	-1.146	8
2006	0.579	1.287	-0.708	5
2007	0.530	1.440	-0.910	6
2008	0.183	0.459	-0.276	4
2009	0.313	-2.133	+2.446	9
2010	0.452	0.219	+0.232	2
2011	0.348	0.107	+0.241	3
2012	0.378	0.147	+0.231	1

Source: calculated by the author.

The sum of ranks of the positive differences is T(+) = 15, the sum of ranks of the negative differences is T(-) = 30. The Wilcoxon test value is the smaller sum T=15. Since with n=9 the critical values are $T_{0,1}$=3 and $T_{0,5}$=8, $T>T_{0,1}$ and $T>T_{0,5}$. In result, the discrepancies between 'return on asset' ratio of *BNP Paribas Group* and 'return on asset' ratio of *BNP Paribas Bank Polska SA* are not significant.

The Step B consists of:

- calculation of the Wilcoxon test for 'return on equity' ratio of BG and RB;
- estimation of the Wilcoxon test result using the scale of points (tab. 10).

Table 10

The database of the Wilcoxon test calculation for 'return on equity' ratio of BNP Paribas Bank Polska SA and BNP Paribas Group during 2004-2012, %

Year	BNP Paribas Group	BNP Paribas Bank Polska SA	Absolute difference	Rank
2004	15.955	13.417	+2.538	4
2005	16.502	14.565	+1.936	3
2006	15.489	13.558	+1.931	2
2007	14.553	18.191	-3.638	5
2008	5.833	6.596	-0.763	1
2009	9.294	-33.156	+42.451	9
2010	11.043	3.155	+7.888	8
2011	8.051	1.553	+6.498	7
2012	8.123	1.907	+6.216	6

Source: calculated by the author.

The sum of ranks of the positive differences is T(+) = 39, the sum of ranks of the negative differences is T(-) = 6. The Wilcoxon test value is the smaller sum T=6. Since with n=9 the critical values are $T_{0,1}$=3 and $T_{0,5}$=8, $T>T_{0,1}$ and $T<T_{0,5}$. In result, the discrepancies between 'return on asset' ratio of *BNP Paribas Group* and 'return on asset' ratio of *BNP Paribas Bank Polska SA* are significant.

After all stages have been assessed it is required to develop the stages and sub-stages evaluates matrix (Table 11). The maximum possible score that can be obtained at the stage (line 2) equals the maximum score from the score scale and number of monitorings.

Table 11

The marks of the stages and the steps

Figure	№ of the stages and № of the steps						
	I	**II**		**III**		**IV**	
	A	**A**	**B**	**A**	**B**	**A**	**B**
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1. The sum of points	4	12	12	6	7	7	7
2. The maximally possible point	6	24	24	12	12	18	18
3. The index of multiplication (stage V)	-	×1	×2	-	-	-	-
4. The mark (line 1 / line 2 × line 3)	0.67	0.5	1	0.5	0.58	0.39	0.39

Source: developed and calculated by the author.

The resulting bank group member's efficiency value is calculated as the total of all columns in line 4. According to the research done it has been found that out of 9 points possible in the resulting evaluate, *BNP Paribas Bank Polska SA* has obtained 4, 03 points. Consequently, under the efficiently rate score scale, *BNP Paribas Polish Bank SA* has the average rate of efficiency (Table 12).

Table 12

Scale of group member efficiency level estimation

Final mark values	Efficiency level
1	*2*
0.0< Mark ≤3.0	Low
3.0< Mark ≤6.0	Medium
6.0< Mark ≤9.0	High

Source: developed by the author.

Conclusion. The proposed method of complex analysis for banking group member efficiency is based on calculation of inflow and outflow information indexes, relative changes of 'return on asset' ratio and ROE ratios and Wilcoxon criterion. The method is recommended to be used in cases when analysts have to deal with financial statements for periods of different length. The analysis results obtained under the above method may be further used for making management decisions whether it is appropriate to include this or that bank in a banking group.

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