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Examining the Relationship between Bank Profitability and Economic Growth: Insights from Central and Eastern Europe

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A B S T R A C T

Purpose: The purpose of this research article is to investigate the impact of bank profitability on the economic growth of 16 Central and Eastern European countries over the period from 1999 to 2022. The study aims to determine whether higher bank profitability has a positive influence on economic growth, challenging the notion that low bank profitability hinders economic growth.
Design/methodology/approach: Our study employs an extensive empirical analysis, utilizing a range of econometric methods. We explore the relationship between bank profitability and economic growth, taking into account various factors and control variables. This includes assessing the impact of bank profitability on economic growth by considering a diverse set of economic indicators and factors influencing the banking sector.
Findings: Our research consistently reveals a statistically and economically significant positive relationship between bank profitability and economic growth. Specifically, a one percent increase in the return on assets of banks is associated with a notable increase in economic growth, falling within the range of 0.534 to 0.625 percentage points. These findings suggest that higher bank profitability contributes positively to the economic growth of the studied Central and Eastern European countries.
Research limitations/implications: While this study provides valuable insights into the relationship between bank profitability and economic growth, it has certain limitations. Future research in this area could delve deeper into the nuanced relationships between different dimensions of bank profitability and economic performance. Additionally, further investigations could explore the effects of varying ownership structures and competition dynamics on economic growth in these countries. This acknowledges the need for more in-depth research and understanding of the complex interplay between bank profitability and economic growth.
Originality/value: This research contributes to the existing literature by shedding light on the positive impact of bank profitability on economic growth in Central and Eastern European countries. The findings offer valuable insights for policymakers, financial institutions, and researchers interested in understanding the dynamics between the banking sector and economic development in this region. The study's originality lies in challenging conventional wisdom and highlighting the potentially positive role of bank profitability in economic growth, thereby providing practical and policy-relevant implications.

Keywords: Bank profitability, Economic growth, Central and Eastern Europe, Panel analysis

I. Introduction

The interplay between economic growth and

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various determinants has been a focal point in recent research (Darrat et al., 2010). One area of significant exploration is the role of financial development in propelling economic growth, with two predominant hypotheses, demand-following and supply-leading, underscoring diverse policy approaches (Musembia & Chunb, 2020).

Bank profitability's significance becomes evident when considering its impact on economic growth (Petkovski et al., 2023). Firstly, higher profitability allows banks to generate more capital, facilitating increased lending in the economy. A decline in bank profitability, combined with insufficient capital reserves and the prohibitively expensive process of raising capital through issuing new shares, results in reduced lending. This reduction, driven by the need to meet regulatory capital requirements, directly affects consumption and investment in the economy. Secondly, stringent lending policies due to low profitability can diminish the effectiveness of flexible monetary policy measures, as banks play a pivotal role in the monetary transmission mechanism. A stable and profitable banking system is essential for effective monetary policy, as highlighted by the German central bank, particularly in the wake of the financial and debt crisis in the Euro area (Deutsche Bundesbank, 2018). Thirdly, heightened bank profitability is crucial for regulators as it ensures adaptable capital ratios, even in a riskier business environment. Lastly, a robust and profitable banking system is better equipped to weather negative shocks, contributing to the overall stability of the financial system (Athanasoglou et al., 2008).

Despite its critical role, the impact of bank profitability on economic growth has been relatively underexplored in the academic literature. Only a few studies have delved into this association, as seen in the works of Cole et al. (2008) and Klein & Weill (2017).

To address this gap, we conducted a panel analysis to examine the causal effect of bank profitability on economic growth in 16 countries from Central and South Eastern Europe from 1999 to 2022. These countries share commonalities in their banking sectors but also exhibit variations in their economic and social conditions.

In our analysis, we utilized the System Generalized Method of Moments (S-GMM) to consider a substantial number of parameters and address potential endogeneity issues. In our analysis, we utilized the System Generalized Method of Moments (S-GMM) to consider a substantial number of parameters and address potential endogeneity issues. It's important to note that economic and social conditions vary significantly across these economies, which necessitated the use of a heterogeneous panel Granger-causality test to account for these variations (Dumitrescu and Hurlin, 2012). This research study significantly contributes to the existing literature by examining the influence of bank profitability on economic growth across a diverse spectrum of Central and South Eastern European countries. We used a distinct methodology that focuses on the relationship between return on assets (ROA) as a measure of bank profitability and real GDP per capita growth as an indicator of economic growth. Our research explores the cause-and-effect connection between bank profitability and economic growth, offering insights into how this impact varies among different economies within Central and Eastern Europe.

The subsequent sections of this article include a selective review of relevant literature, an overview of the data used in our analysis, a discussion of the econometric method employed, a presentation of our results, and a summary of key findings, along with suggestions for future research and exploration.

II. Literature Review

The role of banks as facilitators of economic growth has been a central focus of various studies in the literature. Several studies have explored the relationship between bank profitability and economic growth, albeit with different findings and methodologies.

Chava et al. (2013) conducted a study in the United States, suggesting that policies promoting financial

market development can positively impact long-term economic growth by stimulating innovation. However, it is essential to note that the study primarily focused on the U.S. economy, which may not be directly generalizable to other regions with distinct economic structures and regulatory frameworks.

Hamza and Khan (2014) reported a positive association between bank profitability and economic growth in Pakistan, aligning with the conventional wisdom that profitable banks can contribute to economic development. However, the study's limited sample size and focus on a specific country raise questions about the generalizability of these findings to a broader set of economies.

Adekola's study (2016) in Nigeria identified a negative effect of low bank profitability on economic growth, emphasizing the need for effective regulatory measures to ensure the sustainability of banking sector reforms. This finding underscores the importance of regulatory frameworks in shaping the impact of bank profitability on economic growth, but it also highlights the need for further research in different economic contexts.

Alev (2018) explored the relationship between bank profitability and economic growth in Turkish banks, demonstrating a positive impact of bank profitability on economic growth. However, it's crucial to consider that the findings may not be directly transferable to other countries due to variations in banking systems and economic structures.

Klein and Weill's comprehensive cross-country analysis (2017) revealed nuanced findings. While high existing bank profitability positively contributed to economic growth, the previous level of bank profitability exerted a short-term negative influence on economic growth. This highlights the dynamic nature of the relationship between bank profitability and economic growth, emphasizing the importance of considering temporal factors.

The research conducted by Kumar and Bird in 2020 within the Asia-Pacific region identified a positive correlation between bank profitability and economic growth. Nevertheless, the study emphasized variations across different economies, indicating that the impact of profitability is more pronounced in developed economies compared to emerging ones. This indicates that the economic context is a crucial factor in influencing this association.

Moussa and Hdidar (2019) examined the link between bank profitability and economic growth in Tunisia, reporting a positive association. However, the specific indicators used and the contextual factors in Tunisia may limit the generalizability of these findings to other regions.

In summary, while the literature generally supports the idea that bank profitability can positively influence economic growth, the studies reviewed here underscore the complexity of this relationship. Variations in economic contexts, regulatory frameworks, and methodological approaches can lead to contrasting findings. Further research is needed to explore this relationship in greater depth, especially in regions with diverse economic structures and regulatory environments.

III. Data and Variables

Our study focused on assessing the impact of bank profitability on economic growth in Central and Eastern Europe. We examined a sample of 16 countries, including Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Montenegro, Poland, Romania, Serbia, the Slovak Republic, and Slovenia, spanning the years from 1999 to 2022. These countries were selected based on historical and socio-economic similarities, as well as geographical and cultural proximity. However, they exhibited differences in public debt levels, GDP growth rates, GDP per capita growth, European Union (EU) membership, and other factors. It's worth noting that data for Serbia and Montenegro were incomplete due to their status as a single country until 2006.

The banking sector in Central and Eastern Europe has undergone significant transformations since the end of communism in the late 1980s and early 1990s.

While the general structure of the banking sector in these countries is somewhat uniform, featuring a mix of domestic and foreign-owned banks, the dominance of foreign-owned banks varies among countries. For example, in Poland, foreign-owned banks play a major role, whereas in Bulgaria, most banks are domestically owned.

Credit levels as a percentage of GDP also vary across the region, with 2020 data from the World Bank indicating a range from approximately 50% in Albania to over 100% in Estonia and Slovenia. These variations highlight the diverse economic conditions in the region.

The privatization of state-owned banks was a significant process that shaped the banking sector in these countries, starting in the early 1990s. State-owned banks were privatized and sold to private investors, including foreign banks, leading to the introduction of new business models, capital, and expertise. The integration of these countries into the EU also played a crucial role, resulting in the adoption of EU banking regulations and increased competition from foreign banks.

Despite the increased stability and competitiveness of the banking sector in the region due to improved regulation, oversight, increased capitalization, and a wider range of financial products and services, challenges persist. Some countries continue to grapple with high levels of non-performing loans, which have an ongoing impact on the sector.

In our study, we used the real growth of GDP per capita (in constant 2015 US dollars) as the dependent variable, consistent with previous research (Klein & Weill, 2018, 2022). To measure bank profitability, we employed data on banks' Return on Assets (ROA), a widely recognized indicator in the banking industry. To account for cross-country differences in taxation, we followed the approach of Klein and Weill (2018) by using ROA before tax.

We also included lagged GDP growth as a potential determinant to account for growth persistence. Previous studies have produced mixed results on the impact of lagged GDP growth, with some indicating a positive effect and others a negative one. We hypothesized that lagged GDP growth would positively influence economic growth.

We also incorporated nine additional explanatory variables commonly used in finance-growth literature: We used net interest margin, bearing in mind that commercial banks are a catalyst for national monetary policy transmission Their behavior in the deposit and lending rate setting plays a critical role in the monetary policy transmission mechanism (Nguyen & Davis, 2008). The inflation rate was characterized as the yearly percentage rise in the consumer price index. Although numerous studies have observed an adverse connection between inflation and economic growth, the effect can fluctuate, ranging from negative to positive.

Domestic credit to the private sector (% of GDP)-DCPS is a vital economic indicator for Central and Eastern Europe countries, providing a key source of funding for businesses and households to invest and expand without heavy reliance on foreign borrowing. In Croatia and Estonia, where this ratio exceeded 60% of GDP in 2021, it underscores their economies' self-financing capacity, enhancing resilience to external shocks. This indicator is crucial as it directly reflects the accessibility of funds for business growth, project investments, and job creation, all of which are pivotal drivers of economic expansion in Central and Eastern Europe nations. A healthy ratio signifies a favorable financial environment that fosters entrepreneurship, innovation, and overall economic development.

Deposit money bank-DMB are pivotal in Central and Eastern Europe countries as they serve as the primary sources of credit for businesses and households. This reliance is evident in all Central and Eastern Europe, where deposit money bank assets constituted over 60% of total financial system assets in 2022. This underscores their central role in these economies. The deposit money bank assets to deposit money bank assets and central bank assets (%) ratio further emphasizes the financial system's strength and independence. A higher percentage signals that banks rely less on central bank assets for stability, indicating a well-capitalized and self-sufficient banking sector.

The next independent variable that we used is Liquid liabilities to GDP (%)-LLG as one of the factor for Central and Eastern Europe countries which represent a significant funding source for investment and economic growth. This ratio's importance lies in its role in providing access to capital, ensuring financial stability, aiding effective monetary policies, and supporting private sector expansion.

Government expenditure, representing the annual percentage change in government spending, was another variable considered. The link between government expenditure and economic growth is intricate, as certain studies propose a favorable impact, while others indicate an adverse one.

Trade openness, which is quantified as the total of exports and imports of goods and services, was incorporated in the study due to prior research indicating a beneficial connection between trade and economic growth.

Educational attainment was measured using the secondary gross enrollment ratio, which represents the ratio of total enrollment to the population of the corresponding age group. It was expected that higher educational attainment would positively influence economic growth.Namelly education leads to producing skilled labor which is an important part of the production cycle (Jehangir et al., 2020).

Lastly, we will used The Index of Economic Freedom-IEF is a economic indicator for Central and Eastern Europe countries as it assesses the degree of economic freedom and liberalization within their respective economies. This index measures factors such as property rights, rule of law, limited government intervention, regulatory efficiency, and open markets. For Central and Eastern Europe nations, which are characterized by varying degrees of economic development and regulatory environments, a high score on the Index of Economic Freedom is indicative of a business-friendly climate that encourages entrepreneurship, investment, and market competition. A strong commitment to economic freedom can enhance the ease of doing business, attract investments, and promote sustained economic growth.

All control variables were transformed into logarithmic form, as commonly done in similar studies. Data for these variables were sourced from reputable sources such as the World Bank's World Development Indicators (WDI) database, Eurostat, and the Federal Reserve Bank of St. Louis. Additional details on

Table 1. Definition of variables

Variables	Symbol	Units	Source
Real GDP per capita growth	GR	Percent	World Development Indicators
Bank return on assets	ROA	In percent (before taxes)	
Net interest margin	NIM	Percent	FRED, Federal Reserve Bank of St Louis.
Liquid liabilities	LL	Percent to GDP	World Development Indicators
Deposit money banks	DMB	Percent	
Domestic credit to the private sector	DCPS	Percent to GDP	
Inflation rate	INF	Percent (Consumer price index, average annual change)	
Trade openness	TRADE	Percent of GDP	
Government expenditure	GEXP	Percent of GDP	
Educational attainment	EDU	Ratio of total enrollment, to the population of the age group	Eurostat
Index of Economic Freedom	IEF	The range can vary, but it usually spans from 0 to 100, with 0 indicating minimal or no environmental policy stringency, and 100 representing the highest level of stringency, reflecting the most comprehensive and strict environmental regulations and policies.	Heritage fondation

Source: Authors' calculations.

Table 2. Descriptive statistics

Descriptive stats.	GR	ROA	NIM	DCPS	DM	LL	GOVEXP	INF	TRADE	EDU	IEF
Mean	3.20	1.02	4.39	46.76	96.51	56.78	18.70	3.97	109.85	77.29	64.23
Maximum	12.77	4.79	20.74	101.39	100.00	96.01	29.94	95.00	190.70	89.20	80.00
Minimum	-15.31	-9.99	1.36	0.19	63.50	11.27	9.69	-1.58	22.49	46.42	29.4
Standard deviation	3.95	1.44	2.42	17.23	6.69	16.19	2.95	7.55	32.43	7.70	7.591
No. of observations	352	319	330	280	325	320	352	340	352	301	352

Source: Authors' calculations.

the variables used in the model can be found in Table 1.

Additionally, we provide descriptive statistics for all the countries and engage in a comprehensive discussion of the primary trends in the evolution of the selected variables over time (Table 2).

IV. Methodology

Maddala and Wu (1999) highlighted the advantages of using panel data analysis, which we applied to ensure consistent and unbiased results. We employed three different estimation techniques to address the challenges of heterogeneity and endogeneity in our analysis.

The initial analysis started with the fixed effect model, a commonly used statistical method in panel data analysis. This model incorporates fixed effects or dummy variables to account for unobservable, time-invariant heterogeneity among cross-sectional units. It effectively controls for unobserved heterogeneity and produces unbiased coefficient estimates. However, it has limitations, especially with a large number of cross-sectional units or when the assumption of constant effects over time doesn't hold.

As observed in previous studies by Gábor & Gábor (2021), Pattillo et al. (2002), estimating the relationship between variables in a panel data context faces challenges related to heterogeneity and endogeneity. Pooled Ordinary Least Squares (OLS) regression cannot address unobservable country-specific effects, leading to inconsistent and biased estimates. Therefore, we evaluated alternative econometric models, specifically the Fixed Effect Method (FEM) and Random Effect Method (REM), which effectively control for heterogeneity within the sample.

However, these models can introduce correlation between lagged endogenous variables and residuals, negatively biasing results. To address potential endogeneity, we adopted an instrumental variable (IV) estimation technique, specifically the System Generalized Method of Moments (S-GMM) by Blundell and Bond (1998). All control variables were considered endogenous, and we used lags of the variables as instruments to address endogeneity concerns. The balanced ratio of instruments relative to the number of countries was maintained, following the methodology outlined by Klein and Weill (2018).

We categorized variables as endogenous or predetermined, with education and lagged variables falling into the latter category. To validate the selected instruments, we conducted Sargan tests and assessed serial correlation in the residuals through first-order and second-order differentiation. According to the findings of Arellano and Bond (1991), first-order autocorrelation in the differentiated residuals doesn't necessarily imply inconsistent estimates, while second-order autocorrelation could indicate potential issues with consistency.

In summary, our analysis employed panel data analysis with three different estimation techniques to address the challenges of unobservable heterogeneity and endogeneity. We started with fixed effects to control for unobserved heterogeneity, and then we considered alternative models like FEM and REM.

To mitigate endogeneity, we adopted an IV estimation technique, specifically S-GMM, and validated the instruments selected. This comprehensive approach allowed us to obtain robust and reliable results in our analysis of the impact of bank performance on economic growth.

To estimate the impact of bank profitability on economic growth, we followed Klein and Weill (2018) and proposed the following growth model:

$$gr_{i,t} = \alpha_0 + \alpha_1 gr_{i,t-1} + \beta_1 ROA_{i,t} + \beta_2\ ROA_{i,t-1} + \beta_3 NIM_{i,t} + \varepsilon_{i,t} \quad (1)$$

where gr stands for real GDP growth and ROA for banks' return on assets. Countries are indexed with i and years with t; $gr_{i,t-1}$ is the past realisation of growth; $ROA_{i,t}$ denotes banks' return on assets; $ROA_{i,t-1}$ indicates the impact of the past level of bank profitability on growth; $NIM_{i,t}$ is the net interest margin; t is a matrix comprising of the other control variables (education, inflation, trade openness and government expenditures). As already mentioned, we used the age dependency ratio as an exogenous instrument in the regression equations. The estimation results of the equation given in (1), using the S-GMM test, are demonstrated in Table 3.

To test the robustness of our results, we will employ the Two-Stage Least Squares (2SLS) method to assess the impact of selected determinants on economic growth, specifically the relationship between bank performance (Return on Assets or ROA) and GDP growth. The 2SLS method involves a two-step process aimed at addressing potential endogeneity concerns and disentangling the relationship between bank performance and GDP growth.

In the first stage, instrumental variables are used

Table 3. Empirical results

Explanatory variable	Fixed effects panel data estimation	2SLS	System GMM estimation
	[1]	[2]	[3]
Lagged real growth of GDP per capita	**0.232***** [0.04]	**0.365***** **[0.09]**	**0.322***** [0.04]
Return on assets (ROA)	**0.534***** [0.23]	0.625***** [0.12]	**0.598***** [0.19]
Lagged ROA	**-0.211***** [0.17]	**-0.299****** **[0.15]**	**-0.268****** [0.09]
Net interest margin	0.175 [0.05]	0.115 [0.10]	-0.074 [0.26]
Liquid liabilities	0.135 [0.09]	**0.091***** **[0.10]**	**0.139****** **[0.13]**
Deposit money banks	**0.178***** **[0.12]**	**0.152****** **[0.09]**	**0.149****** **[0.27]**
Domestic credit to the private sector	0.248***** [0.17]	0.298****** [0.11]	0.212***** [0.25]
Ln (Government expenditure/GDP)	-2.169 [3.23]	**-2.137** **[3.28]**	**-2.712****** [1.42]
Ln (Trade openness)	**3.291***** [2.41]	3.612****** [2.41]	1.269 [0.21]
Ln (1+infl. rate/100)	**-11.145***** [6.11]	-13.290* [7.17]	-5.451 [5.61]
Educational attainment	-5.489 [4.15]	-5.269 [4.53]	-4.736 [1.54]
Index of Economic Freedom	0.078 [0.11]	0.052 [0.25]	0.059 [0.32]

Table 3. Continued

Explanatory variable	Fixed effects panel data estimation	2SLS	System GMM estimation
	[1]	[2]	[3]
Number of countries	16	16	16
Number of instruments	/	31	43
R-squared	0.832	0.785	/
Sargan test (p-value)	/		0.738
Arellano-Bond test [AR (1)]	/		0.005
Arellano-Bond test [AR (2)]	/		0.642

Source: Author's calculations
Note: [1] Robust standard errors are reported in parentheses.
[2] All specifications include time dummy variables, but the statistically significant ones are not reported here.

to obtain a reliable estimate of ROA while mitigating the potential reverse causality issue, where GDP growth could affect ROA. These instrumental variables are selected to be correlated with ROA but not directly with GDP growth. This initial step helps us obtain a more robust and less endogeneity-affected measure of ROA.

In the second stage, the residual ROA, which represents the part of ROA not explained by the instrumental variables and is less likely to be influenced by endogeneity, is used to assess its impact on GDP growth. This residual ROA is a more robust measure of bank performance that has been purged of potential endogeneity concerns.

By employing the 2SLS method and focusing on the residual ROA in the second stage, we can test the robustness of the positive association between bank performance and GDP growth while considering various potential determinants that could influence this relationship. This approach allows for a comprehensive analysis of the impact of bank performance on economic growth, enhancing the reliability and credibility of our findings.

V. Results from Panel Data Estimations

The estimated coefficients from the three-panel data models (static fixed-effects panel data estimation,2SLS and S-GMM estimation) are presented in Table 3.

The estimation results reveal a significant and positive relationship between Return on Assets (ROA) and economic growth. Even after addressing potential endogeneity concerns, particularly reverse causality, our empirical specification indicates a positive link between contemporaneous ROA and real GDP growth. To elaborate, a one percent increase in ROA is associated with a higher economic growth rate, ranging between 0.534 to 0.625 percentage points, all else being equal. It's worth noting that the second lag of the dependent variable did not yield significant results, and therefore, we won't present those estimation results here. However, we also explored the potential dynamics of bank profitability by including past levels of ROA (ROAt-1). Interestingly, the impact of profitability on growth appears to be short-lived, as evidenced by the negative influence of past profitability levels. Specifically, a one percent increase in past profitability levels leads to a decrease of 0.211 to 0.299 percentage points in contemporaneous economic growth.

These results imply that bank profitability may play a role in both the upward and downward phases of the business cycle. The business cycle encompasses economic fluctuations, including periods of expansion (upward phase) and contraction (downward phase). Although we didn't explicitly test this, it's evident that this issue warrants further investigation. The

hypothesized impact of bank profitability can be conceptualized in two phases:

Upward Phase (Expansion): During economic expansion, bank profitability tends to rise. This is because expanding economies typically witness increased demand for loans from businesses and consumers. Banks generate income from interest on loans, so higher lending activity can boost profitability. Additionally, lower default rates on loans during economic expansions contribute positively to profitability, as borrowers are in a better position to repay their debts. Furthermore, banks may benefit from higher fee income from services like investment banking and asset management during periods of economic growth, further enhancing their profitability.

Downward Phase (Contraction): Conversely, during economic contractions, bank profitability may decline. Reduced borrowing by businesses and consumers during economic downturns leads to decreased demand for loans, resulting in reduced interest-based income for banks. Higher default rates on loans during economic hardships also increase provisions for loan losses, negatively impacting bank profitability. Additionally, decreased demand for fee-based services like investment banking during economic downturns can further affect profitability.

It's crucial to recognize that other factors, including changes in interest rates, regulatory policies, market conditions, and bank-specific factors, also influence bank profitability and its impact on the business cycle. The relationship between bank profitability and the business cycle is intricate and multifaceted, shaped by the interaction of various factors. Furthermore, our findings align with previous research by Ayadi et al. (2010), Alev (2018), as well as Klein and Weill (2018; 2022), emphasizing that profitable banks can act as drivers of economic growth. Therefore, economic growth is likely associated with increased bank profitability.

In summary, our estimations lead to two main conclusions:

Bank profitability contributes to economic growth, with evidence indicating a positive association between current profitability levels and higher economic growth rates.

Nevertheless, when we account for the dynamic aspect of bank profitability by concurrently evaluating the consequences of both prior and present profitability levels, the influence on economic growth loses its statistical significance. The favorable effect of current levels is offset by the unfavorable impact of past levels.

The apparent contradiction between these two results can be understood as follows:

Business Cycle Dynamics: One possible explanation for this contradiction is related to the phases of the business cycle. Economic growth is not a constant; it experiences fluctuations over time, including periods of expansion (upward phase) and contraction (downward phase) in the business cycle.

Lagged ROA and Economic Growth: The negative coefficient for Lagged ROA might indicate that past high bank profitability doesn't necessarily lead to high current economic growth, possibly because economic growth experiences cycles. When a country has experienced strong economic growth in the past (associated with past high bank profitability), it doesn't guarantee that the same level of growth will be sustained in the current period.

Current ROA and Economic Growth: The positive coefficient for ROA suggests that during periods of current high bank profitability, economic growth is positively influenced. In economic expansion phases, bank profitability might play a more direct role in fueling economic growth due to increased lending, lower default rates, and higher fee income.

In summary, the results may reflect the dynamic nature of the relationship between bank profitability and economic growth, considering the phases of the business cycle. During expansion phases, bank profitability appears to have a more direct and positive effect on economic growth, while the lagged profitability might not necessarily lead to sustained growth in the current period. The interaction between these phases and their effects on bank profitability and economic growth is a complex area that would benefit from further investigation and research.

Regarding other explanatory variables, we observed

that past GDP growth rates have a positive contribution to current economic growth, implying a degree of inertia or persistence in growth dynamics.

In the context of the selected Central and Eastern European countries, the findings suggest that the financial health and practices of the banking sector play a substantial role in driving economic growth. Specifically, the positive and statistically significant impact of "Liquid liabilities" signifies that a well-functioning financial system, capable of meeting short-term financial obligations, contributes to economic growth across these nations. The presence of robust "Deposit money banks," which effectively manage deposits and provide lending services, is vital for sustaining economic growth in this region. Moreover, the significant positive effect of "Domestic credit to the private sector" highlights the importance of accessible loans for businesses and individuals, which fosters economic development within these countries. These financial factors are key drivers of economic growth within the unique economic landscapes of Central and Eastern Europe, emphasizing the critical role played by the banking sector in their economic progress.

Lastly, our results emphasize the substantial and positive influence of trade openness on a nation's economic growth. This aligns with the notion that open economies have the advantage of accessing advanced technology and expanding their markets, which, in turn, fosters economic growth. These findings align with the principles of endogenous growth theories.

On the other hand, the inflation rate exhibited a negative association with economic growth in the selected countries during the study period. This suggests that changes in inflation rates should be carefully considered when implementing economic policies. Moreover, policymakers need to balance targeted economic activity increases with maintaining stable and low long-term inflation rates, especially as countries in Central and Eastern Europe enter periods of recovery and economic expansion following global crises.

Finally, our Sargan test results confirm the validity of our instruments and indicate the presence of autocorrelation. However, the AR(2) test shows no second-order serial correlation in the specified models.

VI. Conclusions

Our research investigated the connection between bank profitability and economic growth, focusing on a dataset spanning 16 countries in Central and Eastern Europe from 1999 to 2022. Our analysis revealed two key findings. Firstly, there is a statistically significant and positive relationship between current bank profitability and contemporaneous economic growth. Specifically, a one percent increase in a bank's return on assets corresponds to a higher economic growth rate ranging between 0.575 to 0.603 percentage points, holding other factors constant. Secondly, when examining the more dynamic aspect of bank profitability by considering past profitability levels, we observed a statistically significant and negative impact on economic growth. A one percent increase in past profitability levels results in a decrease in economic growth by 0.23 to 0.27 percentage points.

Additionally, our study aligns with earlier empirical research in several key areas. We find indications of growth persistence, suggesting that current economic growth is influenced by past performance. Furthermore, we confirm that international trade openness positively impacts economic growth in the chosen countries, while a negative relationship is observed between inflation and economic growth.

The findings of our research have practical implications for central banks, governments, financial institutions, and investors in Central and Eastern European countries:

Policy Implications for Central Banks and Governments: Policymakers can use our findings to formulate policies aimed at promoting economic growth. Given the positive association between bank profitability and economic growth, measures supporting and enhancing bank profitability could

include maintaining a stable regulatory environment, effective supervision, and fostering an environment conducive to financial innovation.

Financial Institutions: Banks and financial institutions can use these findings to inform their strategies. Profitable banks may find it easier to attract investors and access capital markets. They can focus on prudent risk management practices to maintain and potentially increase profitability.

Investors: Investors can assess the attractiveness of the banking sector in these countries based on the research findings. Higher bank profitability might indicate a more favorable environment for investments in the financial sector.

While our study provides valuable insights, it has some limitations, including missing data and omitted variables. These limitations could lead to potential biases and reduced precision in the results. Addressing these limitations in future research could provide more robust and comprehensive findings.

Future research avenues could explore the influence of additional determinants like customer service, bank reputation, and marketing strategies. Alternative methods such as two- or three-stage least squares or panel co-integration models could be employed. Investigating the effects of bank types and domestic-foreign ownership on bank-level data using quantile regression estimators could yield valuable insights and expand our understanding of the relationship between bank profitability and economic growth.

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