Undergraduate Economic Review

Volume 2 | Issue 1 Article 1

2005

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Undergraduate Economic Review

A publication of Illinois Wesleyan University

Vol. II – 2005-2006

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Abstract The last decade witnessed the biggest privatization initiative so far that transitioned the markets of Central and Eastern Europe from centrally-planned to competitive and western oriented. As a result, an increasing share of the banking sector in many of the transitional states is controlled by foreign capital. This study examines the effect of privatizing banks to foreign owners as opposed to domestic owners on bank performance. Using the ratio approach and the stochastic frontier approach, the paper concludes that although the effects of new ownership are not very pronounced due to the recent nature of the transition, banks privatized to foreign owners outperform these sold to domestic owners across all measures: profitability level, portfolio quality and managerial efficiency.

1. INTRODUCTION

The collapse of the centrally planned economies of Eastern Europe in the early 1990s prompted region-wide market-oriented reforms in which privatization of state-owned financial institutions played a key role. For only a decade the once exclusively state-run financial sector, witnessed dramatic opening to private domestic ownership and strategic foreign presence. Although the process of privatization is still ongoing in some countries and recently completed in others, I evaluate privatization policies as a prerequisite for successful transition to market economy. The study examines the effect of privatizing banks to strategic foreign investors on bank performance as opposed to privatizing to domestic owners in the first and the second wave of European Union accession countries, namely, Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

The increasingly frequent implementation of privatization worldwide has spawned a variety of studies of the effect of ownership on bank performance. Most of the literature concerning the effect of ownership on bank performance covers the similar and older process in Latin America, and other developed and developing countries. Foreign ownership improved the performance of provincial banks in Argentina but the process was not rapid due to an initial process of adapting to the market (Clarke and Cull, 1999). In Nigeria privatization failed to deliver because of the weak regulatory environment (Beck, Cull and Jerome, 2003). On the contrary, given the overall economic stability and stringent regulation, Italian privatized banks did not take long to outperform state-run banks (Frabullini and Hester, 2001). The recent literature on the transitional states shows that as a rule, banks sold to strategic foreign investors do better than these sold to domestic owners. Bonin, Wachtel and Hasan (2003) demonstrate that banks privatized to strategic foreign investors achieve higher levels of profitability than state banks and are even comparable in performance to foreign greenfield banks. Banks for which a foreign investor was chosen also exhibit improved portfolio quality (Abel and Siklos, 2002). However, they also have higher initial costs due to restructuring (Bonin and Wachtel, 2003), but eventually they achieve better cost efficiency (Weill, 2003) than these sold to domestic owners.

Despite the presence of extensive literature on the benefits of privatization, few studies examine explicitly the effect of foreign ownership on privatized banks in transitional countries. Most available works compare unprivatized with privatized entities regardless of the type of new ownership, or domestic with foreign banks irrespective of their ownership

history. For these few, which explicitly focus on the performance of banks privatized to foreign investors as compared to these sold to domestic owners, three major drawbacks preclude the emergence of a uniform conclusion. Firstly, many studies use a very early dataset; often just a couple years after privatization when the effect of ownership has not picked momentum yet and the results it yields are inconclusive. Secondly, a sizeable portion of the research focuses on just a handful of cases within each country or on a limited number of countries which may not be representative for the whole region of Central and Eastern Europe (Bonin and Wachtel, 2003 and Weill, 2003). Finally, the different empirical methods employed yield contradicting outcomes. This research aims to amend for these shortcomings. It expands the area surveyed by including ten countries and covering most of the banks operating within each one. It also uses the most recent data available from 2002. By utilizing two different approaches, this study attempts to achieve a degree of robustness of the results.

2. DATA

2.1. THE DATA SOURCE

Data comes from Banker's Almanac which contains yearly balance sheet data and profit and loss data as well as the ownership type for individual banks in a large number of countries. It covers 170 countries and the banks included represent about 90% of the total banking assets in a particular country. Additionally, it goes back to six years back from the most recent balance sheet reported. For each bank, the Banker's Almanac provides coverage on the nature of services provided, years of operations and major events in the development of the bank, mainly, mergers and acquisitions, as well as a description of the current ownership structure. It goes on to report two balance sheets for each bank: one compiled by Fitch and the other provided by the bank itself according to internal accounting standards. Since the Fitch balance sheets are superior in coverage and comparability, I relied on them for constructing my dataset.

The main limitations of the dataset were twofold. First, although it provided information on the current ownership, it did not cover ownership history, which did not permit accurate classification of banks into different ownership categories for the period surveyed. To amend for this shortage, I conducted extensive background research of the history of each bank that involved contacting the respective financial supervision agencies

and individual banks to construct a detailed picture of the ownership changes in the development of each bank.

The second drawback was incompleteness. For quite a few banks the data either spanned a period of less than six years or had individual observations missing. The incompleteness factor was heavily tilted toward underperforming institutions so we expect an upward bias of the estimations. Additionally, some branches of foreign banks did not report separate balance sheets for the branch in the given country but rather an aggregate balance sheet for the parent entity. Due to the inability to separate the individual branches from the parent entity, these observations were removed from the dataset. In addition, all incomplete bank-year observations were also deleted. As a result, the analysis is based on 358 bank-year observations for the Ratio Approach and on 587 bank-year observations for the Stochastic Frontier Approach. However, even with the removal of incomplete observations the dataset covers approximately 80% of the banking sector in each country and could be deemed fairly representative.

2.2. DATA UTILIZATION

In order to avoid currency conversions, which would increase the errors in variables, I employed ratios of the financial indicators rather than the nominal values. The additional positive effect of this conversion is that it reduces the variance that would have been caused by outlier cases.

Therefore, for the Ratio Approach I have extracted some of the main financial indicators and have converted them into the following ratios: administrative costs over total assets, cash over total assets, market share over loans, net interest margin, ROA, ROE and loan loss reserves over loans (LLR). LLR attempts to proxy for non-performing loans (NPL) since few banks reported actual percentage of NPL.

For the computation of the efficiency scores the Stochastic Frontier Approach relies on the following ratios: total costs to the price of borrowed funds, profits to the price of borrowed funds, and administrative costs to the price of borrowed funds. The level variables included are total bank output, the price of loaned funds and the bank's equity. All variables are converted to dollar figures corrected for inflation to achieve comparability.

The ownership specifications merit more attention. A financial institution is deemed foreign owned if the at least 51% of its assets are held by foreign investors. In short, the paper utilizes the "majority ownership benchmark" rather than individual country criteria for

foreign control which range from 20% in Poland to 50% in Hungary. The main reason behind the decision to disregard state definitions is that only when owners control the majority of the stake, are they able to wield influence over the bank's policy.

Banks are separated into six categories along ownership lines: foreign greenfield, foreign privatized, foreign M&A, domestic de novo, domestic privatized, and state. A bank is deemed foreign greenfield if it is initially established with foreign investment and remains in this category even when transferred to another foreign owner since the type of ownership does not change. However, if a private domestic bank is sold to foreign owners, it changes category to foreign M&A. Similarly, domestic de novo banks are banks that have been kept only in private domestic hands. The categories foreign privatized, domestic privatized and state are self-explanatory. The dummy variable for ownership type takes one if the bank is of ownership type *i* during year *j*, and zero otherwise.

A foreign owner is classified as such if its assets come from a non-transitional country. Based on this assumption, Hansabanka in Latvia is classified as domestic, although it is owned by Hansapank based in Estonia. This decision is motivated by the fact that transitional countries share similar political and economic heritage and cannot offer significantly different banking expertise to each other.

Majority ownership does not necessarily indicate the presence of a single majority owner. In cases of multiple owners, the stakes of several minority foreign owners may be aggregated to yield a majority position for foreign owners as a group even though no single owner has a majority stake.

Finally, classifying ownership was a formidable task due to the lengthy transitions from one ownership type to another. Quite often the state ceded control over a bank long after the privatization contract was signed. Therefore, this study registers change in ownership when the actual majority share portfolio is transferred and not when the deal was reached.

2.3. BASIC FEATURES OF THE DATA

The ownership table shows that in the period from 1997 to 2002 banks in Central and Eastern Europe exhibited diverse forms of ownership and no single ownership type prevailed. Somewhat surprisingly the most popular ownership type is that of domestic *de novo* banks that comprise about 23% of the sample. Foreign greenfield establishments come second with 22% of the observation. The statistics show that state ownership was still prevalent during the six-year period and almost one fifth of the cases were in governments' hands. Furthermore,

while in 13% of the observations banks switched ownership from domestic private to foreign private, there are absolutely no cases in the opposite direction. Finally, the statistics indicated that despite widespread negative sentiments towards foreign investors, more banks were privatized to foreigners than to domestic owners. The two groups constitute 12% and 5% respectively of the cases.

Table 2.1.: Ownership Statistics for Ten Eastern European Countries for the Period 1997-2002

	N	Mean	Std. Dev.	Min.	Max.
Foreign Greenfield	358	0.215	0.411	0	1
Foreign Privatized	358	0.120	0.326	0	1
Foreign M&A	358	0.134	0.341	0	1
Domestic De Novo	358	0.232	0.422	0	1
Domestic Privatized	358	0.050	0.219	0	1
State-owned	358	0.193	0.395	0	1

The predominance of domestic de novo banks does not imply that this ownership group controls the biggest slice of the financial sector. Rather, the simple statistics is misleading, since they do not account for bank size. Domestic greenfield establishments tend to be small relative to foreign greenfield and privatized entities.

Table 2.2.: Financial Statistics for the Ratio Approach

	N	Mean	Std. Dev.	Min.	Max.
Administrative Costs over Assets	358	0.350	3.199	0.008	36.772
Cash over Total Assets	358	0.807	8.915	0.000	126.956
Loans over Total Assets	358	3.251	30.108	0.010	372.815
Market Share over Loans	358	0.000	0.001	0.000	0.009
Net Interest Margin	358	0.074	0.132	-0.169	1.390
Return on Assets	358	0.111	1.926	-3.816	35.655
Return on Equity	358	-1.891	36.246	-685.60	5.356
Loan Loss Reserves over Loans	358	0.166	1.032	0.000	18.046

The financial statistics for the Ratio Approach shows that the ratio of administrative costs over total assets exhibits wide swings in value from almost zero to 37. The latter is clearly an outlier case since the mean is at modest 0.35. The mean of the ratio of cash over total assets is 0.8, however an outlier case reaches the exorbitant value of 127. On average, banks made loans roughly a little over three times their total assets. The ratio of market share to loans shows that most banks control a relatively small share of the financial sector. The mean of the net interest margin is 0.074 which suggests that few banks enjoyed a wide spread. The average bank in the transitional region reached the promising return on assets

(ROA) of 11%, however, the average return on equity (ROE) is precariously skewed downward by a single outlier case. The loan loss reserves serve as a proxy for non-performing loans since few banks reported actual loan losses. Somewhat surprisingly, despite the heightened risk of default on loans in the economically and politically fragile transitional states, the average bank provisioned loan loss reserves only 17% of the actual loans given.

Table 2.3.: Country Statistics for Ten Eastern European Countries for the period 1997-2002

	N	Mean	Std. Dev.	Min.	Max.
GDP Growth	60	3.483	3.260	-6.000	10.000
nflation Rate	60	29.733	136.741	0.000	1058.00
Real Interest Rate	60	4.183	12.136	-82.000	15.000

Finally, macroeconomic country statistics provide vital information about the setting in which the banks operated. The typical transitional country averaged 3.5% annual GDP growth. The early years saw the biggest slump in GDP in Romania and in the same period Estonia achieved the highest rate for the Central and Eastern European region. Inflation rates were precariously high even for the average transitional country at 30%. Bulgaria, the outlier case, registered hyperinflation at the rate of 1058% in 1997 and the same year brought 155% inflation in Romania. Real interest rates averaged the acceptable 4% rate. However, again in Bulgaria in 1997 inflation heavily taxed deposits at a negative –82% real interest rate.

Despite the obvious presence of outlier cases, I did not remove them from the sample for two reasons. First, removing them would further shrink the sample pool, and second, a quick glance at the dataset shows that these outlier cases are strongly related to the ownership type and removing them from the dataset would yield skewed results about the effect of ownership on performance.

Table 2.4.: Financial Statistics for the Stochastic Frontier Approach in Millions of US Dollars.

	N	Mean	St. Dev.	Min.	Max.
Total Costs	587	260.156	1573.983	0.855	18736.79
Total Profits	587	5458.123	710.313	1.000	10821.37
Total Output	587	2327.918	15834.31	8.300	215540.5
Equity	587	329.995	2535.099	0.024	38481.97
Interest Paid to Total Costs	587	0.506	4.825	0.006	0.719
Admin. Costs to Total Costs	587	0.438	4.425	0.008	0.774
Interest Received	587	238.87	1381.52	0.478	19945.89
Market Share	587	0.087	0.140	0.001	0.944

The total expenditures, profits, output and the interest received for the SFA Approach varies from single digit million dollars to double digit billion dollars. The level of equity dips from positive double digit billions to almost zero. The share of interest paid and administrative costs of total costs show similar movements from almost zero to as much as 72% and 77% respectively of the total expenditure. Finally, the average bank controls only 9% of the market share while the biggest one is a total monopoly holding as much as 94% of the financial assets in the country.

Table 2.5.: Efficiency Scores Statistics in Percentages

	N	Mean	St. Dev.	Min.	Max.
Profit Efficiency Score	587	58.186	0.367	39.914	62.208
Cost Efficiency Score	587	29.336	0.472	10.450	49.222

Finally, the efficiency scores do not exhibit wide swings in value. Most scores are clustered around the mean values and no bank manages to reach very high efficiency. Banks appear to be more successful in achieving profit efficiency than cost efficiency. The lowest profit efficiency score is 40% while the highest is 62%. Likewise, the lowest cost efficiency score is 10% while the highest is 49%.

3. METHODOLOGY

I propose two methods for estimating the effect of bank ownership on bank performance: the Ratio Approach and the Stochastic Frontier Approach. Since both methods suffer several drawbacks, I utilize both to achieve a degree of robustness of the results.

3.1. THE RATIO APPROACH

The Ratio Approach (RA) is a simple econometric model that employs various measures of performance and quality of the bank and examines their dependence on managerial and external factors. The underlying model studies the effect of ownership and macroeconomic factors on various performance estimates:

$$\text{(1)} \quad \text{PERFORMANCE} = \alpha + \beta_i \text{ INTERNAL CONTROLS} + \gamma \text{ TIME} + \\ + \delta_i \text{ OWNERSHIP} + \theta_i \text{ MACRO CONTROLS} + \\ + \kappa_i \text{ INTERACTION CONTROLS} + \lambda_i \text{ COUNTRY}$$

Since converting all financial indicators to a common currency base would increase the measurement error, this study adopts the ratio approach in which all variables are ratios rather than absolute values. This is even more necessary for the transitional economies where most banks operated in high inflationary environments. Another positive by-product of this approach is that it controls for biases that could arise from the scope of operation of each bank.

Several indicators are used to measure PERFORMANCE. Measures such as administrative costs over assets, net interest margins, interest over deposits, interest over loans, ROA and ROE are measure performance on the financial side. Since the percentage of non-performing loans (NPL) is reported for very few banks, the loan loss reserves (LLR) attempt to serve as a proxy for it and to capture the quality of individual bank portfolios.

The equation controls for internal factors that could also affect performance, the most prominent of which is the market share of the particular entity in addition to the main services provided by the bank besides other factors. OWNERSHIP is a matrix of dummies each of which takes the value of 1 if the bank is of ownership type *i* during the particular year and 0 otherwise.

Additionally the equation contains several macro controls that account for economy wide factors that could affect performance regardless of the ownership type. The main indicators included are annual GDP growth, annual inflation, and the real interest rate. Finally, the model allows for interactions between some of the exogenous variables included and contains a matrix of dummies for the country of operation of each bank.

This simplistic estimation could suffer from several flaws, the main of which is endogeneity. In most countries, the ownership type is not independent of the bank performance and as explained in the process overview, there are a host of political and economic factors that predetermine to a significant extent who ends up controlling the majority share of the bank. Earlier studies attempted to use bank size as a proxy for foreign ownership since the first banks to be sold to foreign owners were big influential entities. However, in recent years, this pattern has been broken and market size does not appear to be related to the ownership type.

To amend for this shortage, the dummy matrix COUNTRY attempts to partly account for the different privatization objectives that prevailed in each country and that ultimately influenced the ownership type of privatized banks. The size of the bank effectively accounted for by the market share control also wields control over the selection of the future owner since in many countries governments are reluctant to cede control over a dominant bank.

Additionally, COUNTRY jointly with the MACRO CONTROLS partly captures the political and economic environment of each country that affects the number of domestic private banks and foreign greenfield establishments. However, there are individual factors that affect the ownership type of each bank that remain unaccounted for. Since no model could effectively capture them, in an attempt to achieve a degree of robustness of the results I propose a second model for determining the effect of ownership on bank performance.

3.2. THE STOCHASTIC FRONTIER APPROACH

The Stochastic Frontier Approach (SFA) estimates the degree of cost and profit efficiency each bank achieves. The farther the actual costs or profits are from the optimal point, the less efficient the financial institution is. Thus, the efficiency score measures how close a bank's cost or profit is to what a best-practice bank's cost or profit would be for producing the same bundle of outputs.

Several techniques have been proposed in the literature to measure efficiency using frontier approaches. Non-parametric techniques such as the Data Envelopment Analysis (DEA) utilize linear programming techniques to compute efficiency scores. They do not require any assumptions regarding the functional form of the frontier, allowing the frontier to tightly envelop the data. However, their main weakness is that they do not allow for any error in the data: the entire distance to the frontier is considered as inefficiency, resulting in the inclusion of exogenous events in the inefficiency term (Weill (2003)).

Parametric approaches, such as the stochastic frontier approach, use econometric tools to estimate the efficiency frontier. Their main weakness is that they impose more structure on the shape of the frontier by specifying a functional form for the cost function. However, their major advantage is that they allow for random error, which improves the estimation of efficiency scores. But this allowance creates a new problem: the separation of random error from inefficiency. Parametric approaches differ in the method adopted to separate random error from inefficiency. The stochastic frontier approach uses a composed error model in which inefficiency is assumed to follow an asymmetric distribution (e.g. half-normal, truncated normal. gamma) while the random error is assumed to follow a symmetric distribution (usually normal). The rationale is that inefficiency cannot diminish costs and thus must have an asymmetric distribution, whereas random error can add or subtract cost and then have a symmetric distribution.

Another problem that is inherent to all efficient frontiers is the size of the sample: since efficiency scores are relative measures of performance, the larger the sample, the better, the comparison will be. Fortunately, the ten transitional countries offer enough observations for reliable conclusions

Following the applications from Berger and Mester (1997), Kumbakhar and Lovell (2000), Weill (2003) and Bonin, Hassan and Wachtel (2003), I adopt the stochastic frontier approach to estimate the cost efficiency scores. Cost efficiency measures how close a bank's cost is to what a best-practice bank's cost would be for producing the same bundle of outputs. It then provides information on losses in the production process and on the optimality of the chosen mix of inputs. The stochastic frontier methodology, based on a multiproduct translog cost function, is adopted to calculate cost and profit efficiency scores for the 596 bank-year observations in the sample.

The basic model assumes that total cost deviates from the optimal cost by a random disturbance, v, and an inefficiency term, u. Thus the cost function is

$$TC = f(Y, P) + \varepsilon \quad (2)$$

Where TC represents total cost, Y is the vector of outputs, P is the vector of input prices and ε is the error term which is the sum of u and v. u is the one-sided component representing cost inefficiencies, meaning the degree of weakness of managerial performance. v is a two-sided component representing random disturbances, reflecting bad or good luck and measurements errors. u and v are independently distributed. v is assumed to have a normal distribution and variance σ^2. Several distributions have been proposed, however this model follows the convention adopted by Weill (2003) and utilizes the gamma distribution.

The complete model estimates a system of equations composed of a translog cost function and its associated input cost share equation derived using Shepard's Lemma. Estimation of this system adds degrees of freedom and results in more efficient estimates than just the single equation cost function.

Since the share equations sum to unity, I solve the problem of singularity of the disturbance covariance matrix of the share equations by omitting one input cost share equation from the estimated system equations. Standard symmetry constraints are imposed. Normalizing total costs and the price of labor by the price of borrowed funds imposes homogeneity conditions. Thus, the complete cost model is the following:

$$(3)\quad \ln (TC/ w_2) = \beta_0 + \alpha \ln y + \beta \ln (w_1/w_2) + \gamma \ln (w_1/w_2) \ln y + \\ + \ln EQUITY + \sum COUNTRY + \varepsilon$$

$$(4)\quad S = \delta \ln (TC/w_2)/ \delta \ln w_1 = \beta_0 + \beta \ln (w_1/w_2) + \gamma \ln y + \eta$$

where TC is total costs, y is the bank output, w_1 is the input price, w_2 is price of borrowed funds, *EQUITY* is total equity, *COUNTRY* is a matrix of dummies that equal 1 when the bank operates in country *i* and 0 otherwise. S is the input cost share, η is error term independent of ε.

For the definition of inputs and outputs, the intermediation approach is adopted that considers deposits as an input. The output included is loans measured by the currency volume that the bank held each year. The inputs, whose prices are used to estimate the cost frontier, include non-earning expenses and the price of borrowed finds, i.e. interest paid on deposits. The price of non-earning expenses w_1 is measured by the ratio of personnel and other non-interest bearing expenses to total assets, as data on the number of employees and separate personnel expenses are not available. The price of borrowed funds w_2 is measured by the ratio of interest paid to total assets.

The level of equity is included to control for differences in risk preferences. If managers from one bank are more risk-averse than the managers from another bank, they can hold a higher level of equity than the cost-minimizing level. Consequently, by omitting the level of equity, we may consider a bank as inefficient even if it behaves optimally, given the risk preferences of its managers. If, for instance, bank managers of foreign-owned banks are more risk-averse than the managers of domestic-owned banks, their performance would be underestimated if equity is not controlled for in the cost efficiency model.

Berger and Mester (1997) provide another reason for the inclusion of equity in the efficiency model. Bank insolvency risk depends on the equity available to absorb losses. Consequently, the insolvency risk affects the bank's costs through the risk premium that the bank has to pay in order to borrow funds. This issue has particular importance in transitional economies where the insolvency risk of banks can be particularly great, due to the high proportion of non-performing loans in the loan portfolio.

The standard profit function uses essentially the same specifications with a few changes. First the dependent variable for the profit function replaces ln (TC/w_2) with ln $[(\pi/w_2) + |(\pi/w_2)^{min}| + 1]$, where $|(\pi/w_2)^{min}|$ indicates the absolute value of the minimum value of (π/w_3) over all banks in the period. Thus, the constant $\theta = |(\pi/w_2)^{min}| + 1$ is added to every

firm's dependent variable in the profit function so that the natural log is taken of a positive number, since the minimum profits are typically negative (Berger and Mester (1997)). Thus, for the firm with the lowest value of (π/w_2), the dependent variable will be ln (1) = 0. Furthermore, the terms containing the variable output quantity ln (y) are replaced by the corresponding output price, ln (p). The standard profit function is:

$$(5) \quad \pi + \theta = f(V, P) + \varepsilon$$

Where π represents profits, V is the vector of output prices, P is the vector of input prices and ε is the error term which is again the sum of *u* and *v*. This the complete profit model is the following:

$$(6) \quad \ln [(\pi/w_2) + |(\pi/w_2)^{min}| + 1] = \beta_0 + \alpha \ln p + \beta \ln (w_1/w_2) + \\ + \gamma \ln (w_1/w_2) \ln p + \ln EQUITY + \sum COUNTRY + \varepsilon$$

$$(7) \quad S = \delta \ln [(\pi/w_2) + |(\pi/w_2)^{min}| + 1]/ \delta \ln w_1 = \\ = \beta_0 + \beta \ln (w_1/w_2) + \gamma \ln p + \eta$$

Here p is the bank output price. The output price indicator employed is the interest rate received on loans.

The two equations for the profit and cost functions are estimated using the Iterative Seemingly Unrelated Regression (ITSUR) that generates maximum likelihood estimates. The estimated residuals capture the degree of profit and cost inefficiency in the ideal case when no unexplained disturbances occur. The obtained inefficiency scores are converted to efficiency scores and are subsequently regressed on ownership structures controlling for time and the size of the bank since these are shown to affect bank efficiency. The following model is estimated:

$$(8) \quad EFF = \alpha + \beta \text{ Foreign Greenfield} + \gamma \text{ Foreign Privatized} + \\ + \delta \text{ Foreign M\&A} + \zeta \text{ Domestic De Novo} + \theta \text{ Domestic Privatized} + \\ + \lambda \text{ Market Share} + \mu \text{ Time}$$

Finally, the cost and profit efficiency variables fall in the interval between 0 and 1, making the dependent variable a limited dependent variable. Therefore, the models are

estimated using a Tobit regression model rather than an OLS regression model that would provide biased results.

4. EMPIRICAL RESULTS

4.1. PREDICTED RESULTS

For many of the variables, predicting the signs of the coefficients is a fairly complicated task due to different forces working in opposite directions. Nevertheless, some patterns emerge. The ratio of cash to total assets is expected to have a negative effect on almost all performance measures, since cash constitutes non-earning assets and the greater amount of cash a bank holds the less its earning assets are. Increased net interest margin and loan loss reserves tend to be associated with higher administrative costs since they increase servicing costs.

The ratio of market share to loans is expected to exert positive influence over administrative costs and the performance measures. A greater ratio of market share to loans is expected to increase loans as a share of total assets, ROA and ROE due to the bandwagon effect. The net interest margin is also expected to rise due to greater market power associated with a larger market share, and the loan loss reserves could increase reflecting a more diverse portfolio and better ability to provision for non-performing loans.

The ratio of loans over assets is expected to have a negative effect on net interest margin since a lower interest spread would affect positively the volume of loans. On the other hand, its effect on loan loss reserves is ambiguous: more loans could increase the necessity for insurance against non-performing loans (NPL), but it could also reduce them if the quality of the portfolio is improving.

Loan loss reserves reduce all profitability measures since they subtract directly from earning assets, but would increase as the interest spread widens and servicing loans becomes more difficult. Higher loan loss reserves are associated with increased servicing expenditures that raise administrative costs.

The effect of ownership types could be quite contradicting since they depend at large on underlying priorities of the management and previous bank practices. The ratio of administrative costs to total assets is expected to be lower for banks under predominantly foreign ownership with the effect most pronounced for foreign greenfield establishments. Foreign privatized banks are expected to gradually reduce the share of administrative costs to

total assets as they shrink the oversized personnel, a legacy from state-ownership and increase the productivity of the retained staff through training or replacement. Domestic de novo banks and banks privatized to domestic owners are expected also to aggressively strive to reduce administrative costs. The only groups that may have higher administrative costs are state banks since they would retain workers for political reasons without regard to profit-maximization.

The ratio of loans to total assets mainly depends on individual banks' priorities; however, consistent with profit-maximization foreign-held entities are expected to have a higher share of loans. The effect of domestic de novo and state ownership is ambiguous since on one hand the behavior of private domestic banks may also be consistent with profit-maximization, but they may also occupy a niche of the industry and limit to servicing a select number of customers. Despite their big size and government backing, state banks may exhibit lower lending due to outdated banking practices and unattractive lending terms.

The sign of ownership with the dependent variable is the net interest margin is ambiguous at best. While foreign banks are assumed to exhibit better management expertise and thus realize higher profits, the liberalization of the market increases competitiveness that brings the margin down and the overall effect is not clear.

Both ROA and ROE are expected to increase for privately held banks regardless of the ownership type. The difference, however, lies in the degree of superior performance. Foreign greenfield banks are expected to improve performance most closely followed by foreign privatized and the respective domestic types due to lack of inherited problems from previous managements. Both types of privatized banks may exhibit initial negative returns as they restructure a former state bank but eventually, the returns are expected to increase due to improved management and internal monitoring. Overall the sign of ownership for privatized banks will be strongly correlated with time elapsed since privatization. State banks are the only group that is expected to underperform since their policy is mainly dictated by political considerations.

The effect of ownership on the ratio of loan loss reserves to loans runs mainly along nationality lines. The main premise is that foreign banks would make higher loan loss provisions due to a more stringent management. However, this effect may be dampened by the fact that foreign banks may engage in a better screening process of loan applicants and thus increase the quality of their portfolio which will render the need for loans loss provisions less acute. Domestic banks, regardless of type of ownership are expected to have lower loan

loss provisions relying on the government to bail them out in time of crisis. However, with increased, financial regulation the negative sign of domestic ownership may be dampened.

A main flaw of the dataset is the few observations of non-performing loans (NPL) which would provide vital information about the soundness of the banks and would throw more light on the LLR ratio. Therefore, since very few banks reported their NPL, the LLR ratio attempts to proxy for it. However, it is not closely correlated with NPL since besides NPL, it also captures the effect of financial monitoring and willingness of the government to lend help in times of difficulty.

Finally, the macroeconomic controls have predictable signs. GDP growth and a high real interest rate are expected to positively affect the performance variables. Inflation is expected to have a negative effect on all performance measures except loans, since in high inflationary environment, the perceived real interest rate on loans falls. Additionally, profitability and the level of loans are expected to rise with time as market efficiency increases while administrative costs should fall. The net interest margin is also expected to decrease with time as markets become more competitive and loan loss reserves may fall if the quality of portfolio improves with time or increase reflecting improved financial regulations.

Similarly for the SFA approach, private ownership, regardless of the nationally of the owners is expected to have positive effect on both profit and cost efficiency. Foreign greenfield establishments are expected to have the greatest positive influence with foreign privatized entities following. As in the Ratio Approach, cost and profit efficiency is expected to rise with market share and time due to the bandwagon effect and increased competitiveness respectively.

4.2. Discussion of the Estimated Coefficients of Control Variables for the Ratio Approach

Tables 1 to 6 show the estimated coefficients for control variables using Ordinary Least Squares with heteroskedastic-consistent standard errors. Tracking the effect of the same control variables across equations, we see that some are uniformly consistent, while others yield surprising results across various equations. Contrary to expectations, the ratio of market share to loans has a negative effect on the ratio of administrative costs to total assets, albeit a statistically insignificant one except for the last specification. This suggests that market control allows banks to be more efficient in their nonproductive expenditures. A similar picture emerges when the ratio of loans over assets is the dependent variable: higher market

share is associated with fewer loans probably reflecting the fact that bigger banks reorient their main activities away from loans to other financial activities. Quite predictably, the market share has a positive effect on net interest margin reflecting potential gains from monopoly although in only two of the five specifications the effect is statistically significant. A rather complicated picture emerges from the ROE, ROA and loan loss reserves equations. Although market share is uniformly insignificant, it attains different signs depending on the other controls included. When only market share is included in the equations, its effect on the dependent variables is negative, while when it is also interacted with the ownership structures, the main variable assumes a positive sign while the interaction variables have uniformly negative signs. While the decreased profitability for major banks is at odds with their privileged position as central financial players, it may be a result of the fact that the survey was taken at a time when banks experience active restructuring in transitioning to competitive markets and short-term profitability may not have been their immediate goal. The reduction of the share of loan loss reserves for larger banks may be due to various factors: it could be a co-effect of the general reduction of the share of loans in the portfolio or to more stringent loan auditing that larger entities could afford or that the increased importance of the bank for the economy would make it more difficult for the government to let it go bankrupt in times of financial downturn.

The ratio of loans to assets has a negative sign in the equations where net interest margin and loan loss reserves over loans are the dependent variables, however, it is a statistically insignificant one. As expected, the increased number of loans reduces the interest spread since profits come from the volume of loans not from the individual rates charged. In the case of the loan loss reserves over loans equation, it probably reflects a trend of increased monitoring and thus lower necessity of loan loss reserves in institutions that handle a larger volume of loans.

The effect ratio of cash to total assets has negligibly positive and statistically insignificant effect on net interest margin and loan loss reserves. The influence of non-earning assets on ROE is predictably negative but insignificant one. A little surprisingly, more cash is associated with higher ROA. Rather than being a cause and effect the two factors may be an outcome of the same causation, namely increased loans, which directly contribute to profitability, but also require more cash for servicing.

The ratio of loan loss reserves to loans has positive but insignificant sign only for two specifications out of five for both the administrative costs and loans over assets

specifications. In the rest of equations it has the expected negative sign but the effect is statistically insignificant.

Quite expectedly, increased interest spread is associated with higher administrative costs probably a resultant of the fact that banks, which enjoy a wider interest spread, can afford more bloated personnel expenses. Finally, the ratio of administrative costs to total assets has a positive albeit an insignificant effect on loan loss reserves reflecting increased staffing costs in handling non-performing loans.

The macrocontrol variables yield some surprising outcomes. Although GDP growth is supposed to positively affect all dependent variables, it exhibits consistently positive but statistically insignificant coefficients only for the administrative costs, loans over assets and ROE specifications. However, higher GDP growth is associated with lower ROA, net interest margin and loan loss reserves, although none of the coefficients are significant.

Inflation has a positive sign only in the net interest margin specification probably accounting for widened interest spread that the depreciating currency can cause. The only surprising outcome is the one in the loans to asset ratio, where the expected positive effect of the attractiveness of loans in times of depreciating currency is outweighed by the economic burden it imposes.

Quite predictably the real interest rate has a negative effect on ROE, ROA, administrative costs, loans over assets and net interest margin, although only the last one is statistically significant. Contrary to expectations, the real interest rate has a negative effect on loan loss reserves probably reflecting decreased demand for loans as the price of loaned funds increases.

As predicted, time affects positively ROA and ROE, and negatively administrative costs, net interest margin and loan loss reserves. It comes as a little surprising that time would positively affect negatively the ratio of loans to assets, but it may reflect a shift away from loan quantity toward loan quality in the process of adapting to the demands of a competitive market.

Finally, the last column in all specifications includes country controls with Bulgaria being the base case. Most of the countries do not have statistically significant effect on the dependant variables with a few exceptions. All banks, except Hungarian and Latvian ones have lower administrative costs than Bulgarian ones while the effect is significant only for the Czech Republic, Hungary and Slovenia. Similarly, while banks in the Czech Republic and Slovenia operate significantly fewer loans than their Bulgarian counterparts, these in Hungary significantly outmatch all the surveyed countries. Banks in all countries without exceptions

have a statistically significant lower net interest margin than Bulgarian ones probably accounting for the hyperinflationary environment in which Bulgarian banks operated in the beginning of the observed period. Banks in Latvia, Lithuania, Poland, Romania and Slovenia have higher ROE than these in Bulgaria while banks in Hungary, Latvia and Lithuania have a higher ROA than these in Bulgaria although none of these effects are statistically significant. On the other hand, Latvian banks, probably reflecting better monitoring, provide less for covering non-performing loans.

4.3. Discussion of the Estimated Coefficients of Ownership Variables for the Ratio Approach

In the equation for administrative costs over loans foreign greenfield ownership and occasionally foreign privatized ownership have the wrong sign that suggests that state banks have lower administrative costs than foreign banks and it is significant for three of the six specifications. This may reflect a temporary trend in which administrative costs increase for foreign greenfield banks reflecting initial establishment costs. Banks privatized to foreign investors have lower administrative costs than state-owned banks for half of the specifications and in two out of the three cases the reduction in administrative costs is greater than that for banks privatized to domestic owners. Again this may be a transitional feature rather than a permanent characteristic. Foreign investors go through an initial period of adjustment to the local market that puts them at disadvantage compared to domestic owners. This notion is supported by the ownership and time interactions, which suggest that for both types of privatized banks, foreign and domestic, administrative costs fall with time. Only when ownership types are interacted with the bank's market share do two of the ownership types, namely, foreign greenfield and foreign privatized banks exhibit lower administrative costs compared with state-owned banks, which suggests that the effect of ownership on administrative costs depends on the size of the enterprise.

The loans over assets equations reveal another surprising effect of private ownership, namely all privately owned banks, except foreign greenfield ones, handle fewer loans than state banks. Only foreign greenfield banks operate more loans than state banks and the effect is statistically significant in three of the six specifications. In the remaining cases, although statistically insignificant, this outcome could hardly be viewed as undesirable. It could be explained with the improved management on the part of private owners that shifts away from quantity toward quality. This policy substitutes the volume of loans with improved portfolio

by means of improved monitoring and attracting superior borrowers. Among privatized banks, these sold to foreign investors exhibit lower reduction in loans than these with domestic owners for four out of the six specifications. This effect is reversed when ownership is interacted with the size of the financial institution signifying that this trend is in force only for niche banks while private market-controlling financial institutions operate more loans than their state-owned counterparts except for foreign greenfield banks. Finally, banks privatized to foreign investors tend to increase the volume of loans with time while these privatized to domestic owners do not.

The effect of ownership differs across specifications for the net interest margin equation. When no controls are included as in column (1) and only bank-specific controls are included as in column (2), only banks privatized to foreign owners have a statistically significant positive effect on net interest margin. However, this may be a result of the fact that banks privatized to foreign owners are often big formerly state entities that still retain a significant share of the financial market and are able to enjoy a wider interest spread that generates higher profits. In some of the subsequent specifications this effect is sometimes reversed as in (3) which shows that domestic privatized banks have higher profitability than foreign privatized ones and all private banks have higher profitability than state banks, and this effect is statistically significant for foreign M&A banks, domestic de novo and domestic privatized entities. The original status quo is restored in column (4), only to be reversed again in the last two columns. However, the initial notion is supported by the fact that when interacted with the market share, privatized foreign ownership has a positive effect on net interest margin, while the effect of privatized domestic ownership is negative and statistically significant. Interacted with time, foreign private ownership increases profitability more than domestic privatized ownership. In this sense, foreign privatized banks exhibit superior and improving profitability than domestic privatized ones, whose sign is negative.

Quite expectedly, private banks, regardless of ownership type have higher values of ROE and ROA than state-run entities. Among these, banks privatized to foreign owners, in almost all specifications outperform banks privatized to domestic owners, and frequently, even foreign greenfield banks. Although in none of the specifications are the coefficients statistically significant, this sweeping superiority supports the general claim that banks privatized to foreign owners utilize a better management of their resources than these privatized to domestic owners. Foreign know-how and longer experience in competitive markets seems to play in integral role in improving bank profitability.

Finally, foreign-owned banks, greenfield, privatized and M&A, have lower loan loss reserves relative to loans distributed compared to state-run entities, while domestic de novo have higher ratios in all columns and domestic privatized in two of the specifications. In all specifications banks privatized to foreign investors have higher and statistically significant reduction in loan loss reserves than banks privatized to domestic owners. This trend could be explained with the fact that due to improved performance and superior monitoring practices foreign-owned banks "cherry-pick" the better borrowers and can afford to hold a lower ratio of loan loss reserves to loans. On the other hand, private domestic banks, lacking governmental shelter, opt for an internal insurance against non-performing loans in form of increased ratio of loan loss reserves to loans. Since the data does not permit observations of non-performing loans directly, we can infer that foreign banks must clearly have a lower ratio of NPL, while the opposite may not be true for domestic ones. For them, it may be an indicator of risk aversion, rather than the state of the portfolio.

The Ratio Approach shows that while the effect of foreign privatized ownership tends to be ambiguous in terms of cost efficiency, in terms of profitability and portfolio quality, banks privatized to foreign investors outperform these privatized to domestic owners.

4.4. Discussion of the Estimated Coefficients of Ownership Variables for the Stochastic Frontier Approach

Table 7 presents the results of the Stochastic Frontier Approach where the efficiency estimates for both profit and cost are obtained with an ITSUR regression and then regressed on the ownership dummies in a Tobit estimate.

Market size has a positive and statistically significant effect on both cost and profit efficiency suggesting that efficiency rises with the size of the bank. Additionally, both efficiency scores improve with time as countries transition to better-organized financial markets.

Although not all of the ownership dummies are significant (in line with the pattern developed in the Ratio Approach), some important implications about the effect ownership emerge. In both estimates, foreign ownership of privatized banks has statistically significant effect on profit and cost efficiency. Banks privatized to foreign owners achieve statistically significant higher profit and cost efficiency than unprivatized banks, while these privatized to domestic owners do so only for the profit efficiency equation. In both specifications, foreign privatized banks emerge as more efficient than domestic privatized banks. An interesting

observation is that for both profit and cost efficiency estimates, foreign privatized banks outperform foreign greenfield banks. While foreign greenfield entities achieve higher profit efficiency than state ones, their cost efficiency is lower than that of state banks. A plausible explanation for this trend may be the fact that privatized banks are large entities with a long presence on the market which would enable them to hold onto previously amassed experience versus small and often specialized greenfield entrants which face initial costs in adapting to the domestic market.

Overall, the results from the Stochastic Frontier Approach echo these of the Ratio Approach. While both methods yield insignificant coefficients for some of the ownership dummies, the majority of the coefficients have signs and degrees of impact that suggest that banks privatized to foreign owners have superior profitability indicators, achieve better portfolios and exhibit higher degree of managerial efficiency than banks privatized to domestic owners. The fact that not all of these trends are statistically significant may be partly due to the recent nature of the bank reforms in the transitional states. I expect this trend to become more pronounced as time progresses. Nevertheless, foreign ownership emerges as the better choice for policy-makers looking to privatize their financial institutions regardless of the macroeconomic setting of the host country. The experience of the ten transitional states shows that fears of foreign entry are often unjustified and the benefits for both the privatized entity and the sector as a whole outweigh the strains associated with liberalizing the market to foreign influence.

5. CONCLUSION

The collapse of the centrally planned economies witnessed the biggest privatization initiative so far that completely transformed the financial markets of the countries in Central and Eastern Europe. As a result, many stare-run banks were privatized and independent private enterprises have been set up. This study aims to assess the benefit of privatizing banks to strategic foreign investors as opposed to selling to domestic owners.

Despite the limitations of the dataset, some important conclusions emerge. The two approaches adopted, namely the Ratio Approach and the Stochastic Frontier Approach show that banks privatized to foreign owners outperform these sold to domestic owners across all measures: profitability level, portfolio quality and managerial efficiency. The fact that not all of these trends are statistically significant may be partly due to the recent nature of the bank

reforms in the transitional states. I expect this trend to become more pronounced once the initial restructuring is over. Nevertheless, foreign ownership emerges as the better alternative for privatizing state-run banks that benefits both the entity itself and the domestic financial market as a whole by increasing competitiveness and the array of services offered The experience of the ten transitional states (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) shows that fears of foreign entry are often unjustified and the benefits for both the privatized entity and the sector as a whole outweigh the strains associated with liberalizing the market to foreign influence.

Nevertheless, the fact that privatization is a very recent process does not permit the emergence of definite conclusions about the effect of foreign ownership on the performance of privatized banks as opposed to domestic ownership. Replicating the same or a similar study in a decade would allow to pinpoint the long term effects of various types of ownership on bank performance irrespective of initial adjustment trends. Furthermore, as banks fully adopt western accounting practices, future works would be able to access more detailed balance sheets that would allow more precise modeling of the data and the inclusion of variables such as non-performing loans, which at present time are unavailable for the majority of the banks surveyed.

REFERENCE

Ábel, István, and Pierre Siklos. 2002. "Secrets of the Successful Hungarian Bank Privatization: The Benefits of Strategic Partnerships and Foreign Ownership." Working paper.

Banker's Almanac. <http://www.bankersalmanac.com>

Barth, James, Gerard Caprio and Ross Levine. 2003. "Banking Systems Around the Globe: Do Regulation and Ownership Affect Performance and Stability?" Working Paper.

Beck, Thorsten, Robert Cull and Afeikhena Jerome. 2003. "Bank Privatization and Performance: Empirical Evidence from Nigeria." World Bank Conference on Bank Privatization, November 20-21.

Berger, Allen and Loretta Mester. 1997. "Inside the Black Box: What Explains Differences in the Inefficiencies of Financial Institutions?" *Journal of Banking & Finance* v. 21, p. 895-947.

Berger, Allen, George Clarke, Robert Cull, Leora Klapper and Gregory Udell. 2003. "Corporate Governance and Bank Performance: A Joint Analysis of the Static, Selection, and Dynamic Effects of Domestic, Foreign, and State Ownership, Including Domestic M&As, Foreign Acquisitions, and Privatization." World Bank Conference on Bank Privatization, November 20-21.

Bonin, John and Paul Wachtel. 1999. "Lessons from Bank Privatization in Central Europe." New York University, Salomon Center Working Paper.

Bonin, John, Iftekhar Hasan and Paul Wachtel. 2003. "Privatization Matters: Bank Performance in Transition Countries." World Bank Conference on Bank Privatization, November 20-21.

Bonin, John, Iftekhar Hasan and Paul Wachtel. 2003. "Bank Performance, Efficiency and Ownership in Transition Countries." Paper presented at the Ninth Dubrovnik Economic Conference, sponsored by the bank of Croatia, June 26-28.

Bonin, John. 2001. "Banking in the Balkans: The Structure of Banking Sectors in Southeast Europe." Wesleyan University October Working Paper.

Bonin, John. 1998. *Banking in Transition Economies: Developing Market Oriented Banking Sectors in Eastern Europe*. Northampton, MA: E. Elgar.

Claessesns, Stijn, Asli Demirgüç-Kunt and Harry Huizinga. 2001. "How Does Foreign Entry Effect Domestic Banking Markets?" *Journal of Banking & Finance,* v. 25, p. 891-911.

Clarke, George and Robert Cull. 2002. "Political and Economic Determinants of the Likelihood of Privatizing Argentine Public Banks." *Journal of Law and Economics,* v. 45, n.1, p. 165-97.

Clarke, George and Robert Cull. 1999. "Why Privatize? The Case of Argentina's Public Provincial Banks." *World Development,* v. 27, n.5, p. 865-86.

_____1999. "Provincial Bank Privatization in Argentina: The Why, How, and So What?" World Bank Working Paper No. 2159.

Clarke, George, Robert Cull and Mary Shirley. 2003. "Empirical Studies of Bank Privatization: An Overview." World Bank Conference on Bank Privatization, November 20-21.

Crystal, Jennifer S., B. Gerard Dages, and Linda S. Goldberg. 2001. "Does Foreign Ownership Contribute to Sounder Banks in Emerging Markets? The Latin American Experience." Federal Reserve Bank of New York Working Paper.

De Haas, Ralph, and Iman van Lelyveld. 2003. "Foreign Banks and Credit Stability in Central and Eastern Europe: Friends or Foes?" De Nederlandsche Bank Research Series Supervision Working Paper No. 58.

Denizer, Cevdet. 2000. "Foreign Entry in Turkey's Banking Sector, 1980-1997." World Bank Working Papers No. 2462.

Fries, Steven, Damien Neven and Paul Seabright. 2002. "Bank Performance in Transition Economies." William Davidson Institute at the University of Michigan Business School Working Paper No. 505.

Fries, Steven and Anita Taci. 2002. "Banking Reform and Development in Transition Economies." European Bank for Reconstruction and Development Working Paper No. 71.

Farabullini, Fabio and Donald Hester. 2001. "The Performance of Some Recently Privatized Italian Banks." University of Wisconsin-Madison Working paper No. 10.

Grigorian, David and Vlad Manole. 2002. "Determinants of Commercial Bank Performance in Transition: An Application of Data Envelopment Analysis." World Bank Working Paper No. 2850.

Haber, Stephen and Aldo Musacchio. 2004. "Foreign Banks and the Mexican Economy." Working paper, Stanford University.

Hasan, Iftekhar and Katherin Marton. 2003. "Development and Efficiency of the Banking Sector in a Transitional Economy: Hungarian Experience." *Journal of Banking & Finance,* v. 27, p. 2249-2271.

Kalyuzhnova, Elena and Michael Taylor. 2001. *Transitional Economies*. New York, NY: Palgrave.

Kumbakhar, Subal and Knox Lovell. 2000. *Stochastic Frontier Analysis*. Cambridge, MA: Cambridge University Press.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer. 2002. "Government Ownership of Banks." *Journal of Finance,* v.57, n.1, p.265-301.

Majnoni, Giovanni, Reshmi Shankar and Éva Várhegyi. 2003. "The Dynamics of Foreign Bank Ownership: Evidence from Hungary." World Bank Working Paper No. 3114.

Martinez Peria, Maria Soledad and Ashoka Mody. 2004. "How Foreign Participation and Market Concentration Impact Bank Spreads: Evidence from Latin America." World Bank Working Papers No. 3210.

Meyendorff, Anna and Edward A. Snyder. 1997. "Transactional Structures of Bank Privatization in Central Europe and Russia." *Comparative Economic Studies*, v. 36, n. 4, p. 161-71.

Meyendorff, Anna and Anjan Thakor. 1997. "Romanian Financial System Reform." William Davidson Institute at the University of Michigan Business School Working Paper No. 100.

Omran, Mohammed. 2003. "Privatization, State Ownership and the Performance of Egyptian Banks." World Bank Conference on Bank Privatization, November 20-21.

Unal, Haluk and Miguel Navarro. 1999. "The Technical Process of Bank Privatization in Mexico." *Journal of Financial Services Research,* v. 16, n. 1, p. 61-83.

Weill, Laurent. 2003. "Banking Efficiency in Transition Economies." *Economics of Transition* v. 11, n. 3, p. 569-592.

Table 1.

Dependent Variable is Administrative Costs/Assets						
Ordinary Least Squares with Heteroskedastic-Consistent Standard Errors						
	1	**2**	**3**	**4**	**5**	**6**
Foreign Greenfield	1.301*	1.289*	1.566*	1.577	2.162	1.543
	1.715	1.703	1.718	0.830	1.005	0.828
Foreign Privatized	-0.030*	-0.117	-0.110	0.042	0.082	0.088
	-1.829	-1.473	-1.373	0.201	0.326	0.203
Foreign M&A	-0.030*	-0.157	-0.195	-0.113	-0.118	-1.392
	-1.805	-1.574	-1.561	-0.577	-0.524	-1.595
Domestic Greenfield	-0.008	-0.001	-0.116	0.297	0.187	-0.553
	-0.448	-0.017	-0.996	1.003	0.649	-1.355
Domestic Privatized	-0.021	-0.106	-0.318	0.051	-0.408	-0.033
	-1.186	-0.915	-1.527	0.153	-1.283	-0.104
Bank Controls	NO	YES	YES	YES	YES	YES
Size Controls	NO	NO	YES	NO	YES	YES
Time Controls	NO	NO	NO	YES	YES	YES
Macro Controls	NO	YES	YES	YES	YES	YES
Country Controls	NO	NO	NO	NO	NO	YES
R-squared	0.029	0.035	0.045	0.038	0.049	0.178

Table 2.

Dependent Variable is Loans/Assets						
Ordinary Least Squares with Heteroskedastic-Consistent Standard Errors						
	1	**2**	**3**	**4**	**5**	**6**
Foreign Greenfield	11.896*	11.959*	14.438*	15.936	21.458	15.888
	1.665	1.681	1.685	0.886	1.040	0.906
Foreign Privatized	-0.511	-1.334*	-1.400	-0.777	-0.441	-0.362
	-1.361	-1.645	-1.620	-0.301	-0.150	-0.084
Foreign M&A	-0.458	-1.691*	-2.056*	-1.961	-1.964	-13.656*
	-1.222	-1.694	-1.665	-0.824	-0.746	-1.657
Domestic Greenfield	-0.581	-0.387	-1.598	1.523	0.357	-6.247
	-1.548	-0.490	-1.350	0.475	0.113	-1.584
Domestic Privatized	-0.536	-1.267	-3.388	-0.401	-4.857	-1.424
	-1.424	-1.088	-1.643	-0.113	-1.393	-0.438
Bank Controls	NO	YES	YES	YES	YES	YES
Size Controls	NO	NO	YES	NO	YES	YES
Time Controls	NO	NO	NO	YES	YES	YES
Macro Controls	NO	YES	YES	YES	YES	YES
Country Controls	NO	NO	NO	NO	NO	YES
R-squared	0.029	0.035	0.045	0.038	0.049	0.178

Table 3.

Dependent Variable is Net Interest Margin						
Ordinary Least Squares with Heteroskedastic-Consistent Standard Errors						
	1	**2**	**3**	**4**	**5**	**6**
Foreign Greenfield	-0.006	-0.026*	0.012	-0.010	0.008	0.001
	-0.455	-1.873	0.976	-0.351	0.419	0.040
Foreign Privatized	0.102**	0.101**	0.023	-0.001	-0.061	-0.065
	2.385	2.503	1.101	-0.008	-0.803	-0.973
Foreign M&A	-0.020*	-0.018	0.020*	-0.017	0.012	0.015
	-1.755	-1.496	1.921	-0.645	0.744	0.741
Domestic Greenfield	0.005	-0.010	0.041***	0.001	0.048**	0.050**
	0.398	-0.673	3.360	0.026	2.551	2.236
Domestic Privatized	-0.007	-0.019	0.038***	-0.045	0.018	-0.005
	-0.553	-1.130	2.959	-1.211	0.828	-0.145
Bank Controls	NO	YES	YES	YES	YES	YES
Size Controls	NO	NO	YES	NO	YES	YES
Time Controls	NO	NO	NO	YES	YES	YES
Macro Controls	NO	YES	YES	YES	YES	YES
Country Controls	NO	NO	NO	NO	NO	YES
R-squared	0.084	0.129	0.350	0.139	0.356	0.468

Table 4.

Dependent Variable is ROE						
Ordinary Least Squares with Heteroskedastic-Consistent Standard Errors						
	1	**2**	**3**	**4**	**5**	**6**
Foreign Greenfield	9.783	7.323	9.463	21.511	23.397	20.867
	0.999	1.007	1.010	0.989	0.993	0.983
Foreign Privatized	9.773	8.570	12.174	22.111	24.272	21.140
	0.998	0.999	0.997	0.986	0.986	0.958
Foreign M&A	9.719	8.263	11.004	18.401	20.259	12.453
	0.992	0.990	0.999	0.981	0.986	0.955
Domestic Greenfield	9.495	7.670	9.790	19.322	20.660	12.354
	0.969	0.967	0.973	0.945	0.947	0.883
Domestic Privatized	9.777	7.019	8.695	17.379	17.406	5.490
	0.998	0.994	1.005	0.965	0.972	0.734
Bank Controls	NO	YES	YES	YES	YES	YES
Size Controls	NO	NO	YES	NO	YES	YES
Time Controls	NO	NO	NO	YES	YES	YES
Macro Controls	NO	YES	YES	YES	YES	YES
Country Controls	NO	NO	NO	NO	NO	YES
R-squared	0.011	0.023	0.026	0.027	0.030	0.051

Table 5.

Dependent Variable is ROA						
Ordinary Least Squares with Heteroskedastic-Consistent Standard Errors						
	1	**2**	**3**	**4**	**5**	**6**
Foreign Greenfield	0.573	0.290	0.360	-0.790	-0.716	-0.860
	1.243	1.116	1.139	-0.826	-0.796	-0.854
Foreign Privatized	0.049	0.005	0.033	0.288	0.296	0.283
	0.874	0.077	0.419	1.124	1.108	1.040
Foreign M&A	0.043	-0.013	-0.012	0.178	0.179	-0.162
	0.773	-0.180	-0.128	0.777	0.757	-0.410
Domestic Greenfield	0.027	0.009	-0.014	0.145	0.137	-0.153
	0.481	0.163	-0.169	0.642	0.585	-0.501
Domestic Privatized	0.052	0.000	-0.046	0.212	0.185	0.283
	0.918	0.005	-0.390	0.931	0.775	1.230
Bank Controls	NO	YES	YES	YES	YES	YES
Size Controls	NO	NO	YES	NO	YES	YES
Time Controls	NO	NO	NO	YES	YES	YES
Macro Controls	NO	YES	YES	YES	YES	YES
Country Controls	NO	NO	NO	NO	NO	YES
R-squared	0.014	0.110	0.111	0.121	0.122	0.144

Table 6.

Dependent Variable is Loan Loss Reserves/Loans						
Ordinary Least Squares with Heteroskedastic-Consistent Standard Errors						
	1	**2**	**3**	**4**	**5**	**6**
Foreign Greenfield	-0.115***	-0.137***	-0.155***	-0.212	-0.258*	-0.251
	-3.717	-2.783	-2.607	-1.482	-1.738	-1.413
Foreign Privatized	-0.090***	-0.106**	-0.111**	-0.082	-0.085	-0.238*
	-2.901	-2.398	-2.179	-0.580	-0.620	-1.661
Foreign M&A	-0.116***	-0.126**	-0.174**	-0.264*	-0.309*	-0.265
	-3.789	-2.553	-2.432	-1.813	-1.923	-1.551
Domestic Greenfield	0.251	0.324	0.373	0.637	0.697	1.044
	1.159	1.282	1.369	1.253	1.296	1.484
Domestic Privatized	-0.073**	0.021	-0.031	0.029	-0.161	-0.055
	-2.193	0.270	-0.556	0.137	-1.225	-0.325
Bank Controls	NO	YES	YES	YES	YES	YES
Size Controls	NO	NO	YES	NO	YES	YES
Time Controls	NO	NO	NO	YES	YES	YES
Macro Controls	NO	YES	YES	YES	YES	YES
Country Controls	NO	NO	NO	NO	NO	YES
R-squared	0.021	0.062	0.065	0.070	0.073	0.119

Table 7.

Tobit Estimates		
	Profit Efficiency	**Cost Efficiency**
Constant	0.972***	0.894***
	68.074	19.736
Foreign Greenfield	0.006**	-0.064
	0.404	-1.300
Foreign Privatized	0.061***	0.259***
	3.257	4.391
Foreign M&A	-0.007	-0.030
	-0.365	-0.519
Domestic Greenfield	-0.000	-0.109**
	-0.003	-2.240
Domestic Privatized	0.045*	0.011
	1.681	0.135
Market Share	1.698***	1.208***
	4.690	10.037
Time	0.006*	0.023**
	1.698	1.986

T-statistics is below coefficients for each variable.
* denotes significance at the 10% double-sided level.
** denotes significance at the 5% double-sided level.
*** denotes significance at the 1% double-sided level.