AN INQUIRY ON TOP BANKS BY TIER 1 RANKING FROM CENTRAL AND EASTERN EUROPE

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Abstract: *Tier 1 capital ranking represents an important instrument that measures a bank's financial strength and efficiency and The Banker Database, a service provided by The Financial Times it is an important source of data and analysis for the banking sector. Under these circumstances, the objective of the article is to examine the financial and non-financial indicators that might have an impact on the Tier 1 capital ranking banks from Central and Eastern Europe. The research starts with a brief theoretical review of the indicators that influence the financial performance of the banks, the profitability, efficiency and the capital structure. The empirical research was conducted on the first 200 banks from Tier 1 capital ranking and the data was collected from The Banker Database, in the period 2015 - 2018. The banks included in analysis were from 23 countries with a total of 800 observations. The empirical research consists in a qualitative and a quantitative analysis of the banks, with focus on their structure, characteristics and their financial indicators. Using a panel data econometric model, the study highlighted the correlations between the financial and non-financial indicators and the rank of the banks. The researched results revealed that the highest number of the top banks were from Russia (57 banks), Poland (17 banks), Bulgaria (12 banks) and Romania (12 banks). The econometric analysis highlighted that the dependent variable had a positive correlation with Return on Asset (ROA), Total Liabilities to Total Assets (LTA), Loans to Assets Ratio (LTA) and Risk-Weighted Assets Density (RWA). A negative correlation was found with the number of employees and Return on Equity (ROE). The results obtained are in correlation with the recent studies in the field, a bank with smaller liabilities and higher revenues is more efficient and has a higher position in the Tier 1 capital ranking.*

Keywords: *Banks; Financial indicators; Tier 1 Rank; Central and Eastern Europe.*

JEL Classification: *G21; G32.*

1. Introduction and background

There is an extended literature studying the main factors that influence the financial performance of banks. Considering the objective of the article, to examine the financial and non-financial indicators that have an impact on the Tier 1 capital ranking banks from Central and Eastern Europe, in this section was done a brief literature review of the indicators used in the empirical analysis. Therefore, the paper focus on the following financial indicators: Capital Assets Ratio (CAR), Return on Assets (ROA), Return on Equity (ROE), Non-Performing Loans (NPL), Loans to

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Assets Ratio (LAR), Risk-Weighted Assets (RWA) Density, Profit Margin (PM), Total Liabilities to Total Assets (TLTA) and Cost Income Ratio (CIR).

This research was focus only on the Tier 1 capital banks. Tier 1 capital is composed of core capital (Basel Capital Accord, 1998), that considers primarily the common stock and disclosed reserves (BIS, 1998) and it represents an important measure of a bank's financial strength from a regulator's point of view. (Chodnicka-Jaworska, 2019). Also, Tier 1 capital include elements of common equity, like paid up equity, share premium resulting from issue of common equity, statutory reserve, capital reserve, other disclosed free reserves, if any. (Kishore, 2018) This, is strictly connected with Basel II and Basel III regulations, because it is one of the newest factors that can be taken into consideration only for a short-term period of time.

The depositors have asymmetric information about bank's assets and the deposit structure might lead to runs when real assets value falls (Ibimilua and Adebayo, 2018) that's why the banks can be view as vulnerable due to provision of liquidity services. Therefore, the bank's capital, provides a "cushion" against losses for depositors (Diamond and Dybvig, 1983, Morrison and White, 2005).

Banks are required to maintain a certain amount of capital through legal capital requirements (Grzelak, 2019), a reason why the bank's capital it has to be at least at the minimum requirements level. Mishkin (2000) also states that banks are obliged to do so by supervisors and regulators.

Capital Asset Ratio (CAR) represents, in general, a method of credit control. In case of banks, this variable represents the ratio of capital a commercial bank should have to its total assets. When a bank registers a high value of CAR, it's considered to have enough capital to cover the risk-weighted assets and to protect the depositor's assets. (Smith, 2020)

Cooke (1990) believe that an Increase in leverage leads to an increase of the cost of financial distress and if the cost of financial distress rises, then the capital ratio declines. The measure of how a company turns its capital into profit it's done by Return on Capital. This financial indicator shows if a bank is using its investments effectively to maintain and protect the long-term profits. (Li Cain, 2020)

A similar financial indicator is Return on Assets (ROA), which measures the profit a bank can generate considering its total assets. If its value is high, the risk it's low (Chodnicka-Jaworska, 2019).

Return on Equity (ROE) measures the performance of the banks, which represents "the degree of success in attaining a state objective" (Sathye, 2005) and in this specific context the objective is to maximize the shareholder's wealth. It reflects how effectively a bank management is using shareholders' funds (Rega, 2017).

The ratio of Non-performing loans to total loans (NPL) shows the quality of the bank's loan portfolio and measures the credit risk of the bank's clients (Grzelak, 2019). If this indicator has a high value, the bank is considered to be risky.

Another important financial indicator that measures the impact of capital structure is Loans to Assets Ratio (LAR) (Pinto and Joseph, 2017). Abbadi & Abu-Rub (2012) studied the relationship between the market efficiency and capital structure of Palestinian financial institutions considering LAR and obtained a strong positive correlation between the indicators.

Even though Basel III norms introduced and considers a non-risk weighted parameter, in the primarily guidelines the capital ratio was defined as proportion of Risk-Weighted Assets (RWA). This financial indicator can be used to understand the changes in risk profile of assets portfolio of the banks (Kishore, 2018).

Banks may be seen as special institutions, but they are primary business organizations with the objective to generate profit (Ibimilua and Adebayo, 2018). However, the profit margin was found by Pradhan and Paudel (2017) to be negatively related with stock prices.

Another proxy for capital structure can be considered to be Total Liabilities to Total Assets (TLTA), which was studies by Pinto & Joseph (2017) and found that it has a significant impact on the financial performance in the banking industry.

The expenses in correlation with the income are calculated in Cost Income Ratio (CIR) indicator, dividing the operational costs by the operational income. It's an efficient indicator to measure the operation margins, in special how costs are changing compared to income (Rega, 2017)

In the context of banking sector, besides all these financial indicators there are also non- financial ones that have an importance in studying the banks, like the size of the bank, that can be expressed in number of employees (Nakamura and Roszbach, 2016, Hau et al., 2012) but also in number of branches or the volume of the business (Pinto and Joseph, 2017).

Considering the literature on the financial indicators, in Table 1 was presented the calculation method for each studied variable, for a better understanding of the empirical analysis.

Table 1: Calculation method of the financial indicators

Variable	Code	Formula
Capital Assets Ratio	CAR	The bank's capital is divided by the risk-weighted assets (%)
Return on Assets	ROA	Net profit scaled by total assets (%)
Return on Equity	ROE	Net profit scaled by equity (%)
Non-Performing Loans	NPL	A loan for which wasn't payed the agreed instalments or interest in more than 90 days
Loans to Assets Ratio	LAR	Loans provided to clients scaled by total assets
Risk-Weighted Assets Density	RWA	Risk-weighted assets scaled to total assets
Profit Margin	PM	Net profits divided by net sales
Total Liabilities to Total Assets	LTA	Total liabilities divided by total assets
Cost Income Ratio	CIR	Operating costs divided by operating income

Source: made by author based on reference list

The rest of the paper is structured as follows: Section 2 describes the methodology and the data used, Sections 3 presents the main findings with discussions and Section 4 concludes and gives some future research directions.

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2. Methodology and data

The analysed data was collected from The Banker Database provided by the Financial Times, and consists of the Tier 1 capital ranking banks from Central and Eastern Europe in the period 2015-2018. The banks included in the analysis are from 23 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Serbia, Slovakia, Slovenia and Ukraine.

A panel data econometric model was employed to test the correlations between the analysed indicators and the Tier 1 ranks. The dependent variable was the Ranks of the banks and the independent variables were the financial indicators: Capital Assets Ratio (CAR), Return on Assets (ROA), Return on Equity (ROE), Non-Performing Loans (NPL), Loans to Assets Ratio (LAR), Risk-Weighted Assets (RWA) Density, Profit Margin (PM), Total Liabilities to Total Assets (LTA) and Cost Income Ratio (CIR) and two non-financial indicators: Number of Employees (E) and the number of Branches of the banks (B) .

First, an OLS regression was built to test the multicollinearity of the independent variables by calculating the variance inflation factor (VIF) to see if there is a multicollinearity problem. Also, the Modified Wald test has been done to check for homoscedasticity. The Prais-Winsten regression with heteroskedastic panel corrected standard errors was further used in the analysis, with the following form:

$$\text{Rank}_{it} = \alpha_i + \beta_1 CAR_{it} + \beta_2 ROA_{it} + \beta_3 ROE_{it} + \beta_4 NPL_{it} + \beta_5 LAR_{it} + \beta_6 LAR_{it} + \beta_7 RWA_{it} + \beta_8 PM_{it} + \beta_9 LTA_{it} + \beta_{10} CIR_{it} + \beta_{11} E_{it} + \beta_{12} B_{it} + \varepsilon_{it} \tag{1}$$

This model was tested on all 238 banks from the sample, regardless of the number of years they appeared in the Rank, and all the panel data testing and coefficient estimation was done using Stata Statistical Software: Release 13.

3. Results and discussion

The empirical analysis begins with a qualitative analysis of the banks and their particularities. The structure of the banks, based on the number of observations collected, can be seen in Figure 1.
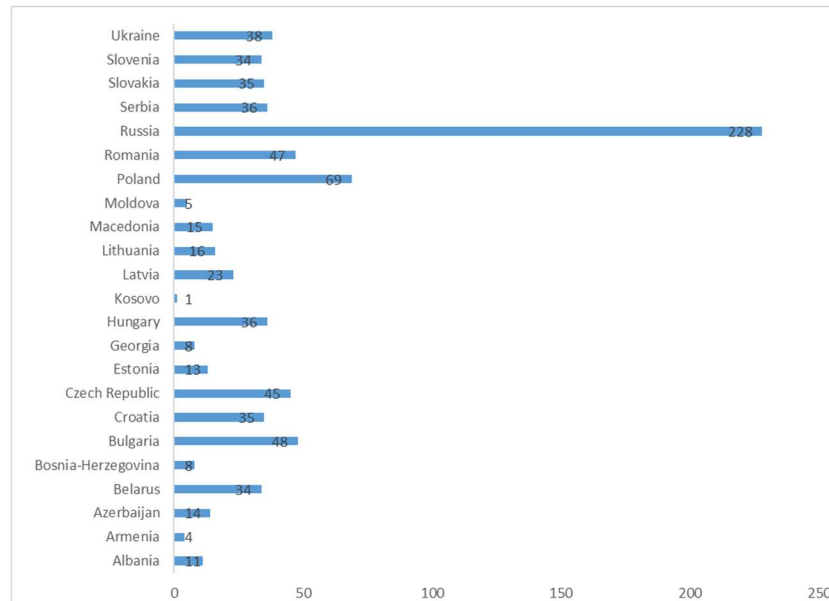
Figure 1: The structure of the analysed banks
Source: own computation using data from The Financial Times Ltd 2019. TheBankerDatabase.com

The countries with most banks in the Tier 1 Ranking are: Russia, with 57 banks, the higher rank being 1 and with an average rank of 101; followed by Poland, with 17 banks, rank 5 being the average one and Bulgaria and Romania, both with 12 banks and an average rank of 105, respectively 100.

The next step of the analysis represents the descriptive statistics of all banks, which are presented in Table 2.

In the ranking were 200 positions and a total of 800 observations, but the banks changed from year to year. In average, in the sample, there were 120 banks from a certain country, with a minimum number of 1 from the same country and the maximum number of 238 banks from the same country.

Data with 800 observations were available only for two variables: Capital Assets Ratio (CAR), which registered a mean value of 11.56%, with a minimum value of 2.43% and a maximum value of 73.89%, and Return on Assets (ROA), which registered a mean value of 0.77% with a minimum of -42.63% and maximum of 9.73%. The negative values obtained are due to the losses the banks registered in the analysed period.

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Table 2: Descriptive statistics

Variable	Observations	Mean	Min	Max
CAR	800	11.56	2.43	73.89
ROA	800	0.77	-42.63	9.73
ROE	790	5.12	-285.77	805.85
NPL	496	10.06	0.16	74.12
LAR	790	67.65	12.5	210.4
RWA	745	70.50	12.45	203.47
PM	786	8.89	-2558.71	684.3
LTA	799	86.74	9.01	112.32
CIR	787	52.01	-170.29	1264.51
E	627	6955	95	330677
B	629	341.21	1	18000
Banks	800	120.52	1	238

Source: own computation using data from The Financial Times Ltd 2019. TheBankerDatabase.com

For Return on Equity (ROE) variable were available 790 observations and the indicator registered a mean value of 5.12, with a minimum of -285.77% and a maximum of 805.85%.
For Non-Performing Loans (NPL) indicator were available 496 data. In average, the banks have 10.06 Non-performing loans, the minimum number was 0.16 loans and the maximum number of non-performing loans was 74.12.
Loans to Assets Ratio (LAR) has 790 observation and registers an average of 67.65 which means that most of the bank's assets were financed through debt.
For Risk-Weighted Assets (RWA) Density were collected 745 observations and the banks register in average the value 70.50, with a minimum of 12.45 and a maximum value of 203.47, which shows that the risk profile of the banks was deteriorated.
For Profit Margin (PM) were available 786 observations and the banks registered an average value of 8.89. The highest margin losses were -2558.71 and the highest margin profit was 684.3
For Total Liabilities to Total Assets (LTA) variable were collected 799 observations and the banks register a mean value of 86.74.
For Cost Income Ratio (CIR) indicator were available 787 observations and the mean value registered was 52.01.
As for the non-financial indicators, two of them were introduced in the model, both of them measuring the size of the banks. Employees, for which 627 observations were available, showed a mean value of 6955 employees in a bank, the minimum number being 95 and the maximum number of employees was 330677. This variable was converted into natural logarithm when included in the econometric model. The other variable was the number of Branches, with 629 observation available and their number varied from 1 to 18000.

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In Table 3 is presented the correlation matrix for all the analysed indicators and it can be observed that the Rank has a positive correlation with CAR, NPL, RWA and CIR and a negative correlation with ROA, ROE, LAR, PM, LTA, E and B.

Table 3: Correlation matrix

Var	Rank	CAR	ROA	ROE	NPL	LAR	RWA	PM	LTA	CIR	E	B
Rank	1											
CAR	0.0282	1										
ROA	-0.02	0.26	1									
ROE	-0.077	0.15	0.86	1								
NPL	0.241	-0.04	-0.34	-0.4	1							
LAR	-0.15	0.01	-0.08	-0.13	0.12	1						
RWA	0.115	0.33	-0.09	-0.07	-0.07	0.18	1					
PM	-0.05	0.19	0.58	0.63	-0.23	-0.06	-0.02	1				
LTA	-0.080	-0.72	-0.26	-0.13	0.001	-0.02	-0.21	-0.19	1			
CIR	0.072	-0.26	-0.34	-0.39	0.13	0.09	-0.12	-0.76	0.22	1		
E	-0.69	-0.27	-0.07	-0.06	-0.09	0.24	0.17	-0.09	0.28	0.04	1	
B	-0.02	-0.06	-0.03	-0.02	-0.04	0.11	0.15	-0.03	0.08	-0.04	0.55	1

Source: own computation using data from The Financial Times Ltd 2019. TheBankerDatabase.com

The results obtained from the pre-estimation tests show there is not a multicollinearity problem, the variance inflation factor (VIF) was 3.82, lower than the threshold of 7. Modified Wald test revealed a $chi2(149)$ of 9.4 with a p-value of 0.000, thus the null hypothesis was rejected.
From the Prais-Winsten regression with heteroskedastic panes corrected standard errors, applied on 378 observations, was obtained an R-squared of 0.88 which means that the variation of the dependent variable can be explained 88% by the variation of all independent variables. Wald $chi2(11)$ was 2209.83 with a p-value of 0.000, which means that the model is statistically significant at 1% significance level. The results from the regression model are presented in Table 4.

Table 4. The results of the regression model

	CAR	ROA	ROE	NPL	LAR	RWA	PM	LTA	CIR	E	B
Coef.	-.271	5.71	-0.46	1.84	-0.05	1.01	0.07	2.91	0.38	-34.5	0.002
Std. dev.	0.48	1.33	0.11	0.23	0.19	0.09	0.04	0.37	0.17	2.91	0.008
Z	0.56	4.28***	-3.96***	7.71***	-0.29	10.54***	1.67*	7.80**	2.17**	-11.89***	3.31***

*, ** and *** mean 10%, 5% and 1% level of significance
Source: own computation using Stata 13 Software

The results obtained in the table above show that two of the studied variables were not found statistically significant, CAR and LAR. All the other ones were validated to be significant at 1%, 5% and 10% level.

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A positive correlation was found between the rank and ROA, NPL, RWA, PM, LTA, CIR and Branches. The highest coefficient of correlation is with Return on Assets (ROA) of 5.71, which means if the ROA increased by 1%, the rank might increase with 5.71 levels, followed by Total Liabilities to Total Assets (LTA), of 2.91, which means that is LTA ratio increases by 1 point then the rank might increase with 2.91 levels, both significant at 99% level of confidence.

A negative significant correlation of the dependent variable was found with ROE and the number of employees. The highest coefficient is for the number of employees, - 34.5, which means that if the number increases by 1, the ranks might decrease by 34 levels. And the coefficient of ROE was -0.46, which means that if ROE increases with 1%, the rank of a bank might decrease by -0.46 levels.

The results obtained are in accordance with the recent publications in the field. Grzelak (2019) also studied the Tier 1 commercial banks in Central and Eastern Europe and analysed the significant influence factors, like Size, Non-Performing Loans (NPL), Return on Equity (ROE) and Liabilities to Total Assets (LTA). Fijałkowska et. al (2018) concluded also that a bank it's more efficient if it recorded higher revenues and smaller liabilities. Similar studies, using these financial indicators were also done on non-banks entities: Return on Assets (ROA) and Return of Equity (ROE) were analyses in correlation with the company's value (Hategan & Curea-Pitorac, 2017), Liabilities and Assets were studied in correlation with the market value by Hategan at el. (2017), and Tomczak (2017) realized a complex study on the stability of the financial indicators on 1600 companies.

4. Conclusion

The objective of this paper was to examine the financial and non-financial indicators that have an impact on the Tier 1 capital ranking banks from Central and Eastern Europe. To achieve this purpose an empirical research that consists in a qualitative and a quantitative analysis of the banks was done. The focus of the research was on the structure, characteristics and financial indicators of the first 200 top banks from Tier 1 ranking.

The results highlighted that the highest number of the top banks were from Russia (57 banks), which also had banks on the first rank, Poland (17 banks), Bulgaria (12 banks) and Romania (12 banks). The econometric analysis revealed that the dependent variable had a positive correlation with Return on Asset (ROA), Total Liabilities to Total Assets (LTA), Loans to Assets Ratio (LTA) and Risk-Weighted Assets Density (RWA). From all the indicators the highest correlation is with ROA, if ROA increased by 1%, the rank might increase with 5.71 levels. A negative correlation was found with the number of employees and Return on Equity (ROE).

A limitation of this study represents the availability of data, the results would have been more robust with same number of observations for all the analysed variables and also a longer period of time. Considering this, a further research direction for this subject would collecting more recent and complete data and also consider other non-financial and financial indicators in the analysis.

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