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Drivers of bank profitability: Case of Latvia and Lithuania

Jelena Titko[a], Viktorija Skvarciany[b,*], Daiva Jurevičienė[b]

[a] *The University College of Economics and Culture, Latvia*
[b] *Mykolas Romeris University, Lithuania*

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Abstract

The issues regarding measuring and managing bank performance are always on the agenda due to the critically important role of banks in the national economies of new member states of the European Union. The goal of the given study is to explore drivers of bank profitability in Latvia and Lithuania. Research period covers 2008–2014. Performance of the banking sector is proxied by profitability ratios. The set of explanatory factors involves financial and non-financial measures. The core research method is a multiple regression analysis. Data processing is performed in SPSS environment. The paper contributes to the scope of knowledge regarding bank performance drivers and the research results provide the basis for the future studies in the related field.

JEL classification: G21; G32; C2

Keywords: Bank profitability; Regression analysis; Latvia; Lithuania.

1. Introduction

The issues regarding bank performance and its drivers have been a frequently chosen topic for discussion among academicians and business professionals. Besides, the importance of these issues is always emphasized by governmental authorities due to the large contribution of banks into the national economic growth.

Recent global financial crisis revealed the fact that Baltic banking sector is exposed to earnings risk more than the banking sector of other European countries. In 2009, ROE in the banking sector of Latvia and Lithuania was –44% and –56%, respectively (ECB, 2009a). In turn, average ROE in EU27 was only –2.83. Thus, issues regarding reasonable management of bank performance are still prioritized.

Exploring the drivers of bank performance, some authors put the emphasis on the macroeconomic variables (Gerlach, Peng, & Shu, 2005; Jurevičienė & Doftartaitė, 2013; Titko, Kozlovskis, & Kaliyeva, 2015), but the

* Corresponding author.
E-mail address: viktorija.skvarciany@mruni.eu (V. Skvarciany).

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most of papers explore both external (macroeconomic and industry-specific) and internal (bank-specific) factors affecting bank performance (Gul, Irshad, & Zaman, 2011; Titko & Dauylbaev, 2015).

Despite the huge amount of scientific literature dedicated to investigation of bank performance determinants, the number of papers analyzing Baltic banking sector is limited. Besides, the results in most of the papers are obsolete (Aarma, Vainu, & Vensel, 2004; Bonin, Hasan, & Wachtel, 2005; Grigorian & Manole, 2002; Košak, Zajc, & Zorić, 2009).

The goal of the current paper is to explore the factors affecting bank performance in the Latvian and Lithuanian banking sector. The authors analyze the driving force of industry-specific (sector-level) factors.

Based on the literature analysis on main drivers of bank performance, the following hypotheses are stated by the authors:

H1: There is a significant positive relationship between bank size and bank profitability
H2: Bank profitability is negatively affected by operational efficiency
H3: Developed infrastructure and e-banking services positively influence bank profitability

Performance of the banking sector is proxied by profitability ratios: return on assets (ROA), return on equity (ROE), net fees and commission income as a percentage of total assets (NFCITA) and net interest margin (NIM). Profitability affecting sector-level are represented by a set of financial and nonfinancial ratios.

Research period covers 2008–2014. The statistics used for research purposes is provided by the European Central Bank (ECB), the Association of Commercial Banks of Latvia (ACBL), The Financial and Capital Market Commission (FCMC), Bank of Lithuania, and the Association of Lithuanian Banks (ALB).

Data processing is performed, using the correlation analysis and the multifactor regression analysis in the SPSS 20.0 environment.

The current research contributes to the scientific literature in the field of bank performance management in the Baltic countries. The results of the study revealed a problem of inconsistency between statistical data provided by different information sources. It is also obvious that availability and quality of bank statistics in Lithuania should be improved.

2. Bank performance and its drivers

Bank performance can be expressed "in terms of competition, concentration, efficiency, productivity and profitability" (Bikker & Bos 2008). The multidimensional nature of the concept of bank performance explains the existence of a wide range of its measures.

The most frequently used measures of bank profitability are return on assets (ROA), return on equity (ROE) ratio and net interest margin (NIM) (Bikker, 2010; Kosmidou & Zopounidis, 2008; Tomuleasa & Cocrish, 2014; Ameur & Sonia Moussa Mhiri, 2013; Ongore & Kusa, 2013; Hasan, Schmiedel, & Song, 2012; Kumbirai & Webb, 2010).

Despite ROE is still the primary performance measure for the most investors and analysts, sometimes ROA provides a better understanding of a company performance (Hagel, Brown, & Davison, 2010). Based on the viewpoint of experts from the European Central Bank, a good level of ROE may either reflect a good level of profitability or more limited equity capital" (ECB, 2009).

Besides, some experts consider that a single-ratio cannot be a good proxy for bank performance due to the "complex operational environment of banks" (Yang, 2009).

In the given research the authors investigate bank profitability that, in turn, determines the scope of the study and the measures used.

Contribution of various factors to bank profitability is a frequently debated topic among academicians and practitioners. Scientific papers dedicated to the investigation of the factors affecting bank profitability can be combined into several main groups according to the analyzed issue.

Analysts study the impact of GDP growth and inflation on bank profitability (Athanasoglou, Brissimis, & Delis, 2008; Pasiouras & Kosmidou, 2007; Rachdi, 2013).

A wide range of papers explore the relationship between market structure, competition level, bank efficiency and profitability in the banking industry (Bikker & Bos, 2008; Guillén, Rengifo, & Ozsoz, 2014; Tabak, Fazio, & Cajueiro, 2011). The theoretical basis for these studies is the Structure-Conduct-Performance (SCP) hypothesis that

assumes the direct positive link between market concentration and profitability and negative correlation between concentration and competition (Bain, 1956).

Post-crisis literature emphasizes the importance of the quality of loan portfolio and credit risk management on bank profitability (Dietrich & Wanzenried, 2011; Vazquez, Tabak, & Souto, 2012).

Many researchers focus their attention on electronic banking services as a driver of bank profitability (Abaenewe, Ogbulu, & Ndugbu, 2013; Ahmed, Rezaul, & Rahman, 2010; Akhisar, Tunay, & Tunay, 2015). Electronic banking or online banking refers to the several types of services through which a bank's customers can request information and carry out most of their banking transaction using computers or mobile phones (Nasri, 2011). Regarding the contribution of electronic banking usage to bank profitability, the most frequently studied e-banking services are (1) payment cards (Al-Qudah, Al-Hawary, & Al-Mehsen, 2012; Ngari & Muiruri, 2014) (2) automatic teller machines (ATMs) and point-of-sale (POS) terminals (Floros & Giordani, 2008; Jegede, 2014; Ogbuji, Onuoha, & Izogo, 2012), and internet-banking services (Callaway, 2011; Malhotra & Singh, 2009).

The authors in the current study made a focus on investigation of the relationship between bank profitability and bank size, liquidity, operational efficiency, as well as on studying of e-banking contribution to bank performance.

The empirical evidence supports both positive (Alper & Anbar, 2011; Flamini, Schumacher, & McDonald, 2009; Muda, Shaharuddin, & Embaya, 2013) and negative (Rachdi, 2013) relationship between size and profitability in the banking sector. Controversial results were obtained in studying relationship between liquidity and bank performance (Liu & Wilson, 2010; Rachdi, 2013). A number of studies confirmed the hypothesis about the negative relationship between bank profitability and operational efficiency expressed by cost-to-income ratio (Ali, Akhtar, & Ahmed, 2011; Rachdi, 2013; Trujillo-Ponce, 2013).

As for e-banking services, it was proved that a greater use of electronic payment instruments can improve bank performance. Based on the country-level retail payment service data from across 27 EU markets, evidence confirms that banks perform better in countries with more developed retail payment services. This relationship is stronger in countries with more retail payment transaction equipment, like automatic teller machines (ATMs) and point-of-sale (POS) terminals (Sumra et al., 2011).

3. Methodology

3.1. Research environment

The role of banks in the Latvian and Lithuanian banking sector is still more important than the role of other financial sector players, such as insurance companies, pension funds and others. According to the Latvian statistics provided by FCMC (FCMC, 2015), as for the 3rd quarter of 2015 the volume of total bank assets was equal to 31.5 billion. In turn, the volumes of total assets of private pension funds, insurance companies and credit unions were only 304 million, 636 million and 24 million, respectively.

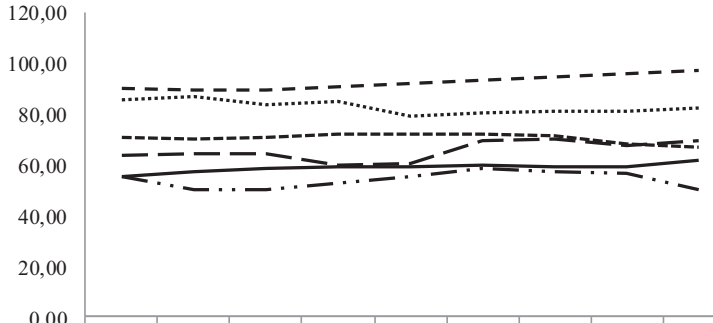
As of 2014, seventeen local banks and ten financial service providers from the European Economic Area operated in Latvia (ACBL, 2015). In turn, Lithuanian banking sector is represented by seven local banks and nine foreign banks (Bank of Lithuania, 2015).

Banking business in Latvia and Lithuania is concentrated in a few major banks. Statistics on concentration in the banking sector of Latvia and Lithuania, compared with other new member states of the European Union, is summarized in Fig. 1 (ECB, 2015a). Concentration is represented by CR5 ratio (market share of five largest banks).

The banking sector in the Baltic countries is a very concentrated one, especially in Lithuania and Estonia. To compare with EU15 countries, CR5 value in 2014 is equal to 32 per cent in Germany and 47 per cent in France (ECB, 2015a).

The largest banks in both countries in terms of assets are Swedbank, SEB bank and DNB bank (ACBL, 2015; Economy and Banking Sector of Lithuania, 2015). Due to the fact that the Latvian banking sector is represented by the larger number of financial institutions, there are some local banks among the major players: ABLV bank, Rietumu banka and Citadele banka.

Banking sector in Latvia and Lithuania is strongly dominated by foreign investors. Shareholders of the largest Latvian and Lithuanian banks – Swedbank and SEB banka – are Swedish Swedbank and Skandinaviska Enskilda Banken, respectively.



	2006	2007	2008	2009	2010	2011	2012	2013	2014
Bulgaria	55,03	49,85	50,38	52,58	55,17	58,29	57,31	56,69	50,34
Estonia	89,85	89,71	89,60	90,64	92,26	93,43	94,75	95,75	97,11
Lithuania	85,70	87,10	83,63	84,75	78,83	80,48	81,25	80,91	82,49
Latvia	63,60	64,13	64,05	59,57	60,43	69,35	70,24	67,24	69,17
Slovenia	55,61	57,08	58,35	59,33	59,27	59,65	59,14	59,48	61,99
Sovakia	70,69	70,32	70,72	72,23	72,03	72,09	71,55	68,15	66,85

Fig. 1. Concentration in the banking sector of new member states of the European Union, 2006–2014.

Most of the banks in Latvia and Lithuania are engaged in the traditional banking business, i.e., operate mostly as intermediaries between depositors and borrowers. Key funding source for banks remains to be customer deposits – 81% and 68% of total liabilities as of 2014 in Latvia and Lithuania, respectively (ECB, 2015b).

Despite the large negative effect of the global financial crisis on the banking sector performance in Baltics, since 2011 ROE ratio has had a positive value in both countries (ECB, 2015b). However, the fact that the banking sector in Latvia and Lithuania was affected by global financial crisis dramatically, especially comparing with other European countries, confirms the necessity to focus more attention to performance management in Baltic banks.

3.2. Data and methods

To achieve the research objectives, sector-level financial and non-financial indices are analyzed. Research period covers 2008–2014. Data are extracted from the statistical data warehouse of the European Central Bank (ECB), Financial and Capital Market Commission of Latvia (FCMC), Bank of Lithuania, the Association of Latvian Commercial Banks (ALCB) and the Association of Lithuanian Banks.

To measure the profitability in the banking sector, four variables are used: (1) return to assets ratio (ROA), (2) return to equity ratio (ROE), (3) net fees and commission income as a percentage of total assets (NFCITA), and (4) net interest margin (NIM).

The authors use a multiple linear regression analysis as a core method. A functional relationship between profitability of the banking sector and industry-specific measures takes the following form:

$$P_t = f\left(Size_t,\ Liquidity_t,\ Efficiency_t,\ LoanQual_t,\ Infrastructure_t\right) \tag{1}$$

where

P_t is a sector-level profitability at the time t;
$Size_t$ is a set of indices representing the size of a banking sector at the time t;
$Liquidity_t$ is a set of sector-level liquidity measures at the time t;
$Efficiency_t$ is a set of sector-level operational efficiency measures at the time t;
$LoanQual_i$ is a set of sector-level loan portfolio quality measures at the time t;
$Infrastructure_t$ is a set of sector-level e-banking related and infrastructure measures at the time t.

Selected industry-specific explanatory variables are expressed by the ratios summarized in Table 1. The last column of Table 1 provides information about the expected signs of regression coefficients.

Table 1
Industry-specific explanatory variables (*Source*: author's compilation).

Group of variables	Measures	Label	Expected sign
Size	Total assets (natural logarithm)	lnTA	+
	Total loans (natural logarithm)	lnTL	+
	Total deposits (natural logarithm)	lnTD	+
	Number of private customers	NoPC	+
	Number of legal customers	NoLC	+
Liquidity	Demand deposits to total deposits	DDTD	+
	Loans to total deposits	LTD	+
Operational efficiency	Cost to income ratio	CIR	–
Loan portfolio quality	Provisions to total assets	PTA	–
E-banking and Infrastructure	Number of payment cards	PC	+
	Number of ATMs	ATM	+
	Number of POS terminals	POS	+
	Number of internet-bank users	Ibank	+
	Number of branches	NoB	+

A regression analysis is based on the set of assumptions. The authors check the relationship between dependent variable (Y) and explanatory variables (X), using the correlation analysis. The decision about the existence/ non-existence of the relationship is made, based on the value of the Pearson correlation coefficient. An acceptable level for statistical significance (Sig.) of the coefficient is 0.05 level. Multicollinearity problem (correlation between independent variables) is detected, based on VIF (variance of inflation) value. The critical value for VIF is determined equal to 5, following Jansons and Kozlovskis (2012). VIF > 5 indicates a multicollinearity problem. Durbin–Watson test is applied to check the correlation between error terms.

Stepwise regression method is applied. It means that non-important variables are removed from the list and the variables left explain the distribution best. The decision about the appropriateness of a model is made, based on the significance of the regression coefficients.

4. Results

The results of the correlation analysis to test the relationship between dependent variables and explanatory variables are summarized in Table 2.

Statistics on the number of customers is limited for the period 2012–2014. Thus, these variables are not included into the data set used for the correlation analysis.

The correlation analysis yielded potential explanatory variables that could be used for regression models. Dependent variables with no potential predictors are net interest margin (NIM) for Latvian sample data and net commission and fees income as a percentage of total assets (NFCITA) for Lithuanian sample data. There is no statistically significant relationship between these variables and explanatory factors.

Applying stepwise regression method for Latvian sample data, six regression models are created (Tables 3 and 4).

For Model 2 and Model 4 Durbin–Watson test is inconclusive due to the fact that DW value is in the range between its lower ($DW_L = 0.700$) and upper ($DW_U = 1.356$) critical values. There is no autocorrelation detected for remaining models.

Applying stepwise regression method for Lithuanian sample data, seven regression models are created. Model summary and coefficients' statistics are presented in Tables 5 and 6.

For Model 2 and Model 5 Durbin–Watson test is inconclusive due to the fact that DW value is in the range between its lower and upper critical values. There is no autocorrelation detected for remaining models.

Obviously, the volume of provisions affects the value of profitability expressed by return-on-assets or return-on-equity ratio. ITA (impairments as a percentage of total assets) variable is a main predictor of ROA and ROE for both data samples. In turn, to predict commission and fees income, it is logically to use variables related to retail banking services, payment services and electronic banking. Regression analysis based on the Latvian sample

Table 2
The results of the correlation analysis (*source*: author's calculations).

	Latvia				Lithuania			
	ROA	ROE	NFCITA	NIM	ROA	ROE	NFCITA	NIM
lnTA	0.025	0.053	–0.193	0.586	–0.435	–0.368	–0.331	0.698
	0.958	0.909	0.679	0.167	0.330	0.417	0.468	0.081
lnTL	0.024	0.053	–0.193	0.585	–0.432	–0.358	–0.274	0.702
	0.960	0.911	0.679	0.168	0.334	0.431	0.552	0.079
lnTD	0.376	0.347	0.804*	–0.689	0.937**	0.944**	0.693	0.089
	0.406	0.446	0.029	0.087	0.002	0.001	0.085	0.849
NoPC	n/a	n/a	n/a	n/a	–0.707	–0.737	–0.596	–0.279
	n/a	n/a	n/a	n/a	0.076	0.059	0.157	0.545
NoLC	n/a	n/a	n/a	n/a	0.569	0.527	0.536	–0.194
	n/a	n/a	n/a	n/a	0.182	0.224	0.215	0.677
DDTD	0.746	0.744	0.884**	0.039	–0.952**	–0.969**	–0.701	–0.218
	0.054	0.055	0.008	0.935	0.001	0.000	0.079	0.638
LTD	–0.302	–0.270	–0.742	0.747	–0.958**	–0.968**	–0.707	–0.148
	0.511	0.559	0.056	0.054	0.001	0.000	0.076	0.752
CIR	0.310	0.323	0.461	0.618	0.020	0.050	–0.154	0.839*
	0.498	0.479	0.297	0.139	0.967	0.915	0.741	0.018
PTA	0.963**	0.959**	0.691	–0.036	0.997**	0.988**	0.589	0.173
	0.000	0.001	0.086	0.939	0.000	0.000	0.164	0.711
PCards	–0.576	–0.555	–.807*	0.555	–0.669	–0.599	–0.273	0.281
	0.176	0.196	0.028	0.196	0.100	0.155	0.553	0.542
ATM	–0.693	–0.694	–.851*	–0.056	–0.707	–0.642	–0.308	0.058
	0.084	0.084	0.015	0.905	0.076	0.120	0.501	0.902
POS	0.566	0.551	0.912**	–0.290	0.176	0.134	0.345	–0.233
	0.185	0.200	0.004	0.528	0.706	0.775	0.449	0.615
Ibank	0.181	0.156	0.267	–0.268	0.443	0.381	0.347	–0.741
	0.698	0.739	0.563	0.562	0.319	0.399	0.445	0.057
NoB	–0.610	–0.588	–0.941**	0.419	–0.590	–0.513	–0.250	0.428
	0.146	0.165	0.002	0.350	0.163	0.239	0.589	0.338

Values of the coefficient marked with "*" are statistically significant at the 0.05 level, and those which marked with "**" are statistically significant at the 0.01 level.

Table 3
Models based on Latvian data: summary and ANOVA (*source*: authors' compilation).

Model	Dependent variable	Predictors	R^2	Adj. R^2	F Sig.	DW
Model 1	ROA	PTA	0.817	0.786	0.002	0.435
Model 2	ROA	PTA, const	0.928	0.913	0.000	1.096
Model 3	ROE	PTA	0.834	0.807	0.002	0.546
Model 4	ROE	PTA, const	0.920	0.903	0.001	1.101
Model 5	NFCITA	POS	0.992	0.991	0.000	0.804
Model 6	NFCITA	NoB, const	0.885	0.862	0.002	2.374

Table 4
Models based on Latvian sample data: coefficients' statistics (*source*: authors' compilation).

Model	Dependent variable	Predictors	Unstandartized coefficients B	Sig.	VIF
Model 1	ROA	ITA	0.866	0.002	1.000
Model 2	ROA	Const	0.693	0.035	
		ITA	1.073	0.000	1.000
Model 3	ROE	ITA	9.730	0.002	1.000
Model 4	ROE	Const	6.856	0.059	
		ITA	11.783	0.000	1.000
Model 5	NFCITA	POS	3.493E-005	0.000	1.000
Model 6	NFCITA	Const	1.478	0.000	
		NoB	–0.001	0.002	1.000

Table 5
Models based on Lithuanian data: summary and ANOVA (*Source*: authors' compilation).

Model	Dependent variable	Predictors	R^2	Adj. R^2	F Sig.	DW
Model 1	ROA	PTA	0.692	0.641	0.010	0.530
Model 2	ROA	PTA, const	0.994	0.993	0.000	1.157
Model 3	ROA	PTA, lnTD	0.994	0.991	0.000	1.250
Model 4	ROE	PTA	0.789	0.754	0.003	0.856
Model 5	ROE	PTA, const	0.976	0.971	0.000	1.251
Model 6	ROE	PTA, lnTD	0.947	0.967	0.000	1.190
Model 7	NIM	CIR	0.960	0.953	0.000	1.282

Table 6
Models based on Lithuanian sample data: coefficients' statistics (*Source*: authors' compilation).

Model	Dependent variable	Predictors	Unstandartized coefficients B	Sig.	VIF
Model 1	ROA	ITA	0.642	0.010	1.000
Model 2	ROA	Const	1.095	0.000	
		ITA	0.877	0.000	1.000
Model 3	ROA	ITA	0.847	0.000	1.236
		lnTD	0.066	0.000	1.236
Model 4	ROE	ITA	9.077	0.003	1.000
Model 5	ROE	Const	11.408	0.002	
		ITA	11.533	0.000	1.000
Model 6	ROE	ITA	11.225	0.000	1.236
		lnTD	0.691	0.001	1.236
Model 7	NIM	CIR	–0.031	0.000	1.000

Table 7
Application of the regression models for predicting performance of the Latvian banking sector (*Source*: authors' compilation).

Model	Variables	Real value of the dependent variable	Predicted value of the dependent variable
Model 1	Dependent variable: ROA Predictors: ITA	1.41	–0.032
Model 2	Dependent variable: ROA Predictors: ITA, const	1.41	0.65
Model 3	Dependent variable: ROE Predictors: ITA	13.30	–0.365
Model 4	Dependent variable: ROE Predictors: ITA, const	13.30	0.408
Model 5	Dependent variable: NFCITA Predictors: POS	0.77	1.181
Model 6	Dependent variable: NFCITA Predictors: NoB, const	0.77	1.2

data yielded two models with NFCITA as a dependent variable. Explanatory variables in these models are the number of POS terminals and the size of branch network.

However, despite the statistical significance of the models, their prediction power is rather limited. To test the reliability of the forecast, it is possible to use recent data as of September 2015. For the Latvian banking sector it is possible to test Model 1–4, using the data as of II quarter 2015 and Model 5–6, using the data as of III quarter, 2015 (ACBL, 2015; ECB, 2015b; FCMC, 2015). The real and predicted values of dependent variables are summarized in Table 7.

The quality of the performed forecast is doubtful, especially in the case of Model 1 and Model 3 (models with no intercept). However, the research results allow making some conclusions about the factors affecting performance of the banking sector of Latvia and Lithuania.

5. Conclusions

The current paper continues the series of studies devoted to the issues regarding performance management and performance drivers in the banking sector of the Baltic States.

The results of the authors' stated hypotheses are the following:

H1: There is a significant positive relationship between bank size and bank profitability.

Based on the results of the correlation analysis using Lithuanian sample data, there is a statistically significant positive relationship between bank profitability expressed by ROE and bank size expressed by the volume of deposits. Correlation analysis provided no evidence for Latvian banking sector. Regression analysis did not provide any statistical support for confirmation/rejection of H1 for Latvia, nor for Lithuania.

H2: Bank profitability is negatively affected by operational efficiency

H2 was not confirmed, neither rejected, using Latvian sample data. As for Lithuania, the results are controversial. Correlation allowed rejecting H2, confirming a statistically significant positive relationship between cost-to-income ratio and bank profitability, expressed by NIM. In turn, regression analysis provided support for H2.

H3: Developed infrastructure and e-banking services positively influence bank profitability.

There are no results for H3 testing, using Lithuanian sample data. Correlation analysis based on Latvian data provided evidence of the negative relationship between e-banking ratios and NFCITA ratio. Thus, H3 is rejected. Regression analysis revealed a negative relationship between NFCITA and number of branches.

The current study was limited with the volume of available data on Lithuanian banking sector. Longer period for analysis probably could significantly influence the results. The authors came to the conclusion that the analysis of factors affecting bank performance should be done at the bank-level, especially in cases when the banking sector is represented by a small number of participants. Analysis of aggregated data makes sense when the number of analyzed countries is sufficiently large - for instance, banking sector of all EU countries is analyzed.

The current research also revealed a problem with data inconsistency between the data provided by the local authorities and the European Central Bank. In some cases, the difference can substantially affect the results of the analysis.

The authors' intention is to continue the study in the future, analyzing bank-level data and focusing primarily on retail banking services and electronic banking.

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