

# The cost efficiency of Polish banks driven by the ownership structure. Does the ownership structure matter?

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## Abstract

This study investigates the influence of ownership structure on banks' cost efficiency in Poland's banking sector, emphasising the comparison between foreign, private, and state ownership. We use data from 2005 to 2021 to explore whether the ownership type impacts banks' cost-to-income ratios. Our findings reveal that government and domestic-owned banks have higher cost efficiency than their private and foreign counterparts. The study also identifies other determinants that positively affect banks' efficiency, including banks' profitability, loan loss provisions, and solvency ratio, or that affect them negatively, such as implementing the Basel requirements and the banks' age. These insights are critical for regulatory authorities, policymakers, and banking sector managers, highlighting the impact of ownership structure on bank cost-efficiency and the broader implications for the Polish banking industry's competitive landscape and regulatory framework.

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## 1. Introduction

Massive privatisation in transition economies (TEs), accompanied by the globalisation of the financial sector, caused significant changes in the ownership structure of banks in Central and Eastern Europe. In these countries, there is a pronounced trend towards the privatisation of assets, particularly favouring foreign private ownership. In 2000, in eight of the eleven European TEs,<sup>1</sup> more than half of the assets were held by banks with a majority foreign ownership. In Slovakia and Romania, it was 42.7% and 46.7%, respectively. Slovenia was the outlier at 15.6% (see Bonin, Hasan, Wachtel 2005b).

However, the superiority of private and foreign ownership over state-owned and domestic banks in TEs is still fiercely debated. Governments in developing countries are prone to complain about foreign banks taking control of the national banking sector. At the same time, economists proclaim foreign entry as a way to accelerate the development of an efficient financial system (Nikiel, Opiela 2002). However, the privatisation paradigm is not unequivocally accepted (see, for example, Shirley, Walsh 2000).

A discussion concerning the potential pros and cons of the different ownership structures is particularly important in the case of the Polish banking sector as it is a unique case in terms of TEs' financial systems. Over 30 years, it went from 100% state ownership through privatisation, with nearly 77% of foreign ownership in 2008, to "repolonization". This is a form of nationalisation, as foreign-owned banks are voluntarily sold to government-owned financial institutions. The breakthrough year was 2020 when government-owned banks constituted nearly 48% of commercial banks' assets. The government became a main player ahead of foreign-owned and domestic-owned private banks (respectively, nearly 47% and nearly 5% of banks' assets, see Klepczarek, Wieczorek 2023). The reasons for withdrawing foreign capital from the Polish banking industry are unclear. Scholars emphasise that the authorities in the post-transformation country preached the idea of keeping the banking industry "national" (Balcerowicz, Bratkowski 2001). However, in the late 1990s, the political narrative was different, promoting liberalisation and allowing the entry of foreign capital.

As noted by Vachudová and Snyder (1997), aggressive nationalism has now been marginalised in politics. Like the other TEs, Poland first increased the share of private and foreign ownership in banks' assets. Then starting in 2008, the reverse was observed – a systematic decrease in foreign engagement, which accelerated in 2016. As mentioned, the withdrawal of foreign capital from Poland was voluntary.

Thus, there is a need for a severe substantive discussion on the legitimacy of reducing the share of foreign capital in favour of state ownership in the Polish financial sector. This paper shifts the focus to the question of whether the ownership structure of banks influences their efficiency, proxied by the cost-to-income ratio (CIR). The literature on transition countries concludes that ownership matters; in particular, government ownership of banks is argued to be less efficient than private ownership (Bonin et al. 1998), and foreign-owned banks are often more efficient than domestic banks (Bonin, Hasan, Wachtel 2005b). Nevertheless, the studies of Polish banks concern the periods of the first decade of the transition, i.e. 1997 (Weil 2003) and the beginning of the second decade, i.e. 1997–2000 (Nikiel, Opiela 2002) and 1997–2001 (Havrylychuk 2006). All confirmed the superiority of foreign and private ownership in banks, albeit under certain conditions. They were in the early post-transformation years, and the results should be verified, especially as there came a surprising turn in the banking sector's ownership structure.

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<sup>1</sup> These countries are the Czech Republic, Hungary, Poland, Slovakia, Bulgaria, Croatia, Romania, Slovenia, Estonia, Latvia, and Lithuania.

Our study allows for a comprehensive examination of how ownership structure and other factors contribute to efficiency within the Polish banking sector, providing insights into the dynamics of operational performance in relation to ownership types.

Our research primarily benefits regulatory authorities and policymakers as it indicates the legitimacy of public sector intervention. Moreover, pointing out the other determinants of cost efficiency, estimated based on operational costs and profits, contributes to the knowledge about overall management and risk control in banks, as managers believe that nearly 30% of the risk a financial organisation runs is a result of operational losses (Cruz 2003). Finally, we indicate the limitations of the variables used, noting that efficiency should not be the only prerequisite for shaping the ownership structure of the Polish banking sector.

Section 2 of our study includes a literature review of the impact of bank ownership on efficiency, providing a theoretical background for our hypotheses. Section 3 outlines the study's aims and proposes hypotheses based on the literature review. Section 4 describes the analytical approach, the data set used, the variables considered for the study and the model specification. Section 5 shows the main empirical findings on the explanatory variables and the differences between the different types of owners, synthesizes the results and discusses their implications. The final section concludes and acknowledges the study's limitations, suggesting avenues for future research.

## **2. Literature review**

Emerging market banking systems receive special attention in terms of their ownership structures. Privatisation and globalisation, which transformed the image of transition economies, need theoretical and empirical validation. In response to this need, there are single-country studies regarding particular TEs, like Matousek and Taci (2004), who found greater efficiency of private banks in the Czech Republic between 1993 and 1998. In contrast, Kraft and Tirtiroglu (1998) showed that new banks were more inefficient than old privatised banks or old state banks in Croatia between 1994–1995. Jemric and Vujcic (2002) studied the Croatian banking sector between 1995 and 2000 and demonstrated that foreign-owned banks were, on average, the most efficient. The superiority of foreign capital in terms of bank efficiency was also demonstrated by Hasan and Marton (2003) for Hungary between 1993 and 1998 and Nenovsky and Tochkov (2009) for Bulgaria between 1999–2007. Regarding Poland, Nikiel and Opiela (2002) investigated the period 1997–2000, Havrylchuk (2006) investigated 1997–2001, and Weill (2003) looked at the period up to 1997. There should be some nuances highlighted, however, especially in Poland. Foreign capital's higher efficiency was conditioned by greenfield investments (2006) or servicing foreign business customers (2003).

Another strand of the literature comprises cross-country analyses of emerging markets. For example, Fries and Traci (2005) examined cost efficiency in 15 East European countries, while Bonin, Hasan and Wacht (2005b) studied the impact of bank privatisation in 6 transition countries. Grigorian and Manole (2006) verified the transformation results of 17 transition economies, while Yildirim and Philippatos (2007) estimated the cost and profit efficiency of banking sectors in 12 transition economies. The cross-country studies of Central and Eastern Europe support the hypotheses that foreign-owned banks were the most efficient and government-owned banks were the least efficient in the first decades following the transformation.

Opposite results were obtained for developing and developed markets. Demirgüç-Kunt and Huizinga (1999) and Claessens, Demirgüç-Kunt and Huizinga (2001) demonstrated that foreign banks have higher margins and profits than domestic banks in developing countries, while the opposite holds in industrial countries. Berger et al. (2000) studied developed economies during the 1990s and found that, on average, domestic banks have higher profit efficiency than foreign banks. On the other hand, Micco, Panizza and Yanez (2007) found no strong correlation between ownership and performance for banks in industrial countries. However, they demonstrated that state-owned banks in developing countries tend to have lower profitability and higher costs than their private counterparts. The opposite was true for foreign-owned banks.

Empirical research provided little evidence that government bank ownership can substantially benefit the banking sector, the real economy, or users of banking services, especially in developing countries (Cull, Peria, Verrier 2017). Havrylchyk (2006) found that in Poland, state banks appeared to be more efficient than other domestic banks. However, she suggested treating this result with caution since the reporting quality of state banks may have been doubtful in the late 1990s. Similarly, for the period between 2004 and 2015, state-owned banks in Russia were more cost-efficient than domestic private banks and foreign-owned banks (Belousova et al. 2019). Surprisingly, German state-owned banks also had a profit and cost advantage, which was not the result of their alleged unfair advantage in the cost of borrowing funds (Altunbas, Evans, Molyneux 2001). The same was true for banks in Southeast Asian (SEA) countries, where state-owned banks exhibited greater efficiency than their local private sector peers (Gardener, Molyneux, Nguyen-Linh 2011; Ab-Rahim et al. 2012).

The results for SEA, Germany, Russia and Poland were outliers in the literature. Government ownership is usually believed to lower cost efficiency (although it could increase profit efficiency simultaneously, see Yildirim, Philippatos 2007). And there were a few differences between emerging and industrial economies when analysing state ownership. Research into transition countries in the 1990s found that government-owned banks are less cost-efficient than private (domestic and foreign) banks (Fries, Taci 2005; Yildirim, Philippatos 2007; Bonin, Hasan, Wachtel 2005a; 2005b). Similarly, in Western Europe, state-owned banks also exhibited lower cost efficiency than privately-owned banks (Iannotta, Nocera, Sironi 2007). Large, not regionally focused samples also identified state-owned banks as the least efficient compared to private domestic and foreign ones. This view was confirmed by Mian (2003) for a large panel of 100 emerging economies. He found that state-owned banks performed uniformly poorly and only survived due to strong government support. Recent studies in the African banking sector also proved that state-owned banks show lower profit and cost efficiency and found no significant difference between domestic and foreign ownership (Mutarindwa, Siraj, Stephan 2021). It is worth mentioning that most studies were concerned with the periods before the TEs joined the EU. The question arises of whether joining the EU, which changed the institutional environment and accelerated competition, somehow influenced the correlations demonstrated thus far. If one follows Bonin, Hasan and Wachtel (2005b) that “with the correct combination of regulation and competition, ownership will not matter if management has little opportunity for rent-seeking,” the ownership-efficiency relationship is likely to change.

Three groups of methods are used to analyse cost efficiency: efficiency ratio analysis and the parametric and non-parametric approaches, usually the Stochastic Frontier Approach (SFA) and Data Envelopment Analysis (DEA), respectively. Parametric and non-parametric methods have merits and limitations, and some authors point out the lack of consistent results obtained with them (see Berger,

Humphrey 1997; Dong, Hamilton, Tippett 2014). Additionally, after establishing different efficiency levels with SFA or DEA, significant parts of the variance of the efficiency ratio remain unexplained (Berger, Mester 1997). Our study follows Mesa, Sánchez and Sobrino (2014), who considered a bank's efficiency ratio as the dependent variable of the regression model. We develop the literature on ownership and bank performance by adopting regression analysis with the CIR as the explanatory variable. This approach limits the possibility of international comparisons. As Tripe (1998) notes, structural differences in balance sheets rule out comparing CIRs for banks in different countries. Calculating the CIR is based on operating costs and income. Thus, it depends strongly on country-specific issues like labour costs, depreciation rules, and interest rates. Huljak, Martin and Mocero (2019) claim that the most significant part of bank inefficiencies stems from long-term structural factors, such as location, client structure, macroeconomic environment, and regulation. Wei, Xie and Zhang (2005) mentioned that the institutional environment is an essential element that can either enhance or limit companies' competitive power. All these macro-variables influence the effective capacity of bank entities and affect the average CIR they achieve in a particular country. This undermines the legitimacy of international ratio comparisons and justifies the single-country analysis presented in this paper. This approach increases the novelty of the paper.

### **3. Objectives and hypotheses**

The primary objective of this article is to evaluate the relationships between the cost efficiency of banks in Poland and their ownership structure. To this end, three specific objectives have been designated. The first is to verify whether domestic or foreign ownership influences efficiency. The second objective investigates whether cost efficiency varies depending on whether the ownership is governmental or private. The third specific objective is to explore other determinants that impact the cost efficiency of banks in Poland. This approach allows for a comprehensive examination of how ownership structure and other factors contribute to the efficiency of the Polish banking sector.

The literature review confirms two opposite theories of Berger et al. (2000) – the “global” and the “home field” advantage hypotheses. Within emerging economies, the global advantage theory is more often confirmed. It states that foreign banks operate more efficiently than their domestic rivals. This is due to their ability to overcome cross-border disadvantages using best practice policies, like advanced technology, better access to the capital market, and risk management strategies (Wanke et al. 2022). By contrast, the home-field advantage hypothesis states that foreign banks' difficulties stem from cultural and regulatory barriers, higher agency and informational costs, and unfamiliarity with local supervisory structures. In light of these views, we formulate our first hypothesis as follows:

H1: Foreign banks in Poland are less efficient than their domestic competitors. This presumed inefficiency is attributed to the home-field advantage prevalent in developed economies, and Poland has demonstrated characteristics of a developed banking sector since 2005.

There are also two opposing points of view regarding state ownership. Proponents of state intervention believe that government-owned banks can allocate resources to strategically essential industries that the private sector is unable or unwilling to finance, enhancing economic development (Stiglitz 1993). La Porta, Lopez-De-Silanes and Shleifer (2002), and Shleifer (1998) additionally argued that state-owned banks can be used to achieve political goals. Micco, Panizza and Yanez (2007)

demonstrated that the weaker performance of public banks in developing countries is driven by political considerations, worsening in election years. La Porta, Lopez-De-Silanes and Shleifer's (2002) cross-country study also supports the "political" theories of the effects of government ownership of banks. Based on this discussion, we formulate the following hypothesis:

H2: Private banks in Poland are more cost-efficient than state banks. This increased efficiency is attributed to private banks' greater operational flexibility, profit-driven incentives, and freedom from political influence.

Our study addresses a significant gap in the literature by presenting findings for the banking sector that, following transformational reforms, has reached a certain level of maturity. It covers a period not yet explored in existing research, both in the context of Poland and, more broadly, concerning any of the transition economies. This exploration sheds light on the dynamics and efficiencies within a matured transferred banking landscape, offering new insights into banks' post-transitional development and operational nuances in environments characterised by economic and regulatory evolution.

## **4. Data, methods and model specification**

### **4.1. Dependent variable**

The definition of the CIR is the relationship of non-interest costs (operating costs, administrative costs, overheads) to the total of net interest and non-interest income (operating income). It is "one [that is] most focused on ratios currently and measures the overheads or costs of running the bank, the major element of which is normally salaries, as a percentage of income generated before provisions" (Mesa, Sánchez, Sobrino 2014 after Bankscope). Specifically, a lower cost-to-income ratio indicates heightened efficiency, as it reflects the bank's ability to generate income with minimal operational expenditure. It is widely used in the literature to assess if a bank's resources are effectively utilised compared to other banks within the same country or in the cross-country analysis (Muntenau 2012; Mesa, Sánchez, Sobrino 2014; Burger, Moormann 2008).

The CIR has limitations that are widely discussed (for example Osborne 1995; Elahi, Poswal 2017; Burger, Moormann 2008). The main limitation we consider when using CIR in our calculations is that the operating costs are calculated excluding bad and doubtful debt expenses. Thus, a bank providing high-risk loans could record a low CIR as it will not include deferred credit losses. However, the CIR reveals the risks of the previous years, as a high level of outstanding loans granted in the past generates additional operating costs and lower income in the present. Despite that, as noted by Elahi and Poswal (2017), managers are often forced to focus on CIRs as it is believed that an operationally efficient bank is more likely to achieve a satisfactory return on the owner's equity and survive in adverse economic conditions.

### **4.2. Independent variables**

To investigate the effect of ownership on bank efficiency, we take dummy variables for ownership type as the explanatory variables. We examine the impact of government vs private ownership and foreign

vs domestic ownership of the banks. We define a bank as government-owned if the controlling stake is in the hands of the Treasury or a state company. We apply the same classification to foreign ownership. It is foreign-owned when the controlling stake belongs to a foreign-owned company. The controlling stake does not necessarily have to be a majority stake. It is enough that the state/foreign owner is provided with a decisive voice in the bank's economic activity.

The potential determinants of bank cost efficiency (CE) that we use as control variables are given below. We considered mainly bank-specific measures and one institutional variable in our study. Based on the literature review, we selected bank characteristic variables, including bank size, profitability, credit risk, solvency ratio, total deposits to total assets ratio, non-interest margin, and the years of operation as potential determinants of CE. We introduced one time-specific dummy variable, which indicates the year the Basel II and Basel III requirements had been implemented into the European and Polish legal regimes.

The intuitive belief that better efficiency should correlate with higher profitability was confirmed in numerous studies (for example Elahi, Poswal 2017; Casu, Molyneux 2003; Isik, Hassan 2002; Mesa, Sánchez, Sobrino 2014). Elahi and Poswal (2017) suggested that clients prefer profitable banks. Thus, an encouraging environment is created for profitable banks to be more efficient from the point of view of intermediation activities. We use the return on average assets (ROAA) ratio to measure bank profitability, as it shows management's ability to generate profit from the bank's assets.

The CIR reflects the bank's credit risk in a limited range only. We use the loan loss provisions to net interest income ratio as an explanatory variable to describe credit risk. The lower the ratio, the better the bank's credit portfolio quality, thus, the lower the risk of credit activities. Such a proxy for credit risk was used by Elahi and Poswal (2017), who found it was insignificantly related to cost efficiency for Germany but positively and significantly linked in the case of UK banks. Yildirim and Philippatos (2007) also demonstrated that a higher level of problem loans is associated with lower cost and profit efficiency levels. Havrlychuk (2006) also concluded that higher efficiency is negatively associated with the quality of the loan portfolio of banks in Poland.

Equity constitutes a source of funds with lower administrative costs than traditional deposits. Thus, they may improve cost efficiency, as some claimed (for example Elahi, Poswal 2017; Fiordelisi, Marques-Ibanez, Molyneux 2011). Nevertheless, there is a consensus that debt financing is cheaper than raising equity capital. Thus, lower solvency ratios should be linked with higher efficiency, which aligns with Allen and Rai (1996), and Altunbas et al. (2007). This study employed the solvency ratio (equity over total assets) following Mesa, Sánchez and Sobrino (2014), as it represents the degree of financial independence, regardless of asset risk, unlike the regulatory capital ratios.

The other significant source of funds in banks is the deposit base. Reaching a high level of deposits requires establishing an extensive delivery capacity and a broad customer base (DeYoung, Nolle 1996). This process is usually time-consuming but relatively less costly than relying on purchased funds. As Yildirim and Philippatos (2007) demonstrated, cost-efficient banks have higher customer and short-term funds in total funding and low interbank deposit ratios. Thus, we propose the total deposits to total assets ratio as one of the explanatory variables to reflect the primary source of funding in banks, i.e. deposits.

In European banks, approximately 50% of profits are net interest margins (NIM) (data for 2007 provided by Burger, Moormann 2008). Thus, we conclude that the increase in earnings increases the CIR denominator. At the same time, however, the increase in net interest margin could be caused by

increased costs, as banks pass these costs on to customers (Maudos, de Guevara 2004). Although this explanation of the NIM increase makes it impossible to anticipate the direction of CIR change, there is a consensus that the relationship between net interest margin and CIR is negative (Elahi, Poswal 2017; Burger, Moormann 2008). The idea of risk-taking could also explain this correlation. The higher the risk undertaken by the bank, the higher the risk premium and interest margin. This increases the present earnings and lowers the CIR as it does not include the deferred risk adjustments.

The effect of the bank's years of operation on cost efficiency is not widely discussed in the literature. Esho (2001) and Sultana and Rahman (2020) used bank age as a potential determinant of cost efficiency. Both studies confirmed the hypothesis of higher efficiency of older banks. We use bank age as a proxy to measure cost optimisation experience and search for the best investment opportunities. We assume that the older the bank, the better it understands its institutional and market environment.

The last variable in our model identifies when the Basel II and III rules were incorporated into the European and Polish legal regimes. The Basel requirements include strengthening the equity capital of banks. We assume that in the year of introduction, they involved additional costs of raising capital and limited the possibility of creating loans to a small extent. We assume that compliance costs at the operational level occur primarily in the year following the introduction of the requirements (e.g. time and money spent on introducing new reporting procedures, employee training and the development and updating of internal risk management systems, etc.). We expect them to hinder efficiency since the literature shows that restricted banking systems tend to be less competitive (Claessens, Laeven 2004). However, the Basel regulation's impact is unclear, as some studies confirmed the positive correlation between tighter capital adequacy requirements and higher efficiency (Grigorian, Manole 2006; Pasiouras, Tanna, Zopounidis 2009<sup>2</sup>). The Basel variable takes 1 in 2006, 2007, 2013, 2014 and 2015. These are the years that EU regulations and directives (Directive 2006/48/EC<sup>3</sup>; Directive 2006/49/EC;<sup>4</sup> Directive 2013/36/EU<sup>5</sup>) were published, and they were implemented into the Polish legal order (Act of 5 August 2015).<sup>6</sup>

### 4.3. Model specification

The CIR is used as a proxy of cost efficiency. Based on the literature review, the CIR is defined by a set of explanatory variables that include those related to the ownership structure (the main variables of interest of this study) and the financial condition of the analysed banks.

The data come from the Orbis Bureau Van Dijk database. The final dataset includes 18 banks that operate in the Polish banking sector. The selection of banks is based on two requirements: the availability of continuous and comparable data and the same profile of commercial banks (banks

<sup>2</sup> Pasiouras, Tanna and Zopounidis (2009) found that capital regulation has a positive effect on cost efficiency, but a negative effect on profit efficiency level.

<sup>3</sup> Directive 2006/48/EC of the European Parliament and of the Council of 14 June 2006 relating to the taking up and pursuit of the business of credit institutions (recast).

<sup>4</sup> Directive 2006/49/EC of the European Parliament and of the Council of 14 June 2006 on the capital adequacy of investment firms and credit institutions (recast).

<sup>5</sup> Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC. Text with EEA relevance.

<sup>6</sup> Act of 5 August 2015 on macroprudential supervision over the financial system and crisis management in the financial system.



that offer universal services for consumers). Thus, the analysed banks do not include specialised (e.g. mortgage) banks. The list of banks used in this study is presented in the Appendix in Table 1.

All data are presented in annual frequency. However, the data for the entire sample (covering 2005–2021) are unavailable for all banks. This suggests that the panel is unbalanced. The frame of the time sample covers data between 2005 and 2021; the lowest number of observations is seven, and the highest is seventeen.

The applied general equation is as follows (Eq. 1):

$$CIR_{it} = \alpha_0 + \alpha_1 os_{it} + \alpha_2 basel_{it} + \alpha_3 x_{it} + \xi_{it} \quad (1)$$

where:

- $CIR_{it}$  – the value of the CIR for the  $i$ -th bank in the  $t$ -th year;
- $os_{it}$  – specific ownership structure of the  $i$ -th bank in the  $t$ -th year;
- $basel_{it}$  – the dummy variable for launching Basel requirements; it takes the value 1 in the year the Basel II and III requirements were launched, and 0 otherwise;
- $x_{it}$  – vector of other control variables of the  $i$ -th bank in the  $t$ -th year; the variables are not presented here in detail due to variant specifications, which are explained below;
- $\xi_{it}$  – error term.

The main variable of interest is the ownership structure of the bank ( $os_{it}$ ). This paper considers four types: domestic ownership, foreign ownership, private ownership, and governmental ownership. In each case, the ownership structure is captured by a dummy variable. Variable  $do_{os_{it}}$  takes the value 1 when the bank was dominated by domestic ownership, and 0 otherwise. Variable  $po_{os_{it}}$  takes the value 1 if the dominant owner of the bank was private, and 0 otherwise. The detailed information related to the banks' classification procedure, consistent with their ownership structure, is described in the previous chapter.

As presented by the formula, the specification uses variables that capture the type of ownership structure ( $os_{it}$ ), a dummy variable for the Basel requirements ( $basel_{it}$ ), and the other selected control variables. A full list of these controls and their descriptive statistic are presented in Table 2.

To evaluate the relationship between the CIR and the selected determinants and to overcome the potential problems with the features of the panel (including those related to the short panel), the OLS method is applied first. Robustness checks are also employed by the application of other control variables and estimation methods.

## 5. Results and discussion

Before the estimation, the unit root test for the variables was applied. Due to the unbalanced panel, the Fisher-type unit-root test was chosen, and the results are presented in Table 3 in the Appendix. The outcomes show that using the variables at the level in the modelled specification is possible.

In the next step, the baseline regression (including the variable  $basel_{it}$ ) and the control variables for the solvency ratio ( $so_{r_{it}}$ ), the ratio of loan loss provisions in total loans ( $ll_{tl_{it}}$ ), bank age (captured by the logarithmic variable  $ln_{age_{it}}$ ) and net interest margin ( $nim_{it}$ ),  $roaa_{it}$  (the variable that captures

the financial condition of the  $i$ -th bank in the  $t$ -th year) were built, and the appropriate tests for autocorrelation and heteroscedasticity were conducted. The results are shown in Table 4. To control for autocorrelation and heteroscedasticity, an estimator with clustered standard errors was applied, consistent with the outcomes of the tests' results. The random effects model was preferred due to the sample, which is based on special units – banks.

The estimates for the specifications are presented in Table 5. Column I shows results for a specification where the dummy variable for a bank's ownership structure is not included. Generally, the effect of  $roaa_{it}$  on the dependent variable is statistically significant and negative. It suggests that the profitability of a bank's assets improves the efficiency of the bank and reduces its CIR. The solvency ratio ( $so_r_{it}$ ) and the variable for the loan loss provision to total loans ratio have the same signs of the relationship. The effect of introducing the Basel requirements is not statistically significant in the analysed specification.

Columns II–III of Table 5 present estimates of parameters for the specifications with dummy variables that capture the ownership structure. The  $do_{os}_{it}$  dummy variable indicates that the CIR in banks with domestic ownership is, on average, lower compared to banks dominated by foreign ownership. It suggests that the differentiation between domestic and foreign ownership might have affected the CIR and the cost efficiency in the Polish banking sector. The relationship is confirmed in all specifications by the statistically significant estimates of the parameters.

The effects of dominant stakeholders may also be formulated to differentiate between private and governmental ownership. Generally, private banks have a higher and statistically significant effect on the CIR in comparison to government-controlled banks. Thus, governmental ownership in the Polish banking sector might have been more cost-effective than private ownership.

Finally, the effect of nationalisation in the Polish banking sector is analysed, as the sample includes two banks that changed ownership structure from private to governmental: Alior Bank SA in 2015 and Polska Kasa Opieki SA in 2017. To check whether nationalisation impacted the  $CIR_{it}$ , a dummy variable  $nat_{it}$ , is applied in the specification. It takes the value 1 for Alior Bank SA in 2015 and PKO SA in 2017, and 0 otherwise. The results are presented in column IV of Table 5. The outcomes show that the year of nationalisation was related to the decrease in  $CIR_{it}$  and, as a result, the improvement in cost efficiency. The relationship proves to be statistically significant. It denotes that in the year of nationalisation, these banks improved their cost efficiency compared to other years. This may have been because more efficient banks could negotiate a better price from the buyer (i.e. the Polish government).

Regardless of the dummy variables that capture the ownership structure, the estimates show a statistically significant relationship between the increase in  $roaa_{it}$ , or  $ll\_tl_{it}$  or the solvency ratio and the simultaneous decrease in CIR, which denotes an improvement in cost efficiency. Net interest margin demonstrates the opposite relationship. Bank age is related to reduced cost efficiency (the estimated coefficients were positive). However, statistically significant effects are estimated only for the specifications that included the dummy variables to capture ownership structure (see columns II and III of Table 5). The dummy variable for the Basel requirements is not statistically significant, regardless of the specification. Each column of Table 5 shows that the relationship is positive (denoting a decrease in cost efficiency), although the effects are not statistically significant.

The robustness checks are presented in Table 6 in the Appendix. The estimates are based on the instrumental variable approach, with the loan loss provisions to total loans ratio as the instrumental variable. The applied method is an instrumental variables method with a two-stage least-squares

random-effects estimator. The estimates are presented for two methods: the Balestra and Varadharajan-Krishnakumar (1987) approach and the Baltagi (1981) error-component model. Generally, the results show a statistically significant negative relationship between the dependent variable and  $roaa_{it}$ , the solvency ratio, and the loan loss provisions to total loans ratio, as obtained in the baseline method. Additionally, the impact of the introduction of the Basel requirement is not statistically significant. Bank age reduces cost efficiency (as shown by the CIR), but the result is statistically significant only for the G2SLS random effect regression. This approach confirms the lower CIR (denoting higher cost efficiency) of domestic banks compared to foreign-owned banks. The result for private banks suggested a higher CIR than government-controlled banks, as was the case when the baseline random effects estimation method is used. The estimated coefficients suggest that governmental ownership leads to improved cost efficiency. The “repolonisation” is statistically significant and suggested lower CIR in the year that the ownership structure of the nationalised banks changed. The coefficient estimates for the relationship between the net interest margin and CIR show a statistically insignificant relationship, in contrast to the estimates for the baseline random-effects method (compare these coefficients in Table 6 and Table 5).

Considering the estimates, an additional specification was applied. The set of independent variables was limited to  $roaa_{it}$ , solvency ratio, dummy variables for ownership structure, and Basel requirements. The variable for the ratio of the sum of total deposits (consumer deposits and deposits from banks) to total assets was applied in the specification (variable  $de\_ta_{it}$ ). The equations were estimated with the same baseline method to control autocorrelation and heteroskedasticity. The mentioned results are presented in Table 7. As shown, the relationship between the control variables and the CIR is generally robust for the  $roaa_{it}$ , but the estimates are higher than those in Table 5. The estimates for the solvency ratio are negative and statistically significant but lower than those in Table 5. The solvency ratio is negatively related to the CIR, i.e. better efficiency is expressed by a stronger ability to meet the bank’s long-term financial obligations. The deposit to total assets ratio ( $de\_ta_{it}$ ) is statistically significant in each specification, and the estimated coefficients are negative. This suggests that the relationship between CIR and the  $de\_ta_{it}$  variable is negative, i.e. the increase in the indicator is associated with improved cost efficiency. An important difference is observed for the dummy variable for the year when the Basel requirements were implemented. In the currently analysed specifications, the estimated coefficients are statistically significant. This denotes that the limitation of the initial set of control variables, combined with the inclusion of the deposit to total assets ratio, results in a statistically significant relationship between the coefficients that capture the relationship between the CIR variable and the dummy variable for the introduction of Basel requirements. However, the value of the coefficients show that launching the Basel requirements is associated with an increase in the CIR indicator. The estimates of coefficients for dummy variables for the type of dominant ownership are statistically significant. However, the estimates for the dummy variables for the change in the bank ownership structure from private to governmental (nationalisation) are not statistically significant in the applied specification.

The results from Table 5, Table 6, and Table 7 indicate that there are statistically significant effects of ownership structure on the CIR. However, the effects of the control variables on the CIR might differ in different types of bank controls, suggesting that banks with different ownership structures may be characterised by varying levels of cost efficiency. The data confirm the differences. The descriptive statistic (see and compare results in Table 8) for the CIR shows that the highest mean of  $CIR_{it}$  concerned banks dominated by foreign control or a private owner.

Considering the above, a set of additional estimates of the baseline equation were applied. The estimates were prepared for subsamples that represent the different ownership structures. The results are presented in Table 9. The specifications are consistent with those in Table 5. The estimates shown in Table 9 differ not only in the statistical significance of estimates but also in the sign of the estimated coefficients. Due to the low number of observations for government-owned banks, an interpretation of the estimates for those banks is not provided.

The estimates for banks dominated by a domestic, foreign, or private ownership structure show a negative and statistically significant relationship between the CIR and  $roaa_{it}$ . The association is robust with general estimates (presented in Table 5, Table 6, and Table 7). As for the full sample, the dummy variable for launching the Basel requirements is not statistically significant. The solvency ratio, although statistically significant (as for domestic and private ownership), is negative. The loan loss provision to total loans ratio is negative but statistically significant only for banks characterised by the dominance of foreign or private control. The variable for bank age is statistically significant only for private ownership and was associated with a decline in cost efficiency (compared to the full sample).

The additional estimates for the specification analysed in Table 7 are presented in Table 10. As before, due to the small sample, the results of the governmental ownership structure are not interpreted. However, they indicated that the relationship between  $roaa_{it}$  and CIR is negative and statistically significant. As shown in Table 10, the Basel requirements increased the CIR in the year of their introduction and, in most cases, the estimates are statistically significant. ROAA is negatively and significantly related to the CIR. The relationship between the deposits-to-total assets ratio and the dependent variable is negative for banks dominated by domestic or private ownership. The solvency ratio generally improves efficiency by reducing the CIR.

Table 11 in the Appendix contains the estimates of robustness checks based on the modification of the above specifications – the solvency ratio was replaced with the net interest margin. Generally, as with the results presented in Table 10, the coefficient estimates indicates a statistically significant relationship between the dependent variable and  $roaa_{it}$ . However, the coefficients are generally higher for domestic and private ownership. The indicator for the deposit to total assets ratio has a negative and statistically significant association with CIR for foreign or private stakeholder dominance. However, it is positive when domestic control was dominant (as in the specification with solvency ratio). This may suggest that domestic banks may have a cheaper source of funding than deposits. The introduction of Basel requirements is associated with a statistically significant increase in the CIR. Finally, the net interest margin significantly increases CIR in the case of domestic ownership but decreased it in the case of foreign ownership.

Our paper differs from previous studies on transition economies in that it reviews the situation 15–30 years after the transformation, when massive privatisation and internationalisation seemed to develop and were then completed. Therefore, the common view of private foreign capital bringing new technologies and managerial skills is probably not valid in the case of Poland. Our results reveal some important findings that we believe are important in the ongoing debate on the role of domestic and government banks in Poland.

We demonstrate that ownership matters in terms of bank efficiency. Specifically, domestic and state ownership capital are more cost-efficient than foreign and private capital, respectively. Therefore, the home-field advantage hypothesis of Berger et al. (2000) is confirmed for Poland, contrary to previous research conducted in the early stages of transition (Nikiel, Opiela 2002; Weil 2003; Havrylchuk

2006). We offer several explanations for the lower efficiency of foreign banks in Poland, apart from the cultural and institutional problems mentioned in the home-field advantage approach.

Firstly, our sample comprises 11 foreign banks, four of which are greenfield investments. The rest includes privatised banks that could have “inherited” a poor portfolio and outdated management methods, requiring many years to equalise the efficiency indicators with the competitors. The opposite is true with the state-owned banks. Of the five banks in the sample, two were well-performing banks, taken over from foreign owners in 2015 and 2017. The other one was established in 2009 (Bank Pocztowy SA), which probably took advantage of operating in Polish post offices. Thus, we confirm Bonin, Hasan and Wachtel’s (2005b) statement that “privatisation by itself is not sufficient to increase bank efficiency as government-owned banks are not appreciably less efficient than domestic private banks.”

Additionally, domestic banks often have a local advantage in pursuing fee-for-service business (Bonin, Hasan, Wachtel 2005b). Foreign banks are found to hire better-skilled and better-paid workers, increasing operating costs (Naceur, Goaeid 2008). Alternatively, they may have limited local knowledge, for example, about local deposit-taking or lending to SMEs (Stein 2002). Some also argue that the impact of bad institutions in the host country is more severe for foreign banks than for domestic banks (Lensink, Meesters, Naaborg 2008), which may also be a factor worth noting.

According to Kiss (1994), privatisation should create an efficient, competitive, and fully-fledged market economy. And the transfer of ownership rights from the state to the private sector is believed to create better incentives for efficiency and discipline of workers and managers (Grosfeld 1991). However, we document that state-owned banks are more efficient. The positive effect of governmental ownership on the efficiency of the Polish banks confirms what has happened in Germany (Altunbas, Evans, Molyneux 2001), Southeast Asian countries (Gardener, Molyneux, Nguyen-Linh 2011), Malaysia (Ab-Rahim et al. 2012) and Russia (Belousova et al. 2019). It is in contrast with the common strand in the literature, however (La Porta, Lopez-De-Silanes, Shleifer 2002; Bonin, Hasan, Wachtel 2005a, 2005b). We suggest that state-owned banks may have lower costs of funds (from public institutions). Moreover, access to additional capital allows them to undertake additional wholesale lending or investments at very low operating costs (Tripe 1998). Paradoxically, our findings could be perceived to support “political” theories of government ownership. The political leanings of the management and the supervisory boards could give state-owned entities an advantage in achieving lucrative contracts.

Our study does not resolve the real reasons for differences in the cost-effectiveness of different types of bank ownership in Poland. Nevertheless, it places Poland among developed countries where foreign banks exhibit lower efficiency than domestic owners (for example, Berger et al. 2000). We also demonstrate that the nationalisation of the Polish banking sector did not reduce its efficiency. Therefore the withdrawal of foreign ownership may result not only from political forces (as suggested in Klepczarek, Wiczorek 2023), but also from market forces eliminating less efficient entities.

## **6. Conclusions and limitations**

The Polish path of transformation is a unique one, especially in the banking industry. The deep penetration of foreign capital has receded, and the dominance of government ownership can be seen since 2020. This raises justified questions about the consequences of changes in ownership structures for the efficiency of banks. As an efficient banking system is believed to ensure stability (Burger,

Moormann 2008), and it requires efficient banks to exist, there is a need for an important debate as to whether the bank's owner generates any difference in terms of its efficiency.

The article makes a significant contribution to the literature, introducing innovative elements to the debate on the impact of ownership structure on the banking sector. Specifically, it verifies the relevance of the results obtained for the evolving Polish banking sector in the context of its integration with the European Union (EU). The article sets forth two research hypotheses. The first hypothesis focuses on the issue that foreign banks in Poland are less efficient than their domestic competitors. According to the second hypothesis, private banks in Poland are more cost-efficient than state-owned banks. The results of the empirical part of the study indicate that domestic banks have an advantage, i.e. banks owned domestically demonstrate higher cost efficiency compared to foreign own banks. These results confirm the first hypothesis. However, the second hypothesis was rejected, which proves that government-owned banks tend to be more cost-efficient than their private competitors. The presented estimates also reveal other statistically significant correlations of cost efficiency (CIR) with selected determinants, namely, bank profitability, provisions for loan losses, solvency ratio, and deposit base.

Our analysis has limitations, the most important of which comes from the limitations of the CIR. As it does not capture a bank's risk appetite, a bank can disclose a favourable CIR, even though it needs to write off billions of assets because of impaired loans (Burger, Moormann 2008). Moreover, cutting administrative budgets is not always a reasonable strategy for long-term growth (Tripe 1998). Secondly, we do not differentiate between privatised banks and foreign greenfield banks. Moreover, we do not provide an in-depth examination of the causal relationships between cost efficiency and the ownership structure of banks. As suggested by Cruz (2003), cost efficiency in the banking sector can be influenced by managerial strategies, and future research could further explore these strategies to unravel the mechanisms through which ownership structure impacts bank efficiency. Finally, we do not consider the macroeconomic factors that affect banks' costs and earnings. Any limitation of our study may be considered a call for future research.

Nevertheless, our findings are important considering the public policy agenda. To the best of our knowledge, this is one of the first studies to investigate the efficiency of banks in Poland after it joined the EU. These findings do not claim the superiority of government ownership over private ownership or domestic capital over foreign capital. Rather, they contribute to the discussion, furthering research on the causes and effects of unique changes in the ownership structure of banks in Poland. Finally, the management of banking organisations may be interested in the findings as they point to other, manageable determinants of bank efficiency.

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## Appendix

Table 1

List of analysed banks

Name	Time sample
Alior Bank SA	2011–2021
Bank Handlowy w Warszawie SA	2006–2021
Bank Millennium	2005–2021
Bank Ochrony Środowiska SA – BOS SA	2005–2021
Bank Pocztowy SA	2009–2021
BNP PARIBAS Bank Polska SA	2006–2021
Deutsche Bank Polska SA	2005–2021
DNB Bank Polska SA	2005–2021
GETIN Holding SA	2009–2021
GETIN Noble Bank SA	2011–2021
Idea Bank SA	2013–2019
ING Bank Śląski SA – Capital Group	2005–2021
MBANK SA	2005–2021
Nest Bank SA	2013–2016
Polska Kasa Opieki SA	2006–2021
Powszechna Kasa Oszczędności Bank Polski SA	2006–2021
Santander Bank Polska SA	2005–2021
Santander Consumer Bank SA	2009–2011

Source: own work.

Table 2  
Selected descriptive statistics

	Obs	Mean	Std. dev.	Min	Max
$CIR_{it}$	258	58.991	32.170	-162.640	268.740
$roaa_{it}$	258	0.811	1.373	-8.620	4.270
$ll\_tl_{it}$	258	0.940	1.166	-1.234	10.503
$so\_r_{it}$	258	10.796	4.094	0.900	47.520
$nim_{it}$	258	3.169	1.551	-0.230	9.600
$ln\_age_{it}$	258	3.315	0.768	1.099	5.017
$de\_ta_{it}$	256	81.02	6.08	48.02	92.43

Source: own work.

Table 3  
Results of the p-values for the Fisher-type test for variables in levels (inverse chi-squared) in a specification without trend

	Based on ADF tests	Based on PP tests
$CIR_{it}$	0.0000	0.0001
$roaa_{it}$	0.0927	0.0927
$ll\_tr_{it}$	0.0000	0.0000
$so\_r_{it}$	0.0185	0.0672
$nim_{it}$	0.0907	0.0007
$ln\_age_{it}$	0.0000	0.0000

Source: own work.

Table 4  
Diagnostic tests for the baseline equation

Modified Wald test for groupwise heteroskedasticity	$\chi^2(18) = 3905.68$ prob > $\chi^2 = 0.0000$
Wooldridge test for autocorrelation in panel data	F(1, 17) = 5.484 prob > F = 0.0316

Source: own work.

Table 5  
Estimates of the parameters, dependent variable  $CIR_{it}$

	I	II	III	IV
$roaa_{it}$	-12.26*** (4.56)	-12.45*** (4.54)	-12.37*** (4.49)	-12.33*** (4.58)
$basel_{it}$	2.66 (1.91)	2.24 (2.04)	1.88 (2.01)	2.70 (1.88)
$nim_{it}$	5.19* (2.83)	5.06* (2.84)	5.25* (2.86)	5.33** (2.83)
$so_r_{it}$	-4.40*** (1.40)	-4.59*** (1.26)	-4.65*** (1.29)	-4.44*** (1.38)
$ll\_tl_{it}$	-6.87*** (1.77)	-6.77*** (1.70)	-7.11*** (1.71)	-6.91*** (1.76)
$ln\_age_{it}$	6.60 (4.03)	7.96** (3.91)	9.37** (4.49)	6.73 (4.19)
$do\_os_{it}$		-15.93** (7.80)		
$po\_os_{it}$			21.72** (10.89)	
$nat_{it}$				-3.90** (1.90)
Cons.	83.20*** (13.35)	87.35*** (10.80)	60.18*** (20.83)	82.79*** (13.46)
Obs.	258	258	258	258
Prob > $\chi^2$	0.0000	0.0000	0.0000	0.0000
$R^2$ within	0.5201	0.5276	0.5271	0.5206
$R^2$	0.2273	0.2690	0.2966	0.2262

Notes: \*, \*\*, \*\*\* denote significance at 10%, 5% and 1%, respectively; cluster standard errors in parentheses, RE estimation method.

Source: own work.

Table 6

Estimates of the parameters, dependent variable  $CIR_{it}$ , instrumental variable method

	G2SLS RE					EC2SLS RE		
	I	II	III	IV	V	VI	VII	VIII
$roaa_{it}$	-14.54*** (4.04)	-14.55*** (3.95)	-14.57*** (3.96)	-14.56*** (4.04)	-13.76*** (3.92)	-13.83*** (3.90)	-13.92*** (3.86)	-13.84*** (3.92)
$basel_{it}$	1.05 (2.39)	0.71 (2.31)	0.32 (2.51)	1.13 (2.37)	0.55 (2.16)	0.04 (2.06)	0.07 (2.30)	0.61 (2.14)
$nim_{it}$	7.82 (5.40)	7.34 (5.35)	7.67 (5.38)	7.88 (5.43)	5.78 (4.79)	5.24 (4.72)	5.99 (4.82)	5.92 (4.85)
$so_r_{it}$	-4.97*** (1.52)	-5.12*** (1.38)	-5.20*** (1.43)	-4.99*** (1.51)	-4.90*** (1.52)	-5.08*** (1.35)	-5.10*** (1.44)	-4.93*** (1.51)
$ll_{it}$	-12.82* (6.69)	-12.28** (6.11)	-12.93** (6.52)	-12.78* (6.68)	-10.59** (5.30)	-10.11** (4.74)	-11.02** (5.41)	-10.69** (5.38)
$ln_{age}_{it}$	7.58** (3.80)	8.77** (3.71)	10.30** (4.27)	7.76* (3.98)	1.57 (5.22)	2.28 (5.02)	4.68 (4.67)	1.79 (5.29)
$do_{os}_{it}$		-16.00* (8.22)				-17.74*** (8.63)		
$po_{os}_{it}$			22.49** (10.60)				17.71** (8.79)	
$nat_{it}$				-3.13*** (1.03)				-3.61*** (1.21)
	85.61*** (13.88)	90.60*** (10.62)	62.56*** (20.17)	85.05*** (13.91)	108.73*** (15.46)	116.61*** (15.58)	86.87*** (17.70)	108.06*** (14.80)
Obs.	239	239	239	239	239	239	239	239
Prob > $\chi^2$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
$R^2$ within	0.5010	0.5152	0.5101	0.5022	0.5117	0.5217	0.5194	0.5120
$R^2$	0.2278	0.2626	0.2916	0.2273	0.2433	0.2834	0.2996	0.2428

Notes: \*, \*\*, \*\*\* denote significance at 10%, 5% and 1%, respectively; robust standard errors in parentheses, RE estimation method.

Source: own work.

Table 7

Estimates of the parameters in the modified specification, dependent variable  $CIR_{it}$ 

	I	II	III	IV
$roaa_{it}$	-15.17*** (3.65)	-15.21*** (3.65)	-15.16*** (3.64)	-15.18*** (3.66)
$basel_{it}$	5.44*** (1.39)	5.01*** (1.59)	4.88*** (1.56)	5.46*** (1.40)
$so_r_{it}$	-1.01* (0.54)	-1.20** (0.57)	-1.16** (0.54)	-1.02* (0.54)
$de_{ta_{it}}$	-0.98* (0.50)	-1.02** (0.51)	-1.01** (0.50)	-0.97* (0.50)
$do_{os_{it}}$		-10.50** (5.10)		
$po_{os_{it}}$			12.47** (6.35)	
$nat_{it}$				-2.09 (2.39)
Cons.	160.03*** (46.60)	169.54*** (48.39)	154.59*** (44.93)	159.77*** (46.94)
Obs.	256	256	256	256
Prob > $\chi^2$	0.0000	0.0000	0.0000	0.0000
$R^2$ within	0.5375	0.5418	0.5415	0.5376
$R^2$	0.3759	0.4095	0.4204	0.3755

Notes: \*, \*\*, \*\*\* denote significance at 10%, 5% and 1%, respectively; cluster standard errors in parentheses, RE estimation method.

Source: own work.

Table 8

Characteristic of the  $CIR_{it}$  variable in banks regarding the dominant ownership structure

	Obs.	Mean	St. dev.	Min	Max
DO	89	54.58	44.14	-162.64	261.41
FO	169	61.31	23.39	36.58	268.74
PO	200	61.97	32.31	-162.64	268.74
GO	58	48.70	29.72	-0.12	119.18

Notes: DO – domestic ownership, FO – foreign ownership, PO – private ownership, GO – governmental ownership.

Source: own work.

Table 9

Estimates of the parameters (subsamples for different ownership structures)

	DO	FO	PO	GO
<i>roaa<sub>it</sub></i>	-10.99** (5.03)	-14.72** (6.95)	-12.06*** (4.49)	-2.44 (8.26)
<i>basel<sub>it</sub></i>	5.23 (3.58)	0.59 (1.73)	1.88 (2.72)	4.31*** (1.46)
<i>nim<sub>it</sub></i>	10.56*** (2.11)	-0.67 (2.77)	5.04 (3.17)	-14.65** (7.10)
<i>so<sub>r</sub><sub>it</sub></i>	-5.63*** (0.45)	0.10 (0.43)	-4.67*** (1.29)	10.41*** (3.00)
<i>ll<sub>tl</sub><sub>it</sub></i>	-2.34 (5.02)	-5.43* (3.05)	-7.36*** (1.90)	-7.64 (7.36)
<i>ln<sub>age</sub><sub>it</sub></i>	7.42 (9.11)	-0.30 (3.21)	7.28** (3.37)	-16.83** (7.27)
Cons.	58.29* (32.67)	81.85*** (7.32)	91.28*** (11.50)	67.57 (19.50)
Obs.	89	169	200	58
Prob > $\chi^2$	0.0000	0.0000	0.0000	0.0000
$R^2$ within	0.7735	0.3981	0.5287	0.0007
$R^2$	0.3111	0.4537	0.4374	0.6076

Notes: DO – domestic ownership, FO – foreign ownership, PO – private ownership, GO – governmental ownership; \*, \*\*, \*\*\* denote significance at 10%, 5% and 1%, respectively; cluster standard errors in parentheses, RE estimation method.

Source: own work.

Table 10

Estimates of the parameters (subsamples for different ownership structures)

	DO	FO	PO	GO
<i>roaa<sub>it</sub></i>	-15.29*** (3.55)	-15.23** (7.04)	-15.08*** (3.78)	-17.62** (7.71)
<i>de_ta<sub>it</sub></i>	0.59*** (0.16)	-1.70*** (0.65)	-1.39** (0.53)	-0.74 (0.48)
<i>basel<sub>it</sub></i>	9.15** (3.62)	4.67*** (1.40)	5.22*** (1.68)	11.96*** (4.28)
<i>so_r<sub>it</sub></i>	-0.12 (1.23)	-1.71** (0.66)	-1.63*** (0.44)	7.75** (3.48)
Cons.	16.28 (19.33)	2 310.48*** (66.65)	204.18*** (50.41)	47.84*** (7.47)
Obs.	88	168	198	58
Prob > $\chi^2$	0.0000	0.0025	0.0000	0.0000
$R^2$ within	0.7343	0.4389	0.5627	0.1028
$R^2$	0.3523	0.4068	0.5300	0.3134

Notes:

DO – domestic ownership, FO – foreign ownership, PO – private ownership, GO – governmental ownership; \*, \*\*, \*\*\* denote significance at 10%, 5% and 1%, respectively; cluster standard errors in parentheses, RE estimation method.

Source: own work.



Table 11

Estimates of the parameters (subsamples for different ownership structures), modified specification

	DO	FO	PO	GO
$roaa_{it}$	-16.06*** (3.57)	-14.30** (6.58)	-15.44*** (3.75)	6.57 (10.28)
$de\_ta_{it}$	0.47* (0.27)	-1.28** (0.52)	-0.94* (0.49)	-1.08 (1.32)
$basel_{it}$	8.20*** (2.41)	3.90*** (1.25)	5.05*** (1.73)	-1.26 (5.32)
$nim_{it}$	5.04*** (0.95)	-3.53** (1.58)	-2.34 (2.16)	-17.43* (9.31)
Cons.	9.44 (22.16)	189.09*** (49.59)	157.59*** (46.48)	190.90*** (101.14)
Obs.	88	168	198	58
Prob > $\chi^2$	0.0000	0.0003	0.0003	0.0000
$R^2$ within	0.7516	0.4151	0.5424	0.0005
$R^2$	0.3090	0.4714	0.5513	0.3823

Notes: DO – domestic ownership, FO – foreign ownership, PO – private ownership, GO – governmental ownership; \*, \*\*, \*\*\* denote significance at 10%, 5%, and 1%, respectively; cluster standard errors in parentheses; RE estimation method.

Source: own work.

## Zależność między efektywnością kosztową polskich banków a strukturą właścicielską. Czy struktura własnościowa ma znaczenie?

### Streszczenie

Począwszy od lat 90. XX w. polski sektor bankowy podlegał dynamicznym przemianom w zakresie struktur własnościowych. Zarówno transformacja ustrojowa, jak i akcesja Polski do Unii Europejskiej oraz globalny kryzys finansowy wywarły znaczący wpływ na relacje własnościowe w bankach w Polsce. Dynamiczny rozwój sektora po 1989 r. początkowo charakteryzowała lawinowa prywatyzacja, następnie internacjonalizacja, a wreszcie ponowna „repolonizacja” i dominacja sektora państwowego. Na tle powyższych obserwacji pojawia się pytanie, czy wyniki uzyskiwane przez banki zależą od rodzaju dominującego właściciela i czy struktura własnościowa generuje różnicę w efektywności ich funkcjonowania. Dyskusja w tym obszarze ma szczególne znaczenie w przypadku polskiego sektora bankowego, w którym w 2020 r. to Skarb Państwa stał się dominującym właścicielem aktywów.

W związku z powyższym w prezentowanym artykule poszukuje się odpowiedzi na pytanie, czy struktura własnościowa banków wpływa na ich efektywność wyrażoną wskaźnikiem kosztów do dochodów (*cost-to-income ratio*, CIR). Z literatury odnoszącej się do krajów w okresie transformacji wynika, że rodzaj właściciela ma znaczenie dla efektywności funkcjonowania tych podmiotów. Najczęściej wskazuje się, że własność rządowa jest mniej efektywna niż własność prywatna (Bonin i in. 1998), a banki będące własnością zagraniczną są zwykle bardziej efektywne niż banki krajowe (Bonin, Hasan, Wachtel 2005b). W prezentowanym artykule sprawdzono zatem, czy zawarte w literaturze wyniki znajdują potwierdzenie w polskim sektorze bankowym. W prezentowanym badaniu dążono do realizacji celu głównego oraz trzech celów szczegółowych. Celem głównym jest zweryfikowanie istnienia zależności pomiędzy efektywnością kosztową banków w Polsce a ich strukturą własnościową. Do celów szczegółowych należą: (1) porównanie efektywności kosztowej banków z dominującym kapitałem krajowym i banków z dominującym kapitałem zagranicznym; (2) porównanie efektywności kosztowej w przypadku własności rządowej i prywatnej w bankach w Polsce oraz (3) zidentyfikowanie i analiza determinant efektywności funkcjonowania banków w Polsce.

Zastosowane metody badawcze opierają się na analizie danych panelowych. W badaniu wykorzystano dane roczne dla 18 banków działających w polskim sektorze bankowym w latach 2005–2021. Dane pochodzą z bazy Orbis Bureau Van Dijk. Przy wyborze banków kierowano się dwoma wymogami: dostępnością ciągłych i porównywalnych danych oraz profilem banków komercyjnych (oferujących usługi uniwersalne dla konsumentów). Do analizowanych podmiotów nie zaliczono więc banków wyspecjalizowanych, np. hipotecznych.

Zmienną objaśnianą jest wskaźnik efektywności kosztowej, wyrażony jako relacja kosztów operacyjnych do wyniku działalności bankowej (działalności z tytułu uzyskanych prowizji i odsetek). Główną zmienną objaśniającą będącą przedmiotem analizy jest struktura własnościowa banku. W artykule rozważono cztery typy struktury własnościowej ze względu na dominującego właściciela: własność krajową, własność zagraniczną, własność prywatną i własność rządową. W każdym przypadku strukturę własności ujęto za pomocą zmiennej sztucznej. W przypadku rozróżnienia własności krajowej i zagranicznej zmienna sztuczna przyjmowała wartość 1 dla własności krajowej oraz 0 dla własności

zagranicznej. W przypadku rozróżnienia własności rządowej i prywatnej wartość 1 oznaczała bank o własności prywatnej, a 0 – własność rządową.

Wśród pozostałych determinant efektywności kosztowej uwzględniono między innymi współczynnik wypłacalności, wskaźnik odpisów na straty kredytowe w kredytach ogółem, wiek banku, marżę odsetkową netto, wskaźnik rentowności aktywów, bazę depozytową oraz zmienną sztuczną odnoszącą się do wprowadzenia standardów bazylejskich (zmienna przyjmuje wartość 1 w roku, w którym wprowadzono wymagania Bazylei II i III, a 0 w pozostałych latach).

Aby ocenić związek wskaźnika CIR z wybranymi zmiennymi, a także uwzględnić potencjalne wyzwania wynikające z cech danych panelowych, m.in. z tego, że obejmują krótki okres, zastosowano metodę najmniejszych kwadratów (Ordinary Least Squares, OLS). W celu kontroli autokorelacji i heteroskedastyczności zastosowano jednak estymator z korektą błędów standardowych, zgodnie z wynikami testów diagnostycznych. Preferowano model efektów losowych ze względu na próbę opartą na instytucjach sektora bankowego. Sprawdzone odporność uzyskanych wyników przez zastosowanie innych zmiennych kontrolnych i metod estymacji, m.in. metodę zmiennych instrumentalnych.

Artykuł wnosi istotny wkład do dyskursu naukowego, wprowadzając nowatorskie elementy do debaty na temat wpływu struktury własnościowej na sektor bankowy. W szczególności w niniejszej pracy zweryfikowano aktualność wyników uzyskanych dla ewoluującego polskiego sektora bankowego w kontekście jego integracji z Unią Europejską. W artykule zostały postawione dwie hipotezy badawcze. Pierwsza mówi o tym, że zagraniczne banki w Polsce są mniej efektywne kosztowo niż ich krajowi konkurenci. Zgodnie z drugą hipotezą banki prywatne w Polsce są bardziej efektywne kosztowo niż banki państwowe. Uzyskane wyniki wskazują, że banki z przewagą kapitału rządowego oraz banki będące własnością krajową cechują się wyższą efektywnością niż banki prywatne i zagraniczne. Wyniki te potwierdziły hipotezę pierwszą, natomiast hipoteza druga została odrzucona. Szacunki ujawniają także inne istotne statystycznie powiązania efektywności kosztowej (CIR) z wybranymi determinantami, a mianowicie z: rentownością banków, rezerwami na straty kredytowe, współczynnikiem wypłacalności oraz bazą depozytową.

Prezentowany artykuł wyróżnia się na tle dotychczasowych badań dotyczących gospodarek transformacyjnych tym, że przeprowadzono w nim analizę sytuacji gospodarczej w okresie 15–30 lat po transformacji. W tym czasie procesy masowej prywatyzacji oraz internacjonalizacji osiągnęły pełnię rozwoju, a w przypadku Polski zaobserwowano także tendencję do odwracania wcześniejszych trendów prywatyzacyjnych i globalizacyjnych. Wyniki pokazują kilka ważnych wniosków, które są istotne w toczącej się debacie na temat roli banków krajowych i rządowych w Polsce. Jak wynika z analizy, struktura własności ma znaczenie dla efektywności kosztowej banku. Kapitał własny krajowy i państwowy jest bardziej efektywny (w kontekście minimalizowania kosztów operacyjnych) niż, odpowiednio, kapitał obcy i kapitał prywatny.

Badanie nie nawiązuje jednak do rzeczywistych przyczyn różnic w efektywności funkcjonowania banków o poszczególnych typach własności. Zasadność takiego badania wynika jednak z przedstawionych wyników i rekomenduje się je na przyszłość. W pracy dowiedziono, że nacjonalizacja polskiego sektora bankowego nie zmniejszyła jego efektywności. Wycofanie się własności zagranicznej może zatem wynikać nie tylko z działania sił politycznych, jak sugerują Klepczarek i Wieczorek (2023), lecz także z sił rynkowych eliminujących mniej efektywne podmioty.

W pracy podkreśla się ograniczenia przeprowadzonej analizy. Najważniejsze z nich wynikają z konstrukcji wskaźnika CIR. Ponadto w artykule nie dokonano rozróżnienia między bankami, które

przeszły proces prywatyzacji, a bankami zagranicznymi założonymi jako inwestycje *greenfield*. Co więcej, nie przeprowadzono dogłębnej analizy związków przyczynowo-skutkowych pomiędzy efektywnością kosztową a strukturą własnościową banków. Nie uwzględniono również czynników makroekonomicznych, które wpływają na koszty i zyski banków. Wszelkie ograniczenia niniejszego badania można uznać za przesłanki do kontynuowania analiz w niniejszym obszarze.

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**Słowa kluczowe:** sektor bankowy, przekształcenia własnościowe, gospodarka potransformacyjna, efektywność kosztowa