

Bank Ownership and Lending Patterns in Post-Transition Economies

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Abstract

Using a panel dataset of over 450 banks across fifteen CEE countries from 1994 to 2022, we identify systematic differences in lending activities between foreign- and domestically owned banks. Our results indicate that foreign ownership is associated with a modest but statistically significant increase in lending, which is supported by higher net interest margins. Foreign banks in CEE, while benefiting from access to cheaper liquidity through their parent institutions in Western Europe, exhibit lending behavior that is more vulnerable to operational inefficiencies and external shocks. In contrast, domestic banks are more constrained by liquidity and capitalization, with higher equity and liquid asset ratios significantly reducing their lending capacity. Our findings underscore the significance of foreign ownership in influencing the transmission of financial characteristics into lending behavior, and emphasize the need to consider this factor when evaluating financial system stability. A direct message applies to the specific institutional features of central banks due to the structural trade-offs between cross-border integration and domestic autonomy within post-transition banking systems.

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1. Introduction

Since the early 1990s, banking sectors in Central and Eastern European (CEE) countries have undergone a profound transformation. The shift from state-controlled systems to market-oriented frameworks was marked by large-scale privatization and the entry of foreign strategic investors, particularly Western European banking groups (Bonin et al., 2005; Clarke et al., 2005; Allen et al., 2016). The foreign-owned banks brought capital, expertise, and governance improvements, contributing to financial stabilization and operational modernization (Fries & Taci, 2005; De Haas & van Lelyveld, 2006). However, the 2008 Global Financial Crisis (GFC) revealed structural vulnerabilities in this ownership model, as foreign banks transmitted external shocks to their CEE subsidiaries, often curtailing lending activity during periods of parent-country distress (Cull & Martínez Pería, 2013; Buch et al., 2018). Such a duality, foreign banks as both stabilizers and transmitters of external shocks, has sparked debate over the long-term implications of foreign ownership and its impact on lending activity. Concerns have emerged regarding economic sovereignty, dividend outflows, and the responsiveness of foreign banks to domestic needs (Brana & Lahet, 2012; IMF, 2020). In response, several CEE governments have promoted domestic ownership and re-nationalized key institutions, reflecting a broader trend of economic nationalism and strategic autonomy (Cerutti et al., 2017). Despite extensive literature on ownership and financial stability, several critical questions remain unresolved. They form a background motivation for our analysis, which aims to address them.

First, while foreign banks benefit from access to cheaper liquidity, particularly through lower ECB interest rates (see e.g., Ciccarelli et al., 2013), it is unclear whether and to what extent this advantage translates into increased lending activity in host countries. Second, how do ownership structures relate to the transmission mechanisms between lending activity and bank margin profitability? Understanding the transmission of lending activity through ownership and profitability channels is crucial, as prior research suggests that foreign banks often operate under distinct funding and governance structures that influence their lending behavior (Jeon et al., 2011; Claessens & van Horen, 2014). Moreover, net interest margins may reflect strategic advantages in liquidity access, particularly for foreign-owned institutions that benefit from lower ECB rates (Albrizio et al., 2023). However, the extent to which these margins translate into actual lending remains underexplored for banks in the CEE region. Third, the question of whether foreign banks operate with comparable cost efficiency remains insufficiently addressed. While multinational banking groups may benefit from economies of scale and centralized operations, recent literature suggests that these advantages can be offset

by higher internal compliance costs, transfer pricing mechanisms, and strategic constraints imposed by parent institutions (Nawaz, 2021; Imbierowicz et al., 2024). This issue has gained relevance with the rise of economic nationalism, where domestic policymakers are increasingly scrutinizing the operational footprint and cost structures of foreign-owned banks. As governments seek to reclaim financial autonomy and ensure that banking systems serve national priorities, understanding the true efficiency of foreign institutions becomes essential for evaluating their long-term role in domestic credit provision.

In our paper, we intend to answer the above questions. We contribute to the literature by examining how lending conditions have evolved in CEE countries and how they diverge between domestic and foreign-owned banks. Using a combination of institutional data, ownership patterns, and lending metrics, we identify systematic differences in lending behavior and assess the implications for financial stability, economic growth, and policy design. By focusing on the dynamic interaction between ownership, regulation, and credit provision, our study offers novel insights into the political economy of banking in post-transition economies and contributes to the ongoing debate on the optimal structure of banking systems in open, yet vulnerable, markets.

Hence, in our analysis, we take a step further from the current literature in several ways. First, we compile a unique dataset of banks spanning from 1994 to 2022 for fifteen countries in Central and Eastern Europe. Exploiting this dataset, we provide a comprehensive assessment of how and to what extent ownership structures impact lending conditions in these countries, while also accounting for the effects of macroeconomic and bank-specific controls. Second, by distinguishing between the impacts of foreign and domestically owned banks, we provide a novel view on how domestic and foreign banks diverge in operational efficiency. Third, by examining the dynamics of lending activity from an ownership perspective, we identify the impact on net interest margins. Fourth, we provide policymakers with fresh and robust insights into capital flows into Western European mother banks and their impact on lending conditions.

Our paper is structured as follows. Section 2 presents the developments of CEE banks within a broader perspective of recent findings. In Section 3, we describe the data and the methods used, including GMM and random effects models. We present and discuss our findings in Section 4. Subsequently, we test the robustness of our results in Section 5, while Section 6 concludes.

2. Literature Review

The evolution of lending conditions in Central and Eastern Europe (CEE) over the past three decades has been profoundly influenced by structural transformations in bank ownership, regulatory frameworks, and the region's political economy (Estrin et al., 2009). Following the collapse of centrally planned economies, the 1990s witnessed a large-scale privatization of domestic banks in CEE countries, and a substantial share of these banks was acquired by foreign banking groups, mostly headquartered in Western Europe (Bonin et al., 2015). The transformation was driven by the need to stabilize banking systems plagued by non-performing loans, weak governance, and a lack of capital (Bonin et al., 2005; de Haas & van Lelyveld, 2006; Allen et al., 2014; Dal Maso, 2022). These ownership transformations also had long-run implications for bank resilience: evidence from the CEE countries shows that financial development and ownership categories are strongly associated with bank survival probabilities (Kočenda and Iwasaki, 2020).

The entry of foreign banks into the banking sectors of Central and Eastern European (CEE) countries led to several structural improvements, significantly enhancing the performance and resilience of local financial institutions. One of the most critical contributions was the professionalization of risk management and corporate governance (Kocenda and Iwasaki, 2022). Foreign parent banks, typically located in Western Europe, introduced robust internal systems for credit evaluation, compliance, and audit control. These practices were largely absent in the post-socialist banking systems. These enhancements reduced political interference and the prevalence of connected lending, while improving the quality of loan portfolios (Cull & Martínez Pería, 2013). The presence of foreign strategic investors also accelerated the adoption of international accounting standards and improved managerial discipline. According to de Haas and van Lelyveld (2006), foreign bank subsidiaries were generally better capitalized and more efficient in credit allocation, which helped mitigate systemic risks and supported banking sector stability.

Beyond improvements in governance, foreign banks contributed significantly to the modernization and deepening of financial intermediation in the region. By bringing in capital, technology, and know-how, they facilitated the development of retail banking, broadened access to credit, and introduced a wider array of financial products and services, especially for small and medium-sized enterprises (Gopalan et al., 2007; Dal Maso, 2022). Their market entry was also associated with stronger macroeconomic and financial credibility. In particular, the presence of foreign banks signaled confidence to international investors and credit rating

agencies, often resulting in lower country risk premiums (Jeon et al., 2011; Orphanides, 2022). Empirical evidence shows that, in the pre-crisis period, foreign-owned banks outperformed domestic banks in terms of profitability, asset quality, and capital adequacy (Brei & Schclarek, 2015). Taken together, these developments suggest that foreign ownership played a pivotal role in aligning CEE banking systems with European regulatory norms and in establishing the institutional foundations for financial stability and long-term growth.

However, the global financial crisis (GFC) of 2008 exposed the vulnerabilities associated with foreign bank dominance. As parent banks in Western Europe experienced liquidity shortages and solvency risks, they reduced funding to their subsidiaries in CEE, transmitting the external shock through internal capital markets (Allen et al., 2014).¹ The so-called "home bias" in capital allocation became more salient, and credit growth in CEE declined (Cull & Martínez Pería, 2013). Although international coordination mechanisms, such as the Vienna Initiative, sought to mitigate these risks, the fundamental exposure of host economies to external shocks became a growing concern, alongside deteriorating financial stability across Europe (Bruha and Kocenda, 2018).

As a result, several CEE countries began to reassess the costs of openness, particularly in the absence of full membership in the euro area. For instance, the Czech Republic, Hungary, and Poland, despite initially pursuing integrationist policies, have remained outside the eurozone. One reason, often implicit in the literature, is their desire to retain control over monetary policy and limit exposure to externally driven macroeconomic and financial volatility (Cerutti et al., 2017; Pócsik, 2021). The role of central banks in these countries has evolved toward active guardianship of monetary sovereignty, exchange rate stability, and financial sector autonomy. In Hungary, this included more assertive measures such as policies favoring domestic ownership of banks, including outright re-nationalization (Brana & Lahet, 2012).

Another consequence of foreign dominance was the uneven distribution of profits within banking groups. Studies confirm that subsidiaries in CEE have served as stable profit centers, with significant dividend outflows to parent banks in Western Europe (IMF, 2020). These transfers, while legal and contractually agreed, generated political backlash and gave rise to a narrative of "financial extraction" that fueled economic nationalism in several CEE states. Governments and central banks began to view foreign banks as agents of capital outflow rather

¹ Related evidence on firm outcomes during COVID-19 and the Russo-Ukrainian war indicates that shocks of this type substantially raise vulnerability in bank-dependent emerging European economies, with outcomes strongly conditioned by national institutions (Kočenda and Iwasaki, 2025).

than as a means of financial deepening, further complicating the legitimacy of foreign ownership (Johnson & Barnes, 2024).

In response to rising economic nationalism, the behavior of domestic versus foreign banks began to diverge. Empirical evidence suggests that foreign banks, facing regulatory and reputational pressure, remained relatively more stable lenders, while domestic banks, particularly those with stronger political affiliations, showed signs of credit retrenchment and pro-cyclical behavior. Moreover, policy preferences for domestically controlled banks can sometimes lead to credit allocation distortions or the crowding out of market-based lending practices (Gopalan et al., 2007; Woods, 2024). Moreover, recent literature suggests that due to profit withdrawals in the form of dividends and additional cost payments to their mothers, foreign-owned banks were limited in their efforts to improve cost efficiency (Nawaz, 2021). However, the study primarily investigated U.S. banks, with Europe remaining underexplored. Based on these findings, we define the first two hypotheses:

H1: Foreign ownership exhibits a positive effect on lending activities in the CEE banking sector.

H2: Foreign-owned banks are less efficient in terms of operational costs than the domestic ones.

Besides the advantages in capitalization, modernization, and governance, these groups operate in Western Europe with access to cheaper liquidity as interest rates in the eurozone were lower than in CEE countries with their domestic currencies (Fries & Taci, 2005; Brei & Schclarek, 2015; Albrizio et al., 2023). Such access to liquidity has brought potential for foreign-owned banks to increase their net interest margins. However, this assessment has not been thoroughly investigated for the CEE countries before, with an emphasis on periods corresponding to their privatization stages. Building upon these arguments, we state our third hypothesis:

H3: Foreign ownership exhibits a positive effect on net interest margin.

Despite these trends, the empirical literature has not reached a definitive conclusion about whether the rise in economic nationalism and domestic control has systematically reduced lending activity in CEE, nor whether domestic or foreign banks are more conducive to financial stability and growth. While literature offers suggestive patterns, the identification of causal relationships remains limited by data constraints and methodological challenges. Our study contributes to this debate by offering new evidence on the evolving dynamics of bank

ownership and diverging lending activity in the CEE region, with a focus on disentangling the complex interplay between political economy, regulatory choices, and cross-border banking behavior.

3. Data and Methods

We have built a unique dataset over the period 1994–2022 to capture both firm-specific and country-level dynamics. Specifically, we combine annual unconsolidated bank-level data from the Bankscope, BankFocus, and Orbis databases, with macroeconomic indicators from the World Bank’s World Development Indicators and Global Financial Development Database, and governance indicators from the World Bank’s Worldwide Governance Indicators.

In line with standard practice in the multinational banking literature, we exclude branches and non-independent facilities of foreign banks, as well as a wide set of non-bank financial institutions, specialized credit agencies, holding companies, finance companies, trust institutions, and micro-finance organizations. Because we rely on unconsolidated accounting data, each observation represents the financial position of an individual bank rather than a banking group, ensuring that the analysis captures genuine within-country operations rather than group-level aggregation effects.

The final panel comprises 451 banks with 5392 bank-year observations across fifteen Central and Eastern European (CEE) countries: Albania, Bosnia and Herzegovina, Bulgaria, the Czech Republic, Estonia, Croatia, Latvia, Lithuania, North Macedonia, Montenegro, Poland, Romania, Serbia, Slovenia, and Slovakia.

We use the lending activity ratio (*Lending*), defined as the ratio of loans to total assets, which serves as a proxy for banks’ credit expansion relative to their size. We use lending activity as the dependent variable in our estimation. Subsequently, we use bank-specific controls, macro controls, governance controls, and ownership dummy variables as regressors. Descriptive statistics, separately reported for foreign-owned and domestically owned banks, are presented in Tables A1–A2. Table A3 provides the correlation matrix.

Importantly, we include ownership indicators based on the bank’s ultimate controlling shareholder. Ownership information is taken from the Orbis database. For each bank and year, we identify the ultimate controlling shareholder and assign it to one of three broad groups according to the reported shareholder type: banks, industrial companies, and public authorities or government institutions. We then determine whether the controlling shareholder is located in the same country as the bank or abroad by comparing the shareholder country code with the

host-country code of the bank. This procedure yields four distinct ownership categories, namely foreign bank owners, domestic bank owners, foreign industrial owners, and domestic industrial owners. Banks that are controlled by public authorities or the state form a separate category. Institutions whose controlling shareholders do not fall into any of these groups, such as entities owned by diversified domestic investors, investment companies, or widely held private owners, serve as the reference category in the empirical analysis.

Among the bank-specific controls, we include: *equity-to-total assets ratio*, capturing capital adequacy and financial strength; *total assets-to-GDP*, reflecting the systemic size of the banking sector; *liquid assets-to-total assets ratio*, indicating liquidity buffers; *loan loss reserves-to-gross loans ratio*, as a measure of credit risk coverage; *cost-to-income ratio*, reflecting operational efficiency; *net interest margin*, capturing margin of the banks on loans; and *non-interest income-to-assets*, capturing diversification of revenue sources. To account for the macroeconomic environment, we control for the *growth rate of nominal GDP*, the *inflation rate*, and the *policy interest rate*, which jointly reflect the cyclical and structural conditions that influence lending behavior. In addition, we incorporate a set of institutional and governance indicators: *control of corruption*, *rule of law*, *voice and accountability*, *government effectiveness*, *political stability*, and *regulatory quality*.

While previous contributions have often been limited to selected countries, shorter time spans, or narrower sets of indicators (Bonin et al., 2005; Fries & Taci, 2005; De Haas & van Lelyveld, 2006; Claessens & van Horen, 2014), our approach relies on a comprehensive panel dataset covering nearly three decades. This allows us to capture both structural patterns and cyclical dynamics in lending activity within the region. Followingly, we isolate the influence of ownership from other bank-specific and macroeconomic determinants.

We estimate the determinants of bank lending activity in Central and Eastern Europe (CEE) using panel regression techniques, including the Generalized Method of Moments (GMM) estimator (Arellano & Bond, 1991; Blundell & Bond, 1998) and a random effects model.² The GMM approach is particularly suitable for dynamic panel data settings, where endogeneity and unobserved heterogeneity may bias standard estimators. The specification is defined as follows:

$$Lending_{it} = const + \beta_1 Lending_{it-1} + \beta_2 Ownership_{it} + \beta_3 BankControl_{it} + \beta_4 CountryLevel_{ct} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

² We complement the GMM estimations with random effects regressions, as evidence shows that GMM estimators may yield imprecise or biased estimates when the panel contains long time dimensions (Roodman, 2009).

where *Lending* is defined as the ratio of loans to total assets, serving as a measure of lending intensity for a given bank i in a specific year t . To account for the dynamic nature of lending decisions, the model includes a lagged dependent variable, which captures the persistence of lending behavior over time. *Ownership* is measured through a set of ownership-type dummy variables based on the ultimate controlling shareholder.

A group of the *BankControl* variables is included to account for heterogeneity in financial and operational characteristics. These controls comprise the *equity-to-assets ratio* (a proxy for capital adequacy), *liquidity ratio* (indicating the share of liquid assets), *cost-to-income ratio* (reflecting operational efficiency), *net interest margin* (measuring lending profitability), *loan loss reserves to gross loans* (capturing credit risk provisioning), *non-interest income to assets* (indicating income diversification), and *total assets relative to GDP* (serving as a proxy for the bank's systemic relevance). In addition to bank-level controls, *CountryLevel* represents a set of variables that accounting for macroeconomic and institutional controls. These include *GDP growth*, *inflation rate*, and the *policy interest rate*, alongside six governance indicators derived from the World Governance Indicators (WGI): *control of corruption*, *rule of law*, *voice and accountability*, *government effectiveness*, *political stability*, and *regulatory quality*.³ Finally, μ_i denotes unobserved bank-specific effects and λ_t represents year time-dummies.

Robust standard errors are clustered at the bank level to account for intra-bank correlation over time. We evaluate model validity by using Arellano-Bond tests for autocorrelation and Hansen tests for instrument validity.

4. Results

In this section, we present empirical findings on how ownership structure influences bank lending activity in Central and Eastern Europe (CEE). The results are derived from a comprehensive set of outputs, including five main tables (Tables 1–2 and A4–A6) and three figures (Figures 1–3). Table 1 provides baseline estimates of lending determinants using both GMM and random effects⁴ models, while Table 2 extends the analysis by introducing interaction terms to capture ownership-specific effects. Figures 1 to 3 complement the

³ These institutional measures are widely employed in related empirical work on CEE bank survival, firm survival under crisis, and corporate crime (Kočenda and Iwasaki, 2020; Kočenda and Iwasaki, 2025; Iwasaki and Kočenda, 2025), which allows us to align our institutional controls with the established literature.

⁴ Because ownership variables exhibit very limited within bank variation over time, fixed-effects estimation absorbs almost all between bank variation. This is a well-recognized identification issue in the literature on bank ownership and foreign-bank effects. For this reason, dynamic GMM serves as our main identification strategy, while random effects estimates are reported as a complementary specification that allows us to exploit both within and between bank variation.

regression results by visualizing the temporal dynamics of foreign ownership effects on *lending activity* (Figure 1), *cost-to-income ratios* (Figure 2), and *net interest margins* (Figure 3). The robustness of the findings is further tested across subsamples defined by bank size (Table A4), sector development stages (Table A5), and crisis versus non-crisis regimes (Table A6). Together, these outputs allow for a nuanced assessment of how foreign and domestic banks differ in their lending behavior, cost efficiency, and responsiveness to macro-financial conditions.

Figure 1 provides the first insights, offering a dynamic perspective on the role of foreign ownership in shaping lending activity over time. During the early transition period up to 2000, foreign ownership made a positive contribution to bank lending, reflecting the stabilizing role of foreign bank groups that injected capital and governance practices into fragile banking systems (IMF, 2025). However, between 2000 and 2007, the effect turned (not significantly) negative, suggesting that foreign banks temporarily curtailed lending. One possible interpretation is that the aftermath of the dot-com crisis and increasing integration into global financial markets led multinational banks to adopt more cautious strategies in CEE, redirecting their resources toward parent institutions (in line with Caparusso & Hardy, 2022).

After 2011, the trajectory reversed again, with foreign ownership exerting a clear positive and economically significant effect (Figure 1). The estimates suggest that a one-percentage-point increase in foreign ownership resulted in a 5–15% rise in lending activity, coinciding with a period of falling interest rates and abundant access to low-cost funding in the post-crisis environment. The finding highlights that foreign banks, once recapitalized and supported by accommodative monetary policies (as ECB interest rates were lower than those in CEE countries, allowing foreign-owned banks to access cheaper funds), resumed their role as key credit providers in CEE. It also underscores the dual character of foreign ownership: while exposure to global shocks may temporarily depress local lending (as the parent institutions were withdrawing liquidity from countries in order to strengthen domestic stability (Buch et al., 2018), the structural advantages of access to international capital and governance frameworks ultimately reinforce banks' capacity to expand credit when financial conditions stabilize (Frey et al., 2018). Furthermore, it confirms our first hypothesis about the positive effect of foreign-owned banks on lending activities in CEE countries.⁵

In Figure 2, we document a previously unreported divergence in the *cost-to-income* dynamics of foreign and domestically owned banks in the CEE region. Whereas the established

⁵ The ownership-based differences in lending behavior complement earlier evidence that ownership structure is also one of the most economically significant determinants of bank survival in CEE (Kočenda and Iwasaki, 2020).

transition-economy literature typically asserts that foreign ownership improved cost efficiency by importing governance structures, risk-management frameworks, and modern banking technologies (Fries & Taci, 2005; de Haas & van Lelyveld, 2006), our findings reveal the opposite pattern. Throughout most of the sample period, foreign-owned banks consistently exhibit higher *cost-to-income ratios* than their domestic counterparts, indicating that foreign banks operate with higher operational costs per unit of income. The evidence directly confirms our second hypothesis about the lower efficiency of foreign-owned banks in terms of operational costs. Despite their advantages in credit screening and risk identification, the costs of foreign banks remained structurally higher, suggesting that multinational subsidiaries may have faced elevated compliance expenses, more complex internal reporting obligations, or higher intra-group service and transfer pricing charges that eroded their operational efficiency.

Moreover, Figure 2 highlights an upward shift in cost ratios in the early 2000s. A likely explanation lies in the progressive adoption and eventual mandatory implementation of International Financial Reporting Standards (IFRS) across the European Union. Standards such as IAS 39 introduced requirements for the classification, valuation, provisioning, and disclosure of financial instruments. Contemporary assessments noted that the IFRS-imposed system, reporting, and compliance costs on European banks, including extensive IT upgrades and staff training (ICAEW, 2007). Taken together, the evidence in Figure 2 challenges established assumptions about foreign banks' higher efficiency in post-transition economies and shows that their operational cost disadvantage is a persistent and structurally embedded feature of the CEE banking landscape.

Furthermore, Table 1 reveals more details of the observed patterns. Here, we investigate several consistent determinants of bank lending in the CEE region. The coefficient on the *cost-to-income ratio* (see models 2 and 3 in Table 1) highlights how operational cost inefficiency diverts resources away from credit provision; this pattern is further confirmed by the baseline estimations in models 4 to 6 in Table 1. The result echoes Fries and Taci (2005), who argue that cost efficiency gains in transition banks were central to sustaining credit growth. Profitability, in contrast, acts as a positive driver. As models 2 and 3 indicate, when lending becomes more profitable, banks expand their portfolios proportionally (which is further confirmed by baseline estimations in models 4 to 6). The mechanism is consistent with argument of Claessens and van Horen (2014), who highlight that profitability incentives shape banks' willingness to supply credit.

On the other hand, liquidity management shows the opposite dynamic. The *liquidity ratio* is negative (see Table 1), suggesting that holding liquidity buffers comes directly at the

expense of lending conditions. Such a trade-off is relevant in CEE, where banks often maintain liquidity buffers in response to external volatility (De Haas & van Lelyveld, 2010). Moreover, it aligns with the characteristics of CEE banks, as their liquidity largely consists of client deposits, which are less risk-averse compared to those in Western Europe, where their parent institutions are mostly located (Rieger et al., 2015). Furthermore, capital quality (proxied by Equity to Assets ratio) also shows a negative effect (see models 1 to 6 in Table 1). Rather than reflecting weakness, it may signal a strategic choice, as well-capitalized banks often pursue conservative policies or diversify away from loan markets, thereby reducing their dependence on credit expansion. Laeven and Levine (2009) also observe that stronger capitalization can temper risk-taking, which fits our evidence.

By contrast, loan loss reserves are positively associated with lending. This seemingly paradoxical result can be interpreted by the signaling role of provisions. Banks that credibly account for future risks gain regulatory and market confidence, which eases the pressure on cash flow to expand lending (Leventis et al., 2012). Moreover, both the GMMs and baseline regressions provide evidence about ownership structure playing a role, which confirms our first hypothesis. Foreign banks show a small but significant positive coefficient (see models 3 and 6), suggesting that being a foreign-owned bank raises lending activity compared to domestic peers. Though the effect is modest, it is robust across both specifications and aligns with studies showing that foreign banks benefit from group funding and stronger governance (Jeon et al., 2011). Domestic banks, on the other hand, do not display significant lending effects, which is consistent with prior evidence of political interference and pro-cyclicality (Sapienza, 2004; Micco et al., 2007).

Then, Figure 3 provides more details on the dynamics of *net interest margins* from the perspective of ownership. Throughout most of the observation period, foreign banks have maintained margins that are on average about two percentage points higher than those of their domestic counterparts. The margin premium likely reflects both structural and strategic advantages. First, foreign banks in CEE are generally larger and more competitive institutions (Nițoi et al., 2021), which enables them to price credit more favorably from a position of market strength. Second, and perhaps more importantly, foreign subsidiaries benefit from access to cheaper funding from their parent institutions in Western Europe (as they have access to cheaper liquidity due to lower interest rates from the ECB (Albrizio et al., 2023)). Access to cross-border liquidity enables them to sustain higher lending spreads while maintaining lower marginal funding costs, a mechanism consistent with earlier findings on multinational banks' internal capital markets (Caparusso & Hardy, 2022; IMF, 2025). The findings confirm our third

hypothesis about the positive effect of foreign ownership on *net interest margins*. Such results suggest that cross-border liquidity channels can serve as a stabilizing force in credit provision, particularly when domestic funding conditions tighten. Policymakers should therefore consider the role of international monetary transmission and internal capital markets when designing macroprudential frameworks, especially in financially integrated banking systems.

However, Figure 3 also shows that this relationship was temporarily reversed during the COVID-19 period, when domestic banks increased their *net interest margins* relative to foreign banks. Such a short-lived convergence can be plausibly linked to the inflationary environment and the sharp increase in policy rates. Domestic banks, heavily reliant on local deposit funding, were able to quickly reprice their loan portfolios and pass on higher costs to borrowers. In contrast, foreign subsidiaries faced tighter constraints. Not only were policy rates rising in the euro area, which raised the cost of parent-bank funding, but multinational groups also tightened their internal capital allocations to preserve liquidity during the crisis. As a result, foreign banks were less able to exploit the temporary margin expansion available in domestic markets.

The mechanism of transmission of lower rates to higher *net interest margins* was suggested by Ciccarelli et al. (2013) but was not further analyzed for the area of banks from CEE countries. Taken together, while parent-bank support generally allows foreign banks to sustain higher margins over the long run, their dependence on cross-border liquidity also exposes them to global shocks and policy shifts that may erode these benefits during crisis periods (as previously evidenced by Hanousek et al., 2015). Domestic banks, though less efficient and more vulnerable in normal times, can occasionally gain a relative advantage when local macro-financial conditions diverge from global funding dynamics.

In Table 2, we extend the specifications from Table 1 by disentangling the effects of bank characteristics across foreign- and domestically owned banks. The results confirm the patterns documented in Table 1 but also reveal ownership-specific heterogeneity. A particularly noteworthy finding concerns liquidity management. While liquidity ratios constrain bank lending (see models 1 and 4), the effect is not significant when we study banks separately based on ownership types. The same pattern emerges for the quality of capital and the loan loss reserve ratio on gross loans.

However, net interest margin and cost efficiency differ across ownership types (see models 2 and 3 in Table 2). Higher cost-to-income *ratios* are particularly detrimental for foreign banks, underlining that cost inefficiency weakens their lending capacity. The result is consistent with the dynamic perspective (Figure 2), which shows that foreign banks have higher structural operating costs. The findings confirm our second hypothesis about the lower cost efficiency of

foreign banks. Moreover, net interest margins stimulate lending only among foreign banks, while the effect is absent for domestically owned institutions (see model 3 in Table 2). Such a divergence suggests that foreign subsidiaries can leverage low-cost group funding (due to lower interest rates in the eurozone, Ciccarelli et al., 2013) to maintain higher spreads and expand lending. It also supports our third hypothesis that foreign-owned banks will increase lending due to higher net interest margins. In contrast, domestic banks, more dependent on local funding markets, cannot translate higher margins into proportional credit growth. Taken together, these findings illustrate how ownership mediates the transmission of bank-level characteristics into lending activity, reinforcing the broader conclusion that foreign and domestic banks in CEE operate under distinct strategic and financial constraints.

5. Robustness analysis

To assess the robustness of our baseline findings, Table A4 disaggregates the sample by bank size (small, medium, and large institutions). The findings reveal that ownership effects exhibit a distinct asymmetry across different types of banks. Foreign ownership shows a larger association with lending in medium- and large-sized banks, with the magnitude being comparable across the two groups. However, the effect reaches statistical significance only for large banks, indicating that foreign-controlled institutions of larger scale are better positioned to increase lending. By contrast, government-owned banks exhibit a negative and significant effect, suggesting that state ownership constrains lending capacity, possibly reflecting tighter mandates or risk-averse lending practices (which is in line with and further extends the findings of La Porta et al. (2002)). The significant lending effect observed in large foreign-owned banks highlights the importance of scale in leveraging cross-border funding, with implications for the banking sector's structure and foreign investment strategies. However, as Nițoi et al. (2021) note, large banks in CEE countries are often foreign-owned banks. Additionally (see Table A4), the negative impact of government ownership on lending suggests that state-controlled banks may require governance reforms or mandate adjustments to avoid lending constraints. Therefore, policymakers aiming to stimulate lending in CEE should consider the asymmetric effects of ownership, particularly the strategic role of large foreign banks and the limitations of state-owned institutions.

Subsequently, the results reveal that cost inefficiency significantly affects only lending among small banks. It suggests that operational inefficiencies disproportionately constrain

lending activities in smaller institutions, which may lack economies of scale or access to group-level support. *Net interest margin* is positively associated with lending in medium-sized banks, indicating that profitability incentives are most salient in this segment. A comparable but weaker effect is present in large banks, suggesting that profitability considerations extend beyond the medium-size group, albeit with lower intensity. Liquidity buffers are negatively associated with lending across all bank size groups (Table A4). The effect is relatively stable, suggesting that higher holdings of liquid assets consistently crowd out lending irrespective of bank size. Loan loss provisioning is positively related to lending only to medium and large banks, while the effect on small banks is statistically insignificant. This suggests that the disciplining role of provisioning becomes relevant primarily for larger institutions.

To further enhance our baseline findings, Table A5 estimates the lending determinants separately across three distinct subperiods that reflect key phases in the evolution of CEE banking systems: (i) the privatization phase (pre-2005), (ii) the consolidation and crisis period (2006–2015), and (iii) the post-crisis era marked by digitalization and partial re-nationalization (2016–2022). Across all phases, the effect of ownership becomes statistically significant only during the diversification period, consistent with foreign banks' greater ability to mobilize cross-border funding and scale credit as risk management and digital origination mature. By contrast, domestic ownership exhibits a uniformly negative (though mostly insignificant) association with lending, indicating tighter funding constraints and more conservative balance sheet management. Taken together, the results indicate that foreign banks have a structural advantage in lending, with the gap being most significant in the later stages of the region's banking development compared to domestic banks. The findings are consistent with Figure 1, which shows a statistically significant effect of ownership since 2010. Moreover, it provides more support for our first hypothesis about the positive effect of foreign ownership on bank lending.

Furthermore, the results suggest that cost inefficiency has a negative overall effect on lending over time, although the statistical significance is limited. The strongest adverse impact is observed during the privatization phase, consistent with expectations that operational inefficiencies were most binding when banking sectors were undergoing structural reforms and ownership transitions. In other subperiods, the coefficients remain negative but are statistically insignificant, suggesting that the disciplining role of cost efficiency weakened once banking systems stabilized. In contrast, the *liquidity ratio* consistently exhibited a statistically significant negative effect across all three periods, indicating that liquidity buffers systematically constrained lending activities, regardless of the macroeconomic and financial environment.

Loan loss provisioning generally shows a positive association with lending across subperiods (Table A4). The pattern suggests that maintaining buffers against credit risk was not a constraint in itself, but rather tended to accompany credit expansion during different phases of banking sector development.

We also aim to validate the stability of our findings under varying macroeconomic and financial conditions. Table A6 presents a robustness check by splitting the sample into crisis and non-crisis periods. The ownership effects display a clear asymmetry across regimes. Foreign banks exhibit a systematically positive effect on lending, which becomes statistically significant only during crisis periods. The pattern is consistent with the notion that parent-bank support and access to group-level liquidity buffers allow foreign subsidiaries to sustain lending when domestic conditions deteriorate (Cetorelli & Goldberg, 2012). However, the relationship was not yet observed for the banks from the CEE area. In contrast, domestic banks show persistently negative and insignificant coefficients across all specifications, with the interaction term indicating that their lending declines significantly during crises. These results highlight that ownership structure matters most under stress: while foreign banks are better positioned to stabilize lending activities through cross-border funding, domestic banks appear more vulnerable to downturns. The findings should nevertheless be interpreted with caution, as estimates for crisis periods rely on a smaller sample of observations. Furthermore, we also studied the differences between state-owned banks and banks based on their industrial specialization; however, these ownership-type divisions do not provide any support for affecting lending.

Additionally, the results confirm that the *liquidity ratio* remains the most consistent determinant of lending, with negative and statistically significant coefficients across both regimes. Hence, liquidity management systematically constrains lending irrespective of whether banks operate in crisis or non-crisis environments (in line with Chen et al. (2025)). Loan loss provisioning continues to exert a positive and significant effect on lending across both crisis and non-crisis regimes. Contrary to expectations of a weaker impact in turbulent times, the magnitude is slightly higher during crises than in non-crisis periods. It suggests that credible provisioning may have been particularly important for sustaining lending under stressed conditions, as banks that signaled stronger risk coverage were better able to maintain or expand lending (Mwanjilini et al., 2025).

Furthermore, capital quality, proxied by the equity-to-assets ratio, exerts a significantly stronger negative effect on lending during non-crisis periods than in crisis years, where the coefficient is weaker and not statistically significant. It corroborates the findings from Table 1 and indicates

that in more stable environments, well-capitalized banks may adopt more conservative lending strategies, whereas in times of stress, higher capitalization does not significantly constrain lending. The net interest margin exhibits a positive and significant association with lending only during non-crisis periods, suggesting that profitability incentives encourage credit expansion under normal conditions. However, during crises, banks are unable to translate margin gains into higher lending.

6. Conclusion

Our paper provides new empirical evidence on how ownership structures influence bank lending activity in Central and Eastern European (CEE) economies. By using a large panel dataset covering fifteen countries over nearly three decades, we identify systematic differences in lending behavior between foreign- and domestically owned banks. Our findings show that foreign ownership is associated with a modest but statistically significant increase in lending, confirming our first hypothesis. However, foreign banks are also more sensitive to cost inefficiencies and external shocks, which reflects their exposure to group-level constraints and global financial volatility. This issue was not previously investigated for the CEE banks, and the finding supports our second hypothesis about the lower cost efficiency of foreign-owned banks. Finally, we also show that foreign-owned banks exhibit higher net interest margins, which is in line with our third hypothesis. We argue that ownership structure has an effect on the margins due to lower interest rates in the eurozone.

The analysis reveals that key financial indicators (such as cost-to-income ratio, liquidity buffers, equity levels, and loan loss reserves) have consistent and economically meaningful effects on lending. Cost inefficiency and liquidity holdings systematically reduce lending activity, while profitability and provisioning support lending expansion. These relationships are further moderated by the type of ownership and the size of the bank. Smaller banks are more vulnerable to inefficiency, while medium-sized banks respond more strongly to profitability incentives. Foreign banks tend to benefit from access to cheaper funding (via lower ECB interest rates) and stronger governance, whereas domestic banks rely more heavily on internal provisioning.

Robustness checks across different time periods and crisis regimes confirm the stability of the uncovered patterns. Still, the negative impact of cost inefficiency was most pronounced during the overall period (with no significant subperiods), while liquidity constraints remained consistently binding across all subperiods. Loan loss provisioning retained its positive effect throughout, though its magnitude was not significant during the privatization period.

Importantly, the positive effect of foreign ownership on lending emerged only after the global financial crisis period, suggesting that foreign banks required time to integrate and stabilize their operations before making meaningful contributions to lending activities. These temporal dynamics underscore the importance of institutional maturity and macro-financial context in shaping ownership effects.

Taken together, our findings show that ownership is a fundamental structural element of the banking sector that shapes how financial conditions are translated into lending outcomes. Foreign and domestic banks react differently to the same incentives because they face distinct strategic constraints, funding sources, and risk environments. These differences explain why profitability, liquidity management, and cost efficiency do not affect all institutions in the same way, and why ownership functions as an important channel through which financial and regulatory conditions influence credit supply. The overall structure of the banking sector, including the composition of foreign and domestic banks, their operational efficiency, and their access to funding, therefore plays a central role in determining how credit reaches the real economy. For policymakers in post-transition economies, these structural characteristics are key factors that shape the effectiveness of monetary, prudential, and fiscal policies. As cross-border banking and international consolidation deepen, the importance of coherent regulatory coordination across jurisdictions becomes increasingly critical for maintaining financial stability and limiting asymmetric spillovers within integrated banking groups.

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Tables

Table 1

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Gross Loans to Total Asset					
Lending (lagged)	0.99*** (0.09)	0.71*** (0.09)	0.71*** (0.08)			
Banks foreign			0.02* (0.01)			0.04*** (0.01)
Banks domestic			-0.02 (0.01)			-0.01 (0.04)
Industry foreign			0.01 (0.01)			0.03 (0.03)
Industry domestic			0.01 (0.01)			0.01 (0.03)
Government			0.01 (0.02)			-0.01 (0.04)
Cost To Income Ratio (%)	-0.84 (0.73)	-1.77** (0.74)	-1.65** (0.71)	-3.56*** (1.19)	-3.38*** (1.23)	-3.36*** (1.22)
Net Interest Margin (%)	0.08 (0.10)	0.20* (0.12)	0.22* (0.12)	0.39** (0.18)	0.38** (0.18)	0.38** (0.18)
Non-interest income (%)	0.10* (0.05)	0.04 (0.06)	0.05 (0.06)	-0.02 (0.07)	0.06 (0.08)	0.07 (0.08)
Total assets / GDP (%)	-0.26 (0.16)	-0.28* (0.17)	-0.27* (0.16)	-0.07 (0.07)	-0.07 (0.07)	-0.08 (0.07)
Liquidity ratio	-0.12* (0.07)	-0.33*** (0.06)	-0.33*** (0.06)	-0.73*** (0.03)	-0.73*** (0.03)	-0.73*** (0.03)
Equity / Total Assets (%)	-0.35*** (0.12)	-0.46*** (0.17)	-0.46*** (0.17)	-0.71*** (0.24)	-0.75*** (0.24)	-0.75*** (0.24)
Loan Loss Reserve / Gross Loans (%)	0.03 (0.07)	0.22*** (0.06)	0.22*** (0.06)	0.77*** (0.29)	0.75*** (0.29)	0.76*** (0.29)
Inflation rate		-0.01** (0.01)	-0.01* (0.01)		-0.04*** (0.01)	-0.04*** (0.01)
Interest rate		-0.08* (0.04)	-0.07* (0.04)		-0.17* (0.09)	-0.18* (0.09)
GDP Growth		-0.06 (0.05)	-0.06 (0.05)		-0.04 (0.03)	-0.04 (0.03)
WGI: Control of Corruption		0.04** (0.02)	0.04*** (0.02)		0.07*** (0.02)	0.07*** (0.02)
WGI: Rule of Law		0.02 (0.02)	0.02 (0.02)		0.05* (0.03)	0.05* (0.03)
WGI: Voice and Accountability		-0.07*** (0.02)	-0.07*** (0.02)		-0.08*** (0.02)	-0.08*** (0.02)
WGI: Government Effectiveness		0.00 (0.01)	0.00 (0.01)		-0.01 (0.02)	-0.01 (0.02)
WGI: Political Stability		-0.02 (0.01)	-0.01 (0.01)		0.01 (0.02)	0.01 (0.02)
WGI: Regulatory Quality		0.00 (0.01)	0.00 (0.01)		-0.09*** (0.02)	-0.09*** (0.02)
Constant	0.09 (0.06)	0.37*** (0.08)	0.35*** (0.08)	0.85*** (0.03)	0.92*** (0.04)	0.90*** (0.04)
Observations	5,176	5,051	5,051	5,548	5,392	5,392
Number of banks	456	446	446	461	451	451
AR(1)	-7.03***	-4.49***	-4.59***			
AR(2)	1.19	0.80	0.83			
Hansen J statistic	65.13	94.85	94.20			

Notes: The table reports panel regression results of bank lending. Columns (1)–(3) System GMM estimates and columns (4)–(6) present Random Effects estimates. The specifications are reported sequentially: baseline model, baseline with macroeconomic and governance controls, and baseline with the full set of controls including

ownership variables. Robust standard errors are clustered at the bank level and shown in parentheses. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2

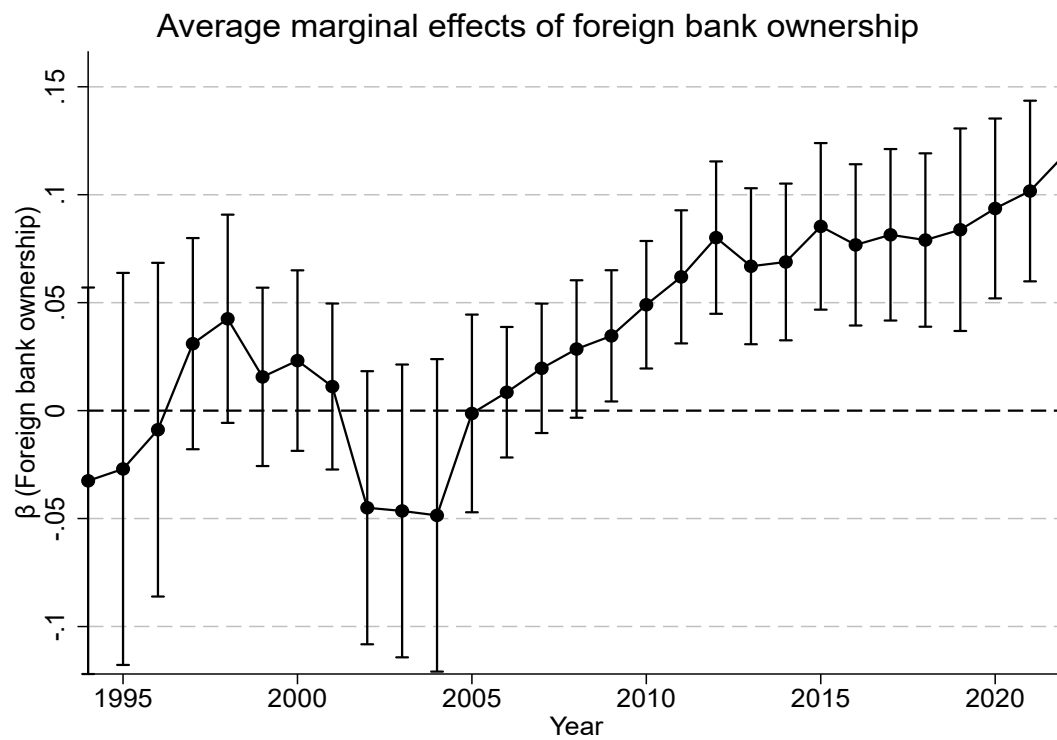
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Gross Loans to Total Asset					
Lending (lagged)	0.57*** (0.05)	0.97*** (0.16)	0.98*** (0.17)			
Liquidity ratio	-0.43*** (0.04)			-0.74*** (0.03)		
Equity / Total Assets (%)	-0.49*** (0.19)			-0.75*** (0.24)		
Loan Loss Reserve / Gross Loans (%)	0.32*** (0.10)			0.74*** (0.29)		
Cost-to-income ratio (%) x Foreign banks	-2.16*** (0.80)		0.85 (1.06)	-2.62** (1.10)		0.37 (0.88)
Cost-to-income ratio (%) x Domestic banks	-2.92 (2.05)		2.77 (3.04)	-9.18 (6.11)		5.63 (4.33)
Net interest margin x Foreign banks (%)	0.56*** (0.17)		0.53** (0.27)	0.68** (0.29)		1.20*** (0.34)
Net interest margin x Domestic banks (%)	0.01 (0.11)		0.02 (0.13)	0.27 (0.20)		0.38 (0.30)
Non-interest income x Foreign banks	0.04 (0.09)		0.08 (0.08)	-0.01 (0.13)		0.08 (0.15)
Non-interest income x Domestic banks	0.27** (0.11)		0.07 (0.10)	0.49*** (0.17)		0.57*** (0.10)
Total assets / GDP x Foreign banks	-0.03 (0.03)		-0.01 (0.04)	0.06 (0.06)		0.18** (0.08)
Total assets / GDP x Domestic banks	0.15 (0.22)		0.64** (0.32)	-0.03 (0.23)		0.58*** (0.22)
Liquidity ratio x Foreign banks		-0.06 (0.05)	-0.09 (0.07)		-0.51*** (0.03)	-0.53*** (0.03)
Liquidity ratio x Domestic banks		-0.05 (0.07)	-0.10 (0.08)		-0.55*** (0.08)	-0.52*** (0.06)
Equity / Total assets x Foreign banks (%)		0.08 (0.08)	-0.06 (0.06)		0.25** (0.10)	0.05 (0.09)
Equity / Total assets x Domestic banks (%)		0.01 (0.13)	-0.15 (0.15)		-0.42*** (0.14)	-0.55*** (0.10)
Loan loss reserves / Gross loans x Foreign banks (%)		0.03 (0.10)	0.00 (0.10)		0.48*** (0.07)	0.46*** (0.07)
Loan loss reserves / Gross loans x Domestic banks (%)		0.04 (0.14)	-0.02 (0.09)		0.73** (0.36)	0.35 (0.31)
Total Assets USD		-0.00 (0.00)			0.00 (0.00)	
Cost To Income Ratio (%)		-1.40** (0.68)			-4.89** (2.14)	
Non-interest income		0.04 (0.08)			0.16 (0.15)	
Net Interest Margin (%)		-0.40 (0.37)			-0.56 (0.82)	
Inflation rate	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.04*** (0.01)	-0.03** (0.02)	-0.03** (0.01)
Interest rate	-0.07 (0.05)	-0.09 (0.05)	-0.06 (0.06)	-0.16* (0.09)	-0.15 (0.11)	-0.12 (0.11)
GDP Growth	-0.03 (0.08)	-0.24** (0.11)	-0.21** (0.10)	-0.05* (0.03)	-0.09* (0.05)	-0.08** (0.04)
WGI: Control of Corruption	0.05*** (0.01)		-0.02 (0.04)	0.07*** (0.02)	0.10*** (0.03)	0.10*** (0.03)
WGI: Rule of Law	0.02 (0.02)		0.02 (0.01)	0.05 (0.03)	0.00 (0.03)	0.02 (0.03)
WGI: Voice and Accountability	-0.06*** (0.02)		-0.02 (0.02)	-0.08*** (0.02)	-0.03 (0.03)	-0.05* (0.03)
WGI: Government Effectiveness	-0.01 (0.01)		0.00 (0.02)	-0.01 (0.01)	-0.02 (0.04)	-0.02 (0.04)
WGI: Political Stability	-0.01		-0.01	0.01	0.00	0.00

WGI: Regulatory Quality	(0.02)		(0.03)	(0.02)	(0.03)	(0.03)
	-0.02		0.02	-0.09***	-0.07*	-0.06*
Constant	(0.01)		(0.02)	(0.02)	(0.04)	(0.03)
	0.46***	0.07	0.03	0.91***	0.73***	0.66***
Observations	(0.05)	(0.08)	(0.11)	(0.04)	(0.06)	(0.02)
Number of banks	5,051	5,051	5,051	5,392	5,392	5,392
AR(1)	446	446	446	451	451	451
AR(2)	-7.01***	-6.09***	-5.65***			
Hansen J statistic	0.94	1.06	1.24			
	78.36	89.59	91.88			

Notes: The table reports panel regression results of bank lending with interaction terms that capture differences between foreign- and domestic-owned banks. Columns (1)–(3) present System GMM estimates and columns (4)–(6) present Random Effects estimates. Specifications are reported sequentially, moving from the baseline model to specifications including macroeconomic and governance controls and the full set of ownership interactions. Robust standard errors are clustered at the bank level and reported in parentheses. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

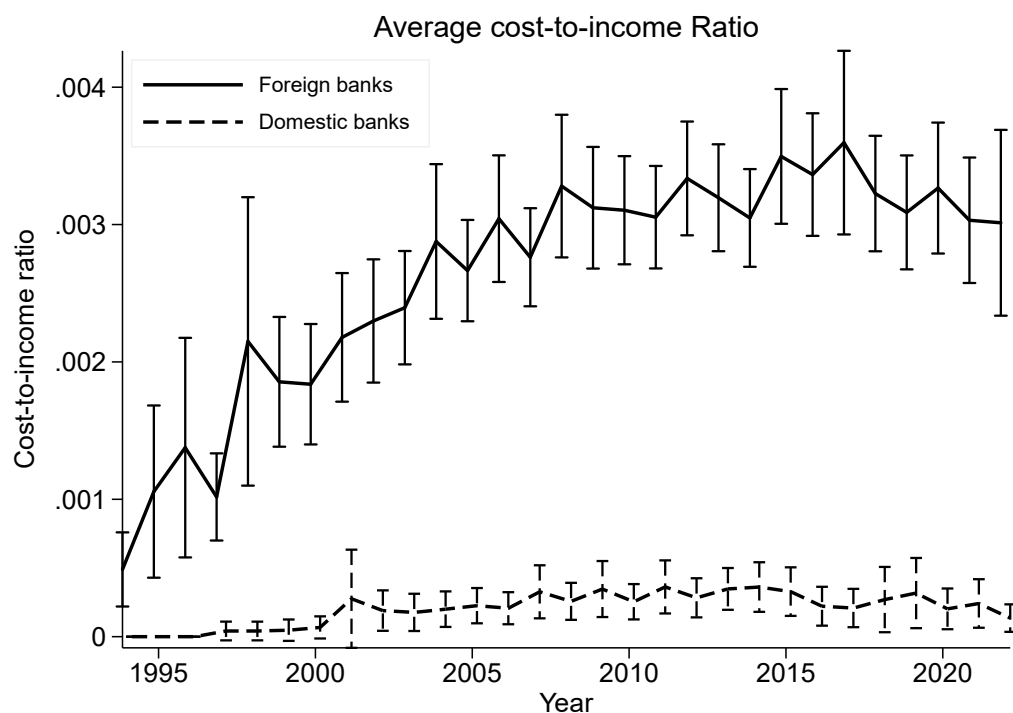
Figures

Figure 1



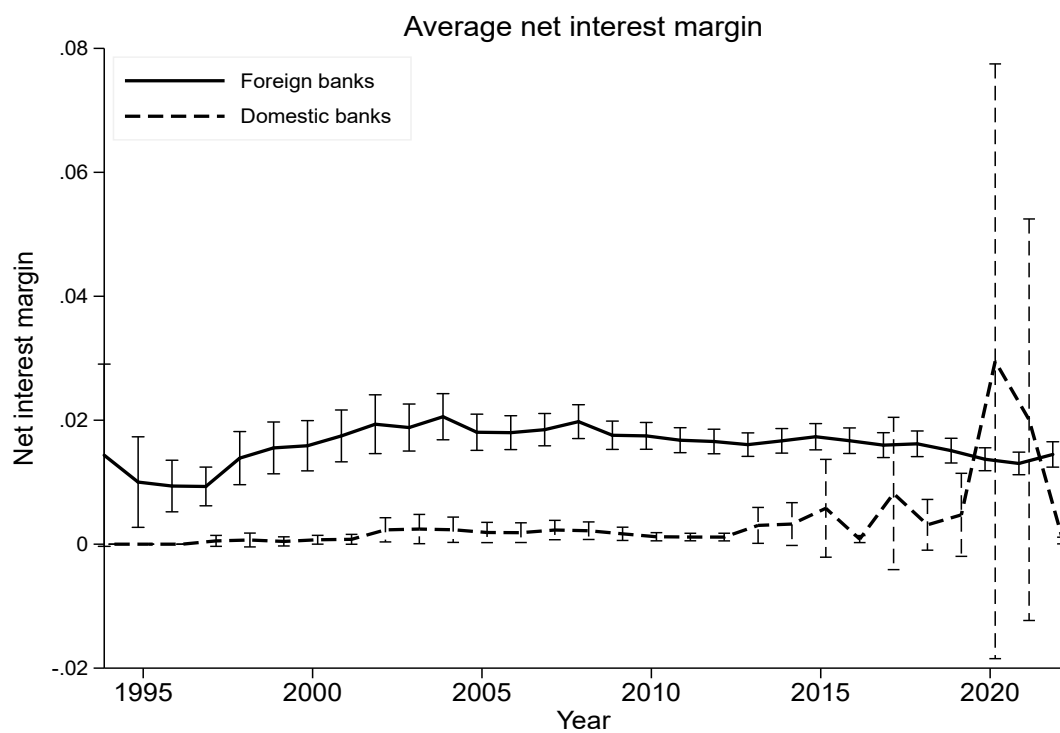
Notes: The figure displays average marginal effects of foreign bank ownership on bank lending, estimated from a random-effects panel regression with clustered standard errors. The vertical bars denote 90% confidence intervals. The effects are computed for each year, capturing how the impact of foreign bank ownership on lending evolves over time. A dashed horizontal line at zero indicates no effect.

Figure 2



Notes: The figure reports yearly average cost-to-income ratios for foreign-owned (solid line) and domestically owned banks (dashed line). Vertical bars denote 90% confidence intervals around the means.

Figure 3



Notes: The figure plots average net interest margins for foreign-owned (solid line) and domestically owned banks (dashed line). Vertical bars represent 90% confidence intervals around the yearly means.

Appendix

Table A1 Descriptive Statistics - Foreign-Owned Banks

Variable	n	Mean	S.D.	Min	P25	Mdn	P75	Max
Total assets / GDP	5007	0.05	0.09	0.00	0.01	0.02	0.06	1.90
Cost To Income Ratio	4953	0.01	0.01	0.00	0.01	0.01	0.01	0.09
Non-interest income	4993	0.03	0.23	-0.23	0.01	0.02	0.03	7.20
Net Interest Margin	4990	0.04	0.08	-4.00	0.03	0.04	0.05	1.26
Liquidity ratio	5020	0.32	0.18	-0.05	0.19	0.29	0.42	1.00
Equity / Total Assets	5023	0.14	0.14	-4.46	0.08	0.11	0.16	0.99
Loan Loss Reserve / Gross Loans	4357	0.07	0.09	-1.25	0.03	0.05	0.09	1.00
Inflation rate	13278	0.45	1.72	-0.02	0.02	0.04	0.12	15.00
Interest rate	12394	0.04	0.15	-0.69	0.01	0.04	0.07	3.38
GDP Growth	13178	0.07	0.16	-0.65	-0.01	0.07	0.15	0.96
Control of Corruption	12141	0.12	0.54	-1.20	-0.31	0.15	0.53	1.58
Rule of Law	12141	0.26	0.58	-1.28	-0.14	0.34	0.77	1.43
Voice and Accountability	12141	0.57	0.49	-1.22	0.29	0.64	0.98	1.28
Government Effectiveness	12071	0.30	0.57	-1.21	-0.08	0.46	0.68	1.34
Political Stability	12061	0.40	0.58	-2.14	0.08	0.56	0.83	1.31
Regulatory Quality	12071	0.52	0.55	-1.03	0.18	0.65	0.95	1.69

Note: This table reports descriptive statistics for foreign owned banks. Reported are the number of observations (n), mean, standard deviation (S.D.), minimum (Min), 25th percentile (P25), median (Mdn), 75th percentile (P75), and maximum (Max).

Table A2 Descriptive Statistics - Domestically-Owned Banks

Variable	n	Mean	S.D.	Min	P25	Mdn	P75	Max
Total assets / GDP	1461	0.03	0.06	0.00	0.00	0.01	0.03	0.57
Cost To Income Ratio	1437	0.01	0.01	-0.04	0.01	0.01	0.01	0.08
Non-interest income	1454	0.03	0.07	-0.13	0.01	0.02	0.03	2.09
Net Interest Margin	1450	0.05	0.20	-0.62	0.02	0.03	0.05	5.92
Liquidity ratio	1463	0.34	0.20	0.00	0.21	0.31	0.44	1.00
Equity / Total Assets	1457	0.14	0.26	-6.91	0.08	0.12	0.18	1.00
Loan Loss Reserve / Gross Loans	1325	0.10	0.12	0.00	0.03	0.06	0.12	0.99
Inflation rate	2829	0.44	1.73	-0.02	0.02	0.04	0.12	15.00
Interest rate	2693	0.04	0.20	-0.69	0.01	0.04	0.07	3.38
GDP Growth	2876	0.07	0.17	-0.65	-0.01	0.06	0.15	0.96
Control of Corruption	2664	0.03	0.54	-1.20	-0.36	-0.04	0.45	1.58
Rule of Law	2664	0.16	0.61	-1.28	-0.27	0.04	0.77	1.43
Voice and Accountability	2664	0.46	0.52	-1.22	0.08	0.52	0.93	1.28
Government Effectiveness	2657	0.17	0.63	-1.21	-0.21	0.22	0.66	1.34
Political Stability	2656	0.26	0.63	-2.14	-0.17	0.40	0.74	1.31
Regulatory Quality	2657	0.41	0.59	-1.03	-0.07	0.53	0.90	1.69

Note: This table reports descriptive statistics for domestically owned banks. Reported are the number of observations (n), mean, standard deviation (S.D.), minimum (Min), 25th percentile (P25), median (Mdn), 75th percentile (P75), and maximum (Max).

Table A3 Correlation matrix

Variable	Total assets / GDP	Cost To Income Ratio	Non-interest income	Net Interest Margin	Liquidity ratio	Equity / Total Assets	Loan Loss Reserve / Gross Loans	Inflation rate	Interest rate	GDP Growth	Control of Corruption	Rule of Law	Voice and Accountability	Government Effectiveness	Political Stability	Regulatory Quality
Total assets / GDP	1.00															
Cost To Income Ratio	-0.15	1.00														
Non-interest income	-0.04	0.01	1.00													
Net Interest Margin	-0.04	-0.01	0.01	1.00												
Liquidity ratio	-0.07	0.11	0.01	-0.04	1.00											
Equity / Total Assets	-0.09	0.06	0.03	0.12	0.08	1.00										
Loan Loss Reserve / Gross Loans	-0.09	0.16	0.17	0.08	0.15	-0.07	1.00									
Inflation rate	-0.02	0.00	0.15	0.04	0.09	0.02	0.07	1.00								
Interest rate	-0.03	0.00	0.03	-0.01	-0.03	0.01	0.02	-0.36	1.00							
GDP Growth	-0.02	-0.02	-0.02	0.03	0.10	0.06	-0.09	0.00	-0.26	1.00						
Control of Corruption	0.14	-0.06	-0.02	-0.08	-0.11	-0.17	-0.14	-0.14	0.05	-0.07	1.00					
Rule of Law	0.14	-0.05	-0.02	-0.08	-0.10	-0.21	-0.16	-0.16	0.06	-0.12	0.92	1.00				
Voice and Accountability	0.09	-0.03	-0.01	-0.07	-0.11	-0.19	-0.17	-0.12	0.11	-0.05	0.89	0.91	1.00			
Government Effectiveness	0.15	-0.04	-0.01	-0.09	-0.10	-0.19	-0.12	-0.14	0.04	-0.10	0.85	0.88	0.86	1.00		
Political Stability	0.09	-0.03	-0.03	-0.08	-0.11	-0.21	-0.17	-0.13	0.09	-0.05	0.79	0.85	0.87	0.84	1.00	
Regulatory Quality	0.15	-0.04	-0.02	-0.09	-0.09	-0.23	-0.19	-0.18	0.05	-0.08	0.82	0.89	0.87	0.87	0.82	1.00

Table A4 Impact of chosen factors based on bank size

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Gross Loans to Total Asset					
Lending (lagged)	0.60*** (0.07)	0.55*** (0.13)	0.43*** (0.08)			
Banks foreign	-0.01 (0.01)	0.02 (0.01)	0.02* (0.01)	0.01 (0.03)	0.06** (0.03)	0.05*** (0.02)
Banks domestic	0.05 (0.04)	-0.02 (0.02)	0.01 (0.03)	0.24*** (0.07)	-0.01 (0.05)	-0.01 (0.05)
Industry foreign	0.02 (0.02)	0.03 (0.03)	-0.01 (0.01)	0.05 (0.07)	0.07 (0.05)	0.01 (0.03)
Industry domestic	-0.01 (0.01)	0.02 (0.03)	-0.02 (0.02)	-0.01 (0.03)	0.05 (0.05)	-0.01 (0.03)
Government	-0.01 (0.02)	0.00 (0.02)	-0.02* (0.01)	-0.03 (0.07)	0.05 (0.05)	-0.04 (0.03)
Cost To Income Ratio %	-2.07* (1.22)	-1.32 (1.14)	0.63 (0.88)	-3.03* (1.61)	-2.37** (1.09)	-1.83 (1.34)
Net Interest Margin %	-0.20 (0.18)	0.48*** (0.18)	0.32* (0.18)	-0.25 (0.34)	0.53** (0.21)	0.15 (0.23)
Non-interest income	-0.10 (0.13)	-0.03 (0.13)	0.07 (0.10)	0.12 (0.18)	-0.10 (0.12)	0.18 (0.13)
Total assets / GDP	-0.46 (0.34)	-0.25** (0.12)	-0.01 (0.03)	0.62 (1.11)	-1.02** (0.44)	0.03 (0.03)
Liquidity ratio	-0.43*** (0.08)	-0.42*** (0.10)	-0.50*** (0.06)	-0.84*** (0.07)	-0.72*** (0.05)	-0.69*** (0.04)
Equity / Total Assets %	-0.04 (0.07)	-0.71*** (0.10)	0.08 (0.07)	-0.19 (0.13)	-1.00*** (0.13)	-0.11 (0.10)
Loan Loss Reserve / Gross Loans %	0.32 (0.27)	0.22** (0.10)	0.34*** (0.10)	1.07* (0.61)	0.43*** (0.11)	0.58*** (0.12)
Inflation rate	-0.05 (0.07)	0.00 (0.01)	-0.03*** (0.01)	-0.08** (0.04)	-0.01 (0.01)	-0.04*** (0.01)
Interest rate	0.04 (0.10)	-0.07 (0.08)	-0.23*** (0.06)	-0.18 (0.21)	0.04 (0.07)	-0.14** (0.06)
GDP Growth	-0.04 (0.16)	-0.13 (0.11)	-0.13 (0.09)	-0.04 (0.05)	-0.00 (0.04)	0.00 (0.03)
WGI: Control of Corruption	0.08** (0.03)	0.07* (0.04)	0.06*** (0.02)	0.13** (0.07)	0.05 (0.04)	0.08*** (0.02)
WGI: Rule of Law	0.00 (0.03)	-0.01 (0.03)	0.00 (0.02)	-0.02 (0.06)	0.09** (0.04)	0.02 (0.04)
WGI: Voice and Accountability	-0.08** (0.04)	-0.08** (0.04)	-0.04* (0.02)	-0.14** (0.06)	-0.16*** (0.05)	-0.06** (0.03)
WGI: Government Effectiveness	-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.01)	0.04 (0.03)	-0.01 (0.04)	-0.03* (0.02)
WGI: Political Stability	0.02 (0.02)	-0.01 (0.02)	0.02* (0.01)	0.06 (0.04)	0.03 (0.02)	0.02 (0.01)
WGI: Regulatory Quality	-0.03 (0.02)	0.02 (0.02)	0.01 (0.01)	-0.12*** (0.04)	-0.06* (0.03)	-0.02 (0.02)
Constant	0.40*** (0.06)	0.46*** (0.11)	0.47*** (0.07)	0.92*** (0.07)	0.92*** (0.04)	0.78*** (0.03)
Observations	942	1,644	2,465	1,031	1,759	2,602
Number of banks	126	154	166	130	155	166
AR(1)	-4.13***	-3.98***	-4.71***			
AR(2)	1.38	-0.54	-1.29			
Hansen J statistic	51.43	45.11	54.60			

Notes: The table reports panel regression results of bank lending for subsamples defined by bank size. Banks are grouped into terciles based on average total assets. Columns (1)–(3) present System GMM estimates for small, medium, and large banks, respectively, while columns (4)–(6) report the corresponding Random Effects estimates. Standard errors clustered at the bank level are shown in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table A5 Impact of chosen factors based on the period

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Gross Loans to Total Asset					
Lending (lagged)	0.50** (0.23)	0.45*** (0.09)	0.56*** (0.14)			
Banks foreign	0.01 (0.01)	0.00 (0.01)	0.02** (0.01)	0.02 (0.02)	0.03** (0.02)	0.08*** (0.02)
Banks domestic	-0.01 (0.03)	-0.02 (0.02)	-0.01 (0.03)	-0.05 (0.07)	-0.03 (0.04)	-0.07 (0.08)
Industry foreign	-0.01 (0.01)	0.00 (0.02)	0.00 (0.01)	0.02 (0.03)	0.03 (0.03)	0.03 (0.04)
Industry domestic	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.02)	0.04 (0.03)	-0.00 (0.03)	0.10 (0.06)
Government	0.01 (0.03)	-0.05* (0.02)	0.00 (0.03)	0.21 (0.25)	-0.04 (0.04)	-0.00 (0.05)
Cost To Income Ratio %	-3.64 (4.44)	-0.61 (0.59)	-1.57 (1.44)	-1.82 (1.25)	-2.42*** (0.73)	-1.17 (1.78)
Net Interest Margin %	-0.20 (0.13)	0.17 (0.14)	0.77*** (0.28)	0.14 (0.15)	0.40 (0.25)	0.44 (0.72)
Non-interest income	0.03 (0.13)	0.01 (0.09)	-0.29 (0.77)	-0.01 (0.06)	0.11 (0.14)	-0.57 (0.60)
Total assets / GDP	0.04 (0.06)	-0.06 (0.04)	-0.05 (0.04)	0.03 (0.07)	-0.08 (0.07)	-0.08 (0.07)
Liquidity ratio	-0.42*** (0.15)	-0.56*** (0.07)	-0.38*** (0.10)	-0.60*** (0.04)	-0.74*** (0.04)	-0.55*** (0.06)
Equity / Total Assets %	0.06 (0.07)	-0.25 (0.16)	-0.67** (0.29)	-0.115 (0.08)	-0.69** (0.31)	-0.83*** (0.19)
Loan Loss Reserve / Gross Loans %	0.32 (0.28)	0.40*** (0.08)	0.22* (0.11)	0.42*** (0.12)	0.68*** (0.18)	0.32*** (0.12)
Inflation rate	-0.01 (0.01)	0.01 (0.12)	0.23 (0.19)	-0.02*** (0.01)	0.03 (0.16)	-0.14 (0.17)
Interest rate	-0.04 (0.05)	-0.20 (0.13)	-0.30** (0.15)	-0.05 (0.04)	-0.24 (0.16)	-0.16 (0.13)
GDP Growth	0.05 (0.04)	0.06*** (0.02)	0.05** (0.03)	-0.03 (0.03)	0.01 (0.04)	-0.17** (0.08)
WGI: Control of Corruption	-0.03 (0.04)	0.01 (0.02)	-0.01 (0.02)	0.13*** (0.03)	0.04 (0.03)	0.02 (0.03)
WGI: Rule of Law	-0.03 (0.04)	-0.02 (0.02)	-0.03 (0.03)	0.10** (0.04)	0.09* (0.05)	-0.04 (0.03)
WGI: Voice and Accountability	-0.03 (0.03)	-0.04*** (0.02)	0.03 (0.02)	-0.10*** (0.03)	-0.03 (0.03)	0.06* (0.03)
WGI: Government Effectiveness	0.04* (0.02)	0.02 (0.01)	-0.03 (0.03)	-0.07** (0.04)	-0.01 (0.03)	0.04* (0.02)
WGI: Political Stability	-0.01 (0.03)	-0.01 (0.01)	-0.04** (0.02)	-0.01 (0.02)	0.01 (0.02)	-0.03 (0.02)
WGI: Regulatory Quality	0.47*** (0.17)	0.53*** (0.07)	0.47*** (0.13)	-0.07*** (0.03)	-0.09*** (0.03)	-0.03 (0.02)
Constant	0.47*** (0.17)	0.53*** (0.07)	0.47*** (0.13)	0.00 (0.00)	0.91*** (0.04)	0.81*** (0.05)
Observations	1,164	2,477	1,417	1,391	2,579	1,422
Number of banks	263	342	235	309	342	236
AR(1)	-2.41***	-2.42**	-3.51***			
AR(2)	-0.53	0.56	-0.05			
Hansen J statistic	27.95	42.74	59.60			

Notes: The table reports panel regression results of bank lending. Columns (1)–(3) present System GMM estimates, while columns (4)–(6) report Random Effects estimates. The specifications correspond to the three institutional phases analyzed in the paper: the privatization period (1995–2005), the consolidation period (2006–2015), and the subsequent phase of diversification and digitalization (2016–2022). Robust standard errors are clustered at the bank level and shown in parentheses. Significance levels: * p<0.10, ** p<0.05, *** p<0.01.

Table A6 Impact of chosen factors during noncrisis and crisis periods

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: Gross Loans to Total Asset					
Lending (lagged)	0.20 (0.24)	0.64*** (0.11)	0.60*** (0.08)			
Banks foreign	0.04* (0.02)	0.01 (0.01)	0.01 (0.01)	0.06*** (0.02)	0.03** (0.01)	0.04*** (0.01)
Banks domestic	-0.05 (0.05)	-0.02 (0.02)	-0.01 (0.02)	-0.01 (0.05)	-0.02 (0.04)	-0.00 (0.04)
Industry foreign	0.03 (0.02)	0.00 (0.01)	-0.00 (0.01)	0.06*** (0.02)	0.02 (0.03)	0.03 (0.02)
Industry domestic	0.02 (0.02)	0.01 (0.01)	0.01 (0.01)	0.01 (0.03)	0.01 (0.03)	0.01 (0.03)
Government	-0.01 (0.01)	0.00 (0.02)	0.00 (0.02)	-0.03 (0.02)	-0.02 (0.04)	-0.01 (0.04)
Foreign × Crisis			0.00 (0.01)			0.01* (0.01)
Domestic × Crisis			-0.06*** (0.02)			-0.04 (0.02)
Total assets / GDP	0.04 (0.06)	-0.06 (0.04)	-0.05 (0.04)	0.03 (0.07)	-0.08 (0.07)	-0.08 (0.07)
Cost To Income Ratio %	-2.66** (1.15)	-1.03 (0.84)	-1.54** (0.69)	-1.53** (0.68)	-4.02*** (1.46)	-3.36*** (1.22)
Non-interest income	-0.07 (0.13)	0.07 (0.10)	0.05 (0.07)	0.03 (0.04)	0.10 (0.13)	0.07 (0.08)
Net Interest Margin %	-0.07 (0.18)	0.31** (0.13)	0.29** (0.13)	-0.093 (0.15)	0.49** (0.21)	0.38** (0.18)
Liquidity ratio	-0.67*** (0.16)	-0.37*** (0.08)	-0.41*** (0.05)	-0.70*** (0.04)	-0.75*** (0.03)	-0.73*** (0.03)
Equity / Total Assets %	-0.14 (0.01)	-0.50*** (0.17)	-0.49*** (0.19)	-0.24*** (0.07)	-0.77*** (0.23)	-0.75*** (0.24)
Loan Loss Reserve / Gross Loans %	0.45** (0.19)	0.32** (0.14)	0.31*** (0.10)	0.48*** (0.11)	0.85** (0.35)	0.76*** (0.29)
Inflation rate	-0.01 (0.01)	-0.03 (0.04)	-0.01** (0.01)	-0.02** (0.01)	-0.11*** (0.04)	-0.04*** (0.01)
Interest rate	0.00 (0.05)	-0.08 (0.10)	-0.07 (0.04)	-0.11** (0.05)	-0.21 (0.16)	-0.18* (0.09)
GDP Growth	0.10** (0.04)	0.04** (0.02)	0.05*** (0.02)	-0.29*** (0.08)	-0.031 (0.03)	-0.04 (0.03)
WGI: Control of Corruption	0.03 (0.04)	0.02 (0.02)	0.02 (0.02)	0.11** (0.04)	0.07*** (0.03)	0.07*** (0.02)
WGI: Rule of Law	-0.03 (0.06)	-0.06*** (0.02)	-0.06*** (0.02)	0.07 (0.05)	0.04 (0.03)	0.05* (0.03)
WGI: Voice and Accountability	-0.02 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.14** (0.06)	-0.07*** (0.02)	-0.09*** (0.02)
WGI: Government Effectiveness	-0.04 (0.03)	-0.01 (0.01)	-0.01 (0.01)	-0.05* (0.03)	-0.01 (0.02)	-0.07 (0.02)
WGI: Political Stability	-0.12*** (0.03)	-0.01 (0.01)	-0.02 (0.01)	-0.01 (0.03)	0.01 (0.02)	0.01 (0.02)
WGI: Regulatory Quality	0.03 (0.04)	0.02 (0.02)	0.02 (0.02)	-0.07** (0.03)	-0.09*** (0.03)	-0.09*** (0.02)
Constant	0.75*** (0.19)	0.40*** (0.09)	0.45*** (0.07)	0.82*** (0.05)	0.92*** (0.04)	0.90*** (0.04)
Observations	867	4,191	5,058	921	4,471	5,392
Number of banks	252	428	447	262	434	451
AR(1)	-0.91	-5.64***	-5.23***			
AR(2)	-1.83*	0.93	0.93			
Hansen J statistic	8.06	7.55	11.38			

Notes: The table reports panel regression results of bank lending during crisis and non-crisis periods. Crisis periods are defined at the country level based on the ECB crisis database. Columns (1)–(3) present System GMM estimates for the crisis subsample, the non-crisis subsample, and the specification with interaction terms capturing differences in ownership effects between crisis and non-crisis periods, respectively. Columns (4)–(6) report the

corresponding Random Effects estimates for the same three specifications. Standard errors clustered at the bank level are shown in parentheses. Significance levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.