Comparative Economic Research. Central and Eastern Europe
Volume 28, Number 2, 2025
https://doi.org/10.18778/1508-2008.28.17

The Impact of Banking Sector Performance on Economic Growth: A Case Study of Selected Countries of Central and Eastern Europe

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Abstract

This study explores the complex relationship between banking sector performance and economic growth in Central and Eastern European (CEE) countries. Given the banking sector's prominent role within the CEE financial system, our research examines its potential as a driver of economic growth using a fixed-effects panel regression model, focusing on four key variables: non-performing loans, total capital ratio, return on assets, and the ratio of bank assets to GDP. Granger causality tests further assess the directional nature of this relationship. Contrary to prevailing assumptions, the findings reveal no significant direct impact of banking sector performance on economic growth across the CEE region. Instead, the results of the Granger causality indicate that economic growth significantly bolsters the banking sector's development, suggesting an inverse causality. These results offer valuable insights for policymakers, indicating that efforts to stimulate banking sector growth may benefit from prioritising economic development. The study contributes to a nuanced understanding of the CEE context, emphasizing the unique interplay between economic growth and banking sector development in post-transition economies.

Keywords: banking dector, economic growth, fixed effects panel regression, Granger causality, financial geography, CEE countries

JEL: C58, E60, G21, O11, O16

Received: 22.05.2024. Verified: 8.11.2024. Accepted: 17.03.2025

Introduction

Background

Economic growth is one of the crucial areas of research (Berg 2016). It is considered through the prism of many factors, such as access to resources, the quality of institutions, the level of infrastructure development, the quality of education, the number and demographic structure of the population, political stability and many others (Kuciński 2015). Nowadays, financial capital plays an increasingly important role in studying the rate of economic growth and development. Consequently, within examining economic expansion, there is increasing recognition of the importance of incorporating variables related to the financial aspects – such as direct foreign investment (FDI) inflows (Alfaro et al. 2010; Azman-Saini, Law, and Ahmad 2010; Almfraji and Almsafir 2014) and the development of financial markets (especially including capital markets and the banking sector) – into empirical studies (Odedokun 1996; Levine, Loayza, and Beck 2000; Qamruzzaman and Wei 2018). Additionally, the debate on the impact of the financial system structure (bank-based versus market-based) on economic growth has a long history (Levine 2002) but with no clear answers.

Our study focuses on the banking sector, which is implicated by banks' dominant role in the Central and Eastern European (CEE) financial system (Kruszka 2012; Stawasz-Grabowska 2020). Our research concentrated on 11 economies from the CEE region. Following Niedziółka et al. (2023), we included the following countries in the CEE group: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. Although studies on the banking sector-growth nexus that use cross-country data are challenging to interpret due to the diversity of historical experiences, cultural norms, and institutional contexts (Silva, Tabak, and Laiz 2021), we assumed that due to the geographical proximity and similar transformations of the CEE countries, a focus on these countries is justified.

This region presents a unique tapestry of financial restructuring, not marked by a gradual evolution but rather by a revolutionary overhaul in banking practices to align with EU standards. This dynamic transformation posits the CEE banking sector as a fascinating case for examining the direct effects of banks' performance on economic trajectories. The region's experience encapsulates a swift integration into global financial systems, the liberalisation of financial services, and the rapid adoption of the EU's banking rule book. Such dynamic shifts offer an interesting research area, extending the significance of this study beyond regional borders to the broader framework of financial geography. The primary objective of our research remains to assess the impact of the banking sector's performance on economic growth in CEE countries.

Furthermore, in a region characterised by a rapid transition from centrally planned to market economies, the banking sector's influence on economic growth is not just a matter of academic inquiry but also a crucial policy issue. After all, the results of our study provide input for considering whether it becomes crucial in emerging economies to implement policy solutions to accelerate the development of the banking sector or instead to focus on ensuring its stability in order to avoid negative feedback loops between the banking sector and economic growth, as a result of the materialisation of systemic risks.

Considering differences in CEE countries' economics, our methodological approach employs the panel regression model with fixed effects, allowing us to control for unobservable heterogeneity (Petkovski and Kjosevski 2014) and provide precise estimations of the banking sector's impact on economic growth. We focus on four key banking variables: non-performing loans (NPL), total capital ratio (TCR), return on assets (ROA), and the ratio of bank assets to GDP – to delineate their contributions to economic growth (measured by GDP growth ratio). Our econometric model is complemented by Granger causality tests, which give insights into the relationships' directionality. The analysis uses quarterly data from Q1 2011 to Q3 2023, covering the post-2007–2008 financial crisis period and capturing the banking sector's response to major disruptions, including COVID-19 and the war in Ukraine. Our preliminary findings challenge the traditionally held belief that a well-performing banking sector is a crucial requirement for economic growth. Instead, the data from CEE countries reveal a more intricate scenario where economic growth may boost the development of the banking sector.

Banking sector as a driver for boosting economic growth – literature review

Banks' multifaceted roles in the financial system constitute a core subject of inquiry in theoretical economics and finance (Berger, Molyneux, and Wilson 2015). Banks directly foster entrepreneurship and job creation by providing necessary financial support, thereby contributing to the country's GDP growth. On the other hand, banks are instrumental in accumulating savings from individuals and companies, transforming them into investments in productive ventures (Ribaj and Mexhuani 2021). By offering secure savings mechanisms, banks assure depositors of the safety of their funds (which is reinforced by the deposit guarantee institution). This security encourages the public to save more, providing banks with the capital to finance investment projects. The transformation of savings into investments is a critical process that fuels economic development by directing funds towards sectors with high growth potential.

Furthermore, banks play a crucial role in international trade by providing various financial instruments that facilitate transactions, manage risks, and finance exports and imports. Moreover, banks also support foreign direct investment (FDI) by offering multinational companies the financial services needed to invest in foreign countries. This not only helps in the transfer of technology and skills but also promotes economic growth by creating new jobs and enhancing productivity. This may suggest that the importance of the banking sector should also be assessed through the contribution of FDI to economic growth. Moreover, by facilitating payments and settlements, banks enhance the efficiency of financial transactions, reducing the cost and time involved.

The above implies that many studies confirm the positive impact of banking sector performance on economic growth (Ferreira 2008; Akpansung and Babalola 2011; Rahimzadeh 2012; Jokipii and Monnin 2013). Moreover, focusing on studies of the impact of banks on economic growth, some authors have highlighted the importance of bank efficiency, emphasising that state-owned banks are characterised by worse efficiency indicators than private banks and that foreign banks perform worse than domestic banks (Poshakwale and Qian, 2011). The literature also includes studies on the impact of financial institutions on economic growth conducted between countries in a particular geographical region, such as the ASEAN countries (Haini 2020). The positive

– and statistically significant – impact of financial institutions on economic growth has been confirmed in this group of countries. Additionally, studies of European Union (EU) countries highlight the positive impact of an effectively functioning and stable banking sector on the national economy (Bayar, Borozan, and Gavriletea 2021).

While the banking sector has traditionally been considered an important driver of economic growth, a more critical examination reveals that its significance may be overstated, particularly in the context of CEE countries. CEE economies often exhibit a heavy reliance on bank financing, which can lead to vulnerabilities, especially during financial crises. An over-concentrated banking sector can create systemic risks if banks face liquidity shortages or insolvency issues. Furthermore, excessive dependence on banks may stifle the development of alternative financing sources, such as capital markets, which are crucial for diversifying funding sources and reducing vulnerability to banking sector shocks (Próchniak and Wasiak 2017).

Thus, when examining the relationship between the banking sector and the economy, some authors focus on the negative feedback between the banking sector and the public finance sector and, thus, economic development (Stawasz-Grabowska 2020). A fragile banking sector not only threatens the enduring stability of an economy but can also spark a financial crisis, potentially precipitating broader economic turmoil (Mhadhbi, Terzi, and Bouchrika 2020). Additionally, Caporale et al. (2014) pointed out that the economically less developed EU countries (including CEE) have an underdeveloped financial market (particularly in terms of depth), and thus, the impact on economic growth is limited.

As highlighted by Ehlers and Villar (2015), significant shifts have been observed in the asset structure of the banking sector within transition economies. While the overall leverage of the banking sector has not markedly increased, the destinations of its credit allocations have undergone considerable transformation. An increasing proportion of banking loans are directed towards households, notably mortgage loans. This evolution suggests that the traditional role of banks as primary financiers of investments may be changing, thereby indicating that credit value might not be the most accurate variable for depicting the impact of banks on economic growth. Given this trend, the financing of households through both mortgage and consumer loans is becoming a more prominent function of the banking sector, potentially altering its contribution to economic growth.

Moreover, the banking sector's traditional focus on collateral-based lending may not be well-suited to financing innovation, particularly in high-tech and start-up sectors. These sectors often lack the tangible assets required for collateral, making it difficult for them to secure bank loans. This financing gap can hinder economic growth by limiting the development and expansion of innovative enterprises, which are critical drivers of competitiveness and growth in modern economies.

A body of research, including that by Hall and Lerner (2009), discusses the challenges of financing innovation in the banking-centric financial systems – which are specific features for CEE financial markets. Kjosevski's (2013) fixed-effects panel model showed that bank credit allocated to the private sector and the margin between lending and deposit interest rates do not speed up

economic growth in 16 transition countries in Central and Southeast Europe. Therefore, even in Southeast European countries, there are discrepancies in research on the topic of the importance of banks in economic growth and development. Some studies indicate a positive impact of the banking sector on economic growth in the CEE region (Zeqiraj et al. 2020), as well as in individual countries in the region (Węgrzyn 2023).

Despite globalisation, the significance of banks diverges substantially across various economies (Berger, Molyneux, and Wilson 2015, Chapter 2). This disparity underscores the need to examine the impact of banks on economic growth within diverse contexts and – especially – diverse geographical regions. Nevertheless, a significant portion of research concentrates on advanced economies. However, emerging and developing economies remain relatively underexplored in this field (Sensarma and Bhattacharyya 2016; Reddy et al. 2023).

Methods and data

Methods

To date, researchers have often successfully used fixed-effects panel models to study the importance of the banking sector in the context of country growth and development (Koivu 2002; Song, Chang, and Gong 2021). Despite Wachtel's (2001) scepticism about the appropriateness of using a fixed effects model to explore the relationship between financial sector development and economic growth – arguing that fixed effects overshadow the analysis due to greater inter-country differences than temporal changes – we believe its application is justified. This stance is especially valid in the context of transition economies, where, contrary to Wachtel's observation, banking sectors have evolved rapidly, leading to significant temporal variations in financial development (Koivu 2002).

The rationale for using a fixed-effects model lies in the unobservable heterogeneity between countries in the CEE region, particularly concerning macroprudential policies that influence factors such as the capital ratio (TCR). We conducted a Hausman specification test to confirm the validity of the fixed-effects panel model. It provided a p-value < 0.0001. Consequently, we opted for the fixed effects model over the random effects model for our analysis, as it provides a consistent estimation by controlling for unobservable heterogeneity across countries.

Researchers have also utilised dynamic panel regressions with lagged values of the explanatory endogenous variables as instruments (Caporale et al. 2014). Such methods are able to control endogeneity and measurement error not only of the banking variables but also of other explanatory variables. Taking this into account, we chose a dynamic panel regression model (balanced panel) with fixed effects, which was used for analogous studies by Ferreira (2008) and Kjosevski (2013), among others. Importantly to explain economic growth, one of the explanatory variables – GDP growth – was also lagged. We used autocorrelation analysis to select the lag of this variable.

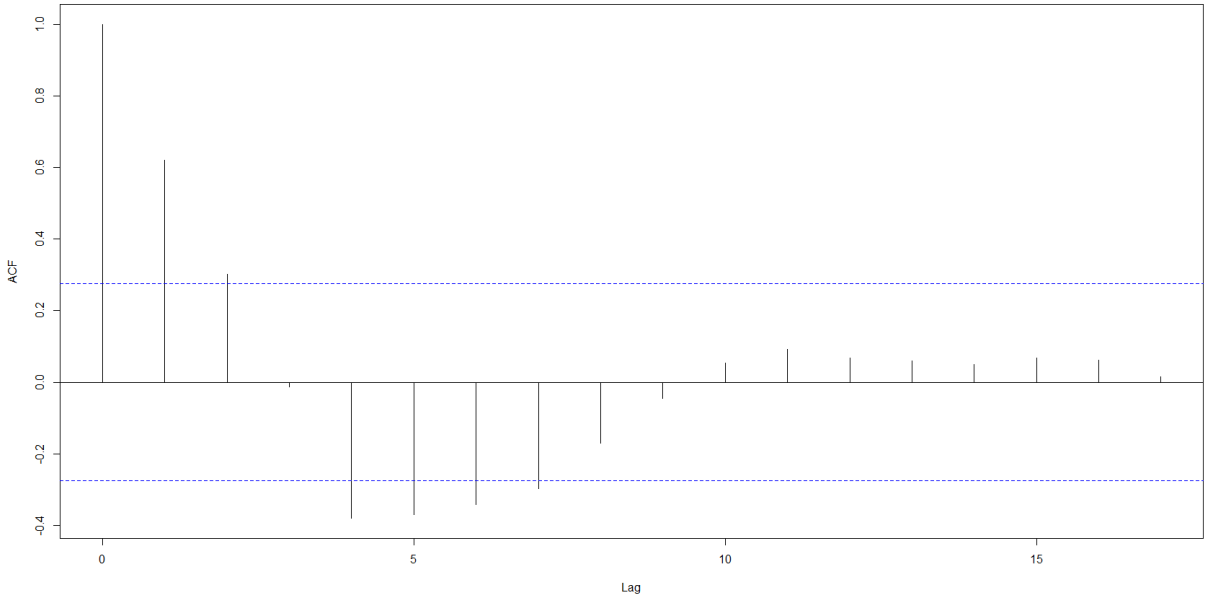

Figure 1. ACF for the GDP variable

Source: own elaboration in R.

Figure 1 illustrates the autocorrelation function (ACF) for the Gross Domestic Product (GDP) series. It exhibits the degree to which the current value of GDP is correlated with its past values, with various lags. Notably, the autocorrelation at lag 1 is substantially high, suggesting a strong positive correlation between GDP and its immediate past value. This significant autocorrelation justifies the inclusion of one lag of GDP in a panel model with fixed effects to capture the immediate temporal dependency, thereby enhancing the model's explanatory power for the current GDP based on its previous value.

Additionally, the autocorrelation at lag 4 is also noticeable, albeit negative. This could indicate a seasonal effect or a cyclical pattern in the GDP data, where the GDP shows an inverse relationship with its value four periods earlier. Including the fourth lag can help control for quarterly seasonality effects in annual data or capture cyclical dynamics in the case of quarterly data. This inclusion refines the model by accounting for any regular pattern or cyclicality that manifests every four periods, ensuring that the model better understands the underlying trends in GDP. Considering that, we decided to include the first and fourth lags of GDP as a dependent variable in a fixed-effects panel model. In conclusion, the study uses a dynamic panel data model with fixed effects to ascertain the determinants of GDP growth. The model is specified as:

$$\begin{aligned} \mathrm{GDP}_{it} = {} & \beta_1 \mathrm{GDP}_{it-1} + \beta_2 \mathrm{GDP}_{it-4} + \beta_3 \mathrm{IND}_{it} + \beta_4 \mathrm{BanktoGDP}_{it-1} + \beta_5 \mathrm{TCR}_{it-1} + \\ & + \beta_6 \mathrm{ROA}_{it-1} + \beta_7 \mathrm{NPL}_{it-1} + \beta_8 \mathrm{COVID}_{it} + \beta_9 \mathrm{WAR}_{it} + u_i + \varepsilon_{it}, \end{aligned} \quad (1)$$

where:

- $\beta_1, \beta_2, \ldots, \beta_9$ are the coefficients that correspond to each independent variable,
- $_i$ represents the cross-sectional unit (country) in panel data,
- $_t$ represents time measured in quarters,

- u_i represents the unobserved individual-specific effect,
- ε_{ti} represents the error term.

Endogeneity (reverse causality, where real economy development drives changes in the banking sector) is a significant issue in research into the banking sector's importance for economic growth (Berger, Molyneux, and Wilson 2020). Some authors have attempted to establish the impact of the banking sector on economic growth, obtaining a two-way causal relationship (Gaffeo and Mazzocchi 2014; Song, Chang, and Gong 2021). On the other hand, inverse relationships between banking sector performance and economic growth have also been observed (Awdeh 2012). Thus, we used the Granger causality test in our study to confirm the existence of such two-sided causality. In formal terms, if variable X Granger-causes variable Y, the past values of X contain information that helps predict Y:

$$Y_{it} = \alpha_i + \sum_{j=1}^{n} \beta_{ij} Y_{i,t-j} + \sum_{j=1}^{n} \gamma_{ij} X_{i,t-j} + \varepsilon_{it}, \quad (2)$$

We employ the Dumitrescu and Hurlin modification. Unlike traditional time series Granger causality tests that examine the relationship within a single time series, it is designed to work with cross-sectional data that span multiple countries over time. Thus, the issue of Granger causality is explored through a panel-based testing procedure that accounts for heterogeneity (Gaffeo and Mazzocchi 2014).

Description and analysis of the data

Reddy et al. (2023) suggest that several indicators, including domestic credit, return on equity (ROE), and total capital ratio (TCR), which reflect the operational and financial performance of banks, correlate with GDP growth. Koivu (2002) believes that increases in credit do not seem to accelerate economic growth. Zidan (2019) also concludes that the relationship between banks' credit and GDP growth is weak. Moreover, Petkovski and Kjosevski (2014) researched Central and Southeast European countries, and the results show that banks' credit is negatively related to economic growth. Other authors have also published studies indicating that the banking sector's development hurts the state's economic growth rate (Saci et al. 2009; Narayan and Narayan 2013). Other studies propose replacing loans with a measure representing the ratio of bank assets to GDP, which also considers possible bank investments in securities, including government bonds (Węgrzyn 2023). Taking that into account, we decided to use the GDP to bank assets ratio instead of the bank's credit. Furthermore, to assess how banks' profitability is linked to the rate of economic growth, we have included the return on assets (ROA) variable in our study.

According to Creel, Hubert, and Labondance (2015), the instability of the banking sector has a negative impact on a country's economy. Thus, following Ferreira (2008), we have included the following variables to measure the stability of the functioning of the banking sector: TCR (which shows the ratio of own funds to banks' risk exposures) and non-performing loans (NPLs) (which show the share of NPLs in the sector's total loans).

Furthermore, researchers studying economic growth have often included FDI inflows in their models (Acquah and Ibrahim 2020). Taking this into account, we also included this

explanatory variable in the model. In addition, we propose adding numerous other control variables to the model that are commonly used to study the determinants of economic growth, such as the unemployment rate, Consumer Price Index (CPI), and industrial production (Próchniak 2011). Evaluating the directional coefficients of these variables will assess the robustness of the model. Finally, recognising that the global COVID-19 pandemic and the war in Ukraine (Węgrzyn and Topczewska 2023) negatively impacted the European economy, these two dummy variables were also included in the model. All data used for the analysis is quarterly and covers the period from Q1 2011 to Q3 2023. A detailed summary of the variables used in the study is provided in Table 1.

Table 1. Data details

Variable	Description	Source
GDP	Gross Domestic Product growth [%], calculated as the percentage change in real GDP compared to the same period of the previous year.	National Statistical Institutes
CPI	Consumer Price Index (CPI) measures the weighted average changes (percentage year-on-year growth) in the prices of consumer goods and services purchased by households in the economy.	National Statistical Institutes
IND	Industrial Production Index (IPI) measures the volume of output produced by industrial enterprises. The percentage change [%] is the standardised unit of measurement used.	National Statistical Institutes
UNEM	Unemployment rate [%], defined as the number unemployed as a percentage of the labour force.	National Statistical Institutes
FDI_to_GDP	This indicator represents the percentage [%] of net foreign direct investment flows into a country relative to its nominal GDP.	OECD
ROA	Return on assets (ROA) provides information on bank profitability relative to total assets [%].	International Monetary Fund (IMF)
BanktoGDP	Percentage ratio [%] of bank assets at the end of the quarter to national GDP (extrapolated from quarterly data).	International Monetary Fund (IMF)
NPL	Non-performing loans ratio [%] refers to the proportion of loans that are in default or close to being in default to the total amount of loans. These loans do not earn income, and full payments are no longer anticipated, or payment of principal or interest is 90 days or more overdue, or the maturity date has passed without full payment.	Central Banks
TCR	This indicator represents the percentage share of regulatory capital to risk-weighted assets [%].	Central Banks
COVID	A dummy variable used to determine the impact of the COVID-19 pandemic on economic growth rates. From Q1 2020 until quarantine restrictions were withdrawn in the particular country, the variable's value was 1. In other periods, the variable's value was 0.	–
WAR	A dummy variable used to determine the impact of the war in Ukraine on economic growth rates. The variable took the value of 1 from Q1 2022 to Q3 2023 for countries neighbouring the Russian Federation. In other cases, the variable was equal to 0.	–

Source: own elaboration.

In the next step, we tested the stationarity of the panel variables using the Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) tests. Given that only one control variable – inflation (CPI)

– was found to be a non-stationary series, we decided not to include it in the model. The remaining variables were included in the modelling and tested with the Granger causality test for panel data.

Table 2. Levin-Lin-Chu (LLC) and Im-Pesaran-Shin (IPS) tests for stationarity

Variable	Levin-Lin-Chu Unit-Root Test		Im-Pesaran-Shin (IPS) Unit-Root Test	
	t-stat	p-value	t-stat	p-value
GDP	– 9.3	<0.0001***	– 11.0	<0.0001***
IND	– 9	<0.0001***	– 11	<0.0001***
CPI	0.46	0.7	– 0.83	0.2
UNEM	– 2.1	0.02*	– 0.27	0.4
FDI_to_GDP	– 19	<0.0001***	– 18	<0.0001***
BanktoGDP	– 2.2	0.02*	– 1.7	0.04*
NPL	– 4.4	<0.0001***	– 0.81	0.2
TCR	– 4.2	0.0002***	– 1.7	0.04*
ROA	– 4.9	<0.0001***	– 4.5	0.0001***

Note: *p < 0.05, ** p < 0.01, *** p < 0.001.

Source: own elaboration in R, based on data presented in Table 1.

Finally, based on the selected data, a graphical summary was prepared (using a map) showing the average level of economic growth over the analysed period, as well as variables such as bank assets to GDP, TCR, and NPL levels at the end of Q3 2023.

As Figure 2 shows, the fastest average quarterly growth rates were in Poland, Lithuania (3.44%) and Romania (3.41%). In contrast, the economies of Estonia (135.2%), the Czech Republic (133.2%) and Hungary (123.4%) had the relatively largest banking sector (Bank assets to GDP). Romania (65.3%), Latvia (68.9%), and Lithuania (80.1%) had the smallest banking sectors. Nizam et al. (2020), in their research on a group of 63 countries, noted that the positive impact of the banking sector on economic growth is evident once a certain threshold of the financial sector inclusion in a country is exceeded. However, as the data on the banking sector's asset-to-GDP ratio show, countries in the CEE region are very different in this respect, which may dampen the effect of the banking sector's positive impact on economic growth. The TCR ratio ranged from 19% (Hungary) to 23.3% (Croatia). The wide divergence in the NPL ratio level is also worth noting. Poland had by far the highest level (5.66%), well ahead of Bulgaria (2.71%) and Croatia (2.66%). In contrast, Estonia (0.17%), Lithuania (0.58%) and Slovenia (0.7%) had the lowest NPL level.

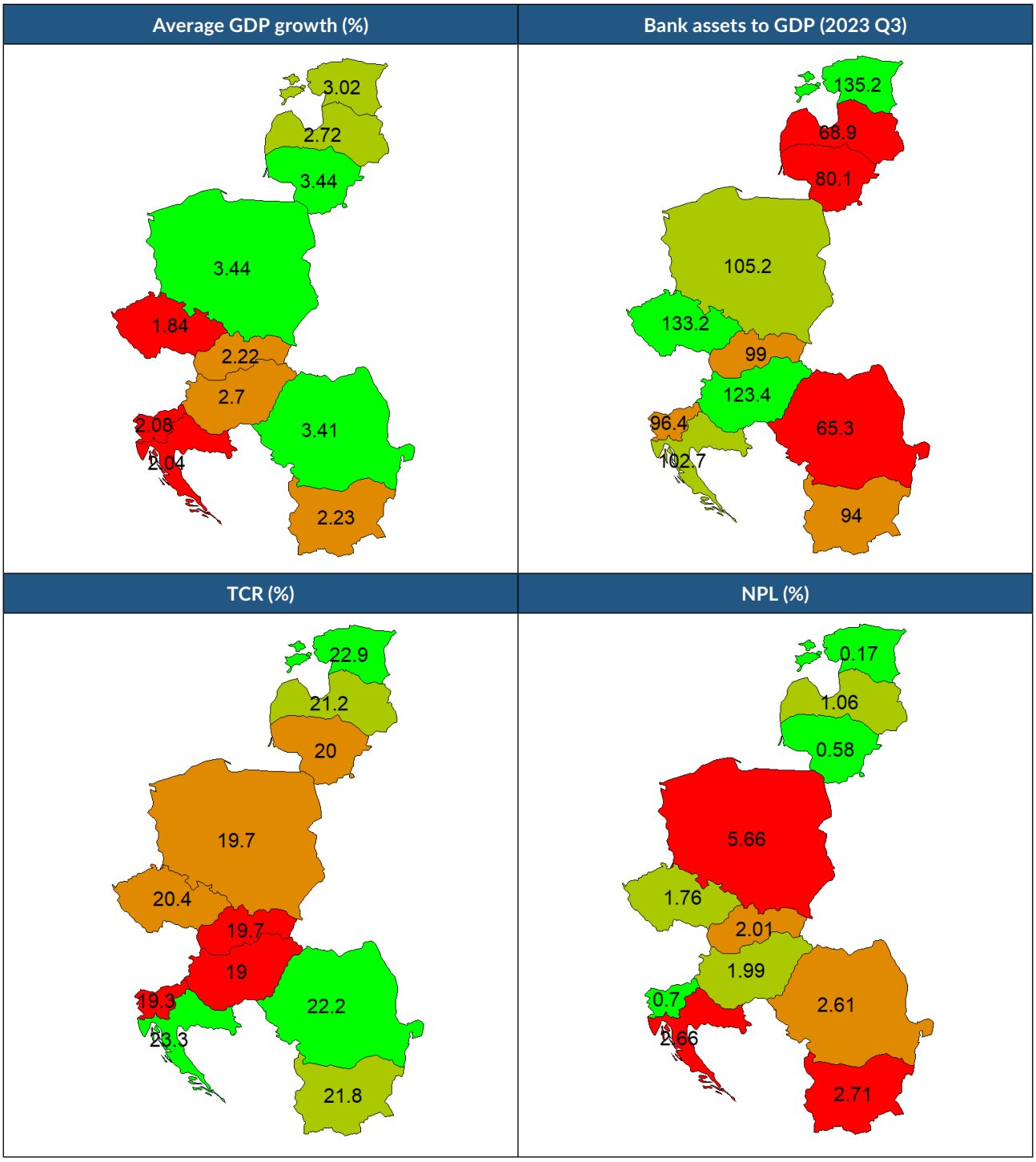

Figure 2. Summary of selected data for individual CEE countries (Q1 2011 – Q3 2023)

Source: own elaboration in R, based on data presented in Table 1.

Results and discussion

Before characterising the coefficients for the individual variables, it is worth pointing out the relatively high level of explanatory power of GDP growth by the explanatory variables (R-squared 0.755, Adjusted R-squared 0.745). Moreover, the F-statistic for the model confirmed its statistical

significance. Nevertheless, in our panel data analysis, we have observed the presence of heteroscedasticity (Wald test p-value = 0.02) and autocorrelation (Durbin-Watson test p-value < 0.0001, Breusch-Godfreya p-value 0.0001) within the residuals. Although it is common in panel models, this occurrence can lead to inefficiencies and inaccuracies in standard errors and, consequently, the test statistics and confidence intervals. To rectify this and increase the results' reliability, we have employed the Driscoll-Kraay standard error correction, renowned for its robustness in heteroskedasticity and autocorrelation within panel data models.

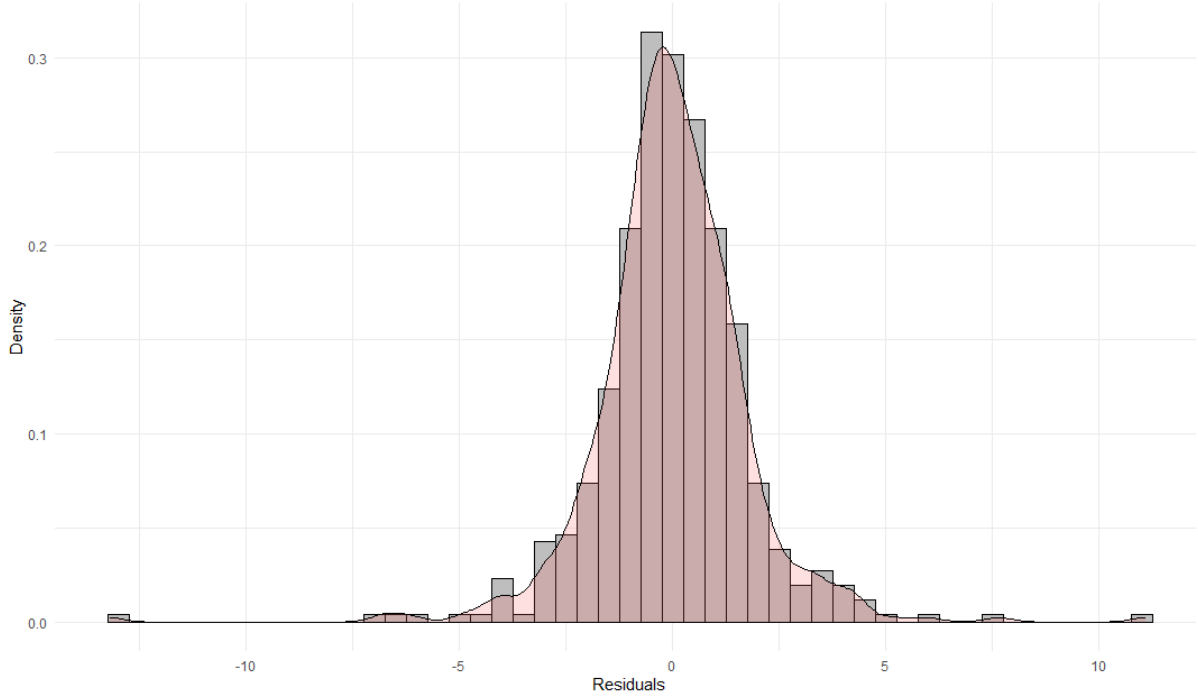

Figure 3. Histogram of the model residuals

Source: own elaboration in R, based on data presented in Table 1.

The histogram of model residuals overlayed with a normal distribution curve reveals a bell-shaped symmetry that closely aligns with the properties of a Gaussian distribution. Due to single outliers, the Anderson-Darling test showed a non-normal distribution of the residuals. Nevertheless, based on graphic analysis, the centrality of the residuals around the zero mark, combined with the unimodal and seemingly symmetrical nature of the distribution depicted in the plot, lends credence to the assumption of normality for the purposes of our study.

Moreover, the comparison of actual and projected GDP growth levels in the cross-sectional analysis (Figure 4) and in the time-series analysis by country (Figure 5) confirms the good fit of the model. However, some differences between the model fit for individual CEE countries become apparent. Thus, we observed the weakest fit for Lithuania and the best fit for Poland.

Figure 4. Actual vs Predicted GDP growth by country

Source: own elaboration in R, based on data presented in Table 1.

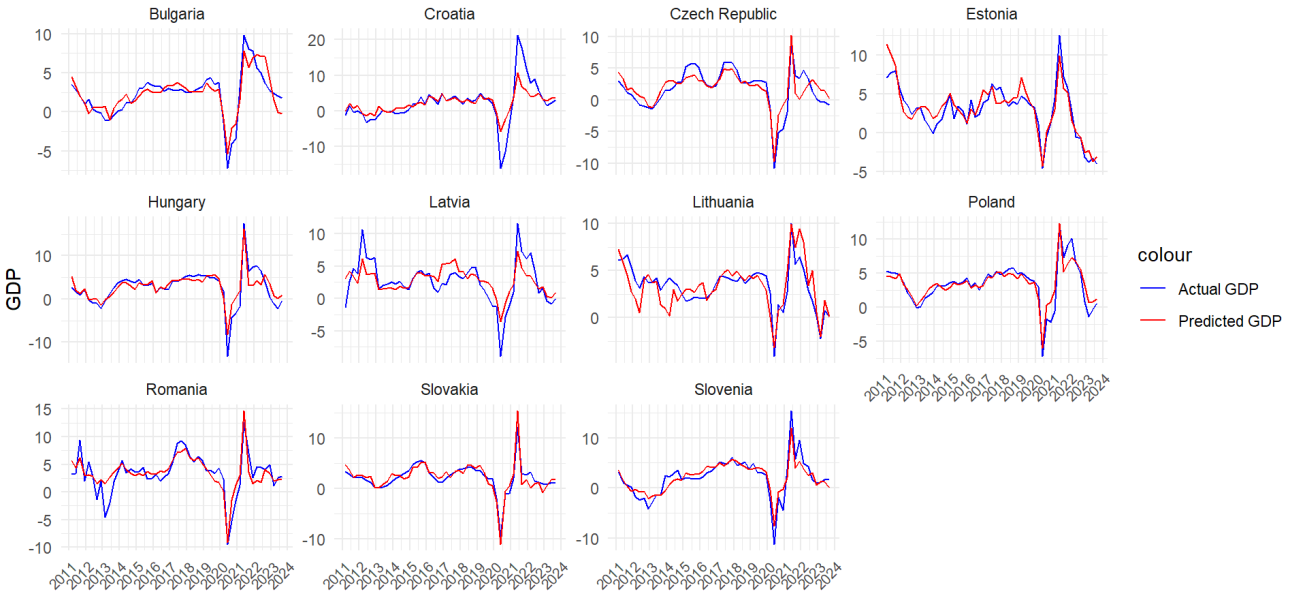

Figure 5. Actual vs Predicted GDP growth by country over time

Source: own elaboration in R, based on data presented in Table 1.

Given the quarterly intervals of the data used for modelling (which was driven by the availability of GDP data), we proposed using quarterly lags l(1) of the control and banking variables in the model (with the exception of the IND variable, which showed a much better fit without delays). Summary results of the dynamic panel model with fixed effects are presented in Table 3.

Table 3. Results of panel model with fixed effects

Variables	Coefficients	p-value	Driscoll-Kraay corrections p-value
GDP(1)	0.4635	<0.0001***	<0.0001***
GDP(4)	−0.2064	<0.0001***	<0.0001***
IND	0.2946	<0.0001***	<0.0001***
FDI_to_GDP(1)	0.0056	0.125	0.0016**
UNEM(1)	−0.0568	0.281	0.4166
BanktoGDP(1)	0.0004	0.950	0.9431
TCR(1)	0.0281	0.471	0.3020
ROA(1)	0.2583	0.038*	0.0708
NPL(1)	−0.0831	0.025*	0.1974
COVID	−1.3850	<0.0001***	<0.0001***
WAR	−0.3837	0.327	0.4017

Note: *p < 0.05, ** p < 0.01, *** p < 0.001.

Source: own elaboration in R, based on data presented in Table 1.

In analysing the impact of individual variables on GDP growth rates in CEE countries, lagged GDP growth emerged as a significant factor, with GDP(1) showing a positive impact and GDP(4) showing a negative impact on current GDP growth. In addition, a significant positive impact on growth was recorded for the IND variable. These findings align with Tongurai and Vithessonthi (2018), who also demonstrated that the development of the banking sector has no impact on the development of the industrial sector, with a relatively high share of industry in the economic structure of the CEE countries compared to more developed Western European countries. The lack of influence may weaken the banking sector's power to influence GDP growth in transition economies.

Furthermore, the directional coefficients of the other control variables confirm the quality and substantive interpretative validity of the model. We observed a positive impact of foreign investment inflows on economic growth (statistically significant), a negative impact on unemployment (statistically insignificant), and a highly negative impact of the dummy variables (statistically significant for COVID-19 and statistically insignificant for the war in Ukraine).

The direction of the coefficients of the banking variables was also in line with expectations. Nevertheless, according to the model results, only ROA(1) and NPL(1) have a statistically significant impact on GDP (positive and negative impact, respectively). However, after the Driscoll-Kraay adjustment, none of the banking variables was statistically significant at alpha = 0.05. A relatively low p-value (0.0708) was recorded only for ROA(1). The ROA results are noteworthy when contrasted with the observations of Poshakwale and Qian (2011) and Mensah et al. (2012), who highlighted a positive and significant relationship between bank operating efficiency and economic growth. Additionally, Botrić and Slijepčević (2008) suggested a relationship between

banking sector efficiency and economic growth in CEE countries. This raises the possibility that Granger causality tests may be warranted as, in theory, it is economic growth that influences the efficiency of the banking sector.

Table 4. Panel Granger causality test results, with Dumitrescu and Hurlin modification

Variables cause GDP			GDP cause variables		
Variable (lag)	t-stat	p-value	Variable (GDP lag)	t-stat	p-value
BanktoGDP(1)	– 0.26	0.8	BanktoGDP(4)	4.1	< 0.0001***
TCR(1)	– 1.3	0.2	TCR(4)	5.1	< 0.0001***
ROA(1)	– 0.88	0.4	ROA(3)	– 1.9	0.06
NPL(1)	– 1.7	0.1	NPL(1)	2	0.05*

Note: *p < 0.05, ** p < 0.01, *** p < 0.001.

Source: own elaboration in R, based on data presented in Table 1.

The results of the Granger test (Table 4) indicate that, at a significance level of alpha = 0.05, no banking variable is a cause of economic growth in the CEE economies. This was true for both the one-lag variable (used in the model) and second-, third- and fourth-order lags. The lowest p-value was recorded for the NPL variable, which had a p-value of 0.1. Conversely, the test confirmed that economic growth was the cause of almost all banking variables (with only ROA showing a p-value of 0.06, which was not significant at the adopted level).

Despite the lack of confirmation of an unequivocally positive and statistically significant impact of the banking sector on economic growth in the CEE region, as indicated by both the panel model and the Granger causality test, our study does align with the findings of many other researchers (Demirguc-Kunt and Detragiache 2000; Deidda and Fattouh 2002). These authors also highlighted the positive and significant impact of banks on economic growth rates in more advanced economies. Furthermore, it is important to recognise how many factors can affect economic growth rates. Thus, it would be beneficial to extend the adopted model or propose additional variables, including demographic factors (Kozlovskyi et al. 2020) and social expenditures (Govdeli and Karakuş Umar 2021).

Conclusions

In conclusion, while the banking sector has historically played a critical role in economic growth in highly developed economies, its significance to economic growth for CEE countries needs to be revised. Challenges in the CEE region, such as overreliance on bank financing, a shift in the structure of loans from corporate investment loans to mortgage and consumer loans, a potentially limited impact on innovation, and the rise of alternative financial sources (for example, European funds) suggest a need for a more nuanced understanding of the relationship between banking sector development and economic growth.

Future research must establish what determines the positive and significant impact of banking sector performance on economic growth and what distinguishes highly developed economies

from those in transition in this respect. As Piątkowski (2019) argued, institutions, including solid and effective financial market supervision or robust monetary policy, play a key role in economic development. This underscores the importance of including qualitative factors, such as institutional performance, political stability, and the concept of path dependence concerning the development of the banking sector in studies examining the importance of the financial market within a country.

The primary objective of this study was to examine the relationship between banking sector performance and economic growth in the CEE region. By using a fixed-effects panel regression model and Granger causality tests, we gained a nuanced understanding of this relationship, highlighting the inverse causality where economic growth supports banking sector development rather than vice versa. The added value of this analysis lies in providing policymakers with insights into how prioritising economic development may indirectly strengthen the banking sector within the unique context of post-transition CEE economies.

Furthermore, as the literature review shows, even the economic growth of countries located in the same geographical region can be affected differently by financial development, including the banking sector or capital market. For example, Liu and Hsu's (2006) model demonstrated that individual financial variables, such as investment inflows relative to GDP or the size of the financial sector, affected East Asian economies (i.e., Japan, South Korea, and Taiwan) differently. This highlights the need for a more individualised approach to researching the impact of the financial sector on the economic growth of countries and regions.

Our results confirm Luintel et al.'s (2008) observation that in studies on the impact of the financial market on economic growth, cross-country data should not be pooled. Therefore, it is advisable to extend the existing research by constructing individual models for each CEE country to determine the impact of the financial market on economic growth in a more individualised way. This is warranted, given that some researchers have identified a positive relationship between the banking sector and the economy in selected CEE countries (Węgrzyn 2023).

The need for such research is further highlighted by the relatively small number of studies examining the relationship between the importance of financial markets (beyond just the banking sector) and economic development in the economies of the CEE region. However, this research should be enriched by considering the characteristics of the economic and political conditions of a given country, which may have an impact on the effectiveness of financial markets in promoting growth. An additional valuable area of research is how financial and economic crises distort financial market transmission channels for economic growth and development. It would be helpful to identify differences in this regard between individual countries to find potential solutions to mitigate the negative impact of crises on the ability of financial institutions to support businesses and, indirectly, the national economy.

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Wpływ sektora bankowego na wzrost gospodarczy. Studium przypadku wybranych krajów Europy Środkowo-Wschodniej

Niniejsze badanie opisuje i wyjaśnia złożony związek między funkcjonowaniem sektora bankowego a wzrostem gospodarczym w krajach Europy Środkowo-Wschodniej (CEE). Mając na uwadze kluczową rolę sektora bankowego w systemie finansowym regionu CEE, autorzy badają potencjał tego sektora jako czynnika napędzającego wzrost gospodarczy, wykorzystując model regresji panelowej z efektami stałymi. W badaniu skoncentrowano się na czterech kluczowych zmiennych: kredytach zagrożonych (NPL), łącznym współczynniku kapitałowym (TCR), stopie zwrotu z aktywów (ROA) oraz relacji aktywów bankowych do PKB. Testy przyczynowości Grangera dodatkowo oceniają kierunkowy charakter tej relacji. Wbrew powszechnym założeniom wyniki nie potwierdzają istotnego bezpośredniego wpływu sektora bankowego na wzrost gospodarczy w regionie CEE. Zamiast tego wyniki testu przyczynowości Grangera wskazują, że to wzrost gospodarczy znacząco wspiera rozwój sektora bankowego, sugerując odwrotną przyczynowość. Wyniki te dostarczają cennych wskazówek dla decydentów politycznych, sugerując, że działania na rzecz rozwoju sektora bankowego mogą odnieść większy sukces przy priorytetowym traktowaniu rozwoju gospodarczego. Badanie to wnosi istotne zrozumienie specyfiki regionu CEE, podkreślając unikalną interakcję między wzrostem gospodarczym a rozwojem sektora bankowego w gospodarkach posttransformacyjnych.

Słowa kluczowe: sektor bankowy, wzrost gospodarczy, regresja panelowa z efektami stałymi, przyczynowość Grangera, geografia finansowa, kraje Europy Środkowo-Wschodniej