INTERNAL AND EXTERNAL DETERMINANTS OF COMMERCIAL BANKS PROFITABILITY: EMPIRICAL EVIDENCE FROM BULGARIA AND ROMANIA

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Abstract: *Our study focuses on commercial banks which are operating in Bulgaria and Romania, two countries whose banking sectors have registered major structural changes in the transition to a market economy and which are showing some similarities.*
Similar to other EU countries, the financial system from Bulgaria and Romania is dominated by the banking sector, which holds the largest share of total assets. Thus, we can say that health, strength and performance of the banking sector are of major importance for the sustainable economic development of states, but also for efficient transmission of monetary policy decisions on the real economy.
The paper aims to identify the key factors that affect bank profitability and to evaluate empirically their contribution to a sample of 29 commercial banks in Bulgaria and Romania, for the period 2003-2012.
Our research is based on data from the Bureau Van Dijk database, the World Bank and the European Central Bank and uses panel data estimation techniques. The dependent variable used in our study is the bank profitability, which is measured by two representative indicators the Return on Average Assets (ROAA) and Return on Average Equity (ROAE). Regarding the independent variables, our analysis includes capital adequacy, the loan loss reserve rate, cost to income ratio, the ratio of liquid assets to total assets, the interest expenses to deposits ratio, the non-interest income over total gross revenues, bank size, the GDP per capita growth, inflation rate, domestic bank credit to private sector and banking industry concentration.
The results of our empirical study shows that among the variables considered, the loan loss reserve rate, the ratio of cost to income, GDP per capita growth and domestic bank credit to the private sector, have a significant impact on bank profitability, results in line with our expectations, but also with the results of other empirical studies.

Keywords: Profitability; Determinants; Commercial banks; Panel data

JEL classification: G21; C33; P52

1. Introduction

During the pre-crisis years, the banking sector in Bulgaria and Romania, similar to other states in the Central and Eastern Europe, has known an extremely rapid growth, as a consequence of the liberalization of the internal financial markets and of the opening of the capital accounts which attracted important capital flows and the significant increase of the number of foreign banks. In this context, the competition on the national banking markets has been intensified and has been registered a very rapid financial development.

One of the most significant features of the banking sector in the two countries over the aforementioned period is the extremely accelerated dynamics of the bank loans granted to the economy, which determined the growth of bank profitability, of the credit risk, but also the accumulation of certain major macroeconomic disequilibria.

In the context of the current global crisis, amid the bank loans contraction, the reduction of the interest margin as a consequence of the increase of the financing costs, of the significant deterioration of the quality of the bank loan portfolio and the important increase

of the provisions, the banking sector in the analyzed countries has registered an important profitability decrease.

Our research aims to identify empirically and to analyze the most important internal and external factors which affect the profitability of the commercial banks operating in Bulgaria and Romania, over a period of 10 years (2003-2012).

In order to achieve our goal, the paper is structured as follows: section 2 is dedicated to the specialty literature review, focusing on the studies investigating the European countries; section 3 describes the data, the selected variables and the methodology used in the assessment; section 4 reflects the main results of the empirical analysis while section 5 contains the concluding remarks.

2. Literature review

Bank profitability is one of the representative indicators used for the assessment of the banking sector health and soundness and is the main concern of the researchers and of the decision-makers, which are trying to identify and analyze the key factors influencing it.

The review of the specialty literature focused on the European countries, reflects the existence of an important number of studies which are investigating the determinants of the profitability of banks operating in the economic environment in different European countries, such as Molyneux and Thorton (1992), Mendes and Abreu (2003), Staikouras and Wood (2004), Athanasoglou et al. (2006), Iannotta et al. (2007), Pasiouras and Kosmidou (2007), Staikouras, Mamatzakis and Koutsomanoli-Filippaki (2007), Claeys and Vander Vennet (2008), Košak and Čok (2008), Havrylchyk and Jurzyk (2011), Rumler and Waschiczek (2012), Trujillo-Ponce (2013), Dumičić and Ridzak (2013), Gunter et al. (2013).

Athanasoglou et al. (2006) analyze the determinants of the profitability of certain banks in countries in South Eastern Europe over the period 1998-2002. The results of the study reflect mainly that the concentration is positively correlated with bank profitability, while the analyzed macroeconomic factors have a mixed impact.

Iannotta et al. (2007) investigate how the ownership structure can affect the profitability, the cost efficiency and risk in the banking sector in 15 European countries. The results of the empirical study highlight that the private banks are more profitable than the mutual and public sector banks. On the other hand, the banks in the public sector register loans having a weaker quality and a higher insolvency risk, while the mutual banks have a better quality of the assets.

Pasiouras and Kosmidou (2007) investigate the main determinants of the profitability of the commercial domestic and foreign banks in 15 countries of the EU. The authors find that, in the case of domestic banks, the most important factor affecting the profitability is the ratio of equity to assets. Comparatively, in the case of foreign owned banks, the most important determinant of the profitability is the cost to income ratio.

The empirical study carried out by Košak and Čok (2008) evaluates the relationship between bank ownership and bank profitability in six South-Eastern European countries over the period 1995-2004. The authors find that there are no significant differences between the profitability of the domestic and foreign owned banks.

Dumičić and Ridzak (2013) investigate the main net interest margin determinants of banks operating in 11 countries in Central and Eastern Europe over the period 1999-2010. The results of the study show that the net interest margins from the banking sectors considered in the sample have decreased over the pre-crisis years, mainly as a consequence of the significant capital entries and of the stable macroeconomic environment. Comparatively, over the crisis years, the net interest margins were significantly influenced by government debt increase, macroeconomic risks increase, credit demand decrease, higher capitalization and the significant increase of the non-performing loans.

3. Data, the variables and methodology

Our research focuses on a sample of 14 commercial banks operating in Bulgaria and 15 commercial banks operating in Romania, the analyzed period being of 10 years (2003-2012), therefore we have a total number of 290 observations.

Our sample includes only the commercial banks for which the entire range of data was available for the analyzed period. The data regarding the internal determinants were obtained from the Bureau Van Dijk database and the annual reports of the banks from our sample, and the data regarding the external determinants were supplied by the World Bank (Global Financial Development Database) and by the European Central Bank (Statistical Data Warehouse).

The dependent variable used in our study is the bank profitability, measured by means of two representative indicators, respectively the Return on Average Assets (ROAA) and the Return on Average Equity (ROAE).

The analyzed independent variables are represented by the factors which can affect the bank profitability. According to the aforementioned empirical studies, profitability determinants are divided into two main groups, namely the *internal and the external determinants*. The determinants from the first group are specific to any bank and, therefore, they are the direct result of the managerial decisions (for instance, capital adequacy, asset quality, operational efficiency, liquidity and the bank size). The second group of determinants is connected to the banking sector and to the macroeconomic, institutional and legal environment in which the banks operate. The external determinants currently analyzed in the empirical studies are represented by the concentration of the banking market, the ownership status, GDP growth, the inflation rate and the interest rates.

In our research, we use 11 variables which could affect the banking profitability, respectively the capital adequacy (*EA*), the loan loss reserve rate (*LLR*), the cost to income ratio (*CIR*), the ratio of liquid assets to total assets (*LIQA*), the interest expenses to deposits ratio (*FC*), the non-interest income over total gross revenues (*NIIR*), bank size (*LNTA*), the GDP per capita growth (*GDP*), the inflation rate (*INF*), the domestic bank credit to private sector (*DCPSB*) and banking industry concentration (*CR*). These variables were selected taking into account the criteria of representativeness and availability of data for all the banks from the sample.

According to the results of the previous empirical studies and in accordance with the economic theory, the capital adequacy (expressed through the ratio of total equity to total asset) has a mixed impact on bank profitability. A higher equity-to-asset ratio has a positive impact on profitability because the bank's financing costs are reduced. On the other hand, according to the conventional risk-return hypothesis, a lower equity-to-asset ratio leads to a higher expected return. The variable loan loss reserve rate (LLR) is used as proxy of credit risk and it is expected to have a negative impact on bank profitability, because the significant deterioration of loans quality, especially in the context of the crisis, reduces the profitability.

As for the cost to income ratio, it is expected to have a negative impact on bank profitability.

As regards the liquidity, we expect to notice a negative relationship with the profitability, in accordance with the empirical studies stating that liquid assets generate lower return.

The interest expenses to deposits ratio variable highlights the capacity of a bank to attract deposits at a low cost. Therefore, a low level of this indicator has a positive effect on bank profitability.

Regarding the income diversification of a bank, we have to highlight that within the conditions of the diversification of the activities of a bank, can be registered a growth of the non-interest income in total gross revenues. As a consequence, this variable is expected to positively affect the bank profitability.

Bank size is measured in our research through the natural logarithm of the accounting value of the total assets of bank. According to the empirical studies, a large size can

generate economies of scale and therefore increase the profitability. On the other hand, a large dimension can have a negative effect on profitability, because of the agency costs and of the bureaucracy.

For the economic activity, we use as proxy variable, the GDP per capita growth. An increase of the level of this indicator can lead to an increase in the demand of bank products and services, with a positive impact on profitability. In accordance with the empirical studies, this variable is expected to have a positive impact on bank profitability.

Another variable taken into account is the inflation rate whose effects on bank profitability depend on the extent to which the inflation is anticipated or unanticipated. According to the previous empirical studies, if the inflation is anticipated, the banks increase the interest rates and therefore bank profitability can increase. If the inflation is not anticipated, an increase of the banking costs may appear, determining a decrease in profitability.

Domestic bank credit to private sector measures the importance of bank financing in the economy. A high level of this indicator can lead to an increase of the credit risk, having a negative impact on bank profitability. On the other hand, within the conditions in which bank loans are granted for viable projects, can be registered an increase of profitability (Mirzaei et al., 2013).

Banking industry concentration is expressed in our research through the weight of the assets of the five largest banks in the total assets of the commercial banks. According to the empirical studies, the relationship between this variable and bank profitability is not clear.

In order to assess the determinants of bank profitability, our study is based on the following model:

$$Dv_t = c + \sum_{i=1}^{N} \alpha_i \, BSV_{it} + \sum_{j=1}^{M} \beta_j MV_{jt} + d + \mu_i$$

where:

Dvt – Dependent variable, represented by banking profitability; BSV – Bank specific variables; MV – Macroeconomic variables; IS - Industry-specific variables;

i, j, k – counters by categories in independent variables; t – Time period (2003-2012); N, M – numbers of independent variables; α, β – Coefficients (estimated parameters); c- constant; ui – Idiosyncratic errors.

4. Empirical Results and Discussions

The descriptive statistics of the variables included in our study is presented in table 1. We can see averages, standard deviations, the minimal and maximal values of dependant and independent variables.

Table 1: Descriptive statistics of the variables used in our analysis

Variables	Obs.	Mean	Std. dev.	Min	Max
ROAA	290	1.07	1.57	-10.94	4.405
ROAE	290	8.85	20.51	-256.54	43.60
EA	290	12.19	7.23	4.22	68.93
LLR	290	4.72	4.89	0.16	34.99
CIR	290	65.26	21.32	14.35	157.48
LIQA	290	29.78	17.71	1.92	109.32
FC	290	5.38	5.01	0.82	40.00
NIIR	290	33.07	13.78	-4.00	70.81
LNTA	290	8.12	1.42	4.28	11.25
GDP	290	4.37	4.51	-6.02	9.75
INF	290	6.55	3.45	2.16	15.27

DCPSB	290	43.43	19.66	13.74	75.39
CR	290	54.82	2.97	50.34	60.10
dummy	290	0.517	0.501	0	1

Source: authors' calculations

The correlation matrix between independent variables can be seen from figure 1. The coefficients are low which suggests no multicollinearity problems.

Panel Data Multiple Linear Regression Model Results
In panel data models, panel id variable is Bank, and time variable is Year. The results of fixed effects (within) regression, naive and robust (coefficient test in table), and random effects (default standard errors and robust – in table robust is shown at coefficient test) are shown in table 2.
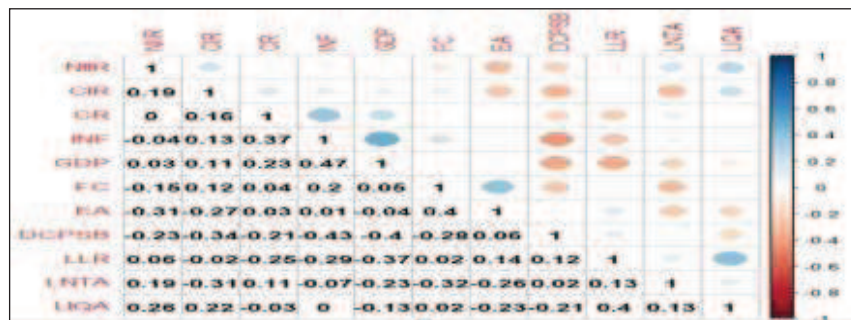

Figure 1: Correlation matrix
Source: authors' calculations

Our empirical results highlight the key factors affecting the profitability of the commercial banks in Bulgaria and Romania. Therefore, the loan loss reserves rate has a major impact on the profitability. The coefficients are statistically significant and reflect a negative relationship, in accordance with our expectations and consistent with the results of certain empirical studies (Košak and Čok, 2008; Dumičić and Ridzak, 2013; Trujillo-Ponce, 2013; Ayaydin and Karaaslan, 2014; Dietrich and Wanzenried, 2014). According to our estimates, the increase of the loan loss reserves rate by 1% would determine the reduction of the Return on Average Assets by 0.109% (fixed effects model) and by 0.114% (random effects model). As for the Return on Average Equity (ROAE), the decrease is by 1.659% (fixed effects model) and by -2.029% (random effects model). These results can be explained by the fact that within the current global crisis, the banks from the two countries have registered an important (even alarming) increase of the nonperforming loans, which has determined the creation of reserves in order to cover the losses from loans, with a negative impact on bank profitability, mainly in Romania. On the other hand, as a consequence of the significant reduction of the supply and demand for loans, loan loss reserve rate has known an important increase, mainly in the Romanian banking sector, which restricted significantly bank lending.

For the entire sample, the coefficients of the ratio of cost to income (CIR) are negative and indicate a major impact on profitability (ROAA), in line with our expectations, but also consistent with the results obtained by Pasiouras and Kosmidou (2007), Košak and Čok (2008), Trujillo-Ponce (2013), Dietrich and Wanzenried (2014). Our estimates show that a 1% increase in the ratio of cost to income would lead to the reduction of the Return on Average Assets by 0.039% (fixed effects model) and by 0.040% (random effects model). We notice, mainly in the case of the Romanian banks, a significantly higher level of the

cost to income ratio, in the context of the crisis, as a consequence of the rapid growth of the provisions expenses and the diminution of bank operational income.

Another main determinant identified by our empirical analysis is GDP per capita growth. The coefficient is positive and it has an important statistical significance, in line with our expectations and consistent with the results obtained by Mendes and Abreu (2003), Athanasoglou et al. (2006), Košak and Čok (2008), Rumler and Waschiczek (2012), Trujillo-Ponce (2013), Dietrich and Wanzenried (2014). Our results can be explained through the fact that an increase in the level of the indicator improves the solvability of the borrowers and increases the demand of bank products and services, with a positive impact on bank profitability.

The profitability of the banks included in our study has also been influenced by the domestic bank credit to private sector. The coefficients of the variable are statistically significant and negative, in line with our expectations and consistent with the results of Ayaydin and Karaaslan (2014). These effects can be explained through the fact that in the years before the crisis Romania and Bulgaria have recorded a significant and rapid (even unsustainable) increase of bank loan ratio and, implicitly, an important growth of the credit risk, with a negative impact upon bank profitability.

Based on dummy variable, Bulgaria performed better, since the dummy has a negative sign.

Table 2: Empirical results

	Dependent variable											
	ROAA fix			ROAA random			ROAE fix			ROAE random		
	BG	RO	both	BG	RO	both	BG	RO	both	BG	RO	both
EA	0.020 (0.022)	0.088 (0.069)	0.033 (0.043)	0.019 (0.013)	0.101 (0.075)	0.027 (0.032)	-0.328 (0.225)	1.502 (1.020)	0.482 (0.664)	-0.377* (0.195)	1.662 (1.09)	0.247 (0.544)
LLR	-0.180*** (0.047)	-0.100*** (0.033)	-0.109*** (0.024)	-0.134*** (0.043)	-0.115*** (0.029)	-0.114*** (0.021)	-1.446*** (0.385)	-1.881*** (0.700)	-1.659*** (0.568)	-1.160*** (0.325)	-2.532** (0.80)	-2.029*** (0.798)
CIR	-0.033*** (0.010)	-0.045*** (0.014)	-0.039** (0.011)	-0.033*** (0.007)	-0.046*** (0.014)	-0.040*** (0.011)	-0.366*** (0.116)	-0.207 (0.260)	-0.193 (0.192)	-0.358*** (0.096)	-0.258 (0.20)	0.247 (0.544)
LIQA	-0.004 (0.010)	-0.001 (0.010)	0.0004 (0.007)	-0.003 (0.008)	0.004 (0.009)	0.003 (0.005)	-0.069 (0.086)	0.114 (0.163)	0.013 (0.096)	-0.032 (0.068)	0.196 (0.15)	0.081 (0.101)
FC	0.033** (0.013)	-0.078 (0.128)	0.015 (0.030)	0.032*** (0.010)	-0.089 (0.107)	0.006 (0.032)	-0.046 (0.162)	-0.113 (0.996)	0.180 (0.214)	-0.072 (0.092)	-0.384 (0.107)	-0.061 (0.198)
NIIR	0.003 (0.005)	-0.017 (0.027)	-0.011 (0.017)	0.002 (0.004)	-0.007 (0.017)	-0.001 (0.012)	-0.016 (0.092)	-0.438 (0.553)	-0.310 (0.377)	-0.024 (0.092)	-0.112 (0.017)	-0.091 (0.222)
LNTA	0.047 (0.376)	0.026 (0.377)	0.001 (0.310)	0.175 (0.141)	0.095 (0.254)	0.143 (0.161)	-0.644 (3.964)	10.674 (7.859)	6.185 (5.282)	-0.229 (1.754)	5.839 (0.254)	4.259 (3.437)

	GDP	INF	DCPSB	CR	dummy	C
	0.040 (0.029)	0.017 (0.038)	-0.017 (0.013)	0.011 (0.043)		
	0.063* (0.034)	-0.022 (0.087)	-0.008 (0.030)	0.057 (0.071)		
	0.075*** (0.020)	-0.036 (0.036)	-0.016 (0.013)	0.032 (0.023)		0.015 (0.026)
	0.034 (0.032)	0.030 (0.039)	-0.027*** (0.004)	0.037 (0.036)		0.014 (0.071)
	0.063* (0.033)	-0.027 (0.091)	-0.017 (0.035)	0.042 (0.089)	-0.009** (0.005)	0.017 (0.023)
	0.066*** (0.013)	-0.020 (0.028)	-0.023*** (0.006)	0.042* (0.023)		
	0.246 (0.244)	0.422 (0.281)	-0.166 (0.142)	0.105 (0.376)		
	1.020** (0.404)	-1.135 (1.063)	-0.726 (0.459)	-0.464 (0.584)		
	0.848*** (0.338)	-0.359 (0.540)	-0.323 (0.199)	0.253 (0.260)		
	0.187 (0.256)	0.504* (0.293)	-0.211*** (0.075)	0.264 (0.294)		0.411 (0.305)
	0.812** (0.033)	-1.318 (1.04)	-0.481 (0.035)	-0.486 (0.089)		0.152 (0.071)
	0.701*** (0.208)	-0.261 (0.394)	-0.235** (0.100)	0.209 (0.206)	-0.133* (0.076)	0.004 (0.331)

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
Source: authors' calculations using Stata

The results of the statistical tests
The results that we have obtained are consistent, being confirmed by the statistical test outcome. The variance inflation factor (vif) results suggest that coefficients indicate no problem. The results are presented in table 3.

Table 3: Variance Inflation Factor

EA	LLR	CIR	LIQA	FC	NIIR
1.789901	1.709169	2.051965	1.517445	1.606327	1.271805
LNTA	GDP	INF	DCPSB	CR	dummy
3.374271	1.839707	1.682070	3.814506	1.548857	6.327617

Source: authors' calculations

The poolability test results shows that we should accept the presence of individual effects (both ROAA and ROAE), so panel data estimation is better than pooled OLS model. Hausman Test suggests what model is more appropriate, but we choose to estimate both models (fixed and random), based on Baltagi's suggestion to also use the information criteria in order to choose between FE and RE models (Baltagi, 2008). The Breusch-Pagan BP test confirms the presence of heteroskedasticity. For all tests the results are presented in table 4.

Table 4: The results of the statistical tests

Test		p value results	
		ROAA	ROAE
F test for individual effects	BG	p-value = 1.734e-05	p-value = 0.002135
	RO	p-value = 0.074	p-value = 0.074
	Overall	p-value = 0.0004947	p-value = 0.0006601

Lagrange Multiplier Test - (Breusch-Pagan)	BG	p-value = 0.002135	p-value = 4.669e-05
	RO	p-value < 2.2e-16	p-value < 2.2e-16
	Overal	p-value = 0.003967	p-value = 0.02779
Hausman Test	BG	p-value = 0.0127	p-value = 0.844
	RO	p-value = 0.241	p-value = 0.241
	Overal	p-value = 0.6221	p-value = 0.006294

Source: authors' calculations

5. Conclusion

Our study aimed to identify and analyze the main factors which affect the profitability of the commercial banks operating in Bulgaria and Romania.

Our research shows that bank profitability is influenced both by internal factors (bank-specific) and by external factors. Therefore, among the internal factors included in our analysis, our empirical results highlight that the profitability of the analyzed banks has been significantly affected by the loan loss reserves rate and by the ratio of cost to income. As regards the external factors, our study finds out that GDP per capita growth and the domestic bank credit to private sector had a significant impact on the profitability of the analyzed banks.

The identification of the factors affecting bank profitability has a significant importance (Chmielewski and Krześniak, 2004) because bank profits constitute one of their capital sources and allow the growth of the capital safety buffer, which can be used for the absorption of the eventual losses which would appear within the conditions of the manifestation of certain unforeseen chokes. Moreover, the profitability level influences banks competitiveness, with a main impact on their credibility.

The monitoring of bank profitability level, of its evolution, but also of the influence factors presents a main interest both for bank managers and for the monetary authorities, for the purpose of identifying measures which can allow the amelioration and the consolidation of banks health, stability and performance.

Taking into consideration the importance of this topic, we consider it appropriate as a future research direction the extension of our analysis through an empirical investigation of the impact of other internal and external factors on the profitability of banks in the 28 member states of the EU.

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