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## Bank Ownership and Performance

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# **Bank Ownership and Performance**

by

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## **Abstract\***

This paper builds a new dataset on bank ownership and bank performance covering approximately 50,000 observations for 119 countries over the 1995-2002 period. The paper then uses the dataset to reassess the relationship between bank ownership and bank performance, providing separated estimations for developing and industrial countries. It is found that, while ownership is strongly correlated with performance in developing countries, that ownership is not correlated with performance in industrial countries. In particular, the paper suggests that state-owned banks operating in developing countries tend to have lower profitability and higher costs than their private counterparts, and that the opposite is true for foreign-owned banks (which tend to be characterized by higher profitability and lower costs). We also find that, in developing countries, the entry of foreign banks plays a useful role by making domestic banks more efficient in terms of overhead cost and spreads, although we do not find any effect on profitability of domestic banks.

**JEL Codes:** G21; D21

**Keywords:** Banking; Privatization; Ownership; Performance

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## 1. Introduction

The purpose of this paper is threefold. First, it describes the construction of a new dataset of banking characteristics and performance. Second, it uses this dataset to reassess the relationship between bank ownership and bank performance. Third, it tests whether previous findings, which indicate that the entry of foreign banks and bank privatization affect the environment in which private domestically owned banks operate, are robust to the use of this new dataset and different econometric techniques.

The first part of the paper extends previous work by Barth, Caprio and Levine (1999, 2001) and La Porta, López-de-Silanes and Shleifer (2002) in two directions. First, while the previous authors focused on a given year (or two years in the case of La Porta, López-de-Silanes and Shleifer, 2002), the dataset presented here consists of a panel covering eight years for the 1995-2002 period. Second, our dataset includes a large number of variables presented at a highly disaggregated level. In particular, while the previous dataset focused on bank ownership (public versus private, foreign versus domestic) and bank regulation, along with a few measures of bank development (net interest margin and concentration), the dataset described here includes a large set of measures of bank performance as measured for the whole banking system and for each sub-group of banks. In particular, the dataset includes about 50 variables of bank performance, each presented using both consolidated and unconsolidated balance sheets and then separated by type of bank (domestic private, state owned, and foreign owned).

The second part of the paper extends the vast literature that looks at the relationship between bank performance and bank ownership.<sup>1</sup> In this sense the paper is similar to Demirgüç-Kunt and Huizinga (2000). These authors, however, focus on an earlier period (1988-1995 versus 1995-2002), use a smaller number of banks and focus only on foreign ownership without distinguishing public from private ownership. In estimating how ownership affects performance, we follow the approach of Berger et al. (2004) and estimate the static, dynamic, and selection

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<sup>1</sup> Studies of the relative performance of foreign versus domestic banks in industrial countries include DeYounge and Nolle (1996), Berger et al. (2000), and Vander Venet (1996) and studies focusing on developing countries (or both developing and industrial countries) include Demirgüç-Kunt and Huizinga (2000), Bonin, Hasan and Wachtel (2004) and Clarke et al. (2000). The research on the relative performance of public banks is more limited; Altunbas, Evans and Molyneux, 2001, focus on the cases of Germany and Sapienza, 2004, focuses on Italy). There is, however, a large literature on the performance effects of bank privatization; for a survey see Megginson (2004).

effects of ownership. However, while Berger et al. (2004) focus on one country (Argentina), we expand their analysis to 119 countries for which we have data.

We find that state-owned banks operating in developing countries tend to have lower profitability than comparable private banks and that this lower profitability is due to lower net interest margin, higher overhead costs (mostly due to the fact that state-owned banks tend to employ relatively more people), and higher non-performing loans. At the same time, we find that foreign banks operating in developing countries tend to be characterized by high levels of profitability; this is mostly due to the fact that foreign-owned banks tend to have much lower overhead costs.<sup>2</sup> When we focus on industrial countries, we find that, relative to their private counterparts, state-owned banks tend to have slightly higher overhead costs but other performance variables (profitability, margins, and non-performing loans) do not vary significantly across these two groups of banks. We also find that foreign banks operating in industrial countries are slightly less profitable than their domestic counterparts and that this difference is due to lower margins.

Finally, we follow Claessens, Demirgüç-Kunt and Huizinga (2001) and look at how changes in bank ownership structure affect the environment in which domestic banks operate. Again, we extend their analysis in two directions. First, we use our panel data, which include observations for more banks and more countries over a longer time period. Second, rather than focusing only on foreign bank entry, we also look at the effect of bank privatization and study the importance of state-owned banks. While we were not able to reproduce the previous result that foreign entry reduces profitability, we did find that, in the case of developing countries, foreign entry leads to an increase in efficiency of the domestic banking system. This in turn leads to a situation characterized by lower overhead costs and lower interest margins.

## **2. The Data**

The purpose of this section is to describe the main characteristics of the dataset used in this paper and the main steps followed in building this dataset. While confidentiality agreements with the data provider prevent us from making the bank-level dataset public, we are making public a dataset that contains information aggregated by country year and type of banking institution

(public, private, foreign). Table A1 in the Appendix presents a detailed list of the variables included in the dataset.<sup>3</sup>

Our main source of data is Bankscope (BSC). Processing the data required two main steps: avoiding duplications and coding ownership. For most banks, BSC reports balance-sheet data at both the consolidated and unconsolidated levels. However, some banks have only a consolidated statement, while others have only an unconsolidated statement. For reasons that are discussed in the Appendix, it is impossible to automatically keep the unconsolidated statement, for instance, if the consolidated statement is missing. An even more difficult problem is that in some cases BSC reports information for the same bank several times. This is especially the case at the time of mergers. Hence, in order to avoid duplication, we adopted the strategy described in the Appendix, which required us to look at one bank at a time and follow banks' history at the time of mergers.

After eliminating duplications, we end up with a total of 49,804 observations, corresponding to a number of banks that ranges between 5,445 (in 1995) and 6,628 (in 2001). Banks located in industrial countries represent approximately 70 percent of total observations, and banks located in developing countries represent the remaining 30 percent. It is interesting to note that the share of banks located in developing countries increased by two percentage points between 1995 and 2002.

Coding ownership also required looking at one bank at a time. Although BSC includes an ownership variable measuring whether a given bank is owned by the public sector or by foreign investors, this variable has limited coverage, as only about 20 percent of banks are coded for ownership. In addition, this variable is only available for the last year for which data are available, as BSC does not provide ownership history. We thus adopted a strategy, described in detail in the Appendix, which consisted of coding a minimum number of banks in each country; in addition, we coded all banks up to 75 percent of total assets of the banking system in every

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<sup>2</sup> This finding is mainly driven by the sub-sample of foreign banks located in East Asia and Eastern Europe. In the case of Latin America, we find that foreign banks have low profitability.

<sup>3</sup> Throughout the paper, we will refer to private banks as banks that are owned by the private sector (they can be either privately owned or publicly listed) and to public banks as banks that are owned by the public sector. Hence the adjectives public and private do not refer to whether banks are publicly listed or not. In the dataset, we classify as public those banks in which the public sector ownership is above 50 percent and classify as foreign banks those banks in which foreigners own more than 50 percent of shares. However, in computing country-level foreign and public ownership, we follow La Porta, López-de-Silanes and Shleifer (2002) and use the actual fraction of shares owned by each shareholder. The dataset is available at [http://www.iadb.org/res/files/data\\_app\\_mpy.xls](http://www.iadb.org/res/files/data_app_mpy.xls)



country. The strategy further included the use of cut-off points to avoid the time-consuming work with information of minimal value.<sup>4</sup>

To validate the data, we check whether the data are consistent with what is found in previous sources. Table 1 reports the correlation between ownership and concentration share computed using the BSC dataset described above and existing data from La Porta, López-de-Silanes and Shleifer (2002) and Barth, Caprio and Levine (2001). The four columns of the table present correlations based on consolidated and unconsolidated statements, both including and excluding specialized government financial institutions (SGI, which are second-tier banks with a specific development mandate). The first row shows that the correlation between the share of state-owned banks computed with our dataset and that reported by La Porta, López-de-Silanes and Shleifer (2002) is always higher than 0.85. The second row compares our data on state ownership with those reported by Barth, Caprio and Levine (2001) and shows that the correlation is always above 0.76; it is above 0.8 when we exclude SGI. The third row compares our data on foreign ownership with those reported by Barth, Caprio and Levine (2001) and again finds a very high correlation (always around 0.7). Finally, the fourth row compares concentration (measured as the share of assets of the three largest banks over total bank assets) and finds correlation coefficients that are always higher than 0.9. These results are reassuring and indicate that our coding is highly correlated with the coding of other studies. In order to make our results comparable with previous work, from now on we focus on the sample that does not include specialized government institutions.

Table 2 reports the number of banks included in our dataset (the table includes all banks for which we have information on ownership and total assets) divided by region and ownership.<sup>5</sup> Out of the approximately 50,000 observations for which we have data, 41,800 (84 percent of observations) are domestic private banks, 2,000 state-owned banks (4 percent of observations), and 6,000 foreign-owned banks (12 percent of observations). The share (in terms of number of observations) of state-owned banks included in the sample decreased from approximately 5 percent in 1995 to 3.2 percent in 2002. At the same time, the share of foreign banks increased from 10.5 percent to 14 percent over the same period.

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<sup>4</sup> Even with the cut-off points used, coding ownership required two months of work by a full-time research assistant.

<sup>5</sup> The table focuses on median values; average values are extremely similar.

South Asia is the region with the largest relative share of state-owned banks (24 percent of observations), followed by East Asia (17 percent of observations), and the Middle East (14 percent of observations). In contrast, Latin America, Sub-Saharan Africa, and the Caribbean are the regions with the largest number of foreign banks (37, 30, and 27 percent of observations, respectively). All other developing regions, with the exception of South Asia, have a relatively large number of foreign banks (always well above 10 percent of observations).

The industrial countries have the largest number of banks in the sample, and Latin America the second largest (4,150 observations, corresponding to 8 percent of the total), followed by Eastern Europe (3,009 observations, corresponding to 6 percent of the total), East Asia (2,252 observations), Sub-Saharan Africa and the Middle East (1,649 and 1,499 observations, respectively). South Asia and the Caribbean have the smallest number of observations (963 and 436, respectively).

Table 3 summarizes the main characteristics of our sample, dividing the banks by geographical region and ownership. The second column shows that public ownership of banks is prevalent in Asian countries and Eastern Europe (reaching a peak in South Asia, with 40 percent of bank assets owned by the public sector) and much lower in Sub-Saharan Africa, the Caribbean and industrial countries (with levels of state ownership which hover around 10 percent). Latin America and the Middle East and North Africa are in an intermediate position. Foreign ownership of banks is particularly important in Sub-Saharan Africa, where more than 46 percent of bank assets are foreign owned, and is also prevalent in the Caribbean, Eastern Europe and Central Asia, and Latin America (with foreign ownership ranging between 25 and 32 percent). By comparing column 2 of Table 3 with Table 2 it is possible to obtain information on the size of banks by ownership. The finding that the share of public (foreign) banks measured as percentage of observations is smaller than the corresponding share measured as percentage of total assets indicates that the average public (foreign) bank is larger than the average domestic private bank. We find that public banks are larger than private domestic banks in every region of the world and that foreign banks are larger than domestic private banks in East Asia, the industrial countries, Eastern Europe, South Asia, and Sub-Saharan Africa. In contrast, foreign banks are smaller than domestic private banks in Latin America and the Middle East. These comparisons, however, hide a great deal of heterogeneity within ownership groups. In the case of Latin America, for

instance, very large foreign banks (in some countries, like Mexico, the largest banks in the country are foreign owned) coexist with small branches of foreign banks.

### **3. Ownership and Performance**

In this section, we look at whether there is a correlation between bank ownership and bank performance. Besides standard indicators of bank profitability like returns on assets (ROA), returns on equity (ROE), interest margin, and non-performing loans, we also check whether there are correlations between bank ownership and employment and bank ownership and public sector lending. We start by simply comparing medians, and then we test for differences in performance with a proper regression set-up.

#### **3.1 A First Look at the Data**

Table 3 compares performance measure across different groups of countries and ownership structure. The table reports median values (average values yield identical results).<sup>6</sup> Columns 3 and 4 of the table focus on two standard profitability indicators: ROA and ROE. They show that, in most regions, foreign banks are more profitable than domestic banks, both public and private. The exceptions are South Asia and the Middle East and North Africa, where foreign banks are less profitable than domestic banks, and the industrial countries, where foreign banks are less profitable than domestic private banks but slightly more profitable than state-owned banks.<sup>7</sup> In Latin America, foreign banks and private domestic banks have similar levels of profitability. In all regions of the world, state-owned banks have the lowest profitability. Differences in profitability are particularly large in South and East Asia, Latin America, and Eastern Europe. Even in the industrial countries, public banks are about half as profitable as private banks.

Columns 5 and 6 look at interest revenues relative to loans plus deposits and relative to total assets (this is a broad measure of net interest margin). We do not find any correlation between ownership and margins. However, the table suggests that margins tend to be high (above 8 percent in the case of column 6) in the Caribbean, Latin America, Eastern Europe, and

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<sup>6</sup> For this exercise, we compute a weighted average at the country level and then compute the median value for each region.

Sub-Saharan Africa, intermediate (between 3 and 8 percent) in the Middle East and South Asia, and low (below 3 percent) in the industrial countries. There are two possible interpretations for this finding. On the one hand, one may claim that the higher margin is related to a higher markup, given that the banking sector is less competitive in developing countries than industrial countries. On the other hand, a higher margin may be justified by the fact that banking activity is more risky in developing countries. Non-interest revenues (column 7) tend to be lower in public banks (Latin America is the exception) and particularly high in Eastern Europe and Sub-Saharan Africa.

Column 8 looks at overheads relative to total assets. This ratio, which can be interpreted as a measure of efficiency, does not vary much across ownership types. There are, however, large differences across groups of countries. Banks located in industrial countries, the Middle East and North Africa and East Asia tend to have fairly low overhead ratios, while banks located in Latin America, East Europe, Caribbean and Sub-Saharan Africa have large overhead ratios.

Column 9 focuses on employment normalized by total assets; the figures measure the number of employed for each US\$1,000,000 of total assets. This can be interpreted as an indicator of efficiency and can provide an idea of whether ownership is correlated with labor hoarding. In three regions, public banks tend to be characterized by higher employment; at 1.16 the ratio reaches a peak of 1.16 in the Middle East and North Africa. The opposite is true in the industrial countries, the Caribbean and East Asia and the Pacific (where employment ratios in public banks are lower than employment ratios in private banks). In South Asia and Sub-Saharan Africa we find no correlation between ownership status and employment ratios. We also find that in four groups of countries—East Asia and the Pacific, the Caribbean, Eastern Europe, and the Middle East and North Africa—foreign banks have lower employment ratios than their domestic counterparts. One reason why different types of banks may have different levels of employment is that they operate in different business areas. For instance, one may think that foreign banks tend to be overrepresented in the wholesale market, which is characterized by relatively low employment-to-assets ratios, and that public banks mostly operate in the retail market and hence tend to have higher levels of employment.

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<sup>7</sup> It should be pointed out that there may be some problems associated with evaluating profitability of foreign banks that, because of the global strategy of the parent bank, may receive subsidies from abroad or try to avoid taxes by shifting costs and revenues from one country to another.

Column 10 looks at whether ownership affects the composition of deposits. It shows that, in the Caribbean and Sub-Saharan Africa, public banks tend to have a much larger share of demand deposits than private and foreign banks. No other clear pattern, however, emerges from the data.

The last three columns focus on non-performing loans and provisions against non-performing loans.<sup>8</sup> In most regions non-performing loans tend to be particularly high in public banks. This is especially the case in the Caribbean, industrial countries, Middle East, and Sub-Saharan Africa.<sup>9</sup> Public banks also tend to have provisions that are slightly higher than those of private and foreign banks, but these higher provisions are often not enough to compensate the difference in non-performing loans. Consequently, public banks in Asia and the industrial countries tend to have particularly high NPL to provisions ratios when compared to other types of banks.

Although interesting, the results discussed above are based on simple comparisons of medians. They could therefore prove misleading because they do not capture possible correlations between ownership and other factors that may affect bank performance, such as type of banking activity and bank size. The objective of the next section is to explicitly control for these differences.

### 3.2 *Regression Analysis*

So far we have looked at the correlation between ownership and performance by simply comparing medians. In this section we formally test for such a correlation by using regression analysis. Our basic set-up is the following:

$$PERF_{i,j,t} = \mathbf{h}_{j,t} + \mathbf{a}PUB_{i,j,t} + \mathbf{b}FOR_{i,j,t} + X_{i,j,t}\mathbf{g}' + \mathbf{e}_{i,j,t} \quad (1)$$

where  $PERF_{i,j,t}$  is a performance indicator for bank  $i$  in country  $j$  at time  $t$ ,  $\mathbf{h}_{j,t}$  is a country-year fixed effect that controls for all factors that are country-specific (like the level of development, geography, institutions, etc) and country-year specific (macroeconomic shocks,

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<sup>8</sup> The data in these three columns should be interpreted with caution because different legislation allows different treatment and leads to different reporting of non-performing loans.

<sup>9</sup> In the case of industrial countries, NPL in public banks are high with respect to NPL in private and foreign banks but low with respect to NPL in other regions of the world.

political instability, changes in regulations, etc.),  $PUB_{i,j,t}$  is a dummy variable that takes a value of one if in year  $t$  bank  $i$  is state owned (we define ownership using the 50 percent threshold),  $FOR_{i,j,t}$  is a dummy variable that takes a value of one if in year  $t$  bank  $i$  is foreign owned (private domestically owned is the excluded dummy), and  $X_{i,j,t}$  is a matrix of bank-specific controls. The set of controls includes two variables aimed at measuring the main sector of activity of the bank and two variables aimed at measuring bank size.

Non-interest income as a share of total assets tends to be higher for banks that derive most of their income from commissions related to services provided to customers. This figure is thus likely to differentiate large retail commercial banks from institutions that derive most of their income from investment banking activities. On the other hand, demand deposits as a share of total deposits is instead likely to be higher in retail commercial banks than in banks that operate mainly in the wholesale market. Following Berger et al. (2004), we also include total assets (using the log of lagged total assets) and the bank asset share (which is the share of bank  $i$ 's assets over total bank assets in country  $j$ , again lagged one period). The former is a measure of the absolute size of the bank and the latter is a measure of its relative size, which Berger et al. (2004) interpret as a measure of market power.

While we follow an approach similar to Demirgüç-Kunt and Huizinga (2000), there is a fundamental difference between our empirical strategy and theirs. As we are not interested in how regulatory and macroeconomic shocks affect bank performance, we control for all these possible shocks by including country-year fixed effects.<sup>10</sup> The main advantage of our strategy is that we fully control for all types of shocks, thereby eliminating problems related to omitted macroeconomic variables and error in the measurement of these variables. The main drawback of our strategy is that it does not allow us to say anything about the role of country-specific factors (an issue that, at this stage, we are not interested in).

In all regressions we drop all observations for which we do not have data for ROA, ROE and Overhead costs. We also drop all country-years for which we do not have at least five banks. To make sure that our results are not driven by the transition from one ownership structure to another, we drop all the bank-year observations in which there is a change in ownership (so if bank  $i$  was public in year 1999 and becomes private in 2000, we drop the observation for 2000).

We also exclude outliers by dropping the top and bottom 2 percent of observations for each dependent variable. Finally, we recognize that some countries have many more observations than others (for instance, the 27 industrial countries included in our sample contain more than 70 percent of observations, and the 92 developing countries the remaining 30 percent) and that, if we do not weight our estimations, our results would end up being driven by the countries for which we have a large number of observations. Claessens, Demirgüç-Kunt and Huizinga (2001) address this issue by weighting each observation by  $1/N_{j,t}$  (where  $N_{j,t}$  is the number of observations in country  $j$ , year  $t$ ). We follow a similar strategy but weight each observation by the bank's share of total assets. This weighting scheme has the same properties as  $1/N_{j,t}$  because the weights add up to one and give each country-year the same weight in the regression. However, Levy-Yeyati and Micco (2003) point out that weighting by bank asset share has some advantages over the simple  $1/N_{j,t}$  weighting scheme. In particular, they suggest that estimations weighted by asset share better reflect the behavior of the banking industry and point out that if measurement errors decrease with bank size, weighting by bank size will produce more precise estimates.

In the empirical analysis we focus on three different characteristics: (i) profitability and interest income; (ii) cost structure, employment and credit allocation; and (iii) provisions and non-performing loans.

### *3.2.1 Profitability and Interest Margin*

The basic results on profitability and interest income are reported in Table 4. We have four dependent variables, two measuring profitability (ROA and ROE) and two measuring interest margin (the first defined as a share of total assets and the second defined as a share of loans plus deposits). In all cases, we run regressions using all available observations and regressions that only focus on developing or industrial countries.

While our main interest is the effect of the ownership variables, we start by briefly describing our set of control variables. The first six columns show that non-interest income is not correlated with either ROA or ROE in the full sample or in the sub-sample of developing

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<sup>10</sup> Instead, Demirgüç-Kunt and Huizinga (2000) directly control for macroeconomic shocks.

countries; instead, non-interest income is positively correlated with these variables only in the sub-sample of industrial countries. The opposite is true for the ratio of demand deposits to total deposits. Taken together, these findings seem to suggest that retail banks tend to be more profitable in developing countries. The findings also suggest that banks that supply many services and hence have high non-interest income tend to be more profitable in industrial countries. The first three columns further show that there is no correlation between absolute or relative bank size and ROA of banks located in developing countries; on the other hand, this correlation is negative and statistically significant for banks located in industrial countries.<sup>11</sup> However, we find that larger banks (in absolute size) tend to have higher ROE in both developing and industrial countries.

Columns 8 and 11 indicate that in developing countries there is no significant correlation between net interest margin and non-interest income, but columns 9 and 12 show that the correlation is positive and statistically significant in industrial countries. This positive correlation may reflect the fact that banks in industrial countries are shifting their main income source from interest margins to fees (Bikker and Haff, 2002).<sup>12</sup> As one may expect, we also find that the share of demand deposit is always positively correlated with net interest margin. Finally, we find that absolute size is negatively correlated with net interest margin, but relative size is positively correlated with net interest margin. These two results may reflect increasing returns and the presence of some market power.

It is interesting to note that, when we look at the whole sample, we find results that are similar to those of developing countries. This is not surprising, because our estimation method gives the same weight to each country regardless of how many banks are included in the sample; in addition, since our sample includes 92 developing countries and only 27 industrial countries, the results for the aggregate sample tend to be similar to those of the developing country sub-sample. Hence from now on we will focus on the two sub-samples and will not discuss in detail the regressions that include both developing and industrial countries.

We are now ready to analyze the effect of the ownership variables. The first two columns show that, in the sample of developing countries, state-owned banks tend to have returns on

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<sup>11</sup> These results are robust to dropping the asset share variable.

<sup>12</sup> Foreign banks headquartered in industrial countries might be starting to adopt the same strategy when they operate in developing countries, as well as introduce more efficient technology that allows them to charge lower margins.



assets that are much lower than comparable domestic privately owned banks. Besides being statistically significant, the effect is also quantitatively important, indicating that the average state-owned bank has a return on assets which is 0.7 percentage points lower than that of the average private domestic bank. Considering that the average value of ROA in developing countries (using the same weights used in the regression) is 1.7 percent, this is a sizable difference (more than one third of average ROA in developing countries).<sup>13</sup> At the same time, we find that in industrial countries there is no statistically significant difference between the ROA of public banks and that of similar private banks (at 0.06 the coefficient is small and far from statistically significant). Hence, the difference between profitability of public and private banks, which seemed very large in the simple comparison of means of Table 3, becomes much smaller and not statistically significant when one recognizes that public and private banks have very different size and tend to operate in different segments of the banking market. This finding illustrates the importance of controlling for bank-specific factors in a proper regression set-up.

These results are interesting because they show that it is not necessarily true that state-owned banks have lower profitability and confirm the results by Altunbas, Evans and Molyneux (2001) who find that, in the case of Germany, there is no evidence that privately-owned banks are more efficient than public and mutual banks. At the same time, the results do support the idea that in developing countries public banks are less profitable than private banks. La Porta, López-de-Silanes and Shleifer (2002) analyze the impact of public banks on growth and find that in developing countries the presence of public banks has a detrimental effect on growth; in industrial countries, however, there is no correlation between state ownership and growth. They argue that this result may be due to the fact that high-income countries are better equipped to deal with the distortions that arise from government ownership of banks. It would be possible to apply the same line of reasoning and claim that our results are driven by the fact that governance issues are less serious in industrial countries (which tend to have better institutions and a better public sector), hence public banks in these countries tend to be better managed than public banks in developing countries. An alternative interpretation is that in industrial countries public banks

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<sup>13</sup> By re-running the regressions separately for the five largest developing regions (East Asia and the Pacific, Eastern Europe and Central Asia, Latin America, the Middle East and North Africa, and South Asia), we find that state-owned banks have lower ROA in four of the five regions. The exception is the Middle East and North Africa, where the difference is not statistically significant at standard confidence levels. Full regression results are reported in Table A2 of the Appendix.

have ceased to play a development role and merely mimic the behavior of private banks, whereas in developing countries public banks still play a development role. Public banks' low profitability is due to the fact that, rather than maximizing profits, they respond to a social mandate.<sup>14</sup>

Our second result is that, in developing countries, foreign banks tend to be more profitable than private domestic banks. Again, the difference is both statistically and economically important. In particular, we find that the average foreign bank in a developing country has an ROA 0.31 percentage points higher than that of a comparable private domestic bank (this is about one quarter of the average ROA in the sub sample of developing countries). When we focus on industrial countries, we find no significant difference between domestic and foreign banks. Columns 4 to 6 repeat the analysis by substituting ROA with ROE and obtain identical results. These results confirm the previous findings that foreign banks tend to be more profitable than domestic banks in developing countries (Demirgüç-Kunt and Huizinga, 2000, and Bonin, Hasan and Wachtel, 2004) but that this is not the case in industrial countries (Vander Venet, 1996).<sup>15</sup>

It is important to note that the above results are to be interpreted as averages for the developing and industrial countries sub-samples, but, as shown in Table 3, the sub-sample of developing countries is far from homogeneous. This is especially the case for the performance of foreign banks. In particular, Levy-Yeyati and Micco (2003) and Inter-American Development Bank (2004) find that foreign-owned banks that operate in Latin America tend to be less (and not more) profitable than their domestic counterparts. While these studies use a different dataset based on quarterly observations for a group of eight Latin American countries, we obtain similar results if we re-run the regressions of columns 2 and 5 separately for each region. In particular, we find that foreign-owned banks located in East Asia, Eastern Europe, and the Middle East and North Africa are much more profitable than their private domestically owned counterparts; the opposite, however, is true in Latin America.<sup>16</sup>

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<sup>14</sup> Of course, this interpretation would be in contrast with La Porta, López-de-Silanes and Shleifer's (2002) finding that public banks have a negative effect on growth and financial development. For a discussion of these issues see Levy-Yeyati and Panizza (2004).

<sup>15</sup> Berger et al. (2000) and DeYoung and Nolle (1996) instead find evidence that foreign banks operating in industrial countries are less efficient than domestically owned banks.

<sup>16</sup> Full regression results are available upon request.

The last six columns of the table focus on net interest margin.<sup>17</sup> When we measure the margin as a share of total assets (columns 7-9), we find that public banks in developing countries have slightly lower net interest margins (the coefficient is statistically significant but, at 5 percent of the developing country average, not very large) and that the coefficient is not statistically significant in the sample of industrial countries. When net interest income is measured as a share of loans plus deposits (columns 10-12), we find that public banks are never significantly different from private banks. These results are driven by the fact that loans represent a lower share of total assets for public banks located in developing countries.<sup>18</sup> When we focus on foreign banks in developing countries, we find that their net margins are never significantly different from those of domestic private banks. In industrial countries, we find that net interest margin (in both definitions) of foreign banks is lower than that of domestic private banks (the coefficient corresponds to about 10 percent of the industrial country average).

### 3.2.2 *Overhead, Employment, Branches, and Credit to the Public Sector*

The first six columns of Table 5 focus on two indicators of efficiency (overhead costs over total assets and employment over total assets), Columns 7 to 9 look at the size of the branch network and the last three columns focus on credit to the public sector.<sup>19</sup> As before, we start by briefly describing the coefficients of the control variables. We find that non-interest income is positively and significantly correlated with overhead and employment but is not significantly correlated with branch network and credit to the public sector. As expected, we also find that the share of demand deposits (a proxy for retail commercial banks activity) is positively correlated with employment and number of branches and therefore overhead costs, but not correlated with credit to the public sector. We further find that absolute size is negatively correlated with overhead costs, suggesting the presence of economies of scale in both developing and industrial countries; this result is in line with previous findings by Mathieson and Roldos (2001). Relative size is positively correlated with employment, particularly in industrial countries, a result that may suggest that unions force banks with some market power to keep a large number of employees. In industrial countries, we find that both absolute and relative size is negatively

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<sup>17</sup> In order to improve the readability of the coefficients, we multiplied the two margin variables by 100.

<sup>18</sup> Regression results are available upon request.

correlated with the size of the branch network (although the latter is not statistically significant); again, we find no correlation in developing countries. No control variable is significantly correlated with credit allocation to the public sector.

The first row of columns 1-3 show that in both industrial and developing countries state-owned banks tend to have higher overhead costs relative to total assets than similar domestic private banks. The coefficients imply that in industrial countries public banks have overhead costs that are between 8 and 10 percent higher than the group average (which is about 2 percent in industrial countries and 4 percent in developing countries), the corresponding value for developing countries is 5 percent. Hence, the lower profitability of public banks reported in Table 4 seems to be due to higher costs rather than lower margins. Again, there are two possible interpretations for these results. The first is that public banks are less efficient than their private counterparts and that this difference in efficiency is reflected by higher overhead costs. The second is that public banks provide services that generate externalities and hence have higher operating costs. The second row shows that in both developing and industrial countries foreign banks have much lower overhead costs than domestic private banks (about 30 percent less than the group average in developing countries and 10 percent less than the group average in industrial countries). These findings corroborate the results of Table 4 and support the idea that in developing countries foreign banks tend to be more efficient and profitable than their domestic counterparts, while in industrial countries the difference between the two types of banks is smaller.

Columns 4-6 show that in developing countries public banks tend to have a higher employment ratio than domestic private banks (the difference is about 9 percent of the average for developing countries) and that foreign banks tend to have lower employment (the difference is about 25 percent of the group average). To test whether differences in overhead costs are explained by high levels of employment, we augmented the regression of column 2 with a measure of employment over total assets.<sup>20</sup> We find that this latter variable is statistically significant and that, once we control for employment, the dummies for public and foreign ownership drop in both magnitude and level of statistical significance (PUB is no longer

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<sup>19</sup> As in the case of net interest margin, we multiplied overhead costs over total assets and share of government loans by 100 to improve the readability of the coefficients.

<sup>20</sup> The results are available from the authors upon request.

significant and FOR remains marginally significant at the ten percent confidence level). In industrial countries we find no strong correlation between bank ownership and employment; while foreign banks have lower employment, the coefficient is only marginally significant. As before, the finding that public banks in developing countries have higher employment ratios can be interpreted in terms of efficiency or in terms of services provided. For instance, it has been argued that one of the roles of public banks is to provide banking service to isolated rural areas (Levy-Yeyati and Panizza, 2004). Such activity would lead to higher overhead costs and higher employment ratio. While we do not have information on whether public banks do provide banking services to rural areas, we do have some information on the size of the branch network.

In analyzing such data, it is reasonable to think that if public banks do accomplish their role of providing service to isolated areas, they should have a relatively high number of small branches and hence a high ratio of branches relative to total assets. Columns 7-9 test this hypothesis and find that public banks in developing countries do have more branches (expressed as a ratio of total assets) than their domestic counterparts, but the coefficient is not statistically significant. We also find that foreign banks have fewer branches and that, in industrial countries there is no correlation between ownership and branch network. While the results of columns 7-9 should be taken with some caution because they are based on a much smaller number of banks (less than one quarter of our observations have information on the size of the branch network), they seem to support the idea that the higher overhead costs, higher employment ratios and lower profitability of public banks in developing countries are partly due to a more extensive branch network.

Public banks are often viewed as an instrument to direct credit to the public sector. The last three columns test whether there is a correlation between ownership and credit to the public sector. No evidence is found of such a correlation. Again, the results should be interpreted with caution because the sample for which we have data on credit allocation is extremely small.

### *3.2.3 Loan Provisions and Non-Performing Loans*

The last set of exercises focuses on loan provisions and non-performing loans. Ownership may be correlated with non-performing loans (NPL) because public (foreign) banks could have lower (higher) credit scoring or loan recovery ability (in this case higher NPL would be associated with less efficient banks) or because public banks may be willing to finance risky projects that

generate positive externalities (in this case higher NPL would merely reflect the development mandate of state-owned banks).

Table 6 reports the results.<sup>21</sup> In developing countries, we find that higher non-interest income and absolute size are positively correlated with NPL and that relative size is negatively correlated with NPL expressed as a share of total assets or total loans. In industrial countries, we find that absolute size is negatively and significantly correlated with NPL.

Column 2 of Table 6 shows that in developing countries the share of NPL of public banks is higher than that of private domestic banks. The effect of public ownership on NPL is incredibly large: the coefficient of 6.5 corresponds to 50 percent of the developing country average (which is 12 percent). We also find that foreign banks located in developing countries have higher NPL than their domestic counterparts. The coefficient, however, is much lower than that of public banks. We find no correlation between ownership status and NPL in industrial countries.

This high level of NPL could be either due to incompetence and inefficiencies or to the development mandate of public banks. In the former case, if all managers follow the same policy in terms of provisions, the level of provisions of public banks should not be different from that of private banks (unless public bank managers internalize their incompetence and acknowledge it by setting higher provisions). In the latter case, managers of public banks expect more NPL and hence keep higher provisions. Column 5 shows that, in developing countries, provisions are indeed higher for public banks (the coefficient implies that the difference between provisions in public banks and private banks is close to 30 percent of the developing country average). This indicates that public banks do expect higher levels of non-performing loans than private domestic banks. In industrial countries, provisions of public banks are slightly lower than those of private banks. Foreign ownership is not significantly correlated with loan provision.

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<sup>21</sup> Table 6 focuses on NPL and provisions measured as a share of total loans, regressions that use NPL and provisions as share of total assets yield similar results. All the dependent variables have been multiplied by 100 to make the coefficients readable.

### 3.3 Selection, Dynamic, and Static Effects

In a recent paper, Berger et al. (2004) point out that in studying the correlation between bank ownership and bank performance, one should distinguish among static effects (i.e., the average difference between performance of, say, public and private banks), dynamic effects (i.e., the effects of change in ownership due to, say, privatization or foreign acquisition), and selection effects (i.e., effects that occur if there is a correlation between bank performance and the likelihood of an ownership change, such as poorly performing banks' greater likelihood of privatization). These authors argue that if these effects go in separate directions (for instance, the static and dynamic effects of private ownership are positive but only underperforming banks get privatized), the simple model of Equation (1) will yield biased estimations. They suggest a specification that jointly estimates the static, dynamic, and selection effects.

As shown in Table 7, our sample includes 19 banks that were made public (0.20 percent of the total number of banks); almost all of these banks were located in developing countries. Clearly, this is a rare event, caused by bank restructuring in the wake of a crisis. We also have 100 banks (1.05 percent of the total number of banks) that were privatized and acquired by domestic investors. The table indicates that privatizations were more prevalent in developing countries (60 percent of the total) than in industrial countries. Finally, we have 200 banks that were acquired by foreign investors (2.10 percent of total number of banks). Again, foreign acquisitions were more prevalent in developing countries than in industrial countries.

In what follows, we adopt a strategy similar to the one suggested by Berger et al. (2004) and estimate the following model:<sup>22</sup>

$$\begin{aligned} PERF_{i,j,t} = & \mathbf{h}_{j,t} + X_{i,j,t} \mathbf{g}' + \mathbf{a}_1 STAT\_PUB_{i,j,t} + \mathbf{a}_2 STAT\_FOR_{i,j,t} + \\ & \mathbf{b}_1 SEL\_PUB_{i,j,t} + \mathbf{b}_2 SEL\_PRIV_{i,j,t} + \mathbf{b}_3 SEL\_FOR_{i,j,t} + \\ & \mathbf{f}_1 DYN\_PUB_{i,j,t} + \mathbf{f}_2 DYN\_PRIV_{i,j,t} + \mathbf{f}_3 DYN\_FOR_{i,j,t} + \mathbf{e}_{i,j,t} \end{aligned} \quad (2)$$

where  $STAT\_PUB_{i,j,t}$  ( $STAT\_PUB_{i,j,t}$ ) is a dummy variable that takes a value of one if bank  $i$  is public (foreign) and did not change ownership in the period under observation (the excluded dummy is  $STAT\_RIV_{i,j,t}$ ). Therefore  $\mathbf{a}_1$  and  $\mathbf{a}_2$  measure the static effects of public and foreign

<sup>22</sup> The main difference between our regressions and those of Berger et al. (2004) is that we do not control for the effect of domestic mergers and acquisitions for which we do not have data.

ownership expressed as a difference from the performance of private domestically owned banks that never changed ownership.  $SEL\_PUB_{i,j,t}$  is a dummy variable that takes a value of one for banks that used to have a different form of ownership but became public during the period under observation.  $SEL\_PRIV_{i,j,t}$ , and  $SEL\_FOR_{i,j,t}$  are defined in similar ways and take the value of one for banks that were privatized or were acquired by a foreign company during the period under observation.<sup>23</sup> Therefore  $b_1$ ,  $b_2$ , and  $b_3$  measure the selection effects of public, private, and foreign ownership (so,  $b_2$  measures the pre-privatization performance of state-owned banks that will be privatized relative to that of domestically owned private banks that have no change in ownership). Finally,  $DYN\_PUB_{i,j,t}$  is a dummy variable that takes a value of one after a bank changes ownership and becomes public and zero before.  $DYN\_PRIV_{i,j,t}$  and  $DYN\_FOR_{i,j,t}$  are defined similarly for banks that are privatized or acquired by foreigners. Therefore,  $f_1$ ,  $f_2$ , and  $f_3$  measure the dynamic effect of ownership change. For instance,  $f_2$  measures post-privatization performance relative to pre-privatization performance among banks that were selected to be privatized, and  $b_2 + f_2$  measures the post-privatization performance of state-owned banks relative to that of domestically owned private banks that have no change in ownership.  $h_{j,t}$  and  $X_{i,j,t}$  are defined as in Equation (1).

### 3.3.1 Static Effects

Table 8 reports the results for ROA, ROE, overhead costs and non-performing loans. In most cases, the static coefficients for public and foreign ownership are similar (both in their magnitude and level of statistical significance) to the ownership coefficients described in Tables 4, 5 and 6. The only exception is the coefficient for public ownership in the ROA and overhead regressions for the sample of industrial countries. In the case of ROA, Table 4 found a coefficient of -0.06, which is not statistically significant. The point estimates of Table 8 find a statistically significant coefficient of -0.13, which indicates that in industrial countries there is also an unfavorable static effect of public ownership. It should be pointed out that, while the effect is statistically

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<sup>23</sup> If a bank has more than one change in ownership, we use the last change (this is the strategy followed by Berger et al., 2004). So, if a bank was public, then sold to domestic investors and subsequently acquired by a foreign



significant at the 5-percent confidence level, the effect is still rather small (the coefficient is just above 10 percent of the industrial country average) when compared with that of developing countries (which is close to 50 percent of the developing country average ROA). Furthermore, we still do not find any statistically significant coefficient when we focus on ROE in industrial countries (column 6). In the case of overhead costs, Table 5 (column 3) shows that public banks located in industrial countries have overhead costs that are significantly higher than those of domestic private banks. However, after controlling for dynamic and selection effects, we find that this difference is no longer statistically significant in the sample of industrial countries. Public banks in developing countries, however, still have higher overhead costs.

Columns 11 and 12 confirm previous findings that state owned banks located in developing countries tend to have higher non-performing loans than their private counterparts but that in industrial countries there is no correlation between ownership and NPL. When we focus on foreign ownership, the results of Table 8 confirm the previous findings that foreign ownership is positively correlated with profitability in developing countries and not correlated with profitability in industrial countries. We also find that foreign banks tend to have lower overhead costs in both industrial and developing countries. Additionally, we find no correlation between foreign ownership and NPL in industrial countries, but we do find that foreign banks located in developing countries have higher NPL than their domestic counterparts.

### 3.3.2 *Selection Effects*

In the sample of developing countries, we find that the selection effect of public ownership is almost never statistically significant. The exception is for NPL, where we find that banks that are selected to become public have higher NPL. This is probably due to the fact that only distressed banks were nationalized or taken over. In the same sample of countries, we find that the selection effect of foreign ownership is negative for both ROA and ROE and not statistically significant for overhead costs or non-performing loans. This indicates that foreign banks tend to acquire banks that have low levels of profitability but that this low profitability is not necessarily due to higher overhead costs or higher levels of non-performing loans. Considering that in developing countries several privatized banks were acquired by foreign banks, our finding of a negative

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company, we assign value one to  $SEL\_FOR_{i,j,t}$  and zero to  $SEL\_PUB_{i,j,t}$  and  $SEL\_PRIV_{i,j,t}$ .

coefficient for Selection Foreign is in line with the existing evidence suggesting that less profitable banks are more likely to be privatized (Berger et al., 2004).<sup>24</sup>

In the sample of industrial countries, no bank was selected to become public. The privatization selection effect is positive and statistically significant for overhead costs (indicating that banks that are selected to be privatized and acquired by domestic investors tend to have higher overhead costs than domestic private banks that never change ownership) and marginally significant for NPL indicating that domestic investors targeted distressed banks. The foreign selection effect is positive and statistically significant for ROA but never significant in the other regressions.

### 3.3.3 *Dynamic Effects*

In the sample of developing countries, we find a strong negative effect of *DYN \_ PUB* on ROA and ROE. This result is probably due to the fact that most of the banks that became public did so because they were involved in a banking crisis (a fact that is consistent with our previous finding that *SEL \_ PUB* is positively correlated with NPL). Interestingly, we also find that the dynamic effect of privatization by domestic banks is negative for both ROA and ROE, although not statistically significant at standard levels. This finding indicates that acquisition of public banks by domestic investors may reduce bank profitability.<sup>25</sup>

Focusing on developing countries, we find that the dynamic effect of foreign ownership on profitability is positive but never statistically significant. This result is in contrast with what Berger et al. (2004) found in their sample of Argentinean banks. This difference in results may be due to the fact that in our sample the Dynamic Foreign variable might be capturing the increase in profitability of previously public banks with low initial profitability that were acquired by foreign institutions. Columns 8 and 11 show that in developing countries the dynamic effects of privatization and foreign ownership are never significantly correlated with overhead costs and NPL.

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<sup>24</sup> In contrast with our sample, in the sample of Berger et al. (2004), privatized banks were mostly acquired by domestic investors.

<sup>25</sup> At least this is the case for the post-privatization average. Berger et al. (2004) find some difference between short-run and long-run effects. Unfortunately, our panel is not long enough to distinguish between the two types of effects.

When we focus on industrial countries, we find that the dynamic effect of privatization has a negative effect on profitability, although not statistically significant at standard levels, and a negative and statistically significant effect on overhead costs.<sup>26</sup> This latter result suggests that privatization leads to cost-reduction activities. In fact, if we study the effect of ownership on employment, we find that the dynamic effect of privatization is large (indicating that after privatization, employment drops by approximately 25 percent) and marginally significant (the p value is 0.11). However, these cost-reduction activities do translate into higher profitability. This is probably due to the fact that net interest margins tend to decrease after privatization.<sup>27</sup> Interestingly, we find that, as in the case of developing countries, privatizations are associated with higher non-performing loans (this may be due to the fact that the privatization process put on the book loans that were *de facto* but not *de jure* non-performing) Finally, we find that the dynamic effects of foreign ownership are associated with lower ROA and ROE and higher non-performing loans.

A possible interpretation for the results described above is that, in industrial countries, the privatization process involved the most inefficient state-owned banks (as implied by the positive Private Selection Effect in the overhead regression) and that, under new management, these banks became more efficient and cost effective (as implied by the negative Private Dynamic Effect in the overhead regression). This interpretation is consistent with the fact that in the regressions of column 3 of Table 5 (which did not separate static effects from dynamic and selection effects) public ownership was significantly correlated with overhead costs, but that this correlation is no longer significant once the selection effect of privatization is controlled for (i.e., once one recognizes that the most inefficient public banks are those most likely to be privatized).

In the sample of industrial countries, the finding that Selection Foreign is positively correlated with ROA might be due to the fact that during the 1990s foreign banks targeted their acquisitions on banks that enjoyed high profitability not because they were more efficient—in fact the foreign selection effect is not statistically significant in the overhead regression—but because they were protected from competition. However, the entry of foreign banks, which was the fruit of the globalization process of the banking industry that characterized most of the 1990s,

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<sup>26</sup> Therefore, our results are somewhat in contrast with those of Verbrugge, Owens and Megginson (2000), who find that bank privatization in OECD countries leads to higher profitability ratios.

<sup>27</sup> Full regression results for employment and net interest margins are available upon request.

might have led to a situation in which previously protected and highly profitable banks faced a sudden drop in their profitability (a fact that is consistent with the negative coefficient for Dynamic Foreign in column 3 of Table 8).<sup>28</sup>

Taken together, all these results confirm our previous finding that public ownership has a negative effect on bank performance in developing countries but no strong effect on bank performance in industrial countries (the only difference is that private banks tend to have slightly lower costs). At the same time, foreign ownership is associated with a positive effect on long-run bank performance in developing countries and either no effect or a negative effect on long-run bank performance in industrial countries.<sup>29</sup>

#### 4. Ownership Structure and the Performance of Domestic Private Banks

In the previous section it was suggested that the globalization of the banking industry in the 1990s might have affected the profitability of domestic banks. In the final section of this paper, we check whether changes in ownership structure (i.e., entry of foreign banks and the privatization process) affect the environment in which domestic private banks operate. Here the key reference is Claessens, Demirgüç-Kunt and Huizinga (2001), who find that an increase in the presence of foreign banks leads to a reduction in the profitability and interest margins of domestic banks.<sup>30</sup> We estimate how changes in ownership structure affect the environment in which domestic private banks operate by estimating the following model:

$$PERF_{i,j,t} = aSHFOR_{j,t} + bSHPUB_{j,t} + X_{i,j,t}g' + M_{j,t}q' + h_j + n_t + m_i + e_{i,j,t} \quad (3)$$

As in the previous regressions,  $PERF_{i,j,t}$  is a performance indicator for bank  $i$  in country  $j$  at time  $t$ . However, now we only use observations for private domestic banks and hence exclude foreign and state-owned banks from the sample. We adopt this strategy because we are interested

<sup>28</sup> As some privatizations involved entry of foreign banks, the hypothesis described in the text is consistent with the finding of a negative and statistically significant Static Public effect in column 3 of Table 8 and no significant relationship between public ownership and ROA in column 3 of Table 4. The fact that the Selection Foreign dummy is not statistically significant in column 6 of Table 8 seems to indicate that the institutions targeted by foreign entrants were well capitalized.

<sup>29</sup> Again, it is worth pointing out that in developing countries there is some heterogeneity across regions.

<sup>30</sup> There are several other papers that study how foreign entry affect the performance of domestic banks, but these papers either focus on just one country (Barajas, Steiner and Salazar, 1999, focus on Colombia, Clarke et al., 2000, on Argentina, and Denizler, 2000, on Turkey) or a region (Claessens and Glaessner, 1999, and Laeven, 1999, focus on Asia and Crystal, Dages and Goldberg, 2001, focus on Latin America).

in how changes in ownership structure at the country level affect the performance of domestic private banks.  $SHFOR_{j,t}$  is a variable that measures the share of total bank assets controlled by foreign-owned banks in country  $j$  at time  $t$ . Hence,  $\mathbf{a}$  measures how foreign bank entry affects the performance of domestic private banks.  $SH PUB_{j,t}$  is a variable that measures the share of total bank assets controlled by state-owned banks in country  $j$  at time  $t$ , and  $\mathbf{b}$  captures how changes in the share of state-owned banks affect the performance of domestic private banks.  $X_{i,j,t}$  is a set of bank-level controls including equity over total assets, non-interest bearing assets over total assets, demand deposits over total deposits, and the lag of total assets (in logs).  $\mathbf{m}_{j,t}$  is a set of macroeconomics controls that include GDP growth, inflation, and the real interest rate.<sup>31</sup> Finally, we include fixed effects at the country ( $\mathbf{h}_j$ ), year ( $\mathbf{n}_t$ ), and bank ( $\mathbf{m}_i$ ) level. It is worth noting that bank fixed effects imply that all our econometric identification comes from changes over time within banks. This makes our empirical specification analogous to estimating the model in first differences (in fact, if we only had two periods, fixed effects and first differences would yield identical results).<sup>32</sup>

Table 9 reports the results. We find that foreign share and public share are never significantly correlated with profit before taxes (columns 1-3). In the sub-sample of developing countries, however, foreign share is negatively and significantly correlated with interest margin, overhead costs and provisions (column 5, 8 and 9). We also find that the share of public banks has a negative and statistically significant correlation with interest margins of banks located in developing countries. In the sample of industrial countries, we find that foreign and public share are never correlated with bank performance.

When we focus on the macroeconomic variables, we find that in the sample of developing countries, GDP growth is positively correlated with profitability and negatively correlated with interest margin, overheads and provisions and that inflation is positively correlated with profitability and provision and negatively correlated with overheads. Finally, the real interest rate is almost never significantly correlated with bank performance (it is marginally significant for the profitability regression that includes both developing and industrial countries).

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<sup>31</sup> When we chose the set of bank-level and macro controls, we tried to adopt the same specification adopted by Claessens, Demirgüç-Kunt and Huizinga (2001), with some notable exceptions that are discussed below.

<sup>32</sup> Below, we discuss why we prefer fixed effects to first differences.

In the sub-sample of industrial countries, we find that the macroeconomic variables are never statistically significant.

These results are somewhat different and often stronger than those of Claessens, Demirgüç-Kunt and Huizinga (2001). First of all, while they find a negative and statistically significant correlation between Foreign Share and profit before taxes, we find that this correlation is positive but not statistically significant; this result is in line with what Levy-Yeyati and Micco (2003) found for a sample of eight Latin American countries.<sup>33</sup> In the cases of Net Margins, Overheads, and Provisions our results go in the direction as the findings of Claessens, Demirgüç-Kunt and Huizinga (2001). However, while they found a negative but not statistically significant correlation between each of these variables and effect of foreign share, we find that the correlation is negative and always statistically significant for the whole sample and the sub-sample of developing countries.<sup>34</sup>

There are two possible explanations for the difference in results described above. The first has to do with differences in the estimation method and the second with the fact that we use data for a different period (1995-2002 versus 1988-1995) and have a larger sample of banks (19,213 bank observations versus 7,900). There are six differences in the estimation method:

- (1) Rather than estimating the various equations in first differences, we introduce bank fixed effects. We think that the latter strategy is preferable because it is able to capture the effect of changes in foreign penetration and public bank share even when these effects materialize with a lag.<sup>35</sup>
- (2) Rather than measuring foreign (public) share as the number of foreign (public) banks over total number of banks in the country, we measure foreign and public share by using the share of assets of these two categories of banks over total bank assets in a given country and year. We think that this strategy is

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<sup>33</sup> When we restrict our sample to Latin America, the coefficient is positive and significant at standard levels.

<sup>34</sup> There are also some differences in the coefficients of the macroeconomic variables. In particular, we do not find that the real interest rate is significantly correlated with profits or overheads and that growth is negatively correlated with overheads (in fact we find that the correlation between growth and overheads is positive and statistically significant).

<sup>35</sup> If we were to use first differences, we would only capture contemporaneous effects and hence would need to augment the equation with lagged values of the change in foreign and public bank shares plus the lag of the dependent variable to be able to capture non-contemporaneous effects. This last specification would have the standard dynamic panel data complications and make the results much more difficult to interpret.

- preferable because it makes clear that a foreign (or public) bank that controls 50 percent of the domestic banking market will have a bigger effect than a branch of a foreign bank that operates mostly in the wholesale market.<sup>36</sup>
- (3) Rather than focusing only on foreign share, we focus on both public and foreign share and run our regression by using only domestic private banks. This is important if one thinks that public banks may have an objective function different from that of private banks.
  - (4) In all regressions we use clustered standard errors. This is extremely important because this estimation strategy recognizes that there is no within country-year variation in the macroeconomic coefficients and corrects the standard error accordingly. Without clustering one would get standard errors that are too small and hence reject the null too often (Bertrand, Duflo and Mullainathan, 2004).
  - (5) There are some small differences in the set of controls. In particular, we do not control for GDP per capita and for overhead costs. We exclude the first variable because it is highly correlated with country fixed effects and GDP growth and exclude the second variable because we think it is endogenous. At the same time, we also control for the share of total assets.
  - (6) All our regressions are weighted by share of total assets and not by one over number of banks in a given country-year.

To check whether our results are driven by differences in estimations, we re-estimated all the equations in Claessens, Demirgüç-Kunt and Huizinga (2001), exactly following their methodology but using our data. However, even using their methodology we could not reproduce their results. In fact, we were surprised to find that our results are closer to those of Claessens, Demirgüç-Kunt and Huizinga (2001) when we use our preferred methodology. This suggests that our results are not driven by differences in the estimation methodology. A more likely possibility

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<sup>36</sup> The distinction between share expressed as a number of banks and share expressed as a fraction of total assets may be important because Claessens, Demirgüç-Kunt and Huizinga (2001) find that their results are not statistically significant if they measure foreign ownership by using asset shares.

is that having a larger sample allows us to estimate more precisely the relationship between domestic bank performance and foreign bank entry.<sup>37</sup>

It is also possible that the difference in results is driven by the fact that the two datasets include somewhat different samples of countries and that the coefficients are not homogenous across groups of countries. To check this hypothesis, we run the profitability regressions separately for East Asia, Eastern Europe, the Middle East and North Africa, Latin America, and South Asia and find that foreign bank entry is negatively correlated with the profitability of domestic banks in the first three groups of countries and positively correlated with profitability in the last two groups of countries. These results confirm the previous findings by Levy-Yeyati and Micco (2003) that foreign bank entry is positively correlated with bank profitability in Latin America (however their sample includes all commercial banks and does not limit the analysis to domestically owned private banks).

## **5. Conclusions**

This paper describes the construction of a new dataset on bank characteristics and bank performance and uses this dataset to reassess the relationship between bank ownership and bank performance. The paper finds that in the case of industrial countries there is no correlation between bank ownership and bank performance, but that there is a strong correlation between bank ownership and bank performance in developing countries. In particular, we find that state-owned banks located in developing countries tend to be characterized by lower profitability, higher overhead costs, and higher non-performing loans than their private counterparts. We find the opposite for foreign-owned banks that, in our sample of developing countries, are characterized by higher profitability and lower overhead costs.

It is also important to note that the paper shows that there is some heterogeneity within the sub-sample of developing countries. In particular, while the results for state-owned banks do not vary significantly across different developing regions, there are large differences in the performance of foreign-owned banks. For instance, the paper shows that, in most cases, foreign bank performance in Latin America seems to be different from foreign bank performance in the “average” developing country (Table A2). While this contrast is beyond the scope of this paper,

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<sup>37</sup> This is the case for Net Margins, Overheads, and Provisions. The difference in profitability remains puzzling.



it would be interesting to conduct further research aimed at documenting these differences in greater detail and trying to explain what drives them.

We are not able to test whether the lower profitability of public banks is due to mismanagement or a development mandate and hence we cannot express any value judgment on the desirability of having state-owned banks. However, we are able to test whether the entry of foreign banks affects the environment in which domestic banks operate. We find that, in the sub-sample of developing countries, foreign bank entry is associated with an increase in efficiency (as expressed by lower overhead costs) and competitiveness of the banking sector (as expressed by lower interest margin). As these two factors tend to balance each other, we find no significant correlation between foreign bank entry and profitability. These are important results because they suggest that entry of foreign banks (which could be related with new technology and/or lower entry barriers) is a healthy phenomenon that plays an important role in increasing the efficiency of the banking sector of several developing countries.

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**Table 1. Correlation between Ownership and Concentration Share within Alternative Datasets\***

	Using Consolidated Balance Sheets		Using Unconsolidated Balance Sheets	
	(1)	(2)	(3)	(4)
	Excluding SGI	Including SGI	Excluding SGI	Including SGI
SOB La Porta et al. for 1995	0.86 (0.000)	0.86 (0.000)	0.85 (0.000)	0.86 (0.000)
SOB Barth et al. for 1999	0.80 (0.000)	0.77 (0.000)	0.81 (0.000)	0.76 (0.000)
FOB Barth et al. for 1999	0.70 (0.000)	0.69 (0.000)	0.71 (0.000)	0.71 (0.000)
Concentration Barth et al. for 1999	0.92 (0.000)	0.90 (0.000)	0.94 (0.000)	0.95 (0.000)

\* p-values in parentheses

**Table 2. Number of Banks Included in the Dataset**

	Caribbean			East Asia and Pacific			East Europe and Central Asia			Industrial			Latin America			Middle East and North Africa			South Asia			Sub-Saharan Africa			TOTAL		
	Priv	Pub	For	Priv	Pub	For	Priv	Pub	For	Priv	Pub	For	Priv	Pub	For	Priv	Pub	For	Priv	Pub	For	Priv	Pub	For	Priv	Pub	For
<b>1995</b>	23	4	10	168	39	40	167	43	42	3,712	62	272	240	50	140	131	27	25	75	31	4	81	16	43	4,597	272	576
<b>1996</b>	26	5	12	179	43	45	209	42	46	3,829	62	282	254	47	151	137	26	25	79	30	5	112	17	47	4,825	272	613
<b>1997</b>	28	6	12	186	50	44	252	44	55	3,972	60	288	285	46	162	138	27	25	84	28	5	138	13	52	5,083	274	643
<b>1998</b>	38	6	11	207	53	47	301	41	67	4,331	49	308	319	43	190	143	25	26	89	28	5	143	13	54	5,571	258	708
<b>1999</b>	41	6	14	211	50	51	298	32	78	4,367	45	315	345	43	204	146	24	26	90	28	5	137	11	58	5,635	239	751
<b>2000</b>	41	5	17	168	50	55	269	33	102	4,102	38	345	275	30	215	128	25	26	89	29	6	142	10	77	5,214	220	843
<b>2001</b>	42	3	20	175	53	56	310	31	112	4,313	29	380	288	35	222	131	25	27	95	28	6	157	11	79	5,511	215	902
<b>2002</b>	43	3	20	173	53	56	295	25	115	4,271	28	386	292	41	233	133	25	28	94	26	4	147	11	80	5,448	212	922

**Table 3. Median Values of Variables excluding Specialized Governmental Credit Institutions\***

Region	Ownership	Share	ROA	ROE	Interest margin relative to loans plus deposits	Interest margin relative to total assets	Non-Interest revenues relative to total assets	Overheads relative to total assets	Employment Relative to Total Assets	Demand Deposits relative to total deposits	NPL relative to total assets	NPL relative to provisions	Provisions relative to total loans
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Caribbean	Dom.Priv.	62%	1.91%	17.21%	8.51%	4.76%	3.10%	5.38%	1.00	33.45%	2.04%	316.67%	1.42%
	Public	12%	1.76%	15.04%	10.99%	5.00%	1.95%	4.30%	0.96	59.90%	3.14%	700.00%	0.92%
	Foreign	25%	2.82%	24.05%	8.15%	4.23%	2.88%	3.44%	0.84	35.80%	2.08%	508.33%	0.85%
East Asia and Pacific	Dom.Priv.	53%	0.65%	7.49%	4.52%	3.05%	1.65%	2.58%	1.00	16.27%	3.89%	522.85%	1.44%
	Public	24%	-0.96%	2.40%	3.34%	2.02%	0.75%	1.83%	0.95	21.27%	4.44%	573.21%	1.58%
	Foreign	23%	1.43%	19.16%	5.37%	3.28%	1.97%	2.62%	0.82	22.71%	4.30%	481.82%	1.42%
East Europe and Central Asia	Dom.Priv.	48%	1.54%	12.13%	9.58%	5.71%	5.05%	6.33%	1.00	39.16%	4.52%	280.00%	4.33%
	Public	23%	0.58%	11.51%	8.97%	4.96%	3.87%	5.88%	1.07	34.83%	3.99%	376.09%	3.53%
	Foreign	29%	3.01%	20.16%	9.59%	5.01%	5.03%	5.10%	0.77	38.64%	2.68%	387.50%	1.93%
Industrial Countries	Dom.Priv.	70%	0.77%	14.81%	2.97%	1.80%	1.25%	1.86%	1.02	26.26%	1.04%	470.24%	0.54%
	Public	10%	0.63%	9.36%	2.62%	1.66%	0.81%	1.37%	0.83	26.11%	2.43%	690.91%	0.62%
	Foreign	20%	0.78%	13.03%	2.74%	1.63%	1.76%	2.22%	0.91	17.64%	0.98%	412.20%	0.59%
Latin America	Dom.Priv.	51%	1.17%	13.06%	8.84%	5.63%	2.72%	5.83%	1.00	17.18%	3.10%	261.51%	2.28%
	Public	17%	0.50%	9.10%	8.76%	5.15%	3.40%	6.36%	1.05	22.23%	4.24%	365.00%	2.30%
	Foreign	32%	1.24%	11.28%	8.59%	5.10%	3.10%	5.27%	1.00	17.69%	3.29%	281.25%	2.34%
Middle East and North Africa	Dom.Priv.	67%	1.35%	13.25%	4.06%	2.65%	1.31%	1.85%	1.00	16.86%	4.45%	835.63%	1.11%
	Public	19%	1.48%	12.98%	8.41%	2.87%	1.26%	2.04%	1.16	19.22%	7.03%	1335.83%	1.07%
	Foreign	14%	1.24%	12.34%	3.70%	2.30%	1.25%	1.75%	0.91	19.10%	3.13%	700.00%	1.04%
South Asia	Dom.Priv.	42%	1.10%	18.91%	4.48%	2.94%	1.77%	2.65%	1.00	15.19%	4.89%	619.15%	1.60%
	Public	40%	0.18%	9.42%	4.21%	2.51%	1.40%	2.86%	1.01	20.06%	8.06%	933.33%	1.69%
	Foreign	18%	0.66%	5.47%	4.88%	3.14%	2.06%	3.23%	1.00	15.80%	10.45%	450.00%	2.08%
Sub Saharan Africa	Dom.Priv.	44%	2.21%	24.35%	10.64%	5.83%	4.35%	5.57%	1.00	55.74%	4.82%	489.64%	3.92%
	Public	11%	2.57%	26.80%	13.98%	6.99%	4.08%	6.28%	1.01	73.21%	5.35%	488.10%	2.56%
	Foreign	46%	3.17%	30.21%	11.58%	6.43%	4.23%	5.43%	1.00	52.94%	4.27%	373.26%	2.20%

\* All variables are weighted.

**Table 4. Bank Ownership, Profitability and Interest Margin**

	ROA			ROE			Marg/TA			Marg/L+D		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Public	-0.571 (0.079)***	-0.731 (0.102)***	-0.060 (0.050)	-4.870 (0.741)***	-6.282 (0.942)***	-0.187 (0.587)	-0.232 (0.072)***	-0.277 (0.093)***	-0.079 (0.052)	-0.018 (0.187)	-0.026 (0.236)	-0.055 (0.074)
Foreign	0.246 (0.069)***	0.305 (0.091)***	0.007 (0.035)	1.687 (0.614)***	2.227 (0.796)***	-0.545 (0.484)	0.011 (0.061)	0.074 (0.080)	-0.217 (0.049)***	0.004 (0.139)	0.048 (0.186)	-0.213 (0.064)***
Non Int Inc/TA	0.007 (0.034)	-0.001 (0.038)	0.128 (0.010)***	-0.047 (0.211)	-0.113 (0.234)	0.828 (0.094)***	-0.017 (0.016)	-0.023 (0.020)	0.047 (0.018)***	0.019 (0.037)	0.001 (0.043)	0.176 (0.021)***
Dda Dep/TDep	0.006 (0.002)***	0.009 (0.003)***	0.000 (0.001)	0.021 (0.013)*	0.039 (0.020)**	-0.012 (0.009)	0.015 (0.002)***	0.016 (0.003)***	0.013 (0.001)***	0.027 (0.004)***	0.033 (0.006)***	0.016 (0.001)***
Lag TA (ln)	0.027 (0.019)	0.069 (0.044)	-0.026 (0.008)***	1.092 (0.157)***	1.744 (0.349)***	0.506 (0.121)***	-0.176 (0.019)***	-0.175 (0.042)***	-0.174 (0.014)***	-0.265 (0.046)***	-0.389 (0.116)***	-0.202 (0.017)***
Lag Share	-0.158 (0.304)	-0.451 (0.463)	0.098 (0.179)	0.832 (2.236)	-2.964 (3.362)	2.705 (2.345)	1.046 (0.276)***	1.145 (0.423)***	0.489 (0.195)**	0.981 (0.617)	1.641 (1.015)	0.316 (0.319)
Observations	18583	5379	13204	18467	5302	13165	18723	5363	13360	18583	5332	13251
R-squared	0.4914	0.4814	0.5607	0.5109	0.5134	0.5139	0.7879	0.7453	0.6205	0.7357	0.6955	0.5999
Group	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed

Robust standard errors in parentheses. All regressions are weighted by asset share.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%



**Table 5. Bank Ownership versus Overheads, Employment, Branches and Credit to the Public Sector**

	OH/TA			Emp/TA			Branch/TA			Gov L/TA		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Public	0.236 (0.067)***	0.238 (0.081)***	0.166 (0.062)***	0.114 (0.038)***	0.153 (0.055)***	-0.039 (0.052)	0.075 (0.074)	0.112 (0.088)	-0.071 (0.094)	-0.411 (0.825)	-0.166 (1.182)	
Foreign	-0.498 (0.070)***	-0.598 (0.089)***	-0.185 (0.061)***	-0.249 (0.038)***	-0.369 (0.056)***	-0.061 (0.051)	-0.301 (0.085)***	-0.377 (0.096)***	0.120 (0.087)	0.377 (0.978)	1.258 (2.292)	-0.852 (0.370)**
Non Int Inc/TA	0.448 (0.048)***	0.415 (0.051)***	0.717 (0.046)***	0.020 (0.009)**	0.014 (0.007)**	0.087 (0.014)***	0.016 (0.012)	0.019 (0.014)	0.005 (0.020)	-0.531 (0.361)	-0.816 (0.639)	-0.063 (0.082)
Dda Dep/TDep	0.013 (0.002)***	0.014 (0.003)***	0.013 (0.001)***	0.010 (0.001)***	0.005 (0.002)**	0.013 (0.001)***	0.011 (0.003)***	0.010 (0.003)***	0.006 (0.002)***	0.013 (0.033)	0.020 (0.055)	0.008 (0.011)
Lag TA (ln)	-0.102 (0.020)***	-0.133 (0.042)***	-0.094 (0.015)***	-0.096 (0.011)***	-0.020 (0.026)	-0.109 (0.012)***	-0.078 (0.025)***	0.009 (0.044)	-0.164 (0.016)***	0.293 (0.217)	0.728 (0.809)	-0.007 (0.075)
Lag Share	-0.822 (0.249)***	-0.950 (0.369)**	0.088 (0.212)	0.333 (0.163)**	-0.091 (0.302)	0.569 (0.187)***	-0.091 (0.461)	-0.445 (0.615)	-0.461 (0.393)	-0.773 (5.632)	-6.335 (10.212)	2.481 (1.671)
Observations	18732	5381	13351	11611	1856	9755	3781	1423	2358	938	193	745
R-squared	0.7997	0.7742	0.7829	0.9127	0.8680	0.7217	0.8289	0.7907	0.8425	0.8691	0.8568	0.7690
Group	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed

Robust standard errors in parentheses. All regressions are weighted by asset share.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 6. Bank Ownership versus Loan Provisions and Non-Performing Loans**

	NPL/L			Prov/L			NPL/Prov		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Public	5.381 (0.834)***	6.454 (1.061)***	0.313 (0.298)	0.833 (0.184)***	1.111 (0.236)***	-0.126 (0.072)*	92.219 (62.483)	81.782 (75.300)	69.659 (86.444)
Foreign	0.934 (0.504)*	1.274 (0.648)**	0.207 (0.209)	-0.150 (0.119)	-0.221 (0.159)	0.022 (0.064)	85.977 (56.072)	-21.752 (43.994)	453.453 (179.270)**
Non Int Inc/TA	1.523 (0.361)***	1.669 (0.375)***	-0.007 (0.068)	0.438 (0.098)***	0.483 (0.110)***	0.067 (0.015)***	-7.688 (6.227)	-1.296 (6.169)	-41.997 (28.902)
Dda Dep/TDep	0.002 (0.028)	0.006 (0.040)	0.003 (0.006)	-0.009 (0.004)**	-0.009 (0.007)	-0.004 (0.001)***	-1.722 (2.802)	-3.735 (3.909)	3.844 (2.462)
Lag TA (ln)	-0.004 (0.137)	0.461 (0.320)	-0.161 (0.069)**	-0.256 (0.057)***	-0.521 (0.138)***	-0.066 (0.017)***	7.995 (15.939)	73.828 (33.593)**	-42.262 (19.790)**
Lag Share	-5.100 (2.474)**	-9.647 (3.408)***	2.173 (1.158)*	1.827 (0.788)**	3.598 (1.278)***	0.404 (0.460)	-188.739 (222.099)	-694.425 (296.358)**	1,160.559 (458.748)**
Observations	8394	2688	5706	14318	3905	10413	7086	2233	4853
R-squared	0.5947	0.5613	0.6011	0.5844	0.5636	0.4052	0.5137	0.5368	0.4697
Group	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed

Robust standard errors in parentheses. All regressions are weighted by asset share.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 7. Banks that Changed Ownership**

	N. of Banks	Selected to become public		Selected to be privatized and become private domestic banks		Selected to become foreign	
		N	Share of total	N	Share of total	N	Share of total
ALL BANKS							
Developing	2905	17	0.59%	60	2.07%	142	4.89%
Industrial	6606	2	0.03%	40	0.61%	58	0.88%
All countries	9511	119	0.20%	100	1.05%	200	2.10%
BANKS INCLUDED IN THE REGRESSIONS							
Developing	1491	12	0.80%	33	2.21%	83	5.57%
Industrial	4140	0	0.00%	27	0.65%	50	1.21%
All countries	5631	12	0.21%	60	1.07%	133	2.36%

**Table 8. Bank Ownership, Profitability, Overheads, Non Performing Loans and Dynamic Effects**

	ROA			ROE			OH/TA			NPL/L		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Static Pub	-0.601 (0.087)***	-0.778 (0.114)***	-0.130 (0.055)**	-5.214 (0.818)***	-6.997 (1.053)***	-0.397 (0.682)	0.248 (0.072)***	0.261 (0.087)***	0.120 (0.075)	6.193 (1.039)***	7.424 (1.299)***	0.114 (0.302)
Static For	0.285 (0.075)***	0.343 (0.100)***	0.035 (0.036)	2.305 (0.655)***	2.851 (0.854)***	-0.262 (0.521)	-0.516 (0.075)***	-0.626 (0.095)***	-0.192 (0.064)***	1.153 (0.578)**	1.537 (0.733)**	-0.039 (0.241)
Selection Pub	0.027 (0.141)	0.005 (0.150)		4.046 (2.527)	3.710 (2.646)		-0.139 (0.103)	-0.162 (0.105)		6.319 (3.733)*	6.499 (3.869)*	
Selection Priv	-0.036 (0.174)	-0.017 (0.296)	0.001 (0.064)	-1.555 (1.459)	-1.825 (2.433)	-0.390 (1.017)	0.123 (0.190)	-0.033 (0.322)	0.256 (0.088)***	1.209 (0.903)	0.023 (1.128)	1.458 (0.870)*
Selection For	-0.314 (0.120)***	-0.529 (0.162)***	0.137 (0.064)**	-3.117 (1.215)**	-5.161 (1.608)***	1.595 (1.000)	-0.073 (0.084)	-0.107 (0.114)	-0.071 (0.088)	-0.210 (1.372)	-0.132 (1.774)	0.166 (0.263)
Dyn. Pub	-1.339 (0.349)***	-1.379 (0.358)***		-13.306 (4.925)***	-13.720 (5.066)***		-0.125 (0.331)	-0.077 (0.327)		0.085 (5.101)	-0.027 (5.258)	
Dyn. Priv	-0.120 (0.223)	-0.184 (0.351)	-0.088 (0.100)	-1.899 (1.922)	-2.546 (2.969)	-1.628 (1.364)	-0.217 (0.239)	-0.071 (0.381)	-0.281 (0.109)**	1.976 (1.284)	2.825 (1.619)*	3.991 (2.030)**
Dyn. For.	0.107 (0.161)	0.308 (0.206)	-0.367 (0.103)***	-1.284 (1.656)	0.264 (2.073)	-4.701 (1.393)***	-0.294 (0.166)*	-0.337 (0.205)	-0.072 (0.164)	1.044 (1.604)	1.068 (2.095)	1.096 (0.468)**
Non Int Inc/TA	0.008 (0.034)	-0.001 (0.038)	0.127 (0.010)***	-0.047 (0.211)	-0.111 (0.234)	0.817 (0.091)***	0.448 (0.048)***	0.416 (0.051)***	0.718 (0.046)***	1.520 (0.362)***	1.662 (0.377)***	0.014 (0.067)
Dda Dep/TDep	0.006 (0.002)***	0.010 (0.003)***	0.000 (0.001)	0.022 (0.013)*	0.043 (0.019)**	-0.011 (0.010)	0.013 (0.002)***	0.014 (0.003)***	0.013 (0.001)***	0.001 (0.028)	0.006 (0.039)	0.003 (0.006)
Lag TA (ln)	0.035 (0.019)*	0.091 (0.044)**	-0.023 (0.008)***	1.220 (0.161)***	2.032 (0.357)***	0.554 (0.124)***	-0.102 (0.020)***	-0.134 (0.043)***	-0.096 (0.015)***	-0.037 (0.136)	0.395 (0.316)	-0.270 (0.055)***
Lag Share	-0.187 (0.304)	-0.526 (0.459)	0.101 (0.181)	0.364 (2.226)	-3.693 (3.354)	2.289 (2.354)	-0.786 (0.244)***	-0.902 (0.365)**	0.117 (0.209)	-5.053 (2.473)**	-9.643 (3.377)***	2.681 (1.132)**
Observations	18583	5379	13204	18467	5302	13165	18732	5381	13351	8394	2688	5706
R-squared	0.4937	0.4842	0.5682	0.5158	0.5200	0.5184	0.7996	0.7742	0.7831	0.5979	0.5653	0.6288
Group	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed

Robust standard errors in parentheses. All regressions are weighted by asset share.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

**Table 9. Performance of Domestic Private Banks**

	Profit before Tax over Total Assets			Net Margin over Total Assets			Overheads over Total Assets			Provisions over Total Assets		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
SHFOR	0.108 (0.662)	0.151 (0.963)	0.101 (0.518)	-1.895 (0.898)**	-4.289 (1.248)***	0.662 (0.485)	-1.692 (0.541)***	-2.850 (0.779)***	-0.072 (0.279)	-1.167 (0.661)*	-2.843 (1.089)***	0.340 (0.280)
SH PUB	-0.383 (0.500)	-0.440 (0.795)	-0.021 (0.630)	-1.080 (0.812)	-2.975 (1.169)**	-0.055 (0.362)	0.039 (0.401)	-0.554 (0.705)	0.251 (0.251)	-0.159 (0.635)	-1.544 (1.062)	-0.129 (0.252)
EQ/TA	0.124 (0.032)***	0.128 (0.033)***	0.076 (0.027)***	0.037 (0.070)	0.038 (0.069)	0.048 (0.027)*	0.019 (0.031)	0.017 (0.031)	0.019 (0.027)	-0.120 (0.045)***	-0.127 (0.044)***	0.002 (0.017)
NON INT ASS/TA	0.118 (0.063)*	0.108 (0.063)*	0.242 (0.079)***	-0.088 (0.096)	-0.092 (0.094)	-0.005 (0.028)	0.404 (0.067)***	0.407 (0.069)***	0.427 (0.086)***	0.213 (0.082)***	0.203 (0.082)**	0.234 (0.037)***
DDEP/TOTDEP	-0.006 (0.007)	-0.006 (0.007)	-0.005 (0.006)	0.017 (0.010)*	0.017 (0.010)	0.004 (0.003)	0.011 (0.005)**	0.012 (0.006)**	0.005 (0.003)*	0.024 (0.008)***	0.029 (0.009)***	-0.005 (0.004)
LTA	0.142 (0.241)	0.173 (0.275)	-0.111 (0.257)	0.331 (0.394)	0.504 (0.451)	-0.217 (0.183)	-0.041 (0.206)	-0.023 (0.230)	0.054 (0.169)	0.124 (0.295)	0.217 (0.316)	-0.022 (0.153)
GDP Growth	6.572 (2.325)***	5.754 (2.312)**	2.846 (3.107)	-7.139 (2.865)**	-7.906 (2.899)***	0.810 (2.239)	-6.641 (2.351)***	-6.739 (2.405)***	1.595 (2.168)	-7.858 (2.605)***	-7.688 (2.630)***	-5.591 (3.661)
Inflation	0.046 (0.016)***	0.043 (0.016)***	0.014 (0.041)	0.036 (0.026)	0.036 (0.024)	0.007 (0.020)	-0.034 (0.015)**	-0.036 (0.015)**	0.012 (0.025)	0.020 (0.015)	0.028 (0.014)*	-0.013 (0.019)
Real Interest Rate	0.026 (0.015)*	0.024 (0.015)	0.032 (0.035)	0.035 (0.026)	0.037 (0.025)	0.021 (0.015)	-0.008 (0.014)	-0.009 (0.013)	0.007 (0.021)	0.014 (0.015)	0.021 (0.014)	-0.020 (0.016)
Observations	7018	2347	4671	7135	2344	4791	7183	2368	4815	5475	1679	3796
R-squared	0.7799	0.7753	0.7778	0.8924	0.8790	0.9561	0.9555	0.9500	0.9751	0.8039	0.7974	0.8336
Group	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed	All	Developing	Developed

Robust standard errors in parentheses. All regressions are weighted by asset share.

\* significant at 10%; \*\* significant at 5%; \*\*\* significant at 1%

## **Appendix A. Construction of the Variables**

The purpose of this appendix is to describe the steps taken to construct the dataset used in the paper. As mentioned in the text, our main source of data is Bankscope (BSC). We obtained data for the 1995-1999 period from the June 2001 update of BSC and data for the 2000-2002 period from the February 2004 update of BSC. Processing the data required two main steps, which we describe below.

Avoiding duplications. For most banks, BSC reports balance sheet data at both the consolidated and unconsolidated levels. In order to avoid duplications, it is necessary to use only one of the two definitions. If BSC reported both types of statements for all banks, this could be easily done by simply dropping all of either the consolidated or unconsolidated statements. However, some banks have only a consolidated statement, while others have only an unconsolidated statement, hence dropping just one category would lead to loss of information. Furthermore, it is impossible to automatically keep the unconsolidated statement, for instance, if the consolidated statement is missing because, in some cases, there are slight changes in the reported name of the bank across different levels of consolidation. An even more difficult problem is that in some cases BSC reports information for the same bank several times. This is especially the case at the time of mergers. An example may be helpful here. Consider the case of INTESA, the largest Italian banking group. INTESA was created in 1998 with the merger of CARIPLO and AMBROVENETO. In 1999, Banca Commerciale Italiana (COMIT) joined the INTESA group and in 2001 COMIT completely merged with INTESA, which took the name of INTESABCI. As of 2000, BSC reports data for (i) COMIT; (ii) AMBROVENETO; (iii) CARIPLO; and (iv) INTESABCI. Clearly, considering all these four banks would lead to a large overestimation of Italian banking assets. To address this problem, we make use of a variable included in BSC that ranks banks within a country and is built in order to limit duplications (the variable name is CTRYRANK). In the above case, CTRYRANK takes a value of one for INTESABCI (recognizing that this is the largest bank in the country), 5 for CARIPLO and 12 for AMBROVENETO. COMIT is not ranked (CTRYRANK takes the value NR). Therefore, dropping the banks that are coded as non-ranked can help prevent duplication. There are, however, still two problems with this strategy. First, the dataset would still include INTESABCI and two of its component (AMBROVENETO and CARIPLO). Second, the ranking variable refers to the last year, and hence if we were to drop all the banks that are not ranked, we would

also drop COMIT for the 1995-1999 period. To address this issue, we looked at all banks coded as non-ranked with assets greater than the country average, and we explored their merger history. This led to a massive amount of recoding that helped us to include in the dataset most of the relevant information and avoid duplications.<sup>38</sup>

Coding Ownership. BSC includes an ownership variable, measuring whether a given bank is owned by the public sector or by foreign investors, but this variable has limited coverage and is only available for the current year, as BSC does not provide ownership history. Therefore, coding ownership history requires looking at one bank at a time. This process involves using a variety of approaches and resources; these include Internet searches, consulting bank websites and publications such as *Euromoney*, and telephone interviews with experts in various countries. As this is a particularly time-consuming and difficult endeavor, and the cost of coding all banks included in the dataset would have been too high, we decided to adopt some cut-off points under which a bank would not be coded.

The following procedure was used to determine cut-off points. In all countries we coded the 10 largest banks, the same strategy as followed by La Porta, López-de-Silanes and Shleifer (2002). If these banks represented less than 75 percent of total assets of the banking system we coded all banks up to 75 percent of total assets of the banking system. In Latin American and industrial countries, we coded the largest 20 banks. Again, if these 20 banks represented less than 75 percent of total assets of the banking system, we coded up to 75 percent of assets of the banking system. If a bank was not among the top twenty or in the 75th percentile but the coding was obvious (for instance in the case of foreign branches) it was also coded.

In coding ownership, we followed the same strategy as La Porta, López-de-Silanes and Shleifer (2002) and assumed that if X percent of bank A is owned by company B and that Y percent of company B is owned by a foreign company (alternately state owned), then we code bank A as being  $X*Y$  percent foreign (state) owned. At this point it should also be noted that, in order to code ownership, we always went back at least two steps in the ownership structure.

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<sup>38</sup> In the case of the example described above, we adopted the following strategy. We re-ranked (and hence included in the dataset) COMIT from 1995 to 1999 and de-ranked (and hence excluded from the dataset) Ambroveneto and CARIPLO for 2000-2002 and Intesa BCI for 1995-1999. After dropping the non-ranked bank we end up with three banks (COMIT, Ambroveneto and CARIPLO) operating for the 1995-1999 period and one bank (IntesaBCI) operating for the 2000-2002 period.

**Table A1. Description of the Variables Included in the Dataset**

<b>Variables</b>	<b>Descriptors</b>	<b>Variables</b>	<b>Descriptors</b>
Year	year	n2095	Loan Loss Provisions
country	Country Name	n2095_ta	Loan Loss Provisions over total assets
C3	Share of assets of the 3 largest banks over total assets	n2095c	Number of banks with information on n2095
SOB	Share of Public Assets to total Assets in the country	n2105	Profit before Tax
FOB	Share of Foreign Assets over Total Assets	n2105_ta	Profit before Tax over total assets
banks	Number of banks in the country per year	n2105c	Number of banks with information on n2105
branches	Number of Branches	n2115	Net Income
branches_ta	Number of Branches over total assets	n2115_ta	Net Income over total assets
branchesc	Number of banks with information on branches	n2115c	Number of banks with information on n2115
empl	Number of Employees	n2125	Total Capital Ratio
empl_ta	Number of Employees over total assets	n2125c	Number of banks with information on n2125
emplc	Number of banks with information on empl	n4024	Return on Average Assets (ROAA)
n2000	Loans	n4024c	Number of banks with information on n4024
n2000_ta	Loans over total assets	n4025	Return on Average Equity (ROAE)
n2000c	Number of banks with information on n2000	n4025c	Number of banks with information on n4025
n2010	Total Earning Assets	n5100	Loans to Municipalities/Government
n2010_ta	Total Earning Assets over total assets	n5100_ta	Loans to Municipalities/Government over total assets
n2010c	Number of banks with information on n2010	n5100c	Number of banks with information on n5100
n2015	Fixed Assets	n5190	Total Customer Loans
n2015_ta	Fixed Assets over total assets	n5190_ta	Total Customer Loans over total assets
n2015c	Number of banks with information on n2015	n5190c	Number of banks with information on n5190
n2020	Non Earning Assets	n5240	Total Problem Loans
n2020_ta	Non Earning Assets over total assets	n5240_ta	Total Problem Loans over total assets
n2020c	Number of banks with information on n2020	n5240c	Number of banks with information on n5240
n2025	Total Assets	n5330	Total Loans - Net
n2025c	Number of banks with information on total assets	n5330_ta	Total Loans - Net over total assets
n2030	Customer & Short Term Funding	n5330c	Number of banks with information on n5330
n2030_ta	Customer & Short Term Funding over total assets	n5410	Government Securities
n2030c	Number of banks with information on n2030	n5410_ta	Government Securities over total assets
n2045	Loan Loss Reserves	n5410c	Number of banks with information on n5410
n2045c	Number of banks with information on n2045	n5490	Tresury Bills
n2055	Equity	n5490_ta	Tresury Bills over total assets
n2055c	Number of banks with information on n2055	n5490c	Number of banks with information on n5490
n2080	Net Interest Revenue	n5920	Deposits-Demand
n2080_ta	Net Interest Revenue over total assets	n5920_ta	Deposits-Demand over total assets
n2080c	Number of banks with information on n2080	n5920c	Number of banks with information on n5920
n2085	Other Operating Income	n5925	Deposits-Savings
n2085_ta	Other Operating Income over total assets	n5925_ta	Deposits-Savings over total assets
n2085c	Number of banks with information on n2085	n5925c	Number of banks with information on n5925
n2090	Overheads	n6000	Customer Deposits
n2090_ta	Overheads over total assets	n6000_ta	Customer Deposits over total assets
n2090c	Number of banks with information on n2090	n6000c	Number of banks with information on n6000



**Table A2. Region-Specific Regressions**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE	ROA	ROE
Public	-0.479 (0.170)** *	-4.493 (3.754)	-0.559 (0.307)*	-3.288 (2.324)	-1.214 (0.253)* **	-6.447 (1.901)***	0.089 (0.107)	-1.976 (1.176)*	-0.211 (0.072)** *	-6.604 (1.270)***
Foreign	0.271 (0.149)*	1.235 (1.795)	0.594 (0.261)* *	5.280 (2.186)**	-0.226 (0.127)*	-0.905 (1.135)	0.084 (0.085)	0.789 (1.009)	0.027 (0.163)	-4.155 (2.454)*
Non Int Inc/TA	-0.130 (0.148)	-1.920 (1.284)	-0.020 (0.069)	-0.351 (0.521)	-0.013 (0.044)	-0.106 (0.272)	0.099 (0.079)	0.062 (0.706)	0.151 (0.058)** *	2.361 (0.893)***
Dda Dep/TDep	0.005 (0.003)	0.026 (0.041)	0.018 (0.006)* **	0.066 (0.040)	0.011 (0.007)*	0.128 (0.050)***	0.002 (0.004)	0.000 (0.037)	-0.003 (0.005)	-0.163 (0.070)**
Lag TA (ln)	0.152 (0.070)**	2.015 (0.893)* *	0.021 (0.144)	0.536 (1.130)	0.129 (0.086)	2.112 (0.707)***	-0.191 (0.040)* **	1.132 (0.434)***	-0.123 (0.040)** *	-0.212 (0.680)
Lag Share	-1.756 (0.686)**	-10.642 (9.260)	-1.770 (1.499)	-3.893 (9.001)	1.187 (0.968)	3.487 (7.850)	1.320 (0.298)* **	3.241 (3.291)	0.148 (0.540)	3.099 (8.096)
Observations	912	913	737	726	1958	1912	732	723	702	696
R-squared	0.3693	0.3301	0.3331	0.4173	0.4166	0.4819	0.5356	0.4292	0.6059	0.5601
Group	East Asia & Pacific		East Europe & Central Asia		Latin America		Middle East & North Africa		South Asia	

Robust standard errors in parentheses. All regressions are weighted by asset share.

\* significant at 10%;

\*\* significant at 5%; \*\*\* significant at 1%