Comparative Economic Research. Central and Eastern Europe
Volume 29 Number 2, 2026
https://doi.org/10.18778/1508-2008.29.14

State-owned Banks and Profitability in Central and Eastern Europe: Testing the State-owned Banks Advantage Hypothesis

Jan Koleśnik https://orcid.org/0000-0003-2182-5645
Ph.D., Associate Professor, SGH Warsaw School of Economics, Warsaw, Poland, e-mail: jan.kolesnik@sgh.waw.pl

Filip Lisak https://orcid.org/0000-0001-8309-1654
Ph.D., SGH Warsaw School of Economics, Warsaw, Poland, corresponding author,
e-mail: fl67696@doktorant.sgh.waw.pl

Abstract

This paper presents and tests an original state-owned banks advantage hypothesis, according to which the nationalisation of a part of the banking sector may positively influence the financial results and reduce risks associated with banking activity. The hypothesis was tested using a model comparing three groups of banks: state-owned banks, foreign owned banks, and domestic privately owned banks. The estimation of model parameters was carried out using a fixed-effects panel data analysis for banks based in Central and Eastern European countries over the period 2014–2020. Based on the models for ROA and, separately, ROE, a statistically significant negative relation was observed in the returns generated by state-owned banks compared to private domestic and foreign banks. The results also indicate a higher business risk for state-owned banks, measured by the level of non-performing loans, which is likely to be related to involvement in projects that are not always profitable but often involve higher credit risk. Therefore, we argue that elements of a country's economic or social policies matter when conducting business but negatively affect the performance of state-owned banks. The results of the model also demonstrate that a bank's market size negatively affects its performance.

Keywords: banking sector, state-owned banks, nationalisation, banks' profitability, Central and Eastern Europe
JEL: E59, G18, G21, G32

Funding information: J.K. – Associate Professor, SGH Warsaw School of Economics, Warsaw, Poland; F.L. – SGH Warsaw School of Economics, Warsaw, Poland, (Corresponding author).
The percentage share of the Authors in the preparation of the work is: J.K. – 50.00%, F.L. – 50.00%.
Conflicts of interests: None.
Ethical considerations: The Authors assure of no violations of publication ethics and take full responsibility for the content of the publication.
Received: 5.11.2025. Verified: 29.12.2025. Accepted: 23.03.2026

Introduction

The study objective

In the early years of their economic and political transformations, Central and Eastern European (CEE) countries were characterised by a significant share of state-owned enterprises. Privatisation involved reducing the direct influence of the state on enterprise activities. It was one of the most important parts of the reform process in post-communist countries, undertaken in parallel with the political liberalisation and stabilisation (Lipton et al. 1990). The banking sector underwent a particularly significant transformation. As Patev, Lyroudi, and Kanaryan (2003) point out, in the last decade of the twentieth century, the ownership structure of the banking sector in CEE changed from 100% state participation to about 90% private ownership. As Domanski (2005) discusses, in some cases, the unsatisfactory results of domestic privatisation prompted governments to encourage foreign capital to invest in domestic banks, which were subsequently acquired by foreign investors. This led to the dominance of foreign capital in CEE's banking sector, as pointed out by Darvas, Schoenmaker, and Veron (2016) and Iwanicz-Drozdowska, Smaga, and Witkowski (2017). Banks in the region also evolved from the 1990s onwards, driven by the accession of post-communist countries to the European Union (EU). Another factor was the 2008–2009 financial crisis and the subsequent implementation of post-crisis regulations, including the Capital Requirements Directive IV (CRD IV), the Capital Requirements Regulation (CRR), and the Bank Recovery and Resolution Directive (BRRD). Their main objective was to restore financial stability in Europe and stimulate the real economy through public investment (including public-private partnerships) and the protection of selected sectors of the economy (Koleśnik 2014). The outcome of the 2008–2009 financial crisis, as discussed by Maudos and Vives (2019), was the progressive consolidation of the banking sector, particularly in countries where the need to restructure the banking sector emerged.

However, the key issue is the impact of the financial crisis, which led to an increase in the number of politicians calling for direct state intervention through the takeover of companies in difficulty. As Panizza (2023) notes, it is likely that banking crises lead to an increase in state ownership. In recent years, the acquisition of a bank at risk of insolvency has become possible thanks to the resolution procedure provided for in Directive 2014/59/EU (BRRD), which allows for the sale of banking activities, the establishment of a bridge institution, the application of debt write-down or conversion instruments, and the separation of assets (Kozińska 2018). As a result, the renationalisation of the banking sector – primarily the Polish banking sector – lasted for several years. According to our calculations based on data from Deloitte (2020) and the European Central Bank, at the end of 2020, the state's share in the banking sector in Poland increased from around 23% to 45% between 2016 and 2020. This was mainly due to the state takeover of the second and ninth-largest credit institutions by asset value. Analysing the situation in other countries, the share of state ownership in Hungary and Romania at the end of 2020 increased by approximately 3 percentage points (compared to the previous year) and amounted to over 12% of the entire sector. Minor increases were also recorded in Bulgaria and Croatia.

The study examines whether state-owned banks (SOBs) differ in terms of efficiency and risk-taking behaviour compared to both foreign owned banks (FOBs) and domestic privately owned banks

(DOPBs). This article contributes to the discussion on the advantages and disadvantages of state involvement in the banking sector. The approach presents the viewpoint of the banks' shareholders, who seek to increase their rate of return and reduce business risk. This study is original because, to date, there has been little research on the impact of the renationalisation of the banking sector (i.e. the state's reacquisition of shares in banks), in contrast to the numerous articles analysing the relationship between shareholding structure and bank performance. There are also few analyses concerning whether SOBs exhibit greater efficiency than FOBs and DOPBs.

Motivation of the research

State participation in the banking sector, viewed as a one-sided process of nationalisation, is associated mostly with rescuing the economy in both developed and developing countries by providing assistance to systemically important entities at risk of insolvency. In recent years, however, other solutions have prevailed over nationalisation processes, mainly due to the mechanisms provided for in the BRRD Directive and the obligations arising therefrom. The latest research on the Polish case of resolution was published by researchers such as Iwanicz-Drozdowska, Kurowski, and Witkowski (2024).

This article analyses the phenomenon of state participation in the economy through shareholding. This was the case in European countries, including Croatia, which Hočevar (2021) described as state consolidation. According to Voszka (2018), a similar process of nationalisation in Hungary was part of a complex political process and was not aimed solely at crisis management. Voszka argues that it stems from the government's policy of taking over strategic sectors of the economy. Méró and Piroska (2016) point out that in 2013–2014, the Hungarian government acquired shares in several smaller banks, guided by political preferences for banking nationalism. They present the "banking nationalism" concept as giving priority to the national interest when developing policies towards banks, including their ownership, regulation, and supervision. This process spread to Poland as "renationalisation" and is particularly interesting because it involves the repurchase of previously privatised companies. According to Pyka and Pyka (2017), successive state acquisitions of banks were motivated by the belief that domestic banks were too dependent on foreign capital, which exerted too much influence. The need to "repolonise" this sector had previously emerged as the government's response to concerns about the large share of foreign capital in the Polish banking sector (Węcławski 2015).

The process of "denationalisation" took place at the same time in another CEE country, Slovenia, which had the largest state share in the banking sector in the region. By the end of 2019, the government had sold its majority stakes in the country's first and third largest banks, in line with EU recommendations. The state's share in the assets of the Slovenian banking sector fell from around 40% to around 6% within just one year. A study on this topic was conducted by Piroska and Podvršič (2020), who link it to the policy of "New European Banking Governance" (NEBG), which includes new European regulations and policies for restructuring the banking sector. The state had to sell its shares so that foreign institutions could recapitalise the sector. According to that study, NEBG led to a significant weakening of democratic institutions in favour of supranational supervision of the banking sector, as well as to a prolongation of the banking crisis in Slovenia. This policy met with strong public resistance. In Romania, most SOBs were

taken over by foreign institutions in response to the need to revive the banking sector, which had suffered from inefficiency and public corruption (Dumitriu, Stefanescu, and Nistor 2012).

In other CEE countries, state participation in the banking sector is negligible and is mainly limited to so-called export-import (EXIM) or development banks. These banks mainly carry out activities commissioned by the government, such as supporting economic and social programmes (Zaleska 2007).

Literature review

Reasons for the re-nationalisation of banks

The literature on the subject cites measures intended to "rescue" the sector or individual entities as the main reasons for the nationalisation of banks in EU countries. Recent developments in the sector indicate that renationalisation is a long-term policy, although its assessment in existing research remains clearly ambiguous. The primary driver for the state takeover of banks is the concept of "banking nationalism" presented by Méró and Piroska (2016). This concept is defined as giving priority to the national interest when developing policies towards banks, including their ownership, regulation, and supervision. That study points out that the banking sector and the policies of individual EU countries are influenced by the integration of the financial sector, and in particular by the Banking Union itself. However, banking nationalism, manifested in strong links between banks and the government, is identified as one of the causes of the crisis in the Eurozone in 2010 (Epstein and Rhodes 2014). A process of renationalisation can be observed in the banking sector in Poland. The need to "repolonise" it had already emerged earlier (Węcławski 2015), mainly as a response by the government to concerns about the large share of foreign capital in the Polish banking sector. According to Pyka and Pyka (2017), further acquisitions are motivated by the belief that domestic banks are too dependent on foreign capital and that their influence on the activities of Polish credit institutions is too significant. Mazzucato and Penna (2016) point out that the objective of development banks is not only to rectify market failures but also to shape the financial market and policies for development. In some countries, such as Poland, these banks are called "national" or "state" banks. In addition to commercial activities, they carry out activities mandated by the government, such as supporting economic and social programmes (Zaleska 2007).

Studies indicating the benefits of state-owned banks in the sector

Several studies point to the benefits of banks remaining under state capital control. Using Croatia as an example, Davidovic, Uzelac, and Zelenovic (2019) found that SOBs were more efficient than banks owned by private investors. Furthermore, the banking crisis in Croatia did not significantly affect the performance of SOBs compared to other entities in the sector. Their study suggests this was due to the proper management of asset and liability maturities, as well as the operational flexibility of the SOBs. Research by Pyka and Nocoń (2018) on the nationalisation of several banks in Poland focused mainly on two commercial banks: Alior Bank S.A.

and Pekao S.A. After the nationalisation of these banks, a significant increase in the efficiency of their operations in terms of profitability was observed. According to a study by Krasovskis, Limanskis, and Pancenko (2016) on the competitiveness of the banking sector in Latvia, the largest banks in the country – SEB Banka, DNB Banka, and Swedbank, which are all foreign banks – had lower liquidity ratios than other banks. They also performed poorly in terms of ROE compared to smaller entities.

Work on the benefits of SOBs is also based on the experience of various regions where this is structurally conditioned, including India, Russia, and China. These conclusions were drawn by Belousova et al. (2021) based on the example of the Russian sector. Their observations from 2004–2015 show that although SOBs are not the most efficient, their performance is significantly better than that of DOPBs. This relationship is explained by the large amount of government support and guarantees that allow SOBs to provide cheaper financing and work with more reliable customers. On the other hand, FOBs have a comparative advantage in terms of better technology and management, including a developed risk management system. The Chinese sector was studied by Koroleva et al. (2021), who argue that larger SOBs with higher credit quality have accordingly higher profitability compared to other banks. Sengupta and De (2020) note that the nationalisation of the banking sector in India was intended to stabilise the country's weak banking system and encourage the public to use banking services. The study argues that both goals were achieved. Boubakri and Saffar (2019) present evidence that state ownership of banks has a positive impact on banks' use of debt financing, and therefore, private companies derive greater benefits from these banks.

Pak (2019) analyses banks based in the countries of the Eurasian Economic Union. The research notes the positive impact of state ownership on a bank's probability of survival (but not on its Net Stable Funding Ratio). Haque and Brown (2017) examine the banking sector in the Middle East and North Africa (MENA) countries and observe a significant impact of the ownership structure on the efficiency of the sector. In particular, they argue that the participation of governments as shareholders of banks had a positive impact on their cost efficiency, but not on their profitability. Unlike the SOBs, the FOBs covered by the study did not show a significant advantage in terms of cost management or profitability. Furthermore, increasingly stringent capital requirements had a negative impact on the cost efficiency of foreign banks, unlike domestic banks.

Cho and Kalinowski (2010) raise another important issue. In Korea, a banking sector model was introduced in which the state became the majority shareholder of banks. Its objective was not exactly to prevent the effects of financial crises in the short term, but to restructure banks in the long term. According to that research, the role of the government was crucial to the success of the subsequent commercialisation of banks. This is an example of the socialisation of losses and privatisation of profits as the basis for economic initiative. Cho and Kalinowski conclude that SOBs performed better in many areas than privately managed enterprises. This is important because, in their view, the privatisation process is not justified by economic efficiency but is solely the result of free market ideology as well as international pressure.

Studies indicating the disadvantages or the indifference of state-owned banks in the sector

Another group of studies points to the detrimental role of state ownership in the banking sector and the lack of significant differences between the profitability or risk-taking of state-owned and private banks. Research on the disadvantages of state ownership in CEE includes the work of Stančić, Čupić, and Obradović (2014) on four transition economies in South-Eastern Europe between 2005 and 2010. That study found that DOPBs perform better than SOBs, which may be due to lower ownership concentration and smaller boards of directors – factors that also negatively affect bank profitability. Jackowicz, Kowalewski, and Kozłowski (2013) emphasise that the view that the state should participate as a shareholder in the banking sector's ownership structure is becoming increasingly popular in CEE countries. However, they note that SOBs are sensitive to political pressure. In the long term, any decision not supported by economic factors may adversely affect the stability of the financial sector. Fang, Hasan, and Marton (2011) obtained similar results for the same region between 1998 and 2008. Their research describes how foreign banks are characterised by higher profit efficiency but lower cost efficiency, while SOBs are associated with lower profit efficiency than DOPBs. Bonin, Hasan, and Wachtel (2005), analysing the performance indicators of the largest banks in Bulgaria, the Czech Republic, Croatia, Hungary, and Romania, concluded that FOBs were more efficient compared to SOBs. Nevertheless, in their opinion, the timing of privatisation was fairly important, as early privatisation gave management more time to implement strategies designed to ensure efficiency.

Recent research by Panizza (2023) shows that, contrary to earlier publications, there is no difference between the profitability of privately owned banks and SOBs. Davydenko et al. (2023) highlight the costs of recapitalising SOBs, claiming that these costs disrupt state finances and make Ukraine even more dependent on debt. Doan, Lin, and Doong (2020), analysing the process of income smoothing among banks, indicated that around election periods, there was a strong tendency for SOBs to smooth their results. Ismiyanti, Rahman, and Mahadwartha (2018) conclude that both foreign and state ownership can increase banks' propensity to take risks. However, in the case of SOBs, this is mainly caused by the political objectives that governments strive to pursue.

Research on the banking sector in Asian countries also demonstrates the shortcomings of SOBs. Han, Epetia, and Cheng (2021) observe that while the presence of SOBs in China is strong, the distortions in interest costs associated with state ownership are more severe. Their research shows that the misallocation of credit is also linked to the ownership structure of Chinese enterprises, which is dominated by state ownership. Rosalina and Nugraha (2019) argue that government ownership in Indonesia has a statistically significant negative effect on bank profitability compared to domestic and foreign private ownership. They believe that these results are consistent with the theory of global advantage. Kamarudin, Sufian, and Nassir (2016) highlight that the level of profit efficiency for both state-owned and private banks in Bangladesh declined in the years following the financial crisis, but private commercial banks still show slightly higher levels of efficiency than state-owned commercial banks.

There are also studies pointing to the detrimental impact of state ownership on banks' risk levels and market behaviour. Lee and Hooy (2020), examining the banking sector in Asian emerging markets, demonstrated a link between state ownership of banks and greater risk-taking in terms of credit risk and return volatility. Bai et al. (2020) argue that the problem of moral hazard is greater in SOBs, while it is smaller in listed banks. Meanwhile, based on data from 13 countries in the MENA region, Lassoued, Sassi, and Attia (2016) argue that state ownership of banks is a factor that encourages higher risk-taking, whereas foreign capital has the opposite effect. Analysing a sample of large European banks, Iannotta, Nocera, and Sironi (2013) found that SOBs have lower default risk but higher operational risk than private banks, which may indicate that government protection encourages greater risk-taking. Jia (2009) believes that lending by SOBs is less prudent than lending by joint-equity banks and sees this as consistent with the hypothesis that private banks are accountable to their shareholders and depositors. As a result, private banks have a much greater incentive to lend cautiously than SOBs.

Finally, Bhattacharyya, Lovell, and Sahay (1997), based on data from the Indian banking sector, proved that publicly owned banks were the most efficient in terms of customer service. The study is important because a similar trend in sector ownership was observed in India during the period analysed: an increase in the number of FOBs and a simultaneous decrease in the number of SOBs. At the end of the period analysed, FOBs proved to be almost as efficient as SOBs, considering regulatory constraints and capital requirements. Thus, banks with a majority foreign capital share were able to adapt to an increasingly competitive environment.

Materials and Methods

Research hypothesis

State ownership of banks has been the subject of numerous studies intended to determine the advantages of state ownership in a free-market economy. An influential work presenting the theories on state-owned enterprises is that of Peng et al. (2016), who examine the fundamental theories related to the existence of state-owned enterprises. Indeed, the debate on the revival of state capitalism has been ongoing for a long time, including an important work by Cornett et al. (2010), who note that ownership structure is widely recognised as an essential determinant of company performance. Based on corporate governance theory, agency-cost theory, and contestable-markets theory, that study tests hypotheses regarding differences in performance between state-owned and private banks before, during, and after the Asian financial crisis.

Today, governments and banking regulators can use better, less costly mechanisms to revive a bank, such as the aforementioned resolution procedure. In the CEE region, given the high economic growth, authorities do not necessarily have to buy or own banks that are unprofitable or have no positive prospects. The current renationalisation, although influenced by political factors, no longer appears to be a purely political process but also a commercial one, focused on a long-term policy of developing banks, the market, and the entire economy. Although political factors will certainly continue to have a strong influence on the activities of commercial SOBs, governments as shareholders seek to increase the ability of these banks to generate profits and achieve economic

policy objectives. An inefficient bank would represent a financial burden on the state treasury; however, financial inefficiency does not necessarily mean total inefficiency, as potential social benefits must also be taken into account. They were analysed by Relaño (2011), who argued – using the example of social banks – that companies have options other than just following the logic of maximising financial profits. He also found that social banks are much more consistent in this respect. In our view, however, even the financial profits of SOBs benefit the entire economy, as in most cases these profits are redistributed. Furthermore, issues regarding the relationship between the principal and agent, which often arise in relation to state-owned enterprises, may no longer be as relevant as before. The banks analysed are commercial in nature and are subject to corporate governance principles in the same way as other commercial companies. Some of the banks analysed are listed on stock exchanges, which means these entities must maintain a high level of transparency by publishing periodic reports and applying rules on confidential information. In such cases, the government is not the sole shareholder.

Given the political environment, which differs significantly from the situation in the 1990s and 2000s, the support of some CEE countries for state ownership of banks, and the research presented in this article, we wish to examine whether theories predicting that SOBs are not beneficial for the economy are correct. We therefore propose to test an original hypothesis, hereafter referred to as the "state-owned banks' advantage hypothesis". According to this hypothesis, the nationalisation (or re-nationalisation) of a bank has a positive impact on its financial performance and on the risks associated with its activities. The main research question is whether the acquisition of banks by state capital has a significant positive impact on their profitability and risk-taking behaviour. This will be measured using return on assets (ROA), return on equity (ROE), and non-performing loans (NPL); on this basis, we will attempt to prove the original hypothesis. In addition to seeking answers to the research question, this article also strives to find – based on available research and our observations – associations between the results obtained and possible causes, rather than specifically identifying the channels through which a potential benefit may arise.

Based on the literature and our observations, arguments that would justify such a hypothesis and support the claim that state ownership has a positive impact on financial performance and risk include, for example, greater credibility of state entities in economic transactions, the possibility of obtaining state guarantees, and general capital stability. This is relevant in the context of the COVID-19 pandemic, as the financial collapse was caused by purely external factors, not factors within the financial system. Furthermore, although the banking system is subject to a higher level of special protection compared to other sectors of the economy, SOBs that have been "renationalised" are of greater importance to the state authorities, as funds were spent on their acquisition (Koleśnik 2019). These characteristics make listed banks attractive to shareholders due to their potentially lower investment risk or higher likelihood of dividend payments. States generate revenue from their economic entities mainly through the distribution of profits from controlled companies.

However, there are arguments which may challenge this hypothesis. In addition to the goal of profit optimisation, such banks may be required to pursue "national interest" objectives, such as benefiting the national economy and citizens. A change in the ruling party may result

in a change in both the bank's policy and the composition of its management board, which may also prevent the implementation of long-term strategies. Furthermore, banks that have an infrastructural advantage or are given preferential treatment by state authorities may impose higher costs or fees on their customers and partners. At the same time, they do not have to bear a high risk of losing their customer base.

Data selection

The analysis uses data from 2014 to 2020 for banks based in 11 CEE countries (Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia). This period was chosen to eliminate the effects of the 2008–2009 global financial crisis and the subsequent restructuring measures taken by several banks. This selection accounts for a number of credit institutions that failed during this period, as well as mergers and acquisitions carried out by the Hungarian government, among others. In addition, the transition period resulting from the accession of Romania and Bulgaria (in 2007) and Croatia (in 2013) to the EU was eliminated, as these countries had to adapt their legal systems to the common regulatory requirements of the EU. Finally, on 1 January 2014, the most important regulations governing banking activities – the CRD IV/CRR package – came into force. This analysis does not cover branches of credit institutions, branches of foreign banks, cooperative banks, or other financial institutions that are not credit institutions and are not subject to CRD IV/CRR under Article 2 (5) of the Directive (i.e., Bank Gospodarstwa Krajowego, Magyar Fejlesztési Bank, Magyar Export-Import Bank, and Sid Banka).

A potential drawback affecting the reliability of the analysis could be a situation in which the banks within the research sample that were renationalised or remain under state control – represented by varying SOB variables in the sample depending on the year – were so-called "bad banks". Such entities are characterised by low profitability or equity levels that threaten their operations and ability to meet liabilities. This was not the case in our study, as the renationalised or denationalised banks in the sample were characterised by high, stable profitability. The ROE and ROA ratios of these banks significantly exceeded the average values for the banks surveyed. It is worth noting that they were some of the largest banks on the market. In the case of other SOBs, the results also showed average, albeit in some cases below-average, profitability. However, the cost-to-income and impaired loans-to-equity ratios remained at an average level. The capital ratios of all SOBs – in particular the Tier 1 ratio, which in the EU is intended to ensure a secure capital base – also remained stable and higher than required by applicable regulations. Therefore, the data suggest there are no "bad banks" in the sample of SOBs where profitability or liability burden would remain consistently low.

The data used in the analysis are derived from the banks' financial statements, as well as data provided by the European Banking Federation, the European Central Bank, the World Bank, and the Orbis database as of 12 March 2022. A list of SOBs is provided in Appendix A.

Model estimation

Regression analysis was used to examine the relationship between a bank's efficiency and its ownership structure. This methodology is a commonly used tool for evaluating the impact of explanatory variables on the dependent variable – the efficiency of a given bank (Zoli 2001; Bojāre and Romānova 2017; Haque and Brown 2017; Fekri and Shawtari 2018). The analysis was conducted by comparing SOBs with FOBs, as well as SOBs with DOPBs, i.e., banks domiciled in the country of their largest shareholder. To examine these relationships, data on the variables listed in Table 1 were collected from the banks' financial statements and the economic databases mentioned above.

Table 1. Explanatory variables adopted in the regression model

Category	Variable	Description
Internal factors relating to the bank's business	NetLoansDep	Loans-to-deposits ratio
	lnLossProv	Loan loss provisions
	lnNetFees	Revenue from net fees and commissions
	lnTax	Income tax from the financial statement
	CosttoInc	Cost-to-income ratio
	lnShaf	Equity and capital funds
Banking sector	BMS	Share of the bank's assets in the market in which it operates
Macroeconomic indicators	IR	Long-term interest rate in the country of operation
Shareholding structure	SOB	*Dummy* variable: 1if state-owned, 0 otherwise

Source: authors' own work.

Two income efficiency measures – return on assets (ROA) and return on equity (ROE) – and one risk indicator – natural logarithm of non-performing loans (lnNPL) – were adopted as the response variables. ROA and ROE are two key indicators measuring profit generation efficiency. The NPL ratio is a commonly used risk indicator as it measures credit risk and asset quality (Alizadeh Janvisloo and Muhammad 2013). Zhang et al. (2016) note that non-performing loans are a major obstacle to banking sector development; an increase in NPLs indicates riskier lending, which may lead to a deterioration in credit quality. Hence, this ratio reflects the level of moral hazard within such institutions. The NPL ratio provides insight into whether SOBs are exposed to moral hazard on the part of management or the largest shareholder, the state.

Several variables listed in Table 1 were adopted as explanatory variables. These encompass both internal factors related to bank operations – which vary by institution and sector – and external factors affecting profitability. These include lending capacity relative to customer deposits, which measures the ability to generate a return on assets, as well as non-interest income (commissions and fees) and cost efficiency. Another factor is taxation, the level of which is determined by both tax shields and mechanisms for optimising taxable profits. This is also related to the size of shareholders' funds and, consequently, the cost of equity compared to debt capital. For the banking sector, the BMS variable accounts for market share, explaining advantages resulting from economies of scale or large-base effects. Regarding macroeconomic indicators, the most significant

external factor is the interest rate (IR) in the country of operation, which relates to monetary stability and determines the interest cost of operations. The SOB variable is a dummy variable, taking a value of 0 for non-SOBs or 1 for SOB, and serves to determine the impact of ownership structure on the response variables.

To test the state-owned banks' advantage hypothesis, the following general multiple regression model has been applied:

$$\begin{aligned} E_i = \alpha_i + \beta_1 \text{NetLoansDep} + \beta_2 \text{lnLossProv} + \beta_3 \text{lnNetFees} + \beta_4 \text{lnTax} + \beta_5 \text{CosttoInc} \\ + \beta_6 \text{lnSHAF} + \beta_7 \text{BMS} + \beta_8 \text{IR} + \beta_9 \text{SOB} + \varepsilon_{it}, \end{aligned} \quad (1)$$

where E represents the response variables (ROA, ROE or lnNPL), α_i is a constant for a given observation, and ε_{it} is the standard error term. To control for cross-section heteroskedasticity, standard errors were estimated using cluster-robust variance estimators (*Huber–White* or *sandwich* estimators). The remaining variables are defined in Table 1.

The model is intended to determine whether the performance or risk-taking behaviour of SOBs differs significantly from that of banks owned by other investor types. Parameter estimation was carried out using fixed-effects (FE) panel data analysis on two sets of unbalanced panel data. This method is widely employed to evaluate the impact of cross-sectional data over a specific period (Yaffee 2003) and effectively captures differences both between entities within the same period and across different periods for the same entity. The advantages of panel data analysis include the generation of more accurate results for individual units by aggregating and pooling data. Furthermore, panel data containing time-series observations for multiple units are well-suited for analysing issues of homogeneity versus heterogeneity (Bresson, Hsiao, and Pirotte 2006). This approach has been validated by studies of similar scope regarding banking sector efficiency (Gul, Irshad, and Zaman 2011; Bojāre and Romānova 2017; Fekri and Shawtari 2018). The use of panel data allows us to estimate and test structural changes observed across individual units in both short- and long-term dynamics (Blundell and Mátyás 1992).

The adoption of the fixed-effects model was confirmed by a robust Hausman specification test of overidentifying restrictions, with the exception of the regression model for ROE for FOBs (χ^2 p-value = 0.6386). Because this specific test did not confirm the validity of the FE model, those results will only be treated as supplementary.

Results and discussion

Model estimations

The model parameters were estimated based on observations from the periods described in section 3.2. The results of the parameter estimation using the FE panel data analysis method are presented in the tables below. All estimations were performed using Stata 17 software.

Table 2. Fixed-effects regression results for ROA:
State-owned banks (SOB) vs domestic privately owned banks (DOPB)

					[95% Conf. Interval]		
ROA	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
NetLoansDep	−.002	.001	−2.33	.023	−.004	0	**
lnLossProv	−.405	.105	−3.85	< .001	−.616	−.195	***
lnNetFees	−.137	.133	−1.03	.308	−.404	.13	
lnTax	.09	.048	1.86	.069	−.007	.186	*
CosttoInc	−.031	.007	−4.21	< .001	−.046	−.016	***
lnSHAF	.366	.271	1.35	.182	−.176	.909	
BMS	−1.276	.605	−2.11	.039	−2.488	−.065	**
IR	−.173	.116	−1.49	.141	−.405	.059	
SOB	−.435	.122	−3.56	.001	−.679	−.19	***
Constant	3.889	4.682	0.83	.41	−5.489	13.267	
Mean dependent var		0.730	SD dependent var			1.118	
R-squared		0.526	Number of obs			235	
F-test		24.674	Prob > F			0.000	
Akaike crit. (AIC)		356.565	Bayesian crit. (BIC)			387.701	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Source: authors' own work based on banks' financial statements, data made available by the European Banking Federation, the European Central Bank, the World Bank and the Orbis database.

Table 3. Fixed-effects model regression results for ROE:
State-owned banks (SOB) vs domestic privately owned banks (DOPB)

					[95% Conf. Interval]		
ROE	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
NetLoansDep	−.003	.001	−2.50	.016	−.005	−.001	**
lnLossProv	−.348	.122	−2.85	.006	−.593	−.103	***
lnNetFees	−.166	.124	−1.34	.186	−.415	.082	
lnTax	.13	.067	1.94	.058	−.004	.265	*
CosttoInc	−.033	.008	−4.21	< .001	−.049	−.018	***
lnSHAF	.652	.389	1.68	.099	−.127	1.431	*
BMS	−.924	.605	−1.53	.132	−2.135	.287	
IR	−.113	.123	−0.92	.361	−.36	.133	
SOB	−.231	.131	−1.76	.083	−.494	.031	*
Constant	−.194	5.83	−0.03	.974	−11.872	11.484	
Mean dependent var		0.804	SD dependent var			1.047	

					[95% Conf. Interval]		
ROE	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
R-squared		0.552	Number of obs			235	
F-test		9.624	Prob > F			0.000	
Akaike crit. (AIC)		371.803	Bayesian crit. (BIC)			402.939	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Source: authors' own work based on banks' financial statements, data made available by the European Banking Federation, the European Central Bank, the World Bank and the Orbis database.

Table 4. Fixed-effects model regression results for ROA: State-owned banks (SOB) vs foreign owned banks (FOB)

					[95% Conf. Interval]		
ROA	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
NetLoansDep	−.001	.001	−0.73	.469	−.004	.002	
lnLossProv	−.286	.055	−5.17	< .001	−.396	−.176	***
lnNetFees	−.189	.082	−2.31	.023	−.351	−.027	**
lnTax	.128	.044	2.92	.004	.041	.215	***
CosttoInc	−.026	.003	−7.89	< .001	−.033	−.019	***
lnSHAF	.627	.217	2.89	.005	.197	1.057	***
BMS	−.61	.311	−1.96	.052	−1.226	.006	*
IR	−.021	.05	−0.42	.677	−.12	.078	
SOB	−.379	.07	−5.43	< .001	−.518	−.241	***
Constant	−1.392	2.421	−0.57	.566	−6.191	3.406	
Mean dependent var		0.879	SD dependent var			1.327	
R-squared		0.637	Number of obs			507	
F-test		58.000	Prob > F			0.000	
Akaike crit. (AIC)		748.205	Bayesian crit. (BIC)			786.262	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Source: authors' own work based on banks' financial statements, data made available by the European Banking Federation, the European Central Bank, the World Bank and the Orbis database.

Table 5. Fixed-effects model regression results for ROE: State-owned banks (SOB) vs foreign owned banks (FOB)

					[95% Conf. Interval]		
ROE	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
NetLoansDep	−.003	.003	−1.19	.238	−.009	.002	
lnLossProv	−.277	.072	−3.85	< .001	−.419	−.134	***
lnNetFees	−.341	.116	−2.93	.004	−.571	−.11	***

					[95% Conf. Interval]		
ROE	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
lnTax	.105	.075	1.40	.165	−.044	.255	
CosttoInc	−.027	.005	−6.00	< .001	−.036	−.018	***
lnSHAF	1.225	.52	2.36	.02	.195	2.255	**
BMS	−.59	.49	−1.20	.231	−1.561	.381	
IR	−.004	.067	−0.06	.956	−.137	.129	
SOB	−.368	.21	−1.75	.082	−.783	.048	*
Constant	−7.265	5.585	−1.30	.196	−18.333	3.803	
Mean dependent var		0.842	SD dependent var			1.784	
R-squared		0.517	Number of obs			507	
F-test		15.907	Prob > F			0.000	
Akaike crit. (AIC)		1078.753	Bayesian crit. (BIC)			1116.810	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Source: authors' own work based on banks' financial statements, data made available by the European Banking Federation, the European Central Bank, the World Bank and the Orbis database.

Table 6. Fixed-effects model regression results for lnNPL:
State-owned banks (SOB) vs domestic privately owned banks (DOPB)

					[95% Conf. Interval]		
lnNPL	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
NetLoansDep	.001	0	2.20	.032	0	.002	**
lnLossProv	.207	.054	3.84	< .001	.099	.315	***
lnNetFees	−.018	.081	−0.22	.829	−.18	.145	
lnTax	−.018	.055	−0.34	.739	−.128	.092	
CosttoInc	.001	.003	0.35	.724	−.004	.006	
lnSHAF	.719	.191	3.76	< .001	.335	1.103	***
BMS	−.479	.282	−1.70	.096	−1.045	.088	*
IR	.093	.044	2.09	.041	.004	.182	**
SOB	.372	.133	2.79	.007	.104	.64	***
Constant	.614	2.47	0.25	.805	−4.342	5.57	
Mean dependent var		11.113	SD dependent var			1.966	
R-squared (overall)		0.7978	Number of obs			220	
F-test		5.133	Prob > F			0.000	
Akaike crit. (AIC)		85.960	Bayesian crit. (BIC)			116.502	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Source: authors' own work based on banks' financial statements, data made available by the European Banking Federation, the European Central Bank, the World Bank and the Orbis database.

Table 7. Fixed-effects model regression results for lnNPL:
State-owned banks (SOB) vs foreign owned banks (FOB)

					[95% Conf. Interval]		
lnNPL	Coef.	Std. Err.	t-value	p-value	Lower	Upper	Sig
NetLoansDep	0	.001	−0.08	.938	−.002	.002	
lnLossProv	.17	.028	5.99	< .001	.114	.227	***
lnNetFees	.242	.07	3.44	.001	.103	.382	***
lnTax	−.047	.024	−1.95	.054	−.096	.001	*
CosttoInc	.002	.001	2.14	.035	0	.004	**
lnSHAF	.094	.118	0.79	.43	−.141	.328	
BMS	.237	.248	0.96	.342	−.255	.729	
IR	.158	.024	6.47	< .001	.11	.207	***
SOB	.553	.162	3.42	.001	.232	.874	***
Constant	6.125	1.49	4.11	< .001	3.172	9.077	***
Mean dependent var		11.781	SD dependent var			1.589	
R-squared (overall)		0.7579	Number of obs			499	
F-test		15.006	Prob > F			0.000	
Akaike crit. (AIC)		173.949	Bayesian crit. (BIC)			211.862	

*** $p < .01$, ** $p < .05$, * $p < .1$.

Source: authors' own work based on banks' financial statements, data made available by the European Banking Federation, the European Central Bank, the World Bank and the Orbis database.

Results discussion

Based on the results obtained, a statistically significant relationship was observed between a bank's ownership structure and its returns, specifically return on assets (ROA) and return on equity (ROE). The coefficients obtained for the SOB variable were negative across all models; they were statistically significant at the 0.01 level for the ROA models and at the 0.1 level for the ROE models. With regard to risk-taking behaviour, the regression results for non-performing loans (lnNPL, Tables 6–7) showed a statistically significant positive relationship between state ownership and non-performing loans when comparing SOBs with both DOPBs and FOBs. These results indicate that SOBs performed statistically worse than banks where the majority or sole shareholder is a domestic private investor or foreign investor, although they were more heavily burdened with riskier assets. As previously mentioned, studies across different regions have yielded ambiguous results; however, our empirical findings suggest that concerns regarding the potentially lower profit-making capacity of SOBs are justified. Our analysis indicates that the state-owned banks' advantage hypothesis may be unfounded, particularly as the data include banks that have undergone "denationalisation" and account for the economic factors driving these processes.

In seeking explanations for these identified associations, it should be noted that Brei and Schclarek (2013) claim that customers perceive state-owned enterprises as safer and "more secure" because

they are owned by the state. However, in both models, a statistically significant positive relationship was found for SOBs regarding credit portfolio risk; hence, SOBs appear more prone to granting "risky" loans. For banks with a significant proportion of assets composed of difficult-to-recover loans, profitability is likely negatively affected by high debt-servicing costs – a trend reflected in the negative relationship between state ownership and ROA. The results for the loan-to-deposit ratio are also negatively correlated with ROA in the model for DOPBs, suggesting that counterparty risk materialises and leads to an increase in bad debts.

Zhang et al. (2016) claim that the lending activities of SOBs contribute to moral hazard. The increase in the NPL ratio in SOBs does indeed indicate riskier lending, which may stem from a focus on generating higher revenues to meet government expectations. The combination of these factors may result in higher credit risk-taking, which is ostensibly offset by a higher capacity to absorb losses. Thus, SOBs may be more likely to grant risky loans when financially backed by the state – the "most solvent" financial market participant – as evidenced by Iannotta, Nocera, and Sironi (2013). However, this does not necessarily mean that their financial stability is at risk; rather, stability may depend on capital or guarantees provided by the government. Our models show that ROE improves when shareholder funds are higher. Combined with the fact that government takeovers of banks were relatively recent, this raises the question of selection bias. Nationalised banks with political ties to the government may enjoy a higher level of state protection, which is why, in theory, their risk of insolvency is much lower. At the same time, taking on more unpredictable risk ultimately proves detrimental to profitability – a fact that becomes even more apparent when comparing SOBs with DOPBs, which are often considered "riskier" or "less profitable" by the market.

These results prompt the issue of whether these banks are poorly managed, as their profitability is statistically worse, but at the same time, they are exposed to greater risk. According to Peng et al. (2016), the question of whether state-owned enterprises outperform the private ones should be considered based on what economic criteria state-owned enterprises can outperform private ones. As Relaño (2011) suggests, profit generation alone may not be the most important factor shaping the profitability of SOBs; instead, the "social banking" dimension should be considered. Based on this, it can be argued that "monetary" profit does not appear to be the only priority for SOBs, as such banks in the research sample were not "bad" banks. They perform social functions that generate social profits, which cannot be measured by classic ROA or ROE.

The lower profit-generating capacity of SOBs may result from their strong involvement in non-banking activities through various forms of sponsorship, social initiatives, or support programmes. In fact, commercial banks controlled by governments have most likely become another source of financing for economic or social activities, which certainly affects financial efficiency and risk-mitigating measures. Ismiyanti, Rahman, and Mahadwartha (2018) suggest that in the case of SOBs, their higher riskiness stems from the political objectives that governments want to pursue. Projects financed by SOBs are often not as profitable. Research by Lapteacru (2017) also showed that involvement in non-interest-income activities actually worsened the risk profile of state-owned institutions. More risky financing could therefore be explained by the fact that SOBs are involved in various projects implemented by the state or local authorities – they may be more willing to finance public or public-private projects than private institutions.

The discussion of the model results should be supplemented with an analysis of the statistically significant negative relationship between banks' market share (BMS) and ROA in Tables 2 and 4 (models for ROA), as the impact of the BMS variable proved to be statistically significant and negative. The results show that larger banks in CEE do not benefit from economies of scale or their market position. This may be attributable to the high need to secure and maintain an adequate capital base in order to meet regulatory requirements, as high capital needs generally result in a higher cost of capital. This argument is founded, for example, on the findings of Lassoued, Sassi, and Attia (2016), who note that SOBs tend to increase their capital adequacy ratio to hedge against high levels of risk. The model results seem to confirm this, as on the one hand, the SOBs analysed were more prone to non-performing lending than privately owned banks and lower profitability. At the same time, however, a large number of non-performing loans necessitates hedging, which increases costs. The ECB (European Central Bank 2015) also found that bank size had a significant negative impact on its profitability, which was explained by the more complex and costly structure of larger banks. Řepková (2014) found that a group of large banks in the Czech Republic was less efficient than other banks in the Czech banking sector. According to that study, this was due to excessive deposits on the balance sheet and an inadequate size of operations. This is also related to a study by Laeven, Ratnovski, and Tong (2016), which found a positive relationship between systemic risk and bank size and a negative relationship between systemic risk and bank capital.

The results of the regression analysis show that smaller banks generated better profits (measured by ROA). However, SOBs represent both large and small banks, so considering the arguments above, internal factors may be more important than sectoral ones. Theoretically, these banks could achieve higher profits because, as the literature suggests, they are perceived as safer, as their main shareholder is the state and their capital base is more robust. However, the results demonstrate that these banks performed statistically worse in terms of ROA and ROE. Hence, it may be argued that elements of the economic or social policy of the bank's home country are relevant to these banks' activities and constitute an additional factor that shapes the banking sector in CEE countries. They are, in a sense, unique actors in the CEE market that do not fit into the general framework of the sector.

Conclusions

The objective of this article was to examine and test the "state-owned banks' advantage hypothesis". According to this hypothesis, the nationalisation of segments of the banking sector positively affects the financial results achieved by such banks and the risk associated with their operations. This article provides further evidence for the long-standing debate concerning the raison d'être of SOBs and state-owned enterprises more broadly. However, it is based on recent developments related to the changing environment in Central and Eastern Europe – a rapidly developing sector gaining an increasingly prominent position in the global economy. This study identifies, based on available research and empirical observations, associations between the results obtained and their possible causes. It is also relevant for comparative research in economics, as it addresses different ownership structures and the effect of state participation as a shareholder within a free-market

economy – specifically, how ownership affects the efficiency of a given sector and the appropriate role of the state in the banking sector.

The analysis, conducted using a fixed-effects panel data model based on data from CEE countries – a region susceptible to structural changes due to renationalisation and denationalisation processes between 2014 and 2020 – confirmed a statistically significant relationship between a bank's return on assets (ROA) and return on equity (ROE) and the level of state capital control. The relationship was negative for SOBs when compared to both DOPBs and FOBs. SOBs were also characterised by higher operational risk, measured by the level of non-performing loans, compared to both groups studied. Thus, the assumption of higher profitability and lower credit risk for SOBs was not confirmed, and the state-owned banks' advantage hypothesis should be rejected. The higher burden of non-performing loans on SOBs is a significant cause for concern; based on the literature and our observations, it may indicate a potential risk of moral hazard resulting from the perception of such banks as more secure due to a stable capital base, as well as from selection bias.

These results raise the question of whether the relatively weaker financial performance of SOBs is attributable to poor management or other factors affecting their operations. It is argued that factors related to the "social" purpose of these banks are more decisive, since profit measured by ROA and ROE is expressed purely in monetary terms. SOBs pursue objectives set by their management boards, which are appointed directly or indirectly by the state. The objectives of SOB management, therefore, may not focus primarily on achieving the best rates of return in the sector – even if the bank is a listed company – but may seek to achieve social objectives, such as supporting commercial, relatively less profitable projects. A higher burden of non-performing loans may result from such a credit base. Secondly, larger CEE banks, including SOBs, do not benefit from economies of scale or greater market share, as a bank's market share was shown to be negatively correlated with return on assets. Therefore, it can be argued that it is not merely a matter of poor management, but rather a reflection of the economic or social policy of the country, which undoubtedly plays a role in the activities of these banks and is an additional factor shaping the banking sector in CEE countries.

Regarding policy implications, further research is essential, particularly concerning the efficiency of SOBs, potential moral hazard risks, the soundness of their capital base, and the level of social returns generated by their existence and operations. The aim of SOBs is not only to generate profit measured in monetary units, but also to generate social returns for their customers, beneficiaries, or the economy as a whole. Social benefits should be measured in order to compare those outcomes with the results of this study and contribute to testing the "state-owned banks' advantage hypothesis" in non-monetary terms. Only then will it be possible to assess whether the state rightfully has a place in the banking sector as a shareholder and decide whether there is any added value from such state activity. Banks are specific enterprises which serve as a source of credit for the economy and thus indirectly determine the economic growth of a country. This may explain why generating high profits will not always be the primary priority for the state. Moreover, it would be useful to assess the performance of SOBs in terms of their ESG (Environmental, Social, and Governance) activity, as these aspects have proven to be significant policy priorities for the EU. Finally, the study points to the need for further research on the relationship between the capital base of SOBs and their profitability.

References

Alizadeh Janvisloo, M., Muhammad, J. (2013), *Non-Performing Loans Sensitivity to Macro Variables: Panel Evidence from Malaysian Commercial Banks*, "American Journal of Economics", 3 (5C), pp. 16–21, https://www.researchgate.net/publication/269695901_Non-Performing_Loans_Sensitivity_to_Macro_Variables_Panel_Evidence_from_Malaysian_Commercial_Banks (accessed: 10.09.2023).

Bai, H., Ba, S., Huang, W., Hu, W. (2020), *Expected government support and bank risk-taking: Evidence from China*, "Finance Research Letters", 36 (C), 101328, https://doi.org/10.1016/j.frl.2019.101328

Belousova, V., Karminsky, A., Myachin N., Kozyr, I. (2021), *Bank Ownership and Efficiency of Russian Banks*, "Emerging Markets Finance and Trade", 57 (10), pp. 2870–2887, https://doi.org/10.1080/1540496X.2019.1668764

Bhattacharyya, A., Lovell C.A.K., Sahay, P. (1997), *The impact of liberalization on the productive efficiency of Indian commercial banks*, "European Journal of Operational Research", 98 (2), pp. 332–345, https://doi.org/10.1016/S0377-2217(96)00351-7

Blundell, R., Matyas, L. (1992), *Panel data analysis. An introductory overview*, "Structural Change and Economic Dynamics", 3 (2), pp. 291–299, https://doi.org/10.1016/0954-349X(92)90008-T

Bojāre, K., Romānova, I. (2017), *The Factors Affecting the Profitability of Banks: The Case of Latvia*, "European Research Studies Journal", 20 (15), pp. 905–919, https://doi.org/10.35808/ersj/753

Bonin, J.P., Hasan, I., Wachtel, P. (2005), *Bank performance, efficiency, and ownership in transition countries*, "Journal of Banking and Finance", 29 (1), pp. 31–53, https://doi.org/10.1016/j.jbankfin.2004.06.015

Boubakri, N., Saffar, W. (2019), *State Ownership and Debt Choice: Evidence from Privatization*, "Journal of Financial and Quantitative Analysis", 54 (3), pp. 1313–1346, https://doi.org/10.1017/S0022109018000881

Brei, M., Schclarek, A. (2013), *Public bank lending in times of crisis*, "Journal of Financial Stability", 9 (4), pp. 820–830, http://doi.org/10.1016/j.jfs.2013.01.002

Bresson, G., Hsiao, C., Pirotte, A. (2006), *Heteroskedasticity and random coefficient model on panel data*, "Working Papers ERMES", 0601, University Paris 2, Paris.

Cho, H., Kalinowski, T. (2010), *Bank Nationalization, Restructuring and Reprivatization: The Case of Korea since the Asian Financial Crisis*, "Korea Observer", 41 (1), pp. 1–30.

Cornett, M.M., Guo, L., Khaksari, S., Tehranian, H. (2010), *The impact of state ownership on performance differences in privately-owned versus state-owned banks: An international comparison*, "Journal of Financial Intermediation", 19 (1), pp. 74–94, https://doi.org/10.1016/j.jfi.2008.09.005

Darvas, Z., Schoenmaker, D., Veron, N. (2016), *Reforms to the European Union Financial Supervisory and Regulatory Architecture and their implications for Asia*, "ADBI Working Paper", 615, https://doi.org/10.2139/SSRN.2893060

Davidovic, M., Uzelac, O., Zelenovic, V. (2019), *Efficiency dynamics of the Croatian banking industry: DEA investigation*, "Economic Research – Ekonomska Istraživanja", 32 (1), pp. 33–49, https://doi.org/10.1080/1331677X.2018.1545596

Davydenko, N., Boiko, S., Cherniavska, O., Nehrey, M. (2023), *Analysis of the Impact of State-Owned Banks on the Sustainability of Public Finances*, "Economies", 11 (9), 229, https://doi.org/10.3390/economies11090229

Deloitte (2020), *CEE banks facing challenging times. Economic turbulence to boost consolidation*, https://web.archive.org/web/20210812111935/https://www2.deloitte.com/content/dam/Deloitte/ce/Documents/finance/MA_Banking_study_2020_digital.pdf (accessed: 10.09.2023).

Doan, A.-T., Lin, K.-L., Doong, S.-C. (2020), *State-controlled banks and income smoothing. Do politics matter?* "The North American Journal of Economics and Finance", 51, 101057, https://doi.org/10.1016/j.najef.2019.101057

Domanski, D. (2005), *Foreign banks in emerging market economies: changing players, changing issues*, "BIS Quarterly Review", December, pp. 69–81.

Dumitriu, R., Stefanescu, R., Nistor, C. (2012), *State-Owned Banks from Romania*, "SSRN Electronic Journal", https://doi.org/10.2139/ssrn.2165040

Epstein, R.A., Rhodes, M. (2014), *International in life, national in death? Banking nationalism on the road to Banking Union*, "KFG Working Paper Series", 61, Freie Universität Berlin, Berlin, https://nbn-resolving.org/urn:nbn:de:0168-ssoar-413148 (accessed: 16.10.2023).

European Central Bank (2015), *Financial Stability Review*, https://www.ecb.europa.eu/pub/pdf/fsr/financialstabilityreview201505.en.pdf (accessed: 16.10.2023).

Fang, Y., Hasan, I., Marton, K. (2011), *Bank efficiency in South-Eastern Europe*, "Economics of Transition", 19 (3), pp. 495–520, https://doi.org/10.1111/j.1468-0351.2011.00420.x

Fekri, A., Shawtari, M. (2018), *Ownership type, bank models, and bank performance: the case of the Yemeni banking sector*, "International Journal of Productivity and Performance Management", 67 (8), pp. 1271–1289, https://doi.org/10.1108/IJPPM-01-2018-0029

Gul, S., Irshad, F., Zaman, K. (2011), *Factors Affecting Bank Profitability in Pakistan*, "Romanian Economic Journal", 14 (39), pp. 61–87.

Han, X., Epetia, M.C.F., Cheng, Y. (2021), *"Subsidies" or "taxes"? Corporate credit misallocation induced by the nexus of state-owned enterprises and state-owned banks*, "Journal of Asian Economics", 76, 101346, https://doi.org/10.1016/j.asieco.2021.101346

Haque, F., Brown, K. (2017), *Bank ownership, regulation and efficiency: Perspectives from the Middle East and North Africa (MENA) Region*, "International Review of Economics and Finance", 47, pp. 273–293, https://doi.org/10.1016/j.iref.2016.10.015

Hočevar, M. (2021), *The Crisis of 2008 and the Rise of the Slovenian Consolidation State*, "Družboslovna Revija", 58 (2), pp. 2–48, https://doi.org/10.51936/tip.58.2.305-321

Iannotta, G., Nocera, G., Sironi, A. (2013), *The impact of government ownership on bank risk*, "Journal of Financial Intermediation", 22 (2), pp. 152–176, https://doi.org/10.1016/j.jfi.2012.11.002

Ismiyanti, F., Rahman, A., Mahadwartha, P.A. (2018), *Do foreign and state banks take more risk?*, "Banks and Bank Systems", 13 (4), pp. 96–102, http://doi.org/10.21511/bbs.13(4).2018.09

Iwanicz-Drozdowska, M., Kurowski, Ł., Witkowski, B. (2024), *Resolution and depositors' trust: empirical analysis of three resolution cases in Poland*, "Qualitative Research in Financial Markets", 16 (2), pp. 239–265, https://doi.org/10.1108/QRFM-06-2022-0113

Iwanicz-Drozdowska, M., Smaga, P., Witkowski, B. (2017), *Role of foreign capital in stability of banking sectors in CESEE countries*, "Finance a úvěr – Czech Journal of Economics and Finance", 67 (6), pp. 492–511.

Jackowicz, K., Kowalewski, O., Kozłowski, Ł. (2013), *The influence of political factors on commercial banks in Central European countries*, "Journal of Financial Stability", 9 (4), pp. 759–777, https://doi.org/10.1016/j.jfs.2012.08.001

Jia, C. (2009), *The effect of ownership on the prudential behavior of banks – The case of China*, "Journal of Banking and Finance", 33 (1), pp. 77–87, https://doi.org/10.1016/j.jbankfin.2007.03.017

Kamarudin, F., Sufian, F., Nassir, A.M. (2016), *Global financial crisis, ownership and bank profit efficiency in Bangladesh's state-owned and private commercial banks*, "Contaduría y Administración", 61 (4), pp. 705–745, https://doi.org/10.1016/j.cya.2016.07.006

Koleśnik, J. (2014), *Podział banków jako skuteczna metoda redukcji ryzyka too big to fail*, "Ekonomia i Zarządzanie", 6 (3), pp. 64–75, https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-b2d19170-e391-4512-8dd7-58536df28a2c/c/kolesnik_podzial_3_2014.pdf.pdf (accessed: 16.10.2023).

Koleśnik, J. (2019), *Uwarunkowania funkcjonowania systemów gwarantowania depozytów i ich wpływ na zachowania deponentów*, "Zeszyty Naukowe Polityki Europejskie, Finanse i Marketing", 21 (70), pp. 94–103, https://doi.org/10.22630/PEFIM.2019.21.70.8

Koroleva, E., Jigeer, S., Miao, A., Skhvediani, A. (2021), *Determinants Affecting Profitability of State-Owned Commercial Banks: Case Study of China*, "Risks", 9 (8), 150, https://doi.org/10.3390/risks9080150

Kozińska, M. (2018), *Resolution tools in the opinion of EU resolution authorities*, "Finanse: czasopismo Komitetu Nauk o Finansach PAN", 1 (11), pp. 68–88, https://doi.org/10.24425/finanse.2018.125392

Krasovskis, D., Limanskis, A., Pancenko, E. (2016), *Measuring competitiveness of banks in Latvia*, "Copernican Journal of Finance & Accounting", 5 (2), pp. 125–147, https://scispace.com/pdf/measuring-competitiveness-of-banks-in-latvia-i529232uzv.pdf (accessed: 16.10.2023).

Laeven, L., Ratnovski, L., Tong, H. (2016), *Bank size, capital, and systemic risk: Some international evidence*, "Journal of Banking and Finance", 69 (S1), pp. 25–34, https://doi.org/10.1016/j.jbankfin.2015.06.022

Lapteacru, I. (2017), *Market power and risk of Central and Eastern European banks: Does more powerful mean safer?*, "Economic Modelling", 63, pp. 46–59, https://doi.org/10.1016/j.econmod.2017.01.022

Lassoued, N., Sassi, H., Attia, M.B.R. (2016), *The impact of state and foreign ownership on banking risk: Evidence from the MENA countries*, "Research in International Business and Finance", 36, pp. 167–178, https://doi.org/10.1016/j.ribaf.2015.09.014

Lee, A., Hooy, C. (2020), *Banks' Risk-taking and State Ownership: Evidence from Asian Emerging Markets*, "Malaysian Journal of Economic Studies", 57 (1), pp. 59–80, https://doi.org/10.22452/MJES.vol57no1.4

Lipton, D., Sachs, J., Fischer, S., Kornai, J. (1990), *Creating a Market Economy in Eastern Europe: The Case of Poland*, "Brookings Papers on Economic Activity", 1, pp. 75–147, https://doi.org/10.2307/2534526

Maudos, J., Vives, X. (2019), *Competition Policy in Banking in the European Union*, "Review of Industrial Organization", 55 (1), pp. 27–46, https://doi.org/10.1007/s11151-019-09687-5

Mazzucato, M., Penna, C.C.R. (2016), *Beyond market failures: the market creating and shaping roles of state investment banks*, "Journal of Economic Policy Reform", 19 (4), pp. 305–326, https://doi.org/10.1080/17487870.2016.1216416

Méró, K., Piroska, D. (2016), *Banking Union and banking nationalism – Explaining opt-out choices of Hungary, Poland, and the Czech Republic*, "Policy and Society", 35 (3), pp. 215–226, https://doi.org/10.1016/j.polsoc.2016.10.001

Pak, O. (2019), *The impact of state ownership and business models on bank stability: Empirical evidence from the Eurasian Economic Union*, "The Quarterly Review of Economics and Finance", 71, pp. 161–175, https://doi.org/10.1016/j.qref.2018.07.008

Panizza, U. (2023), *State-owned commercial banks*, "Journal of Economic Policy Reform", 26 (1), pp. 44–66, https://doi.org/10.1080/17487870.2022.2076678

Patev, P., Lyroudi, K., Kanaryan, N.K. (2003), *The Day of the Week Effect in the Central European Transition Stock Markets*, "Tsenov Academy of Economics Finance and Credit Working Paper", 03–06, https://doi.org/10.2139/ssrn.434501

Peng, M.W., Bruton, G.D., Stan, C.V., Huang, Y. (2016), *Theories of the (state-owned) firm*, "Asia Pacific Journal of Management", 33 (2), pp. 293–317, https://doi.org/10.1007/s10490-016-9462-3

Piroska, D., Podvršič, A. (2020), *New European Banking Governance and Crisis of Democracy: Bank Restructuring and Privatization in Slovenia*, "New Political Economy", 25 (6), pp. 992–1006, https://doi.org/10.1080/13563467.2019.1669548

Pyka, I., Nocoń, A. (2018), *Dylematy pomiaru i oceny procesu repolonizacji banków w Polsce*, "Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu", 531, pp. 404–418, http://doi.org/10.15611/pn.2018.531.36

Pyka, I., Pyka, J. (2017), *Przesłanki i dylematy repolonizacji banków krajowych*, "Zeszyty Naukowe. Organizacja i Zarządzanie / Politechnika Śląska", 108, pp. 349–361.

Relaño, F. (2011), *Maximizing social return in the banking sector*, "Corporate Governance: The International Journal of Business in Society", 11 (3), pp. 274–284, https://doi.org/10.1108/14720701111138698

Rosalina, D.A., Nugraha, N. (2019), *The effects of ownership structure on bank profitability*, [in:] A. Gafar Abdullah, M. Arief, Ch. Furqon, V. Gaffar, H. Mulyani, Y. Setiawan, A. Sofia (eds.), *Proceedings of the 1st International Conference on Economics, Business, Entrepreneurship, and Finance (ICEBEF 2018)*, Atlantis Press, pp. 42–46, https://doi.org/10.2991/icebef-18.2019.10

Řepková, I. (2014), *Efficiency of the Czech Banking Sector Employing the DEA Window Analysis Approach*, "Procedia Economics and Finance", 12, pp. 587–596, https://doi.org/10.1016/S2212-5671(14)00383-9

Sengupta, A., De, S. (2020), *Assessing Performance of Banks in India Fifty Years After Nationalization*, Springer, Singapore, https://doi.org/10.1007/978-981-15-4435-4

Stančić, P., Čupić, M., Obradović, V. (2014), *Influence of board and ownership structure on bank profitability: evidence from South East Europe*, "Economic Research–Ekonomska Istraživanja", 27 (1), pp. 573–589, https://doi.org/10.1080/1331677X.2014.970450

Voszka, E. (2018), *Nationalisation in Hungary in the Post-Crisis Years: A Specific Twist on a European Trend?*, "Europe-Asia Studies", 70 (8), pp. 1281–1302, https://doi.org/10.1080/09668136.2018.1457137

Węcławski, J. (2015), *Przekształcenia polskiego systemu bankowego w latach 1989–2014*, "Annales Universitatis Mariae Curie-Skłodowska. Sectio H. Oeconomia", 49 (1), pp. 189–199, https://doi.org/10.17951/h.2015.49.1.189

Yaffee, R. (2003), *A primer for panel data analysis*, "Connect: Information Technology at NYU", 8 (3), pp. 1–11.

Zaleska, M. (2007), *Charakterystyka systemu bankowego – uwarunkowania instytucjonalne*, [in:] M. Zaleska (ed.), *Współczesna bankowość*, vol. I, Difin, Warszawa, pp. 21–32.

Zhang, D., Cai, J., Dickinson, D.G., Kutan, A. (2016), *Non-performing loans, moral hazard and regulation of the Chinese commercial banking system*, "Journal of Banking and Finance", 63, pp. 48–60, https://doi.org/10.1016/j.jbankfin.2015.11.010

Zoli, E. (2001), *Cost and Effectiveness of Banking Sector Restructuring in TRANSITION economies*, "IMF Working Paper", 2001 (157), https://doi.org/10.5089/9781451857498.001

Appendix A
List of state-controlled banks at the end of 2020

- Bulgarian Development Bank – Bulgaria
- Českomoravská záruční a rozvojová banka, a.s. – Czechia
- Česká exportní banka, a.s. – Czechia
- Hrvatska poštanska banka d.d. – Croatia
- Croatia Banka – Croatia
- Powszechna Kasa Oszczędności Bank Polski S.A. – Poland
- Bank Polska Kasa Opieki S.A. – Poland
- Alior Bank S.A. – Poland
- Bank Ochrony Środowiska S.A. – Poland
- Bank Pocztowy S.A. – Poland
- PKO Bank Hipoteczny S.A. – Poland
- Pekao Bank Hipoteczny S.A. – Poland
- Bank Gospodarstwa Krajowego – Poland
- Magyar Fejlesztési Bank – Hungary
- BUDAPEST Hitel- és Fejlesztési Bank – Hungary
- KELER Központi Értéktár Zártkörűen Működő Részvénytársaság – Hungary
- Magyar Export-Import Bank – Hungary
- Banca de Exp-Imp a României – Eximbank – Romania
- CEC Bank – Romania
- Slovenská záručná a rozvojová banka, a. s. – Slovakia
- Sid Banka – Slovenia

Hipoteza przewagi banków państwowych w kontekście renacjonalizacji banków w Europie Środkowo-Wschodniej

Celem artykułu jest przedstawienie i przetestowanie oryginalnej hipotezy dotyczącej przewagi banków państwowych, zgodnie z którą nacjonalizacja części sektora bankowego może pozytywnie wpłynąć na wyniki finansowe i zmniejszyć ryzyko związane z działalnością banków. Hipotezę przetestowano przy użyciu modelu porównującego trzy grupy banków – banki państwowe, prywatne banki zagraniczne oraz prywatne banki krajowe. Oszacowanie parametrów modelu przeprowadzono przy użyciu analizy danych panelowych w modelu efektów stałych dla banków z siedzibą w krajach Europy Środkowej i Wschodniej w latach 2014–2020. Na podstawie modelu dla ROA i – oddzielnie – ROE zaobserwowano statystycznie istotną ujemną zależność w wynikach finansowych generowanych przez banki państwowe w porównaniu z prywatnymi bankami krajowymi i zagranicznymi. Wyniki wskazują również na wyższe ryzyko biznesowe w przypadku banków państwowych, mierzone jako kwota kredytów zagrożonych, co prawdopodobnie wynika z zaangażowania w projekty, które nie zawsze są rentowne, ale często wiążą się z wyższym ryzykiem kredytowym. Z tego wynika, że elementy polityki gospodarczej lub społecznej danego kraju mają znaczenie przy prowadzeniu działalności gospodarczej, ale negatywnie wpływają na wyniki banków państwowych. Rezultaty estymacji modelu dowodzą również, że wielkość rynku bankowego ma negatywny wpływ na jego wyniki.

Słowa kluczowe: sektor bankowy, banki państwowe, nacjonalizacja, rentowność banków, Europa Środkowo-Wschodnia