

Banking Efficiency and Foreign Ownership in Transition: Is There Evidence of a Cream-Skimming Effect?¹

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This paper revisits the issue of cost efficiency in the banking sector and the role of foreign ownership in European transition economies. The novelty of our approach is that we instrument for the decision of foreign investors to acquire domestic banks. This analysis allows us to evaluate the endogeneity bias that results from the so-called cream-skimming effect. Using a sample of 282 banks in 19 transition countries, we employ a two-stage instrumental variable approach. In the first stage, we estimate the probability of foreign acquisitions of domestic banks by implementing a panel probit model. In the second stage, the estimated propensity scores are used in the Battese and Coelli (1995) stochastic efficiency frontier specification. Although cost differences may also be caused by different product characteristics, our main finding is that the instrumental variable approach reveals that foreign ownership has a negative impact on cost efficiency. This observation indicates that in the transition countries studied the cream-skimming effect is significant, which implies that foreign investors tend to acquire the most cost efficient banks in the first place.

JEL classification: C30, G21, G32

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1 Introduction

The efficiency of banking institutions is an important factor that fosters the economic development in transition economies (Bonin and Wachtel, 2003). A more efficient banking system facilitates financial intermediation and contributes to the optimal allocation of financial resources in the real sector. In transition economies the banking sector plays an even more important role in the process of reallocating financial resources than in developed countries, since other elements of the financial sector are still underdeveloped in those transition

countries (Anderson and Kegels, 1998).

In this paper we focus on foreign ownership as an important determinant of banking efficiency in transition economies. Theoretically predicting the direction of the impact of bank ownership is a complex task (Detragiache et al., 2006). On the one hand, foreign banks benefit from the advantages of having access to more advanced information technologies and better expertise in the field than their domestic counterparts. They import more effective supervision and regulation practices and

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enhance competition. In addition, they may be less vulnerable to political pressures and less inclined to lend funds to connected parties. These factors imply that there is a positive connection between the presence of foreign banks and financial sector performance.

On the other hand, domestic banks have a better idea of how the domestic economies work; they understand the particularities of the respective legal systems, the relevant traditions and other institutional aspects. They are more inclined to lend to informationally opaque firms, as they can monitor these firms more easily than their foreign competitors. All these factors mitigate the negative impact of asymmetric information on the performance of domestic banks as compared to their foreign counterparts.

Our study focuses on the cost side of the efficiency analysis. The prevailing view in the empirical literature on banking in transition countries suggests that banks acquired by strategic foreign partners tend to do better in terms of cost. Only few studies provide empirical evidence suggesting that foreign ownership may, in fact, have a negative impact on efficiency, but these studies are either based on cross-country data from developed countries (Berger et al., 1999), or on data from a set of developing economies including only a

small number of transition countries (Detragiache et al., 2006; Lensink et al., 2006) or on individual country data (Kraft and Tirtiroglu, 1998; Matousek and Taci, 2002).

From the econometric point of view, the possibility of an endogeneity bias caused by the so-called cream-skimming effect is a challenge when evaluating the impact of foreign ownership on efficiency. Cream-skimming describes a situation when foreign investors select the most efficient banks for acquisition, thus rendering the sample from which the individual observations are drawn non-random. The presence of the cream-skimming effect suggests that foreign ownership does not necessarily improve the performance of banks, but that the illusionary positive impact results from the fact that the banks acquired by foreign investors had already been the more efficient ones in the first place.

Surprisingly, the cream-skimming effect has not been given appropriate attention in the empirical literature on banking efficiency in the transition economies.³ This paper tries to take up the challenge and shed some light on the true effect of foreign ownership on banking efficiency by employing a two-step instrumental variable approach. The results of our study can be used by policymakers for developing liberalization strategies and opening domestic banking systems to foreign entry.

³ *The only paper we are aware of that suggests the possibility of cream-skimming in transition banking is Lanine and Vennet (2005), but this paper rather focuses on microeconomic determinants of foreign acquisitions without integrating the issue into the cost efficiency framework. Hanousek et al. (2007) analyze the relation between the endogeneity of ownership and performance for a large sample of firms in the Czech Republic and find a positive effect of foreign ownership if the subsidiary is owned by a foreign industrial firm. However, they do not focus on the banking sector, as banks account for no more than approximately 1% of the observations in their sample.*

2 Literature and Methodology Review

So far only relatively few studies have addressed the issue of banking efficiency in transition economies, and – to our knowledge – none of these studies has directly examined the extent to which the cream-skimming effect matters. Several approaches to the efficiency estimation are available, including parametric and non-parametric methods (an extensive survey of the literature can be found in Berger and Humphrey, 1997). The basic idea underlying all these methods is to compare the total costs, profits or production plans of the economic units with the best achieved levels observed in the sample.

Given that in transition economies the quality of banking data is not perfect and measurement errors are quite widespread, some authors argue that parametric methods, which are more robust to data problems, would constitute more suitable empirical tools for analyzing banking efficiency (see Fries and Taci, 2005). In this paper we apply the stochastic frontier approach, a parametric method assuming a particular functional form of the estimated cost function or production technology and allowing for an error term composed of a symmetrically distributed random error and a truncated inefficiency term. Kumbhakar and Lovell (2000) provide a detailed discussion of this method.

The data used in this study are based on the BankScope database provided by Bureau van Dijk and they allow us to perform a cross-country analysis. Over recent years

BankScope has been the main source of bank-level indicators for several panel data studies⁴ of transition countries. The present study picks up the threads of this literature and provides new insights and results which previously were either impossible to obtain owing to lack of data or which remained unconsidered.

Although some of the panel data studies also deal with profit efficiency in the banking sector, we focus solely on cost efficiency – an approach that does of course not provide direct information about the banks' ability to generate profit. Nevertheless, we decided to exclude profit efficiency from this study as the informative value of the available data gave cause for concern. The 1990s in particular – from which a substantial fraction of the data sample is taken – were characterized by underdeveloped administrative and regulatory systems in the transition economies, which created loopholes for profit misreporting linked to rent extraction, the concealing of nonperforming loans or the privatization process. Thus, we feel that reported profits do not provide a reliable picture of the true state of the individual banks during the period analyzed. Although such strategies certainly also have an influence on cost analysis, the impact on bank costs is substantially lower, since profit control only operates on the margin of total costs.

2.1 Foreign Ownership

There is an overall consensus in the empirical literature that banks' cost efficiency is positively associated with foreign ownership. Bonin et al.

⁴ For instance Grigorian and Manole (2002), Yildirim and Philippatos (2002), Rossi et al. (2004), Bonin et al. (2005) or Fries and Taci (2005).

(2005) report that the participation of international investors adds considerably to banks' cost efficiency. The authors also observe that although government-owned banks tend to make fewer loans, collect fewer deposits and have higher noninterest expenditures relative to other ownership, their performance in terms of efficiency is not significantly lower than that of private domestic banks. Yildirim and Philippatos (2002) find that foreign banks are more cost efficient but less profit efficient than domestic private and state-owned banks. Fries and Taci (2005) use a unique banking database compiled by the European Bank for Reconstruction and Development (EBRD) and provide a detailed ownership breakdown into five categories: greenfield foreign-owned banks, greenfield domestic-owned banks, privatized foreign banks, privatized domestic banks and state-owned banks. Estimation results predict that private banks are more cost efficient than state-owned banks. There are, however, differences among private banks: Privatized banks with majority foreign ownership are the most cost efficient, followed by greenfield banks (domestic and foreign), whereas privatized banks with majority domestic ownership are the least efficient.

Although a statistically significant link between foreign ownership and better performance has been detected in most of the relevant studies, the literature does not provide an appropriate policy discussion of this result on the country level. According to the prevailing results the most developed transition economies exhibit the lowest cost efficiency scores, while it is widely acknowledged that these economies have been very successful in attracting foreign direct invest-

ment (FDI) into their banking sectors. This conclusion contains elements of controversy, since on the one hand, foreign ownership enhances efficiency, but on the other hand countries recording the highest inflows of foreign investment have failed to establish efficient banking systems. Another interesting observation is that Slovenia managed to build one of the most efficient banking systems in transition, although it is the transition country with the lowest presence of foreign-owned banks. In fact, the majority of Slovenian banks are still state-owned, which apparently does not preclude the banking system from being relatively efficient.

In a recent study on banking efficiency in a set of transition economies (including some European transition countries) Lensink et al. (2006) examine whether efficiency differences associated with foreign versus domestic ownership depend on the governance of the host country. According to their findings an increase in foreign ownership is negatively linked to banking efficiency. However, the extent of the negative impact varies depending on the state of institutional development and the rule of law, with cost efficiency-reducing effects being less substantial in countries with better established governance practices. The authors interpret this result as evidence that foreign banks find it more difficult to deal with local banking supervision, the respective judicial system and corruption.

From the above discussion it follows that empirical evidence on the relationship between foreign ownership and banking efficiency is mixed. Most of the relevant papers conclude that foreign ownership benefits outweigh the possible disadvantages and

asymmetric information problems. Therefore, opening the domestic banking sector to foreign entry is a standard policy recommendation given in these papers. However, none of the studies try to explicitly address the cream-skimming effect or to investigate whether foreign acquisitions enhance the cost efficiency or whether foreign investors had acquired the more efficient domestic banks in the first place without adding too much to their efficiency afterward.

In this paper, we challenge the widespread conclusion that foreign-owned banks perform better in terms of cost efficiency than their domestic-owned counterparts. We employ a two-step estimation method in the spirit of the Heckman (1979) procedure. In this setup, the acquisition decision is estimated in the first step; then this estimate is used to control for the selection bias in the second step. The appropriateness of this method is based upon the availability of data on instrumental variables that influence the foreign investor's decision to acquire a bank without being correlated with cost efficiency. This method has been widely used for studies on ownership and total factor productivity in many countries, including transition economies (Djankov and Hoekman, 2000). We are not aware of any study that applies a two-step instrumental variable method to analyze the relationship between foreign ownership and efficiency in the banking sector of transition countries.

2.2 The Impact of EU Entry and Country-Specific Factors

The time and cross-sectional coverage of the above-mentioned panel data studies differs significantly. The time span covered varies from three to eight years and involves samples from 1993 to 2002. It is noticeable that none of the studies employ more recent data that cover the period of EU membership negotiations and EU accession. Grigorian and Manole (2002) provide the most extensive cross-section (585 banks in 17 countries) but use a short time period (1995–1998).

Our dataset allows us to construct an unbalanced panel that spans the period from 1995 to 2004 and includes 19 countries.⁵ Given the length of the time span covered, we are able to reliably investigate the evolution of cost efficiency over time. Moreover, since the data date back to 2004, we can analyze the effect of EU accession on the eight countries that joined in 2004 as well as the impact of the convergence process on those countries that had filed their EU membership applications but had not been accepted by 2004.

In addition to the indirect impacts of improving institutional factors and economic conditions, which are captured by other country-specific covariates, we hypothesize that EU accession may have a positive impact on production opportunities in the acceding countries. Since EU accession is a gradual process, we do not model it as a simple binary variable. For

⁵ Albania (AL), Armenia (AM), Azerbaijan (AZ), Bulgaria (BG), Belarus (BY), Croatia (HR), the Czech Republic (CZ), Estonia (EE), Georgia (GE), Hungary (HU), Kazakhstan (KZ), Latvia (LV), Lithuania (LT), Moldova (MD), Poland (PL), Romania (RO), Slovakia (SK), Slovenia (SI) and Ukraine (UA).

countries which have submitted the application for EU membership, the variable equals zero for years prior to submission, then it gradually grows to one for the year of (actual or expected) accession, and finally it equals one for the years following accession. For countries that had filed their applications but did not actually join in 2004, we use the expected year of EU entry. For countries which have not submitted their applications, we set the value to zero for the entire time period under observation. In this way, we are able to capture the increasing benefits resulting from the reforms carried out by countries during the convergence process.

Furthermore, we focus on the impact of various country-specific factors on banking efficiency. In general, the existing studies provide mixed evidence. Grigorian and Manole (2002) and Yildirim and Philippatos (2002) report a positive association between GDP growth and banking sector efficiency, while Fries and Taci (2005) fail to find any significant link. In the same spirit, market concentration was found to have a positive impact on banking efficiency in Grigorian and Manole (2002) – a fact which, according to the authors, has to do with additional benefits from economies of scale. Fries and Taci (2005), by contrast, did not find any significant association between market concentration and cost efficiency, while Yildirim and Philippatos (2002) report a negative link between cost efficiency and market concentration (market competition improves efficiency).

Fries and Taci (2005) also find that lower nominal interest rates in the economy, a greater market share of foreign-owned banks and a higher intermediation ratio are positively

correlated with cost efficiency, which implies that greater macroeconomic stability and free access to the banking industry for foreign competitors promote the efficiency of banking systems.

In general, banking inefficiency in transition economies was found to show a decreasing tendency over time (Rossi et al., 2004). Also, progress in banking reforms has a nonlinear association with cost efficiency: The impact of reforms appears to have a positive impact on cost efficiency at the outset while it declines over time (Fries and Taci, 2005).

2.3 The Stochastic Efficiency Frontier Model

In order to evaluate the extent and significance of the sample selection problem we pursue the following empirical strategy. We start by specifying a translog cost function, which is broadly consistent with the stochastic efficiency frontier specification employed in the previous panel data studies. The estimation results from this non-instrumented specification are then compared to our two-stage instrumental variable outcomes. Finally, we present and provide a comparative analysis of inefficiency score estimates for both specifications.

Cost efficiency measures the relative performance of a bank by comparing its current level of costs to the efficiency frontier for a given technology. Since technologically feasible cost frontiers are not observable, the measurement of cost efficiency is based on deviations from minimal costs observed in a sample for practical applications (Aigner et al., 1977).

Following the approach pursued in other related papers, we apply a semilogarithmic second-order expansion of the general form of the cost

function to obtain the well-known translog specification⁶ enriched by country-specific factors. In our case, the cost frontier depends explicitly on time. To reduce the number of second-order terms in the regression equation, we assume a linear dependence between total costs and country-specific factors. Thus, the country-specific variables operate as linear cost frontier modifiers and reflect changing operating conditions within which banks optimize their operations; these variables include per capita GDP, the interbank rate, the Index of Economic Freedom provided by the Heritage Foundation and the Index of banking sector reform provided by the EBRD. We prefer this approach to using country dummy variables, since the latter do not explain the sources of differences between countries but merely establish their presence.

In our study banks are modeled as firms producing two outputs (loans Y_1 and deposits Y_2) using two inputs (physical capital and labor, with prices X_1 and X_2 , respectively).⁷ Loans are measured as the total amount of loans granted by a bank and deposits as the total amount of deposits attracted. The price of physical capital is defined as the ratio of noninterest expenses to total assets, while the price of labor is measured as the ratio of total expenses on personnel over total assets. Other related studies have employed

variations of this specification to analyze different aspects of banking efficiency in transition countries.⁸

Furthermore, we are interested in finding out what factors influence the inefficiency term. While country-specific factors constitute the given economic environment for banks and thus cannot be at the source of individual banks' inefficiency, inefficiency itself may depend on bank-specific correlates Z_1 – Z_4 .

In our model, the net interest margin (Z_1) proxies the degree of competition the bank faces (a larger net interest margin indicates more market power). The ratio of other operating assets to total assets (Z_2) measures the diversification of individual banks' operations. Using this quantity also helps to at least partly account for possibly different output vectors in the relatively heterogeneous sample of banks.

The ratio of net loans to total assets (Z_3) captures the ability to transform deposits into loans. Finally, the ratio of equity to total assets (Z_4) serves as an (inverse) indicator of a bank's leverage and thus controls for the owner's risk preferences and decisions about the capital structure.

The inefficiency term also includes a variable that captures foreign ownership; in this respect we create two competing models.⁹ In the benchmark model, foreign ownership is a simple dummy variable, which enters

⁶ The estimated equations are given in the annex. For technical details, see the full version of this paper, which can be obtained from the author upon request.

⁷ By treating both loans and deposits as outputs, we follow the production approach to banking sector modeling (various versions of this approach measure loans and deposits at their nominal values or as the number of realized transactions). The main alternative is the intermediation approach, which considers deposits as inputs that, together with labor and capital, contribute to the creation of loans on the output side.

⁸ For example, Fries and Taci (2005) employ a model with two outputs and one input price; Yildirim and Philippatos (2002) and Rossi et al. (2004) assume three outputs and three inputs; Lensink et al. (2006) use two outputs and two input prices.

⁹ In the full version of this paper, we also specify a third model based on linear instrumenting, which serves as a robustness check.

the specification as exogenous to the residual efficiency variable. Although this assumption is in line with the existing literature, it does not appear plausible to us for the following reason:

While inefficiency caused by variables observed in financial statements (i.e. included in the bank-specific variables) should be priced and thus be reflected in the price at which a bank is sold to a foreign investor, the residual (in)efficiency is what may attract the foreign investor. The so-called cream-skimming effect documented in other studies on foreign entry predicts that foreign investors tend to acquire the best enterprises in the first place.¹⁰ This means that the decision to purchase shares of a bank in a transition economy might in itself depend on the investor's assessment of the bank's future potential in terms of cost efficiency. This situation leads to an endogeneity problem in the given specification, and estimated coefficients from a non-instrumented specification will be biased and inconsistent.

Therefore, we instrument the ownership dummy in our second model to control for the selection bias. In the first stage of our approach, we estimate a panel probit model linking foreign direct investment (*FDI*) dummy variable to a set of instruments. The predicted values \widehat{FDI} (probabilities of being foreign-owned) then replace the original dummy variable for foreign ownership in the second-stage estimation of the stochastic frontier.

A statistically significant discrepancy in the estimated parameters of

the two models indicates an endogeneity bias in the non-instrumented model. The parameter estimates of the non-instrumented model are then inconsistent.

3 Estimation Results

The results of our empirical estimations using the parameterization by Battese and Coelli (1995) are summarized in table 1 and table 2. The cost frontier estimations are performed using the Frontier econometric program developed by Tim Coelli from the University of Queensland (Australia). Accompanying estimations were performed in Stata.

3.1 Cost Frontier Specification

Looking first at the translog time-varying cost function component of the model, we find most coefficients highly significant and relatively similar in all three specifications. This confirms the appropriateness of the time-varying cost function model.

The negative marginal effect of time confirms the overall downward shift in the cost frontier over time, resulting from improvements in the available production technology. These improvements include both hard factors like advanced telecommunications and electronic banking and soft factors like better managerial skills. Consequently, banks are able to cut about 7% of their costs each year, provided they follow the shifts in the cost frontier.

On the country-level, we did not find any significant link between the overall level of economic development measured by per capita GDP and total costs. This finding is consis-

¹⁰ Lanine and Vennet (2005) present evidence of a common practice by western banks to acquire the best banks in Central and Eastern European countries (CEECs).

Table 1

Panel Estimation of Stochastic Efficiency Frontier Models		
	Instrumented with probit	Without Instruments
Constant	-2.1663***	-2.0512***
$\log(y_1)$	0.058	0.0893
$1/2 (\log(y_1))^2$	0.1695***	0.1637***
$\log(y_2)$	1.1092***	1.0739***
$1/2 (\log(y_2))^2$	0.189***	0.1932***
$\log(x_1/x_2)$	0.2039	0.1848
$1/2 (\log(x_1/x_2))^2$	0.1428***	0.1433***
t	0.109**	0.0973**
$1/2 t^2$	-0.0044	-0.0038
$\log(y_1) \log(y_2)$	-0.1767***	-0.1752***
$\log(y_1) \log(x_1/x_2)$	0.0673***	0.0684***
$\log(y_2) \log(x_1/x_2)$	-0.0958***	-0.0964***
$t \log(y_1)$	0.0403***	0.0375***
$t \log(x_1/x_2)$	-0.0143**	-0.0127*
$t \log(y_2)$	-0.0429***	-0.0406***
Country-specific variables (cost frontier modifiers)		
Log per capita GDP	0.0195	0.0039
Interbank rate	0.0048***	0.005***
Index of Economic Freedom	-0.0069	0.0041
Index of banking sector reform	0.0917***	0.1149***
EU accession trend	-0.1018***	-0.0543*
Bank-specific variables (inefficiency correlates)		
Net interest margin	-0.0627***	-0.0696***
Other operating income/total assets	-0.0375***	-0.0388***
Net loans/total assets	-0.033***	-0.0333***
Equity/total assets	0.0049**	0.0053**
FDI ¹	0.2211***	-0.0087

Source: Author's calculations.

Note: *, ** and *** denote 10%, 5% and 1% significance levels, respectively.

¹ estimated probability of being foreign-owned in the first column.

y_1 stands for total loans, y_2 for total deposits, x_1 for the ratio of noninterest expenses to total assets, x_2 for the ratio of total expenses on personnel to total assets, t for time.

Table 2

Panel Estimation of Stochastic Efficiency Frontier Models (continued)		
	Instrumented with probit	Without instruments
Marginal effects		
$\log(y_1)$	1.3773	1.3489
$\log(y_2)$	1.4443	1.4727
$\log(x_1/x_2)$	1.5713	1.5705
t	-0.0721	-0.0673
Number of observations	1780	1780
Number of banks	282	282

Source: Author's calculations

Note: Marginal effects evaluated at variable means. For the definition of y_1 , y_2 , x_1 , x_2 and t , see note to table 1.

tent with results of Fries and Taci (2005) and Lensink et al. (2006). Equally in line with Fries and Taci (2005), we find that the level of nominal interest rates has a positive and significant impact on scaled total

costs: an increase by 1 percentage point in the interbank rate causes total costs to rise by 0.5%. The estimation results are mixed regarding the impact of liberalization reforms on banking costs. We failed to find any

significant connection between the respective country's ranking in terms of the Index of Economic Freedom and banking costs. The Index of banking sector reform, however, was found to have a positive and significant impact on total costs. Fries and Taci (2005) explain the possibility of a positive association between banking sector reforms and banking costs by the fact that banks in transition are moving from a defensive restructurization of banking operations (cost cutting) to operating strategies based on service improvement and innovation, which require a higher level of spending.

The significantly negative coefficient of the variable that captures the EU accession trend confirms the positive impact of EU accession on banking sector productivity. Even after controlling for the benefits linked to institutional and economic development and for the evolution of technology over time, we are still able to find that EU entry shifts the available cost frontier downward. We expect that including subsequent years of data into our estimation will further strengthen this effect as the positive impacts of EU accession unfold.

3.2 Inefficiency Analysis

The analysis of the bank-specific inefficiency correlates uncovers a significantly negative association between banking costs and the proxy for a bank's market power measured as the level of its net interest margin (the difference between the implicit rates for lending and borrowing).¹¹ This re-

sult indicates that banks with greater market power are able to reduce their costs, possibly owing to economies of scale and scope. This finding is consistent with the findings in Grigorian and Manole (2002) and differs from those reported by Fries and Taci (2005) and Yildirim and Philippatos (2002), who found nonsignificant and negative associations, respectively.

We proxy the degree of diversification of banking activities by the ratio of other operating income to total assets and find that it is significant and negatively associated with banking costs. This result is in line with previous findings and indicates that larger banks with a greater variety of banking services tend to perform better. Similarly, banks which are more active in terms of loan provision, as captured by the ratio of net loans to total assets, are also significantly more cost efficient, which might be attributable to economies of scale.

Finally, those banks which allocate a greater share of their assets to their capital for stability reasons should sacrifice part of their cost efficiency, as they distract a share of their assets from circulation.

3.3 The Impact of Bank Ownership

Following the general discussion of estimation results, we focus on the effect of foreign ownership. Contrary to the other cross-country panel data studies (e.g. Yildirim and Philippatos, 2002; Fries and Taci, 2005; Bonin et al., 2005; Lensink et al., 2006), we

¹¹ We believe the net interest margin is a better proxy for the market power of a particular bank than the share of the largest banks' assets in total banking assets (a popular indicator employed in other related works). The net interest margin provides a qualitative measure of how banks benefit from their market position in terms of price setting, while the market share measure may be distorted by specific characteristics of banking sector regulation in a particular country.

do not find a significantly positive relation between foreign ownership and cost efficiency in our non-instrumented model (see the specification without instrumental variables in table 1).

To check for the presence of the cream-skimming effect, we start by running a panel random effect probit model, which we apply to instrument for the decision of foreign investors to acquire domestic banks. In the probit specification, we use the exogenous variables from our model and add instruments which we assume to correlate with the decision of foreign investors to buy a bank, but which are independent of the residual inefficiency after accounting for all exogenous variables. These instruments include information about individual banks (total expenditure, total assets, total fixed assets and net interest revenue as size indicators; cost-to-income ratio, recurring earning power and noninterest expenses-to-total assets as performance indicators) and country-specific information about the size of the country in question, the size of its banking sector and the involvement of other foreign investors (i.e. data on the population, number of banks and number of foreign banks, respectively).

After instrumenting for the foreign ownership dummy, we find a substantial change in the impact of foreign ownership on the cost efficiency (see first column in table 1). The impact of foreign ownership becomes significantly positive, which implies that there is a negative relationship between the foreign ownership of a domestic bank and its cost efficiency. This leads us to the conclusion that foreign investors do not improve cost efficiency, but rather contribute to its deterioration. The

insignificant coefficient in the specification without instrumental variables is caused by two effects working in opposite directions: The less favorable performance in terms of cost efficiency is partly offset by the fact that foreign investors tend to primarily acquire banks with high residual efficiency, which is not captured by our efficiency correlates. The negative impact of foreign ownership on cost efficiency is uncovered in the instrumental variable specification and confirms the cream-skimming hypothesis. Since cream-skimming is related to the residual efficiency not captured by observable quantities, it may be partially caused by insider information the foreign investors have about the acquired domestic banks.

This finding supports the evidence provided by Lanine and Vennet (2005) that “large Western European banks have targeted relatively large and efficient CEEC banks with an established presence in their local retail banking markets”. In addition, the empirical finding has its theoretical justification as stated in Detragiache et al. (2006), where the authors show that in a world with imperfect competition and informational asymmetries, foreign entry can cause banking sector efficiency to diminish.

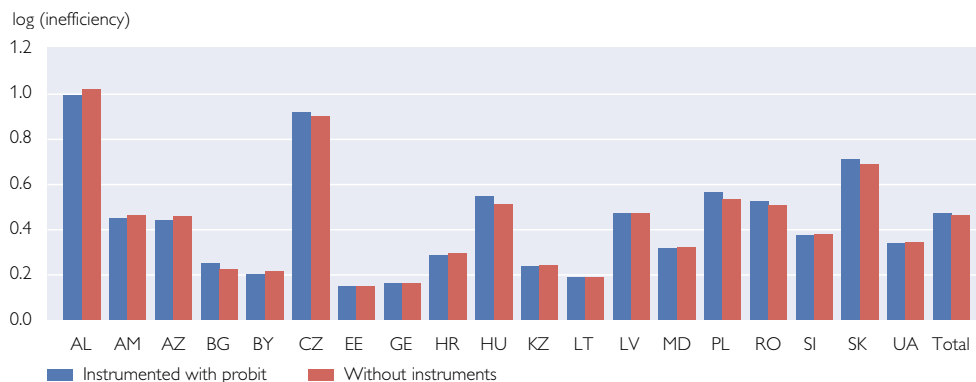
3.4 Inefficiency Scores

Chart 1 presents estimated average inefficiency terms in both models for the set of countries under consideration. Both specifications produce comparable inefficiency scores, and endogeneity does not play a substantial role in this case.

The overall average inefficiency measure indicates that banks are on average operating 47% above the optimal cost frontier. The results vary

Chart 1

Average Inefficiency Scores for Individual Countries



Source: Author's calculations.

Note: AL: Albania, AM: Armenia, AZ: Azerbaijan, BG: Bulgaria, BY: Belarus, CZ: Czech Republic, EE: Estonia, GE: Georgia, HR: Croatia, HU: Hungary, KZ: Kazakhstan, LT: Lithuania, LV: Latvia, MD: Moldova, PL: Poland, RO: Romania, SI: Slovenia, SK: Slovakia, UA: Ukraine.

heavily across countries. The worst performer is Albania, but otherwise the economically less developed countries do not underperform. The Visegrad countries¹² show above-average inefficiency, with the Czech Republic almost matching Albania. This is not a good record for countries which should be closing the gap to the “old” EU members; it is, however, consistent with the findings presented in previous studies. Incidentally, these are the countries that have been very successful in attracting FDI into their banking systems.

On the other end of the spectrum, the Baltic countries generally show a much better performance, with Estonian banks being on average the most efficient ones within the whole sample. Banks in CIS countries exhibit medium inefficiencies, with Georgia being the best-performing country among the CIS countries.

4 Conclusions

In this paper, we address the issue of foreign ownership and banking efficiency in the European transition economies. We employ the instru-

mental variable approach to tackle the sample selection problems caused by the possibility of cream-skimming. Our main observation is that the instrumental variable approach makes the coefficient of the impact of foreign ownership on banking efficiency positive and highly significant. This finding indicates the presence of a cream-skimming effect, which predicts that foreign investors target the most efficient banks for acquisition in the first place.

Furthermore, our estimations suggest that those transition countries which started EU accession negotiations and eventually became (or will soon become) EU members have experienced a downward shift in the cost frontier. This trend documents that improved discipline resulting from the obligations related to EU accession together with benefits from technological and market spillovers indeed improves banking sector technology in the accession countries.

The comparison of inefficiency scores provides evidence that in general, the most advanced transition

¹² The Czech Republic, Hungary, Poland and Slovakia.

countries (the Czech Republic, Hungary, Poland and Slovakia) house the most inefficient banks, with only Albania disrupting this unflattering hegemony. Since these countries have been the most successful in terms of attracting FDI into their banking systems, this result implies that opening the financial sector to foreign entry does not necessarily lead to an improvement in the performance of banking institutions. Drawing parallels to previous findings of a downward shift in the cost frontier owing to EU accession, we interpret this result as the inability of those transition economies that recently joined the EU to accommodate the improved technological possibilities and fully enjoy the gains stemming from productivity improvements.

However, we would like to emphasize that the negative association between foreign ownership and cost efficiency should not be confused with the contribution of foreign ownership to the stability of financial systems in emerging markets. Rather, the results of this paper should be interpreted as evidence of the inefficient use of inputs by foreign-owned banks given the input prices and other country- and bank-specific characteristics. In other words, foreign-owned banks in transition economies might be more active in terms of providing e.g. more loans to local clients or extending banking services within their local networks in transition countries. As mentioned in Detragiache et al. (2006), a possible reason why this is not happening is that foreign-owned banks prefer stability to efficiency and engage in activities

with either top-ranking domestic clients or foreign firms and governmental organizations to ensure the safety of their operations.

In addition, we do not want to necessarily associate the negative impact of foreign ownership on cost efficiency with underperformance. After entering a new market, foreign owners may decide to follow strategies aimed at long-term success and development which may be costly in the short-run. These include aggressive expansion in the market or in-depth modernization and restructuring, which usually require additional spending. Furthermore, this paper does not include an analysis of profit efficiency, which means that we cannot tell whether foreign-owned banks might be able to generate comparable or higher profits despite their higher costs.¹³ However, this does not change our conclusion about foreign banks primarily targeting more efficient domestic banks, which biases cost efficiency results if not treated properly in the analysis.

The results of our estimations suggest that opening domestic financial systems to foreign entry should not be regarded as panacea for policymakers in transition economies. To enjoy the full benefits of bank acquisition by foreign investors, the countries in question should develop appropriate strategies to diminish the impact of the cream-skimming effect. In addition, the creation of beneficial conditions for foreign entrants can lead to greater benefits only if supported by a set of other institutional reforms, for example the improvement of governance practices.

¹³ Maudos et al. (2002) provide some empirical evidence on the aggregate level in their study of the Spanish banking sector.

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Annex

The translog specification of the cost function with K inputs and L outputs can be schematically written as

$$\begin{aligned} \log \frac{TC}{X_1} = & \beta_0 + \sum_{k=2}^K \beta_k \log \frac{X_k}{X_1} + \sum_{l=1}^L \gamma_l \log Y_l + \frac{1}{2} \sum_{k=2}^K \sum_{l=2}^K \delta_{kl} \log \frac{X_k}{X_1} \log \frac{X_l}{X_1} + \\ & + \frac{1}{2} \sum_{k=1}^L \sum_{l=1}^L \psi_{kl} \log Y_k \log Y_l + \sum_{k=2}^K \sum_{l=1}^L \omega_{kl} \log \frac{X_k}{X_1} \log Y_l + \tau_1 t + \frac{1}{2} \tau_2 t^2 + \\ & + \sum_{k=2}^K \tau_k^X t \log \frac{X_k}{X_1} + \sum_{k=1}^K \tau_k^Y t \log Y_l + \sum_{n=1}^N \xi_n G_n + v + u \end{aligned}$$

where TC are total cost, X_k input prices, Y_l output quantities, t denotes time and G_n country specific variables. Dividing by the price X_1 imposes homogeneity of the cost function in prices; we also require symmetry in second partial derivatives $\delta_{kl} = \delta_{lk}$ and $\psi_{kl} = \psi_{lk}$. Furthermore, v is a zero-mean random error and u the inefficiency term specified as

$$u = \lambda_0 + \sum_{m=1}^M \lambda_m Z_m + \alpha FDI + \varepsilon$$

where Z_m are the bank-specific inefficiency covariates, FDI is a dummy for the bank being foreign owned and ε denotes the residual inefficiency. We instrument FDI by OLS and by the panel probit model

$$\Pr(FDI = 1 | I_1, \dots, I_R) = \Phi \left(\sum_{r=1}^R \theta_r I_r \right)$$

and use the estimated probabilities \widehat{FDI} in the inefficiency term specification. The instruments I_r include both country-specific and bank-specific variables.