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APPLYING THE WARD METHOD IN THE ANALYSIS OF FINANCIAL SITUATION OF COMMERCIAL BANKS

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Abstract

The article presents the evaluation of the financial situation of commercial banks in Poland. The ratio analysis shows that the biggest variations between analyzed units were in productivity of tangible fixed assets, share of non-performing loans and overall liquidity. The financial indicators constituted the basis for the process of grouping banks into clusters of similar financial standing. The use of Ward method enabled us to differentiate five clusters. The most profitable banks belong to the first cluster, while the most productive ones are from the fourth cluster. The third cluster comprises the banks with the relatively worst financial situation.

JEL classification: G21, C38
Keywords: financial situation, commercial banks, Ward method

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Introduction

Banks are the most essential element of the financial system in Poland, their stability is guaranteed by the functions performed by them, even if some unexpected events occur. Banks play a key role in financing the economy, providing liquid payments and creating products allowing other entities to manage their financial risk (*Report on the stability of the financial system*, 2010, p. 3). Therefore, the analysis and evaluation of banks' stability and their financial standing is of particular importance.

Financial analysis helps bank managers to make decisions which minimize risk and its results may help to improve the efficiency of the bank's performance, better use of resources, meet the challenges posed by the market and the expectations of owners and clients. The financial analysis of the bank is instrumental, its aim being practical use of appropriate tools to evaluate the financial situation on the basis of financial statements (Kopiński, 2008, p. 12).

One of the most important elements of the financial analysis of the bank is the ratio analysis. Financial indicators, expressing the relations between particular numbers from financial statements enable us to make a synthetic characteristics and evaluation of various economic aspects of the bank performance, and their choice depends not only on the subject performing the analysis, but also on the specificity of the bank (Wędzki, 2006, p. 56).

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The aim of this paper is to conduct an analysis of the financial situation of commercial banks, applying the Ward method. This will allow us to determine the characteristics of distinguished bank clusters.

Material and methods

The basis of our analysis was financial data from 39 commercial banks from 2007 (The Best Banks 2008 Ranking, 2008, p. 11-30)[3]. The information gathered was processed in research procedure which comprised the following stages:

1) choice and calculation of financial indicators,
2) standardization of variables,
3) classification of banks according to the Ward method.

The choice of indicators was dictated by substantive and statistical concerns. The substantive choice of indicators assumed that they reflected various aspects of the analysis of the financial situation of the banks (table 1):

1) liquidity and solvency,
2) profitability,
3) resource utilization effectiveness,
4) property structure and capital structure,
5) property-capital structure,
6) preliminary analysis of the profit and loss account.

In order to avoid information repetition, through variables selected for examination, we conducted an analysis of correlations using the inverse matrix. This process helped us to eliminate the following variables: X_3, X_5, X_7, X_9 and X_{20}[4]. Next, we standardized the remaining variables. Finally, we conducted the classification of commercial banks using the Ward method. This method belongs to hierarchical agglomerate methods, in which on every stage of binding we join the objects (groups of objects) with the lowest degree of differentiation (Hair, Anderson, Tatham, Black, 1998, p. 473). The measure of this difference is the error sum of squares (ESS) expressed by the formula (Stanisz, 2007, p. 122):

$$ESS = \sum_{i=1}^{n_s} d_{is}^2 , \qquad (1)$$

[3] In 2007, the Polish bank sector had 50 banks, however, not all of them met the requirements allowing them to participate in the ranking of „Gazeta Bankowa", such as: access to the balance sheet and the profit and loss account together with the auditor's opinion, filling the questionnaire with additional information, having the solvency ratio at the level of at least 8% and own capital of over 20 million zlotys, as well as obtaining positive net financial results in 2007.
The missing information was completed on the basis of data obtained from banks websites:
Financial results after the 4th quarter of 2007. Reach for more, Warsaw February 2008. Obtained from http://www.pekao.com.pl/informacje_dla_inwestorow/informacje_finansowe/Raporty_roczne.
PKO Bank Polski, results from 2007, Warsaw, April 2008. Presentation of financial results for 2007. Obtained from http://www.pkobp.pl/index.php/id=rel_prez/akt_id=6851/source=rel_prez/section=ri.
ING Bank Śląski S.A., results for the 4th quarter of 2007, February 2008. Obtained from http://www.ingbank.pl/_fileserver/item/1000991.
Results of BRE Bank S.A. Group in 2007 and prospects for 2008, January 2008. Obtained from http://www.brebank.pl/images/BreKorpo2/Portal/BinaryPL/1631509/Prezentacja_2007_IV_kw_1631509.pdf

[4] The descriptions of variables provided in Table 1. As the threshold value on the diagonal of the matrix inverse to the matrix of correlations we assumed 10 (Wysocki and Lira, p. 175).

where d_{is}^2 = distance of *i* object belonging to a newly created *s* group (*n* – size of the group) from the centre of gravity of this group.

The center of gravity of a given group is calculated with the formula:

$$\overline{d_r} = \frac{1}{n_r}\sum_{i=1}^{n_r} d_i , \qquad (2)$$

where d_i = The distance of *i* object belonging to *r* group.

Table 1: Variables used in the analysis of financial standing of the banks

Variable	Name of the financial indicator	Calculation formula
Liquidity and solvency		
X_1	Solvency ratio	Obtained from source materials (%)
X_2	Overall liquidity ratio	Value of cash and operations with central bank in relation to total assets (PLN/PLN)
X_3	International Monetary Fund ratio of current liquidity	Value of cash and receivables from banks in relation to total liabilities (PLN/PLN)
Profitability		
X_4	Return on assets (ROA)	Net financial result in relation to total assets (%)
X_5	Return on equity (ROE)	Net financial result in relation to own equity (%)
X_6	Return on assets ratio based on interest margin	Result from interest in relation to total assets (PLN/PLN)
X_7	Ratio of operational revenue to earning assets	Obtained from source materials (%)
Resource utilization effectiveness		
X_8	Labor productivity ratio	Gross financial result in relation to the number of employed workers (PLN/number of employees)
X_9	Ratio of assets per employed person	Value of total assets in relation to the number of employed workers (PLN/number of employees)
X_{10}	Tangible assets productivity ratio	Gross financial result in relation to the value of tangible assets (PLN/PLN)
X_{11}	Ratio of operational costs share in total assets	Operational costs of the bank in relation to total assets (%)
Property structure and capital structure		
X_{12}	Ratio of non-performing loans	Value of non-performing loans in relation to all receivables[1)] (%)

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X_{13}	Ratio of amounts from customers share in total receivables[2)]	The value of amounts from customers in relation to total receivables (%)
X_{14}	Ratio of liabilities to customers share in total liabilities[3)]	The value of liabilities to customers in relation to total liabilities (%)
Property-capital structure		
X_{15}	Ratio of coverage of loans with deposits	Amount of receivables from clients in relation to liabilities towards them (PLN/PLN)
X_{16}	Ratio of financing bank assets with own capital	Value of own capital in relation to total assets (PLN/PLN)
X_{17}	Ratio of liabilities	Value of liabilities in relation to total assets (%)
Preliminary analysis of the profit and loss account		
X_{18}	Share of revenue from interest in bank's operational result	Revenue from interest in relation to bank's operational result (%)
X_{19}	Share of revenue from commission in bank's operational result	Revenue from commission in relation to bank's operational result (%)
X_{20}	Ratio of bank's obligatory burden	Net financial result in relation to gross financial result (%)

[1)] Non-performing loans were related to the sum of receivables from clients and financial institutions (for example banks, leasing , insurance companies and broking houses).
[2)] Amounts from customers are a sum of receivables from non-financial subjects, that is economic entities, individuals and budget units, whereas total receivables are a sum of receivables from non-financial and financial subjects.
[3)] Liabilities to customers are a sum of liabilities to non-financial subjects, that is economic entities, individuals and budget units, whereas total liabilities are a sum of liabilities to non-financial and financial subjects.

Source: Own work, on the basis of Bień and Sokół, 2001, p. 57-85; Jaworski, 1999, p. 269-286; Wąsowski, 2004, p. 283-293

Ratio analysis

Table 2 shows the values of ratios for the banks which were covered by our research. As the data included in the table indicates, the solvency ratio (X_1) differentiated banks to a very small extent, which can be attributed to the requirement that the banks keep it at the level of 8%. In more than half of the banks this ratio was 11.9% or more, the maximum value achieved by Fiat Bank Polska S.A.

Great differences could be noticed in the ratio of overall liquidity (X_2), which in half of the analyzed banks had the value of below 0.02. This can be explained by the fact that some banks kept low cash reserves, obtaining the means to cover accumulated payments directly from the money market.

Return on assets (X_4) strongly differentiated the surveyed banks, its average value amounting to 1.7% and was on the same level as the average for the whole banking sector in Poland

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(*Report on the situation of banks in 2007*, 2008, p. 49). The lowest return on assets was in Dominet Bank, which was a consequence of relatively low financial result in this bank in relation to the value of assets. Banks with similar value of assets obtained in 2007 similar return on assets, in the region of 1.0-1.5%. The highest return on assets was in BPH bank, however this result could be the effect of the division of 'banking business' (Single annual report of BPH, Chairman's Message, 2007, p. 1) and isolating some assets of the bank, which were then transferred to Pekao S.A. Due to such an outstanding value, this bank was excluded from the process of grouping.

Return on assets ratio based on interest margin (X_6) allows us to determine more precisely what profit in relation to assets is generated by the core activity of the bank – from interest. It also indirectly indicates the policy of determining the interest rates of deposits and loans. In half of the surveyed banks this ratio had the value of 3.0% and higher.

The ratio marked as X_8, X_{10}, X_{11} belong to the measures of the resource utilization effectiveness and were characterized by big or very big changeability in the surveyed environment. Banks differed most in the tangible assets productivity ratio (X_{10}), which ranged from 0.03 to nearly 30. In case of the bank with the lowest ratio (Dominet Bank) it resulted from a very low gross profit, whereas in the bank with the highest ratio (AIG Bank Polska) this was caused by relatively high gross profit and low involvement of fixed assets.

In the group of property structure and capital structure indicators, the least volatile ratio was that of amounts of customers share in total receivables (X_{13}), which in half of analyzed banks amounted to 89.6% or more, which indicates that the credit activity dominated the banks' operations and profit-generation. On the other hand, the most volatile measure in this group was that of non-performing loans (X_{12}), whose minimal value was 0% in Deutsche Bank Polska, which is attributed to the low share of receivables from clients in total receivables. The maximum value of the ratio of non-performing loans was observed in AIG Bank Polska, where it reached the level of almost 12%. Such a wide range of the value of this ratio may indicate that banks run differentiated policy of offering loans and evaluating customers credit capacity.

The indicators of the property-capital structure presented in table 2 (X_{16}, X_{17}) did not differentiate significantly the banks, with the exception of the ratio of coverage of loans with deposits (X_{15}), whose values were within the 0.01 – 4.34 range, which means that the banks used different policies of financing liabilities and approached liquidity risk differently.

The final group of measures of banks' financial standing consisted of the ratios of the profit and loss account (X_{18}, X_{19}, X_{20}), which indicate the significance of revenue from interest and commission in bank's operational result. These ratios showed average changeability and confirmed that the proper policy of interest rates was of prime importance in banks' operations.

Table 2: Banks financial indicators

Name of the bank	Financial indicators[1)]														
	X_1	X_2	X_4	X_6	X_8	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	X_{16}	X_{17}	X_{18}	X_{19}
AIG Bank Polska	12.6	0.01	4.45	0.15	0.21	30.7	3.8	11.9	98.9	16.7	0.15	0.10	76.7	139.4	12.6
Bank BPH	16.0	0.04	12.46	0.04	0.09	1.0	4.3	4.3	79.3	53.1	0.91	0.09	81.2	67.3	64.5
Bank DnB NORD	11.3	0.02	0.09	0.02	0.01	0.3	2.5	4.9	77.3	60.2	0.78	0.08	88.9	150.4	27.2

Bank Millenium	13.8	0.04	1.51	0.03	0.10	1.7	3.2	1.7	95.4	82.2	0.99	0.09	86.9	97.7	38.0
Bank Polskiej	10.4	0.01	0.46	0.01	0.04	0.7	1.4	3.1	54.9	15.6	0.51	0.03	92.4	212.9	41.3
BGK	13.7	0.02	1.29	0.01	0.30	3.8	0.5	2.5	67.4	64.0	0.92	0.04	71.2	196.1	11.0
BGŻ	11.1	0.02	0.96	0.03	0.05	0.5	3.1	1.1	88.9	88.3	1.09	0.08	86.5	127.6	26.9
BH w Warszawie	12.9	0.09	2.12	0.03	0.17	1.7	3.6	1.4	58.9	61.2	1.59	0.09	83.2	80.8	35.6
BOŚ	15.5	0.02	0.78	0.02	0.05	0.8	2.6	7.6	90.3	91.7	1.23	0.08	88.7	150.5	21.6
BPH Bank Hipoteczny	15.8	0.00	0.98	0.03	0.19	26.0	1.3	6.1	99.3	0.8	0.01	0.14	84.7	186.8	5.6
BRE Bank	10.2	0.04	1.32	0.02	0.24	1.5	1.8	3.6	92.4	76.3	1.24	0.08	88.7	102.6	31.3
BRE Bank Hipoteczny	11.3	0.00	1.04	0.02	0.40	5.4	0.9	0.3	98.7	9.2	0.09	0.10	88.9	258.0	3.7
BZ WBK	13.8	0.06	2.07	0.03	0.12	1.9	3.1	0.9	89.6	87.7	1.37	0.08	88.1	84.5	43.1
Deutsche Bank PBC	11.1	0.03	0.46	0.02	0.03	0.5	4.2	0.3	89.2	68.6	0.76	0.10	87.9	91.5	38.3
Deutsche Bank Polska	24.2	0.06	1.34	0.01	0.48	15.9	1.3	0.0	17.9	68.4	4.34	0.08	87.4	165.1	35.8
Dominet Bank	17.0	0.05	0.03	0.09	0.00	0.0	8.3	8.6	94.5	75.5	0.84	0.11	81.9	118.0	21.2
DZ Bank Polska	11.1	0.02	0.55	0.02	0.10	2.8	2.1	0.9	66.2	76.4	1.21	0.09	88.8	141.0	13.9
Eurobank	13.6	0.02	3.39	0.08	0.07	1.5	6.3	0.1	97.5	39.3	0.05	0.11	82.2	79.3	43.8
Fiat Bank Polska	37.0	0.00	1.94	0.06	0.22	6.4	3.3	1.6	100.0	2.5	0.02	0.36	59.9	136.0	0.9
Fortis Bank Polska	11.7	0.11	1.25	0.02	0.13	1.9	1.1	0.5	98.0	50.8	0.56	0.07	87.3	106.4	23.6
GE Money	11.9	0.00	2.88	0.06	0.12	4.7	4.0	6.3	100.0	0.8	0.01	0.13	79.9	108.2	29.1
GETIN Bank	10.9	0.01	1.82	0.03	0.14	3.0	2.2	4.6	79.6	67.0	0.87	0.08	87.5	116.7	27.4
GMAC Bank Polska SA	14.5	0.00	1.11	0.04	0.18	9.1	2.9	8.0	96.5	1.5	0.01	0.14	75.0	176.1	8.5
Gospodarczy Bank Wielk.	10.0	0.01	0.41	0.01	0.04	0.6	1.4	2.9	55.4	4.4	0.12	0.04	90.4	220.7	35.4
ING BS	13.1	0.04	1.22	0.02	0.10	1.5	2.6	3.0	51.9	93.6	2.72	0.06	91.4	123.5	52.7
Invest-Bank	14.6	0.05	0.63	0.04	0.02	0.4	4.3	5.4	68.1	98.5	1.65	0.10	86.6	106.6	35.9
Kredyt Bank	9.6	0.02	1.44	0.03	0.09	1.3	3.6	6.9	87.1	71.2	1.03	0.08	88.5	112.5	25.9
Lukas Bank	11.5	0.02	2.99	0.12	0.06	1.5	8.3	0.3	92.0	61.1	0.62	0.11	81.3	106.0	19.2
Mazowiecki Bank Regionalny	11.9	0.05	0.33	0.01	0.04	1.5	1.3	1.8	39.7	7.4	0.23	0.05	93.0	290.1	37.9
Mercedes-Benz Bank Polska	20.7	0.00	1.59	0.05	0.13	18.3	4.3	8.9	97.8	1.1	0.01	0.20	74.5	156.0	5.5
Noble Bank	21.4	0.01	4.62	0.02	0.44	12.5	1.7	7.3	65.7	63.5	0.81	0.15	74.6	66.0	26.4
Nordea Bank Polska	11.6	0.05	0.69	0.02	0.07	1.2	2.1	1.9	97.0	70.1	0.73	0.10	88.2	131.6	23.9
Pekao	11.6	0.04	1.74	0.02	0.11	1.3	2.2	7.8	79.7	85.0	1.35	0.12	85.3	88.7	46.9
PKO BP	11.9	0.04	2.67	0.04	0.12	1.3	3.8	3.9	93.5	93.4	1.13	0.09	85.5	88.4	40.6
Rabobank Polska	13.8	0.01	0.14	0.00	0.31	28.4	0.4	0.1	27.5	5.9	0.24	0.04	96.6	766.6	22.6
Raiffeisen BP	10.2	0.09	1.74	0.03	0.13	6.6	3.2	4.3	95.0	79.1	0.94	0.08	86.8	94.0	29.1
Santander Consumer Bank SA	8.0	0.02	1.11	0.03	0.25	9.7	1.6	1.2	99.6	1.3	0.01	0.07	90.6	141.9	19.8

Volkswagen Bank Polska	9.8	0.02	1,48	0.05	0.12	2.8	3.0	4.9	94.3	56.9	0.54	0.09	87.0	145.7	6.7
WEST LB Bank Polska	23.3	0.00	0.73	0.01	0.48	11.6	1.2	0.8	33.0	37.0	1.06	0.10	86.9	191.3	11.6
Statistical measures															
Minimal value	8.00	0.00	0.03	0.00	0.00	0.03	0.35	0.00	17.94	0.78	0.01	0.03	59.89	65.97	0.87
Maximum value	37.00	0.11	12.46	0.15	0.48	30.74	8.34	11,92	99.98	98.53	4.34	0.36	96.61	766.5	64.53
Median	11.90	0.02	1.29	0.03	0.12	1.73	2.65	3,00	89.63	61.20	0.81	0.09	86.95	127.5	26.87
Ratio of changeability based on median	14.50	68.55	45.39	42.08	57.71	11.6	41.08	78,30	16.70	52.25	57.00	15.17	3.81	23.68	37.92

[1)]Ratios marked as in table 1.

Source: Own work

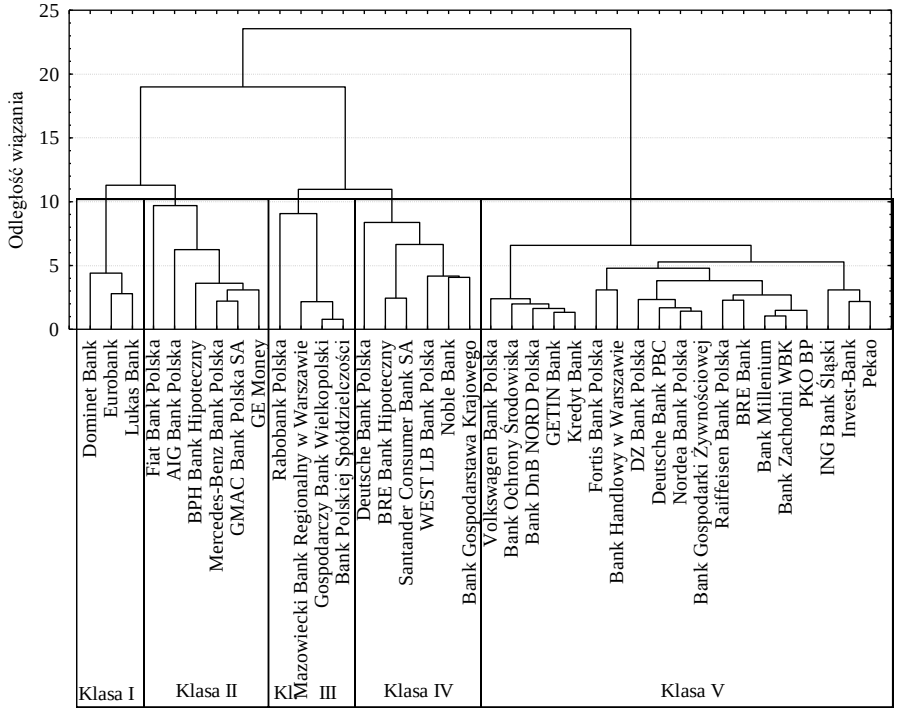
Classification

On the basis of the above financial indicators the grouping process was carried out. The results of this classification are presented in figure 1. The maximum distance between ties on the dendrogram pointed at the existence of three clusters. However, due to low homogeneity of classes, restricting the possibilities of interpretation, the division from the lower level of tying was adopted (Frątczak, Gołata, Klimanek, Ptak-Chmielewska, Pęczkowski, 2009, p. 146).

The first cluster was made by three entities: Lukas Bank, Eurobank i Dominet Bank[5] (figure 1). These are banks focused rather on servicing individual clients. A significant element of their offer is consumer credit (cash and mortgage), though they offer other services which make these banks look more universal. This group of financial entities was characterized by the highest profitability of all classes, both in net assets (nearly 3%) and in interest margin. These banks also had their property greatly burdened by operational costs (8.3%). The value of this indicator was over three times higher than the average for all surveyed financial institutions. At the same time, these entities were not very productive as far as labor resources are concerned. Generally this group showed low effectiveness of resources. Analyzing the property structure of this group of banks, we should emphasize the lowest share of non-performing loans in total receivables, while the level of customer liabilities was quite high (slightly below 95%). This proves that these banks have good policies of crediting individuals, budget units and economic entities. It should also be observed that this group had the lowest share of revenue from interest in bank's operational result. Other indicators were more or less similar to the average values of the surveyed units.

[5] In 2009 formal, legal and organizational merger of Dominet Bank and Fortis Bank Polska was carried out (at present the bank operates under the name BNP Paribas Fortis). Obtained from http://www.bnpparibasfortis.pl/o-banku/historia-banku.htm.

Figure 1: Classification of commercial banks according to their financial situation in 2007 (Euclidean distance)



Odległość wiązania – distance between ties
Class 1, class 2, class 3, class 4, class 5
Source: Own work

The second class was created by such financial institutions as: GE Money[6], BPH Bank Hipoteczny[7], Fiat Bank Polska, GMAC Bank Polska SA[8], Mercedes-Benz Bank Polska and AIG Bank Polska (figure 1). These subjects specialize in some specific areas of activity. The first two concentrate on servicing the real estate market through their offer of mortgage loans. The next three finance the purchase of new and used cars. There are some doubts concerning the presence of AIG Bank Polska in this group, which, like institutions belonging to the first group, bases its activities on *consumer finance* sector. However, it differs from them in being much more involved in financial instruments[9] and being more effective in utilization of resources.

The entities in the analyzed 2nd class were characterized by a markedly higher solvency (15.2%) and the best productivity of fixed assets in comparison to other groups (for every zloty of possessed fixed assets, they generated 13.7 zloty of gross profit). These banks

[6]In June 2008 the majority shareholding of BHP shares after division (and incorporating 80% of assets into Pekao S.A.) was purchased by General Electric Company. In December 2009 GE Money Bank (a subsidiary) merged BPH Bank. Obtained from z http://www.bph.pl/pl/o_banku/historia.

[7] Since 31st July 2008 the bank has been operating as Pekao Bank Hipoteczny SA. Obtained from http://www.pekaobh.pl.

[8] In 2009 100% shares of GMAC Bank Polska SA were purchased by Noble Bank (at present Getin Noble Bank SA). Obtained from http://www.money.pl/gielda/wiadomosci/artykul.

[9] The share of liabilities from financial instruments was in 2007 27.7%, compared with 9.8%, 2.0% and 0.0% for respectively Lukas Bank, Dominet Bank and Eurobank.

targeted their services almost exclusively at non-financial entities, which is reflected in nearly 100% share of amounts from customers in total receivables. The share observed in banking institutions belonging to the first group was not much lower, however, there is one significant difference. The percentage of non-performing loans in the analyzed group is the highest among all classes (7.2%). One could question the quality of the mechanism of assessing customers credit capacity and the effectiveness of receivables recovery. These banks, due to their specialization and method of obtaining means for the credit operations (mainly from other sources than customers' deposits), showed the minimum level of the share of liabilities to individual customers, economic entities and budget units in total liabilities (1.3%). The consequence of this was the ratio of covering loans with deposits being close to zero.

Analyzing the property-capital structure, the entities belonging to this group of banks excelled in financing their property from own funds and showed the lowest profitability (ROE)[10]. These banks were also characterized by the lowest level of liabilities (nearly 76%), which limited the level of risk while being relatively heavily burdened with non-performing loans. The analysis of the banks operational result showed the minimal share of revenue from commission and above the average share of revenue from interest in banks operational result. These banks obtained their revenue almost exclusively from the interest of their credits and loans[11].

The third class was composed of the entities connected with the cooperative sector[12], which direct their offer mainly to the entities operating in the agricultural market. Such institutions also offer their services to self-government units. We have here the entities incorporating cooperative banks operating in Poland as well as Rabobank Polska. In this class we observed the lowest level of solvency (slightly over 11%), which still offered some safety margin in comparison with the legal requirement of 8%. These subjects, due to the specificity of their activities, were also characterized by the lowest profitability. Incorporating cooperative banks, these entities focus their attention on catering to the needs of local communities as well as on generating profits. This approach is also connected with the lowest productivity of labor resources and fixed assets. These entities showed the lowest share of amounts from customers in total receivables and equally low share of liabilities to individual customers, enterprises and budget units (6.7%). At the same time, these banks minimally financed their property with own capital, which was reflected in the already mentioned low level of solvency ratio. In this group we also observed the maximum level of liabilities in relation to the balance sum, which was 6% above the average value. These subjects recorded the highest value of the revenue from interest as well as from commissions in banks operational result. This implies that these banks did not obtain such large benefits from operations on securities and other financial instruments and currencies as entities from other groups.

[10] Though the ROE variable was not taken into account when making the classification due to its strong correlation with ROA, we calculated the value of this indicator for each group. The second class had the lowest value (8.1%), while the first one had the highest one (27.8%).

[11] The share of the result from interest in banks operational result was nearly 98%.

[12] Bank Polskiej Spółdzielczości incorporates 359, Gospodarczy Bank Wielkopolski - 150, while Mazowiecki Bank Regionalny - 77 cooperative banks. Obtained from: http://www.bankbps.pl/o-banku/o-anku, http://www.gbw.com.pl/gbw_spoldzielcza_grupa_bankowa, http://www.mrbank.com.pl/mrbanksa.

Table 3: In-class values of indicators of commercial banks financial situation (median value)

Financial indicator	Class					Total
	I	II	III	IV	V	
Solvency ratio (%)	13.60	15.16	11.15	17.53	11.63	11.90
Overall liquidity ratio (PLN/PLN)	0.02	0.00	0.01	0.02	0.04	0.02
ROA net ratio (%)	2.99	1.77	0.37	1.20	1.32	1.27
ROA ratio based on interest margin (PLN/PLN)	0.09	0.05	0.01	0.01	0.03	0.03
Labor productivity ratio (PLN/number of employed workers)	0.06	0.18	0.04	0.42	0.10	0.12
Ratio of fixed assets productivity (PLN/PLN)	1.49	13.68	1.08	10.65	1.48	1.79
Ratio of the share of operational costs in total assets (%)	8.30	3.52	1.36	1.22	3.03	2.62
Ratio of the non-performing loans share (%)	0.30	7.15	2.37	1.01	3.60	2.96
Ratio of amounts from customers share in total receivables (%)	94.48	99.09	47.30	66.56	89.16	89.98
Ratio of liabilities to customers share in total liabilities (%)	61.11	1.31	6.65	50.28	76.44	62.36
Ratio of covering loans with deposits (PLN/PLN)	0.62	0.01	0.24	0.86	1.09	0.79
Rate of financing bank property with own capital (PLN/PLN)	0.11	0.14	0.04	0.09	0.08	0.09
Ratio of liabilities (%)	81.91	75.84	92.69	87.19	87.47	86.96
Share of revenue from interest in bank's operational result (%)	105.99	147.73	255.42	178.23	106.59	129.57
Share of revenue from commission in bank's operational result (%)	21.17	7.07	36.65	15.71	29.11	26.63

Source: Own calculations

The fourth cluster was composed of six entities (figure 1). These are banks specializing in servicing certain areas, such as commercial property (BRE Bank Hipoteczny) or certain segments of clients, fir example large enterprises (WEST LB Bank Polska). This class of financial institutions was characterized by the highest profitability, which exceeded 17%. These banks were also the most effective in using resources, while maintaining minimum share of operating costs in total assets. Other indicators were similar to the average values. One should emphasize, however, that the amounts from customers share in total receivables was 20% lower. This situation can be attributed to the specialization of some entities in investment activity (Deutsche Bank Polska, WEST LB Bank Polska, Noble Bank).

The final differentiated class, which turned out to be the most numerous one, comprises of typical universal commercial banks (figure 1). These entities had the highest financial liquidity, though the liquidity level did not differentiate significantly the group. In this group we observed the highest percentage of liabilities to clients in total liabilities. This results from

the fact that these banks are strongly focused on servicing individual clients. The banks belonging to this cluster also showed the highest coverage of liabilities with receivables from non-financial subjects, though this value was not much higher than the average for all surveyed banks. These banks, just like financial institutions belonging to the first class, were characterized by comparatively low share of revenue from interest in bank's operational result. Contrary to the above-mentioned entities, these banks had the above-the-average share of commission revenue in the analyzed year.

Conclusions

The aim of this article was to evaluate the financial standing of commercial banks on the basis of some selected financial indicators. The surveyed sample was mostly differentiated by: productivity of tangible fixed assets, share of non-performing loans and overall liquidity. On the basis of financial indicators banks were classified using the Ward method. Taking into account the profitability, the banks belonging to the first cluster excelled here. Productivity was the highest among the banks belonging to the fourth class. The subjects belonging to the second class were nearly as effective in this respect, however, they also showed the highest percentage of non-performing loans. Taking into consideration two elements of the evaluation of the financial standing, profitability and productivity, the worst results were achieved by the banks from the third class, which additionally showed relatively low liquidity. To determine the total level of financial situation of each bank, it would be necessary to use the synthetic measure allowing us to create a ranking. This research aspect, however, requires some additional analyses.

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