

How Foreign Participation and Market Concentration Impact Bank Spreads:

Evidence from Latin America

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Abstract:

Increasing foreign participation and high concentration levels characterize the recent evolution of banking sectors' market structures in developing countries. We analyze the impact of these factors on Latin American bank spreads during the late 1990s. Our results suggest that foreign banks were able to charge lower spreads relative to domestic banks. This was more so for *de novo* foreign banks than for those that entered through acquisitions. The overall level of foreign bank participation seemed to influence spreads indirectly, primarily through its effect on administrative costs. Bank concentration was positively and directly related to both higher spreads and costs.

World Bank Policy Research Working Paper 3210, February 2004

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* The authors are with the World Bank and the International Monetary Fund, respectively. We thank Adolfo Barajas, Giovanni Dell'Ariccia, Asli Demirgüç-Kunt, Tom Glaessner, Stephen Haber, Sergio Schmukler, Jessica Serrano and participants in the World Bank conference on Bank Concentration and the JMCB/Cleveland Federal Reserve Bank conference on Banking Consolidation and Competition for comments and suggestions. We are greatly indebted to Juan Miguel Crivelli and Adrian de la Garza for excellent research assistance. Contact author: Maria Soledad Martinez Peria, 1818 H Street N.W., World Bank, Washington, D.C. 20433. Phone: (202)458-7341. Fax: (202)522-1155. Email: mmartinezperia@worldbank.org.

I Introduction

The market structure of the banking industry in many developing countries has recently undergone significant changes. In particular, the ongoing and, often, extensive entry of foreign banks has been the source of a far-reaching transformation. Between 1994 and 1999, the share of assets held by foreign banks (i.e., those banks that are at least 50 percent foreign) increased from 7.8 percent to 52.3 percent among countries in Eastern Europe (IMF 2000). For countries in Latin America, the increase in foreign bank participation over the same period was from 13.1 percent to 44.8 percent. At the same time, the rise in foreign bank participation often occurred in the context of already high and, in some countries, rising levels of bank concentration. Among a sample of 33 developing countries, the level of bank assets held by the three largest banks averaged 64 percent during 1995-99.¹

Growing foreign bank presence and high levels of bank concentration in developing countries have been the consequence of a number of factors, some of them interrelated. A facet of the larger process of financial liberalization and international integration, foreign entry was also encouraged by local banking authorities following financial crises, as they sought to minimize the costs of recapitalizing domestic financial systems. The high levels of concentration have also in part been the consequence of crises, as banks closed, merged or were acquired. In some cases, where foreign banks acquired existing domestic banks, foreign bank entry contributed to bank concentration. Foreign competition, moreover, induced domestic bank consolidation and concentration.

A question of interest to policymakers and academics alike is the impact of foreign bank entry and bank concentration on bank spreads--the difference between the rate charged to

¹ Figures obtained from Demirgüç-Kunt, Laeven, and Levine (2004).

borrowers and the rate paid by depositors.² Spreads are commonly interpreted as a measure of the cost of financial intermediation (Saunders and Schumacher 2000; Brock and Rojas-Suarez 2000). High spreads can hinder the growth of savings and investment and imply that the cost of using the financial system may become prohibitive for certain borrowers. Furthermore, the impact of high spreads is likely to be more severe for developing countries where, given that capital markets are generally small and under-developed, a larger percentage of firms and individuals tend to depend on banks to meet their financial needs.

A number of recent papers investigate the impact of foreign entry on bank spreads and other variables (see for example Claessens, Demirgüç-Kunt, and Huizinga 2000; Barajas, Steiner, and Salazar 2000; and Deniz 2000). Demirgüç-Kunt, Laeven, and Levine (2004), in turn, examine the implications of concentration and bank regulation on spreads.³ Yet, few studies have considered the parallel trends toward more foreign entry and consolidation in the sector. None has examined how different types of foreign bank entry affect spreads.

Our paper investigates the impact of foreign bank participation and concentration on bank spreads in a sample of Latin American countries during the late 1990s. Using bank-level data for Argentina, Chile, Colombia, Mexico, and Peru, we examine a number of hypotheses. First, we investigate whether foreign banks are able to operate with lower spreads, directly benefiting borrowers. We refer to this effect as the “own effect” of foreign bank presence.

Second, we examine whether the type of foreign bank entry influences how big the “own effect” might be. In other words, among the foreign banks we distinguish between those that entered or increased their presence in the system by acquiring domestic banks and those that

² For a review of the potential consequences of foreign bank participation, see Levine (1996). For a discussion of the impact of bank concentration on profitability, see Berger (1995). For a test of whether bank consolidation and concentration has worsened competition in developing countries, see Gelos and Roldós (2002).

³ For a broader discussion of the implications of consolidation, see Gelos and Roldós (2002) for developing countries and Berger (1995) for a review of the U.S. evidence.

established de novo operations. Dell’Ariccia and Marquez (2004) suggest that even if all banks are equally cost efficient, they may charge different spreads, based on their specialization in different market segments. Alternatively, newly established foreign banks may be more aggressive in their pricing strategies to gain market share. Though we are not able to formally test whether variations in market segments or in pricing strategies account for differences in spreads across banks, to our knowledge, our study is the first to examine whether all forms of foreign entry have the same impact on spreads.

Third, we analyze whether there is a “spillover effect” as a result of foreign bank participation. That is, once we control for the origin (domestic or foreign) of individual banks, we test whether the overall level of foreign bank participation in the banking system raises or lowers spreads across the board, and, in particular, among domestic banks. A priori the spillover effect of foreign bank participation is indeterminate. Spreads would be lowered if foreign banks competed directly with domestic banks, forcing them to reduce their spreads.⁴ Alternatively, faced with foreign bank competition, domestic banks may redirect their lending to segments that are more opaque, where they have an information advantage and greater market power, allowing them to charge higher spreads (Dell’Ariccia and Marquez 2004).

Finally, we study the impact of bank concentration on bank spreads by including several measures of system-wide bank concentration in our estimations. At the same time, we control for banks’ market share and for cases of bank consolidation.

We believe this paper contributes to the existing literature not only by testing some hypotheses that have been overlooked before, but also by focusing on a region that has been at

⁴ Domestic banks may lower spreads either because they are driven to become more efficient following bank entry (by, for example, imitating some of the practices introduced by foreign banks) or because they are forced to give up some of the margins they were able to charge before. In other words, lower spreads could be the result of lower costs or lower revenues.

the forefront of the recent changes in bank market structure in developing countries and that has traditionally been characterized by high spreads. Latin America makes for an interesting case study for a number of reasons. First, perhaps after Eastern Europe, Latin America has been the region to witness the sharpest increase in foreign bank participation (IMF 2000). Second, despite embarking on a process of financial market liberalization during the late 1980s and early 1990s--which included the elimination of interest rates and direct credit controls--spreads in the region remained high even in the mid-1990s.⁵ Third, concentration rose or remained high (depending on the country) in part because many foreign banks increased their participation by acquiring domestic banks. Also, in many of these countries, there has been a trend toward consolidation among domestic banks.

Our empirical analysis yields a number of interesting results. We find that foreign banks are able to charge lower spreads and have lower costs than domestic banks. Moreover, those foreign banks that acquired domestic institutions have higher spreads than those that established de novo operations, suggesting either some market segmentation or differences in pricing strategies to gain market share. However, we do not find consistent evidence of a direct spillover effect on spreads. Instead, the degree of system-wide foreign bank participation (as measured by the share of total loans) appears to influence spreads through its effects on costs. Greater participation of foreign banks lowers costs all around. On the other hand, a higher degree of concentration in the banking system has a positive and economically significant impact on both spreads and costs.

⁵ Brock and Rojas-Suarez (2000) study spreads in Latin America during 1990-1996 and conclude that they have not gone down significantly (perhaps with the exception of Mexico) and in many cases are still three times higher than those observed for industrial countries (though less so for Chile). In general, the study finds that high operating or administrative costs are particularly significant in explaining the behavior of bank spreads in the region.

The remainder of the paper is organized as follows. Section II describes the structure of the banking sector and the behavior of bank spreads in Argentina, Chile, Colombia, Mexico, and Peru over the late 1990s. Section III discusses the empirical methodology and data used to study the determinants of bank spreads in Latin America. Section IV presents the empirical results and section V concludes.

II Foreign Bank Participation, Concentration, and Spreads in Latin America

As in many developing economies, countries in Latin America experienced a significant increase in foreign bank participation during the late 1990s (see Table 1). In Argentina, foreign bank participation increased from 18.9 percent in 1995 to 49.4 percent of outstanding loans in 2000. In Chile, Mexico, and Peru the share of bank loans held by foreign banks rose from below 15 percent in 1995 to exceed 40 percent by the end of the decade.⁶ Colombia is the only country in our sample where foreign banks consistently accounted for one-fourth of the loans during the period under consideration.

Despite the dramatic increase in foreign bank participation, the total number of banks in the region dropped in four of the five countries and concentration levels increased or remained high (see Table 1). In Argentina and Peru, the number of bank declined by more than 30 percent between 1995 and 2000. The total number of banks in Argentina fell from about 141 in 1995 to 90 in 2000. While Peru had 29 banks in 1995, this number dropped to 20 by 2000. For Colombia and Chile, the number of banks fell by 18 and 11 percent, respectively, during this period. The one exception is Mexico, where the number of banks increased from 39 to 40 between 1997 and 2000.

⁶ In the case of Mexico, the foreign bank share exceeded 40 percent by 2001.

In all five countries, the share of loans held by the top three (five) banks exceeded 30 (40) percent for most of this period and the Herfindahl index was above 650. Concentration levels rose significantly for Argentina and Chile between 1995 and 2000. In Argentina, the share of loans held by the top five largest banks increased from 40.9 percent in 1995 to 49.4 percent in 2000. Similarly, this share increased from 51.9 percent to 61.5 percent for the case of Chile between 1995 and 2000.

The drop in the number of banks and the high or rising concentration levels can be ascribed to several reasons. First, there were many bank closures during this period. Such closures typically followed periods of financial distress in the countries, like the Tequila crisis in Argentina in 1995, when 32 banks closed, and the 1998-99 period of financial turmoil in Colombia, when 4 institutions were liquidated.

Second, much of the increase in foreign bank participation resulted from purchases of domestic banks. Thus, foreign entry did not typically add to the number of banks. In Argentina, sixteen foreign banks acquired domestic financial institutions during the period 1995-2000. The Spanish banks BBVA and Santander, the British bank HSBC, and the Canadian Scotia Bank were among the most significant entrants in Argentina. During the same period, foreign banks acquired five domestic banks in Chile, two in Colombia, and three in Mexico. As in Argentina, Santander, BBVA, and Scotia were important players in these countries. Though there were also some truly de novo entries, i.e., cases of foreign banks that started their own operations without any affiliation with domestic banks, these were not the norm.⁷ Six foreign banks set up de novo operations in Argentina, while two banks settled in Peru over this period. This explains why the

⁷ Following the lifting of restrictions on foreign entry, fifteen foreign banks initiated operations in Mexico during 1995 and 1996. These entrants were small relative to the existing domestic banks, and the main increase in foreign bank participation occurred through the acquisition of domestic banks after 1998.

total number of foreign banks in these countries did not increase at the same pace as the increase in foreign bank participation in the system.

At the same time, many domestic banks also consolidated with other domestic banks due to financial distress or as a strategy to compete with foreign banks, bringing down the total number of institutions. Thirty-seven such transactions took place in Argentina, four in Chile, three in Colombia, and three in Peru during the late 1990s.

What has been the impact of foreign bank participation and concentration on bank spreads? While a detailed econometric analysis is required to answer this question, it is interesting to note some trends in these variables. In Argentina, Colombia, and Peru, spreads have dropped during most of the late 1990s (see Table 1). A cursory look at the data for these countries suggests that spreads tended to decline in periods when foreign participation increased, but concentration levels remained constant. In Chile and Mexico, the increase in foreign participation appears to have had little effect on spreads perhaps because both countries had high levels of concentration at the start of the period and throughout. Note, however, that by the mid-1990s spreads in Chile and Mexico were already quite low by regional standards.

Foreign and domestic bank spreads appear to move very much in tandem across countries in the region. This behavior could signal the influence of macroeconomic factors and/or similar cost structures that affect all banks in the system, as well as the possibility that in general or at least in certain markets foreign and domestic banks compete with each other for customers. However, in Argentina, Colombia, and Peru, throughout most of the sample, and in all countries by the end of the period, foreign banks seemed to be able to operate with lower spreads.

III Empirical Methodology and Data

In this section, we turn to an econometric analysis of the impact of concentration and foreign bank presence on bank spreads. In particular, we study the effect of market structure changes on bank spreads, while controlling for a host of bank characteristics and macroeconomic variables, by estimating regressions of the following form:

$$\begin{aligned} Spread_{i,j,t} = & \alpha_0 + \alpha_1 Liquidity_{i,j,t} + \alpha_2 Administrative\ Cost_{i,j,t} + \alpha_3 NPLs_{i,j,t} + \\ & \alpha_4 Equity_{i,j,t} + \alpha_5 Bank\ Market\ Share_{i,j,t} + \alpha_6 Foreign\ Bank_{i,j,t} \\ & \alpha_7 Foreign_M\ \&\ A_{i,j,t} + \alpha_8 Foreign_M\ \&\ A \times Age_{i,j,t} + \\ & \alpha_9 Other_M\ \&\ A_{i,j,t} + \alpha_{10} Other_M\ \&\ A \times Age_{i,j,t} \\ & \alpha_{11} Foreign_De\ novo_{i,j,t} + \alpha_{12} Foreign_De\ novo \times Age_{i,j,t} + \\ & \alpha_{13} Foreign\ Bank\ Participation_{j,t} + \alpha_{14} Bank\ Concentration_{j,t} + \\ & \alpha_{15} Real\ Output\ Growth_{j,t} + \alpha_{16} Inflation_{j,t} + \alpha_{17} Short-Term\ Real\ Interest\ Rate_{j,t} + \\ & \alpha_{18} Argentina_{i,j,t} + \alpha_{19} Chile_{i,j,t} + \alpha_{20} Colombia_{i,j,t} + \alpha_{21} Mexico_{i,j,t} + \varepsilon_{i,j,t} \quad (1) \end{aligned}$$

where i is the bank id, j identifies the country, and t refers to the time period considered.

Equation (1) is motivated by the dealership model of bank spreads developed by Ho and Saunders (1981), extended by Allen (1988), Angbazo (1997) and others, and the firm-theoretical framework developed by Zarruck (1989) and Wong (1997).⁸ Both models predict that operating costs, regulatory costs, credit risks, and the market structure of the banking sector can affect spreads.⁹

In equation (1), the variable *Spread* is the difference between the implicit average interest charged on loans and the implicit average interest paid on deposits. In other words, the spread is

⁸ According to the dealership approach, banks are risk-averse dealers trying to balance loan and deposit markets, where loan requests and deposit flows are not necessarily synchronized. In this set up, bank spreads are interpreted as fees charged by banks for the provision of liquidity under transactions uncertainty. The firm theoretical model of banks assumes these operate in a static framework where the demand and supply for loans and deposits clears both markets.

⁹ A common limitation of the empirical applications of these frameworks is that market structure differences across countries have been modeled by including country dummies (see Saunders and Schumacher (2000), that is they have been implicitly assumed to be constant over time.

calculated by taking the total interest received by banks on loans during one quarter divided by the average loans for that period and subtracting from it the total interest paid on deposits throughout the quarter divided by average deposits. *Liquidity* is measured as the ratio of liquid to total assets. Liquid assets refer to cash and deposit balances in other banks (including reserve requirements at the central bank). High liquidity ratios, either self-imposed for prudential reasons or as a result of regulation (e.g., reserve or liquidity requirements), inflict a cost on banks since they have to give up holding higher yielding assets. To the extent that banks are able to transfer this opportunity cost to borrowers, spreads will rise with liquidity ratios.

Administrative Costs refers to the ratio of administrative expenses (including payroll and overhead) to average assets. If banks incur high administrative costs in the process of providing their services as intermediaries, they are likely to increase the spread they charge their customers. *NPLs* is the ratio of non-performing loans to total loans. This variable is intended to capture credit risk. Faced with higher credit risk, banks are likely to charge higher rates on their loans, as equity holders demand risk-adjusted returns. *Equity* refers to the share of bank equity to total assets. Holding large equity ratios either on a voluntary basis or as a result of regulation can be costly for banks. We would expect bank spreads to rise with this variable. *Market Share* is the ratio of each banks' loans to total system loans. To the extent that market shares get translated into market power, banks with higher shares of the market may be able to charge higher rates on loans. On the other hand, larger banks may be able to reap economies of scale and may pass on some of these benefits to their customers in the form of lower spreads.

Foreign Bank is a dummy that takes the value of 1 if a bank is foreign at each point in time. By introducing this variable, we can test whether the average spread for foreign banks is significantly different from the average spread for domestic institutions. That is, this variable

allows us to test for the “own effect” of foreign bank presence. *Foreign M&A* is a dummy variable that identifies those transactions where foreign banks increased their size or began operations within our sample by acquiring domestic banks. *Foreign de novo*, on the other hand, is a zero/one variable that captures those foreign banks that set up de novo operations in a given country. The purpose of including the latter two variables is to determine how the spreads for these banks compare with those that have been foreign since the start of the sample and how different modes of foreign bank entry and/or strategies to increase participation in local markets affect bank spreads.

We also control for other types of mergers and acquisitions, namely those involving domestic banks or foreign banks, by including the variable *Other_M&As*, which takes the value of 1 for those domestic or foreign banks that acquired an institution of the same type. Both M&A variables (i.e, *Foreign* and *Other*) plus the dummy identifying foreign de novo entry are interacted with *Age*, the time since entry (measured in years), to allow for the possibility that there is an adjustment period until banks can attain their desired level of spreads after they enter a new market or purchase/merge with a bank.

Foreign bank participation is the share of loans in the hand of foreign banks. This variable captures the dynamic impact of changes in the relative importance of foreign banks on the overall level of spreads. In other words, this variable is included to test whether there is a “spillover effect” arising from the presence of foreign banks in the system. *Banking sector concentration* measures the extent to which loans are concentrated on the hands of few banks within a system. In most of the estimations, we include three different measures of concentration, namely, the Herfindahl index – defined as the sum of squared loan market shares - plus the share of loans held by the top 3 and top 5 largest banks, respectively. We expect concentration

measures to have a positive impact on bank spreads, once we control for differences in cost ratios across banks. Furthermore, contrary to the literature on bank concentration and profitability, where a positive association between these variables can signal different things, we interpret a positive sign on bank concentration as an indication of greater market power and less competition in the banking sector.¹⁰

Given that the level of bank spreads can be affected by the macroeconomic environment in which banks operate, we control for the *Inflation* rate, the *Real output growth*, and a measure of the money market *Short-term Real Interest Rate*. Following Smith (2001), we include the inflation rate for two reasons. First, given that bank spreads are the difference between two nominal rates, if inflation shocks are not passed through to both rates equally fast, then spreads should reflect this. Second, Cottarelli and Kourelis (1994) have found that inflation can affect the flexibility of loan rates and therefore of bank spreads. The real growth of output variable could help pick up business cycle effects as those discussed by Bernanke and Gertler (1989) and Kiyotaki and Moore (1997). These studies suggest that changes in output can affect lending rates, and consequently spreads, because borrowers' creditworthiness is countercyclical. As output growth slows down, creditworthiness deteriorates and, other things equal, this is likely to be reflected in higher bank loan rates and, consequently, spreads. Finally, we include a measure

¹⁰ An extensive literature exists studying the impact of concentration on bank profitability (see Berger 1995 for a review). While the literature unanimously predicts a positive association between concentration and profitability, different theories exist explaining what is behind this result. The structure-conduct-performance theory argues that bank concentration signals market power and that a positive association between profits and concentration is unambiguously bad for the economy. A related theory is the relative market power hypothesis, which claims that only firms with large market share and differentiated products can obtain market power and are able to earn profits above normal. On the other hand the efficiency-structure hypothesis contends that larger concentration levels and market shares could reflect greater efficiency by the largest banks, which in turn are able to lower costs and obtain higher profits. While a problem of observational equivalence exists in interpreting the relation between bank concentration and profits, this issue should not arise in analyzing bank spreads. Relatively more efficient banks should be able to charge lower spreads, as a result of having lower costs. Consequently a positive association between bank spreads and concentration should signal greater market power and less competition in the banking sector.

of the short-term money market real interest rate to control for the marginal cost of funds faced by banks.

We obtained bank-level balance sheet and income statement data from the Superintendency of Banks in each of the countries in our sample. For Argentina, Chile, and Peru the data covers the period 1995-2000. For Colombia, we obtained data for 1997-2000. For Mexico, where a change in accounting standards does not allow us to use data before 1997, the sample studied is 1998-2001. The data frequency is quarterly in all cases. The corresponding bank authorities also provided detailed accounts on the foreign banks operating in each country at each point in time along with information on their mode of entry (e.g., via acquisitions or by de novo entry). They also supplied us with the list of mergers and acquisitions among domestic banks and between existing foreign banks.

Data on inflation, output growth, and the real short-term interest rate came from the IMF International Financial Statistics database. Table 2 contains a detailed description of the variables used in this paper together with means and standard deviations for each of them.¹¹

IV Empirical Results

Table 3 presents the estimation results for equation (1), analyzing the determinants of loan-deposit spreads for private banks in Latin America.¹² In particular, results are reported for all private banks and, separately, for domestic and foreign banks, respectively. Throughout, the t-statistics shown were calculated allowing standard errors to be correlated for observations

¹¹ Note that while Table 1 reports annualized spreads, Table 2 presents quarterly spreads, since the regressions are conducted with quarterly observations.

¹² Because the spreads charged by public banks may be subject to constraints due to direct subsidies and other political considerations, we do not include these banks in our sample. Also, since implicit bank spreads calculated from quarterly income and balance sheet data can be quite volatile, we exclude those observations in the top and bottom 5 percentile of the distribution of the change in bank spreads. The purpose of doing so is to avoid the possibility that outliers drive our results. However, eliminating these observations does not change the results described below.

corresponding to the same bank within a country (i.e., using clustered standard errors as described by Rogers, 1993).

The estimates reported in Table 3 were obtained pooling all countries in our sample (Argentina, Chile, Colombia, Mexico, and Peru). However, they are not intended to explain variations across countries. Instead, because they include country fixed-effects, they explain changes in spreads over time within a country. The purpose of pooling observations in this context is to increase the power of our estimations.¹³ At the same time, pooling assumes that the relation between bank spreads and its determinants can be characterized by the same coefficients for all countries. Thus, as part of our sensitivity analysis, we report and discuss below results in which we do not include all countries in the estimation.

The determinants of spreads may be categorized into three groups. First, bank-specific variables that include operational characteristics (such as liquidity, non-performing loans, and administrative costs), the bank's market share, whether it is foreign or domestic, whether the formation of the bank was the result of a merger or acquisition (M&A) or whether the bank was a new (*de novo*) entrant, and the interaction of bank's age with the foreign and M&A dummies.¹⁴ Second, system-wide measures of market structure, including the degree of foreign bank participation and concentration.¹⁵ And, finally, variables that control for the macroeconomic environment are inflation, real growth of production, and the real market interest rate.

¹³ For example, we are interested in analyzing if and how the mode of foreign bank entry, by merger and acquisition or by *de novo* entry, affects bank spreads. However, there are few such transactions in each country to study this question on a country by country basis.

¹⁴ To address the concern of possible reverse causality from spreads to bank's operational characteristics (such as liquid assets, non-performing loans, and market share), we also estimated similar regressions using one-quarter lags of these variables as regressors with virtually identical findings. To save space, this results are available upon request.

¹⁵ Because bank origin might be correlated with the degree of foreign bank participation (i.e., the larger the number of foreign banks, the more likely it is that foreign bank participation will be high) and bank market share might be positively associated with the level of system wide concentration, we reestimated the equations after excluding these

For the sample including all banks, among the bank-specific variables, bank liquidity and administrative costs have a positive and significant impact on bank spreads in all three specifications, corresponding to the different measures of concentration. Banks that either decide or are required by regulation to hold a high proportion of their assets in the form of liquid assets seem to charge higher spreads. This can be interpreted as banks' response to the fact that in holding higher liquidity ratios, banks forego a return on such assets. However, the impact of higher liquidity on bank spreads seems to be quantitatively small: a one standard deviation increase in liquidity raises spreads by 0.14 standard deviation. On the other hand, administrative costs have a larger impact on bank spreads: a one standard deviation change in administrative costs results in an almost 0.6 standard deviation change in spreads. As discussed below, administrative costs are influenced by macro country characteristics (inflation, growth, and domestic interest rates) and subsume their effects in these regressions, as a consequence of which the macro variables do not appear to have a direct influence on spreads.

Foreign banks, on average, charge lower spreads (0.5 percent lower per quarter) than their domestic counterparts. For foreign banks that enter through an M&A process, the full effect on spreads is the sum of the *Foreign Bank* dummy (which has a negative sign) and the *Foreign M&A* dummy (which has a positive sign). This sum is negative and statistically different from zero, as noted in the F-test reported at the bottom of Table 3. The estimated coefficients indicate that spreads for foreign banks that entered the system through acquisitions of domestic banks are 0.26 percent per quarter lower than those for domestic banks. Since the *Foreign de novo* dummy is also negative, its sum with the *Foreign Bank* dummy is a large negative, implying that while both types of foreign banks charge lower spreads than domestic banks, the *de novo* foreign banks

bank level variables to confirm the robustness of our findings. Our main findings remain unchanged. These results are available upon request.

charge much lower spreads (around 2.7 percent per quarter lower than those for domestic banks). The interactions between the mode of entry by foreign banks and the time since entry (*Age*) are never significant.¹⁶

Two factors could explain why the spreads charged by foreign banks that entered the market by acquiring domestic banks might differ from those of *de novo* entrants. First, *de novo* banks, interested in gaining market share, may be more willing to charge lower rates to reach their desired size. Second, the two types of foreign banks may be targeting different market segments. Dell’Ariccia and Marquez (2004) suggest that differences in the information available to banks influence who they lend to and the spreads they are able to charge. By virtue of being newcomers to the sector, *de novo* banks are likely to possess the least information about domestic borrowers and, hence, would have an incentive to focus on the more transparent segments of the market (i.e., where information about borrowers is most accessible). At the same time, since transparent market segments are likely to be more competitive, *de novo* banks would be required to charge lower spreads relative to those possible in other market segments. In contrast, foreign banks acquiring or merging with domestic banks would inherit proprietary customer information, allowing them to serve somewhat less transparent firms, in less contestable markets, where they might have some market power and the ability to charge higher spreads. Since both types of foreign banks charge lower spreads than their domestic competitors, it is possible that domestic banks are forced to increase their lending to the least transparent borrowers from whom they are able to obtain the highest spreads.¹⁷

¹⁶ Excluding these interaction terms does not change our results.

¹⁷ To test these speculations would require specific data on the portfolio of the different banks, which are not available at the present time in the detail that is necessary. As a second best alternative, we tried controlling for the share of loans to assets and the ratio of non-interest expenses to assets to take into account that some *de novo* banks might be investing in bonds and/or securities rather than lending. However, these variables never proved to be significant and in some cases reduced our sample size. Thus, these results are not reported here, but are available upon request.

Beyond their incentive and ability to charge lower spreads, do foreign banks have a “spillover effect” on the overall level of spreads? We test this possibility by investigating if the foreign bank participation variable (i.e., the share of loans held by banks that are at least 50 percent foreign owned) influences spreads. In our basic estimations on Table 3, the coefficient on this variable is statistically insignificant. This result could imply either that no spillover effect exists (lower spreads charged by foreign banks do not create sufficient pressure on other banks to lower their spreads, perhaps, because of market segmentation) or that the spillover effect operates mainly in an indirect manner. For example, through the impact of foreign competition on administrative costs, as we examine below. It is possible, of course, that because foreign bank participation is rising over time, the variable picks up mainly a time trend and does not speak to the issue of “spillovers.” We also explore this possibility below.

Finally, for the sample including all banks, higher bank concentration raises spreads significantly. Regardless of the measure of concentration included, spreads rise as a response to increases in bank concentration. A one standard deviation increase in concentration results in a 0.13 to 0.25 standard deviation change in bank spreads.¹⁸

In the rest of Table 3, we present estimations for the determinants of spreads among domestic banks only (columns 4-6) and foreign banks only (columns 7-9). We continue to find that liquidity and administrative costs have a positive impact on bank spreads, with administrative costs exercising the stronger influence, especially among foreign banks. Within the sample of domestic banks, we also find that those with higher market shares are able to charge lower spreads. This may point to the presence of economies of scale among large domestic banks. Within the group of foreign banks, the evidence for lower spreads charged by

¹⁸ In particular, a one standard deviation change in the share of loans held by the top 3 banks (top 5 banks) results in a 0.25 (0.13) standard deviation change in bank spreads. At the same time, a one standard deviation change in the Herfindahl index leads to a 0.20 standard deviation rise in bank spreads.

the new entrants is reaffirmed. Once again, changes in foreign bank participation do not seem to directly affect the overall level of spreads for domestic or foreign banks. Finally, as before, a rise in bank concentration leads to higher spreads, with the effect being particularly high and significant for domestic banks.

The spread estimations reported in Table 3 make three assumptions. First, by pooling observations across countries we are forcing the coefficients in the spread equations (except for the constant) to be the same for all countries. Second, we are also assuming that there are no structural shifts (over time) in the relation between bank spreads and their determinants. Finally, we are ignoring possible common shocks or time trends.

Because of the short time series at our disposal, we are unable to run separate regressions for each country and formally test the pooling assumption.¹⁹ However, we conduct alternative estimations to analyze the sensitivity of our results to this assumption. In particular, we obtain results excluding Mexico and Colombia, the countries with the shortest time series and with the lowest levels of foreign bank participation (see Table 4).²⁰ Reassuringly, the results are virtually the same for this smaller sample. Also, to mitigate the concern that our findings are driven by Argentina, the country with the longest time series, Table 4 also reports estimations excluding this country. Again, results remained largely unchanged.

To test for structural shifts in the relation between spreads and their determinants over time, we try two possibilities (see Table 5). First, we interact administrative costs (the most consistently significant variable across all spread specifications) with a dummy that equals one for the period 1999 and beyond. Second, to assess whether the impact of administrative costs on

¹⁹ Argentina is the exception, given its large number of banks. Results for Argentina yield the same results and conclusions as those for the panel. These results are available upon request.

²⁰ To save space in Tables 4 and 5 we only report estimations including the loan share of the three largest banks as a measure of concentration. However, regressions using the top 5 bank share and the Herfindahl index produce virtually the same results. These are available upon request.

bank spreads changed with the increase in foreign bank presence, we interact administrative costs with the foreign bank share. All interaction terms are always insignificant and our main results do not change.

To control for possible time trends, we repeat our spread estimations including quarterly time dummies (see Table 6). Most of our results remain unchanged, except that among domestic banks, the foreign bank share has a positive impact on spreads. One possible explanation for this result is that competition from foreign banks causes domestic banks to redirect their lending to more opaque borrowers to whom they can charge higher spreads. However, this finding does not imply that the net effect of foreign bank participation on domestic banks is to increase their spreads, since as discussed above, the presence of foreign banks can affect spreads indirectly through its impact on administrative costs. We turn to this issue next.

Table 7 presents the determinants of administrative costs (expressed as a ratio of total assets) for all banks and separately for domestic and foreign banks.²¹ The macro variables are now seen to be significant among domestic banks, unlike in the spreads equations. Inflation is negatively signed, suggesting that bank costs do not respond immediately to general inflation. Higher interest rates, which are a proxy for the marginal cost of capital, raise administrative costs.

In general, foreign banks appear to operate with lower costs relative to domestic banks. However, in the estimations including all banks, different types of foreign bank entry (via M&As or through de novo entry) do not seem to have differential effects on costs. On the other hand, in the specification for foreign banks, we find that those that entered through merger and acquisitions with domestic banks have higher costs than other foreign banks.

²¹ Again, recognizing the possibility of reverse causation from costs to market share, we reestimated the regressions with lagged values of the market share, with results that are the same as those described here. However, these estimations are available upon request.

Regardless of their origin, the overall level of foreign bank presence seems to exert a downward pressure on the administrative costs of all banks. Thus, despite evidence consistent with the hypothesis of market segmentation in our spreads results, foreign bank presence apparently generates sufficient competitive pressure to induce an all round lowering of costs.

However, if foreign bank entry is also associated with increased concentration, there may be an offsetting effect. Our results indicate that costs, indeed, go up with concentration. Note that unlike for spreads, where the influence of concentration was especially large for domestic banks, more concentration seems to raise costs all around in similar measure. This result is consistent with the notion that in more concentrated systems there is less pressure for banks to lower their administrative costs in order to offer more competitive spreads. Since bank concentration was also seen to raise spreads, it has a particularly powerful effect on the costs of intermediation.

As with the spreads estimations, we repeated the regressions dropping Argentina, Mexico and Colombia and adding time dummies. The results remain the same. To save space we do not report these results here, but they are available upon request.

V Conclusions

Our results show that foreign participation and concentration influence the spreads charged to borrowers--and hence the process of financial intermediation--in a complex manner. The overall effect depends on three channels of influence: the spreads charged by foreign banks relative to domestic banks, the “spillover” effects from the presence of foreign banks on both spreads charged and operating costs, and the concentration in the banking sector that has accompanied foreign entry.

First, foreign banks charge lower interest margins and potentially foster financial intermediation. New establishments (i.e., *de novo* banks) appear to operate with particularly low spreads. Whether such entry generates welfare gains is unclear since that will depend on whether the lower spreads charged are the consequence of a more aggressive pricing strategy or because *de novo* banks choose to lend only to the most transparent segments with high market contestability.

Second, greater foreign presence does not imply a general decline in spreads, but appears to influence the intermediation through lowering costs of operation. More widespread foreign bank presence is associated with cost reduction throughout the banking system. Possibly, a combination of demonstration effects and potential competition, with banks threatening to encroach on each others' customer base, generates the pressures for cost reduction that ultimately benefit bank clients. Thus, long-term benefits of foreign entry are likely to come from lower cost structures in the banking system.

Third, greater concentration raises spreads in an economically important manner. This is so especially for domestic banks. At the same time, concentration is also associated with higher administrative costs all around. The implication is that some part of the benefits of foreign entry may be offset where concentration levels also increase. As noted in the introduction, the consolidation that did occur in the banking sectors of the countries concerned was not necessarily related to foreign entry, although the fact that much of the entry was in the form of takeovers, rather than new establishments, did not help create more competition. For policymakers, this creates a challenge since more competition is desirable for lowering spreads, but could generate vulnerability where the "franchise" value of domestic banks is seriously eroded.

Finally, while we believe this paper adds to our understanding of the impact of foreign participation and concentration on the costs of financial intermediation in developing countries, more work in this area is clearly needed. Given the limited number of countries and short sample period we study, there is a need to extend the analysis in both these directions. Also, further research linking bank-level data with the banks' customer profiles would help to explain the apparent differences in the spreads charged by foreign and domestic banks, something that this paper speculates on but cannot answer definitively.

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Table 1: Bank market structure and spreads in Latin America 1995-2000

Country	Variables	1995	1996	1997	1998	1999	2000
Argentina	Total number of banks	141	122	115	106	96	90
	Number of foreign banks	32	32	35	38	38	40
	Foreign bank share (percent)	18.9	24.2	30.4	40.9	47.4	49.4
	Top 3 banks share (percent)	30.0	29.9	29.5	30.8	32.1	33.9
	Top 5 banks share (percent)	40.9	41.7	40.9	43.8	46.7	49.4
	Herfindahl index	483.3	489.6	482.6	545.3	605.5	656.7
	Average annualized spreads – all banks	15.2	11.4	10.6	11.9	12.7	12.3
	Average annualized spreads – domestic banks	16.7	12.8	12	13.5	15.2	14.2
	Average annualized spreads – foreign banks	11.3	8.2	7.6	9.4	9.4	10.2
Chile	Total number of banks	31	31	29	29	29	28
	Number of foreign banks	17	17	17	17	18	18
	Top 3 banks share (percent)	36.6	35.7	42.5	42.1	41.5	41.1
	Top 5 banks share (percent)	51.9	52.6	62.5	62.1	61.9	61.5
	Herfindahl index	788.8	796.3	982.8	973.1	961.2	949.8
	Average annualized spreads – all banks	4.8	4.5	4.6	4.6	4.5	5.1
	Average annualized spreads – domestic banks	4.8	4.5	4.5	4.3	4.5	6
	Average annualized spreads – foreign banks	4.7	4.4	4.6	4.9	4.5	4.6
Colombia	Total number of banks			33	33	28	27
	Number of foreign banks			13	14	12	10
	Top 3 banks share (percent)			29.5	31.5	32.3	29.9
	Top 5 banks share (percent)			44.1	47.4	50.2	47.3
	Herfindahl index			584.7	644.4	714.4	691.6
	Average annualized spreads – all banks			17	15.9	13.3	11.3
	Average annualized spreads – domestic banks			18.7	17.4	14.7	13
	Average annualized spreads – foreign banks			14.2	13.6	11.6	9.1
Mexico	Total number of banks				39	39	40
	Number of foreign banks				18	18	20
	Top 3 banks share (percent)				50.0	49.2	47.5
	Top 5 banks share (percent)				63.8	62.7	60.8
	Herfindahl index				1,108.0	1,055.5	1,078.2
	Average annualized spreads – all banks				4.3	8.8	7
	Average annualized spreads – domestic banks				4.2	8.0	7.3
	Average annualized spreads – foreign banks				4.4	9.8	6.7
Peru	Total number of banks	29	27	27	27	24	20
	Number of foreign banks	15	14	14	14	13	11
	Top 3 banks share (percent)	60.6	61.2	58.2	54.2	53.3	55.7
	Top 5 banks share (percent)	74.4	74.8	70.7	67.0	68.2	72.5
	Herfindahl index	1468.9	1517.3	1356.5	1203.9	1226.8	1316.4
	Average annualized spreads – all banks	15.7	17.7	15.6	12.8	10.5	9.5
	Average annualized spreads – domestic banks	17	16.6	14.5	12.2	10.9	10.5
	Average annualized spreads – foreign banks	13.3	19.4	17	13.6	9.9	8.4

Table 2: Definition of variables used and data descriptive statistics

Variable	Definitions	Source of original data	Mean	Standard deviation
Spread	Interest income received on loans (over total loans) minus interest expenses paid on deposits (over total deposits)	Bank superintendencies	0.025	0.016
Liquid assets (over total assets)	Cash and deposits with other banks (including the central bank)	Bank superintendencies	0.108	0.077
Non-performing loans (over total loans)	Loans considered to be non-performing by the banking authorities (in most cases 90 days overdue)	Bank superintendencies	0.109	0.151
Administrative costs (over total assets)	Includes payroll and other operating expenses	Bank superintendencies	0.016	0.0128
Foreign bank	Dummy equal to 1 when bank is at least 50% foreign owned	Bank superintendencies	0.412	0.492
Bank market share	Share of loans held by each bank to total loans	Bank superintendencies	0.024	0.043
Equity (over total assets)	Bank capital plus reserves	Bank superintendencies	0.145	0.116
Foreign M&A	Dummy equal to 1 for cases when a foreign bank acquired a domestic bank	Bank superintendencies	0.062	0.289
Foreign M&A×Age	Interaction of Foreign M&A with time (in fraction of years) since acquisition of a domestic bank by a foreign bank	Bank superintendencies	0.048	0.263
Foreign de novo	Dummy equal to 1 for foreign banks that entered the country by setting up de novo operations	Bank superintendencies	0.002	0.044
Foreign de novo×Age	Interaction of Foreign de novo with time (in fraction of years) since entry	Bank superintendencies	0.002	0.044
Other M&A	Dummy equal to 1 for domestic banks that acquired other domestic banks, or for foreign banks that acquired other foreign banks	Bank superintendencies	0.113	0.439
Other M&A×Age	Interaction of Other M&A with time (in fraction of years since entry)	Bank superintendencies	0.091	0.432
Foreign bank participation	Share of loans held by foreign banks (those that are at least 50% foreign owned)	Bank superintendencies	0.273	0.119
Top 3 bank share	Share of loans held by the top 3 banks in the system	Bank superintendencies	0.385	0.105
Top 5 bank share	Share of loans held by the top 5 banks in the system	Bank superintendencies	0.526	0.114
Herfindahl index	Sum of squared bank market shares	Bank superintendencies	794.405	325.403
Inflation	Rate of growth of the consumer price index	IMF International Financial Statistics	0.011	0.015
Real output growth	Rate of growth of industrial/manufacturing production	IMF International Financial Statistics	-0.011	0.054
Real interest rate	Money market rate – inflation	IMF International Financial Statistics	13.189	8.222

The spreads reported here are quarterly spreads as opposed to those shown in Table 1, which are annualized spreads.

Table 3: Panel estimations for bank spreads including all countries

Variables	All Banks			Domestic Banks			Foreign Banks		
	(3.1)	(3.2)	(3.3)	(3.4)	(3.5)	(3.6)	(3.7)	(3.8)	(3.9)
Liquid assets	0.028 (3.75)***	0.029 (3.86)***	0.028 (3.68)***	0.053 (4.77)***	0.054 (4.85)***	0.052 (4.72)***	0.02 (2.41)**	0.02 (2.50)**	0.02 (2.35)**
Non-performing loans	-0.001 (0.25)	-0.00113 (0.29)	-0.00095 (0.24)	0.000331 (0.08)	0.000179 (0.04)	0.000435 (0.11)	-0.0009 (0.08)	-0.0010 (0.09)	-0.0009 (0.08)
Administrative costs	0.653 (7.88)***	0.656 (7.94)***	0.652 (7.87)***	0.569 (7.73)***	0.573 (7.79)***	0.568 (7.71)***	0.74 (5.82)***	0.74 (5.85)***	0.74 (5.83)***
Foreign bank	-0.005 (3.92)***	-0.005 (3.93)***	-0.005 (3.93)***						
Bank market share	-0.014 (1.38)	-0.014 (1.37)	-0.014 (1.41)	-0.023 (2.00)**	-0.024 (2.01)**	-0.024 (2.02)**	0.05 (1.86)*	0.05 (1.85)*	0.05 (1.85)*
Equity	0.01 (1.59)	0.01 (1.61)	0.01 (1.60)	0.019 (1.35)	0.019 (1.37)	0.019 (1.35)	0.01 (0.85)	0.01 (0.87)	0.01 (0.86)
Foreign M&A	0.002379 (2.54)**	0.002377 (2.55)**	0.002439 (2.61)***				-0.00024 (0.16)	-0.00023 (0.16)	-0.00021 (0.14)
Foreign M&A x Age	0.000209 (0.22)	0.000228 (0.24)	0.000159 (0.17)				0.00 (1.35)	0.00 (1.39)	0.00 (1.33)
Foreign de novo	-0.022 (2.08)**	-0.022 (2.08)**	-0.022 (2.07)**				-0.02 (2.05)**	-0.02 (2.06)**	-0.02 (2.05)**
Foreign de novo x Age	0.007 (1.06)	0.008 (1.08)	0.007 (1.06)				0.01 (1.22)	0.01 (1.25)	0.01 (1.22)
Other M&A	0.000195 (0.25)	0.000152 (0.19)	0.000207 (0.26)	0.000599 (0.82)	0.000579 (0.79)	0.000616 (0.84)			
Other M&A x Age	0.000016 (0.03)	0.000048 (0.08)	0.000001 (0.00)	-0.00025 (0.37)	-0.00026 (0.38)	-0.00027 (0.40)			
Foreign share	0.002 (0.71)	0.002 (0.46)	0.001 (0.22)	0.005 (1.12)	0.003 (0.56)	0.003 (0.64)	0.00 (1.02)	0.00 (0.67)	0.00 (1.07)
Top 3 bank share	0.038 (3.03)***			0.05 (3.26)***			0.02 (1.16)		
Top 5 bank share		0.018 (1.83)*			0.032 (2.76)***			0.002 (0.11)	
Herfindahl index			0.000011 (2.82)***			0.000015 (3.17)***			0.00 (0.97)
Inflation	-0.002 (0.07)	0.005 (0.14)	-0.005 (0.13)	-0.023 (0.57)	-0.017 (0.41)	-0.027 (0.67)	0.01 (0.21)	0.02 (0.33)	0.01 (0.20)
Real growth of production	0.002 (0.78)	0.002 (0.67)	0.003 (0.96)	0.004 (0.98)	0.004 (0.87)	0.005 (1.14)	0.00 (0.26)	0.00 (0.30)	0.00 (0.18)
Real market interest rate	0.000014 (0.23)	-0.000004 (0.06)	0.00003 (0.48)	0.000068 (1.20)	0.000056 (0.96)	0.000089 (1.52)	-0.000034 (0.26)	-0.000055 (0.42)	-0.000027 (0.2)
Argentina	0.007 (1.78)*	0.002 (0.54)	0.007 (1.59)	0.014 (3.10)***	0.01 (2.45)**	0.013 (3.01)***	0.00 (0.35)	0.00 (0.56)	0.00 (0.21)
Chile	0.000009 0.00	-0.00442 (1.91)*	-0.00157 (0.63)	0.003479 (1.10)	-0.00104 (0.40)	0.001457 (0.54)	0.00 (0.16)	0.00 (1.18)	0.00 (0.46)
Colombia	0.02 (4.68)***	0.015 (3.95)***	0.018 (4.55)***	0.028 (5.79)***	0.023 (5.60)***	0.026 (5.78)***	0.01 (1.84)*	0.01 (1.25)	0.01 (1.73)*
Mexico	-0.013 (4.47)***	-0.014 (4.92)***	-0.013 (4.75)***	-0.009 (3.29)***	-0.01 (3.76)***	-0.009 (3.58)***	-0.02 (2.94)***	-0.02 (3.19)***	-0.02 (3.10)***
Constant	-0.00651 (0.85)	0.002967 (0.39)	0.000417 (0.07)	-0.0198 (2.21)**	-0.01382 (1.59)	-0.01089 (1.60)	-0.0004 (0.03)	0.01 (0.95)	0.004 (0.48)
Observations	2618	2618	2618	1539	1539	1539	1079.00	1079.00	1079.00
R-squared	0.52	0.52	0.52	0.53	0.53	0.53	0.48	0.48	0.48
F test, Foreign + Foreign M&A=0	5.39	5.41	5.19						
p-value	0.02	0.02	0.02						

Estimations include Argentina, Chile, Colombia, Mexico and Peru. Robust t-statistics (calculated allowing for clustered standard errors by bank) are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4: Panel estimations for bank spreads excluding some countries

Variables	Excluding Mexico and Colombia			Excluding Argentina		
	All banks	Domestic banks	Foreign banks	All banks	Domestic banks	Foreign banks
Liquid assets	0.031 (2.73)***	0.0603 (4.89)***	0.0056 (0.38)	0.021 (2.67)***	0.042 (2.66)**	0.018 (2.03)**
Non-performing loans	-0.0002 (0.04)	0.0012 (0.28)	0.0013 (0.10)	-0.011 (0.59)	0.005 (0.31)	-0.037 (1.75)*
Administrative costs	0.611 (5.71)***	0.5251 (7.28)***	0.713 (3.67)***	0.815 (5.81)***	0.922 (4.10)***	0.854 (5.53)***
Foreign bank	-0.0047 (3.26)***			-0.004 (2.68)***		
Bank market share	-0.027 (2.65)***	-0.034 (2.81)***	0.0209 (0.85)	-0.005 (0.45)	-0.014 (1.10)	0.065 (2.22)**
Equity	0.009 (1.35)	0.0245 (1.58)	0.0012 (0.21)	0.007 (0.91)	0.004 (0.21)	0.007 (0.97)
Foreign M&A	0.0023 (2.60)***		0.0004 (0.32)	0.002 (1.99)**		-0.002 (1.15)
Foreign M&A x Age	0.0001 (0.09)		0.0012 (1.02)	-0.00042 (0.55)		0.001 (0.67)
Foreign de novo	-0.0223 (2.15)**		-0.0184 (2.28)**			
Foreign de novo x Age	0.0073 (1.05)		0.0069 (1.24)			
Other M&A	0.0006 (0.76)	0.001 (1.46)		-0.003 (2.65)***	-0.001 (0.85)	
Other M&A x Age	-0.0001 (0.19)	-0.0004 (0.65)		0.001 (0.58)	0.001 (0.59)	
Foreign share	0.0046 (1.33)	0.0087 (1.71)*	-0.0034 (0.88)	-0.006 (1.52)	-0.007 (1.15)	-0.005 (1.23)
Top 3 bank share	0.0565 (4.16)***	0.0648 (3.83)***	0.0497 (2.39)**	0.027 (2.25)**	0.031 (2.26)**	0.015 (0.82)
Inflation	0.1036 (3.52)***	0.0572 (1.45)	0.1425 (3.72)***	-0.02 (0.52)	-0.03 (0.71)	-0.003 (0.04)
Real growth of production	0.000469 (0.18)	0.000805 (0.21)	-0.00125 (0.43)	0.002 (0.65)	0.003 (0.82)	-0.00009 (0.02)
Real market interest rate	0.0001 (1.93)*	0.0002 (2.23)**	0.0001 (1.12)	-0.00011 (1.45)	-0.0001 (1.57)	-0.0001 (0.79)
Argentina	0.0152 (3.12)***	0.0206 (3.93)***	0.0113 (1.73)*			
Chile	0.0039 (1.30)	0.0075 (2.15)**	0.0038 (0.81)	-0.002 (0.49)	0.002 (0.60)	-0.003 (0.53)
Colombia				0.02 (4.42)***	0.027 (5.37)***	0.012 (1.74)*
Mexico				-0.014 (4.87)***	-0.009 (3.65)***	-0.018 (3.28)***
Constant	-0.0211 (2.54)**	-0.0332 (3.23)***	-0.0173 (1.42)	0.003 (0.42)	-0.006 (0.71)	0.006 (0.48)
Observations	2188	1303	885	1342	695	647
R-squared	0.57	0.55	0.58	0.56	0.64	0.53

The estimations excluding Colombia and Mexico include: Argentina, Chile, and Peru. Those excluding Argentina, include: Chile, Colombia, Mexico, and Peru. Robust t-statistics (calculated allowing for clustered standard errors by bank) are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5: Panel estimations for bank spreads allowing for structural shifts

Variables	Interacting administrative costs With a dummy post 1999			Interacting administrative costs with foreign bank share		
	All banks	Domestic banks	Foreign banks	All banks	Domestic banks	Foreign banks
Liquid assets	0.0281 (3.74)***	0.0522 (4.70)***	0.0187 (2.32)**	0.028 (3.79)***	0.0514 (4.62)***	0.0198 (2.55)**
Non-performing loans	-0.0009 (0.23)	0.0005 (0.12)	-0.0002 (0.02)	-0.001 (0.25)	0.0004 (0.11)	0.0007 (0.06)
Administrative costs	0.6418 (6.24)***	0.5485 (7.35)***	0.7748 (3.98)***	0.6502 (4.60)***	0.4609 (3.98)***	0.8745 (3.56)***
Administrative costs x Dummy 1999-2000	0.0319 (0.39)	0.1051 (1.66)*	-0.0783 (0.46)			
Administrative costs x Foreign bank share				0.0099 (0.03)	0.4513 (1.37)	-0.5312 (0.87)
Foreign bank	-0.0052 (3.91)***			-0.0051 (3.95)***		
Bank market share	-0.0141 (1.39)	-0.0235 (1.99)**	0.0469 (1.79)*	-0.014 (1.38)	-0.0234 (1.98)**	0.0451 (1.69)*
Equity	0.0095 (1.59)	0.019 (1.36)	0.0043 (0.76)	0.0095 (1.58)	0.0194 (1.38)	0.0037 (0.65)
Foreign M&A	0.0025 (2.52)**		-0.0003 (0.22)	0.0024 (2.50)**		-0.0003 (0.20)
Foreign M&A x Age	0.0001 (0.11)		0.0018 (1.50)	0.0002 (0.22)		0.0018 (1.52)
Foreign de novo	-0.0215 (2.07)**		-0.0195 (2.06)**	-0.0217 (2.08)**		-0.0193 (2.17)**
Foreign de novo x Age	0.0073 (1.05)		0.0083 (1.26)	0.0075 (1.07)		0.0078 (1.23)
Other M&A	0.0002 (0.28)	0.0007 (0.90)		0.0002 (0.25)	0.0006 (0.86)	
Other M&A x Age	-0.000007 (0.01)	-0.00029 (0.42)		0.000015 (0.03)	-0.00029 (0.42)	
Foreign share	0.0009 (0.18)	-0.000027 (0.00)	-0.001 (0.15)	-0.0128 (4.45)***	-0.009 (3.35)***	-0.0159 (2.97)***
Top 3 bank share	0.0391 (3.06)***	0.0516 (3.37)***	0.018 (0.87)	0.0382 (3.01)***	0.0513 (3.36)***	0.0175 (0.90)
Inflation	-0.0012 (0.03)	-0.0213 (0.52)	0.0053 (0.09)	-0.0024 (0.07)	-0.0267 (0.66)	0.0046 (0.08)
Real growth of production	0.0017 (0.52)	0.0019 (0.46)	0.0002 (-0.04)	0.0023 (0.77)	0.0028 (0.72)	-0.0006 (0.16)
Real market interest rate	0.000013 (0.22)	0.000064 (1.13)	-0.00003 (-0.24)	0.000014 (0.23)	0.000068 (1.19)	-0.000029 (0.22)
Argentina	0.0078 (1.70)*	0.0151 (3.26)***	0.0009 (0.11)	0.0021 (0.39)	-0.003 (0.44)	0.0032 (0.42)
Chile	0.0002 (0.06)	0.0038 (1.21)	-0.0012 (0.24)	0.0074 (1.75)*	0.0143 (3.15)***	0.0013 (0.19)
Colombia	0.0207 (4.60)***	0.0292 (5.91)***	0.0118 (1.61)	0 (0.00)	0.0035 (1.12)	-0.0011 (0.23)
Mexico	-0.013 (4.75)***	-0.0095 (3.48)***	-0.0151 (2.96)***	0.0204 (4.65)***	0.0287 (5.92)***	0.012 (1.70)*
Constant	-0.0067 (0.87)	-0.0195 (2.20)**	0.0011 (0.09)	-0.0065 (0.85)	-0.0183 (2.10)**	0.0002 (0.02)
Observations	2618	1539	1079	2618	1539	1079
R-squared	0.52	0.53	0.48	0.52	0.53	0.49

These estimations include all countries: Argentina, Chile, Colombia, Mexico, and Peru. Robust t-statistics (calculated allowing for clustered standard errors by bank) are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Panel estimations for bank spreads including quarterly time dummies (not shown)

Variables	All banks			Domestic banks			Foreign banks		
	(6.1)	(6.2)	(6.3)	(6.4)	(6.5)	(6.6)	(6.7)	(6.8)	(6.9)
Liquid assets	0.0272 (3.59)***	0.0275 (3.64)***	0.027 (3.56)***	0.0525 (4.65)***	0.0531 (4.69)***	0.0523 (4.63)***	0.0181 (2.12)**	0.0185 (2.18)**	0.0181 (2.10)**
Non-performing loans	-0.0005 (0.12)	-0.0005 (0.13)	-0.0004 (0.09)	0.0012 (0.30)	0.0012 (0.29)	0.0013 (0.33)	-0.001 (0.09)	-0.001 (0.09)	-0.0009 (0.08)
Administrative costs	0.6424 (7.28)***	0.6446 (7.29)***	0.6424 (7.27)***	0.5498 (7.19)***	0.5506 (7.20)***	0.5488 (7.18)***	0.7338 (5.64)***	0.7372 (5.65)***	0.7347 (5.64)***
Foreign bank	-0.0051 (3.90)***	-0.0051 (3.91)***	-0.0051 (3.90)***						
Bank market share	-0.0141 (1.40)	-0.0141 (1.39)	-0.0143 (1.42)	-0.0239 (1.99)**	-0.0241 (2.00)**	-0.0242 (2.01)**	0.0467 (1.82)*	0.0468 (1.82)*	0.0467 (1.82)*
Equity	0.0095 (1.57)	0.0096 (1.59)	0.0095 (1.58)	0.0185 (1.29)	0.0186 (1.30)	0.0185 (1.29)	0.0049 (0.90)	0.005 (0.92)	0.005 (0.91)
Foreign M&A	0.0023 (2.50)**	0.0023 (2.50)**	0.0024 (2.57)**				-0.0001 (0.06)	-0.0001 (0.07)	-0.0001 (0.05)
Foreign M&A x Age	0.0002 (0.26)	0.0003 (0.34)	0.0002 (0.21)				0.0015 (1.31)	0.0016 (1.39)	0.0015 (1.30)
Foreign de novo	-0.0211 (2.04)**	-0.0214 (2.05)**	-0.0213 (2.06)**				-0.0185 (1.92)*	-0.0189 (1.94)*	-0.0187 (1.93)*
Foreign de novo x Age	0.0071 (1.00)	0.0075 (1.05)	0.0072 (1.01)				0.0075 (1.16)	0.0079 (1.22)	0.0076 (1.18)
Other M&A	0.0004 (0.45)	0.0003 (0.41)	0.0004 (0.47)	0.0007 (1.02)	0.0007 (0.98)	0.0008 (1.05)			
Other M&A x Age	-0.00002 (0.04)	0.000018 (0.03)	-0.000051 (0.09)	-0.000251 (0.36)	-0.000227 (0.33)	-0.000293 (0.42)			
Foreign share	0.0099 (1.51)	0.0109 (1.70)*	0.0077 (1.23)	0.0201 (2.64)***	0.0204 (2.72)***	0.0166 (2.30)**	-0.0071 (0.66)	-0.0057 (0.55)	-0.0076 (0.74)
Top 3 bank share	0.0386 (3.18)***			0.0489 (3.46)***			0.0216 (1.03)		
Top 5 bank share		0.0198 (2.09)**			0.0312 (3.03)***			0.0034 (0.20)	
Herfindahl index			0.000011 (2.99)***			0.000015 (3.49)***			0.000005 (0.78)
Inflation	-0.0048 (0.12)	0.0022 (0.05)	-0.0078 (0.19)	-0.0489 (1.04)	-0.0425 (0.90)	-0.054 (1.14)	0.0474 (0.67)	0.0538 (0.76)	0.0475 (0.68)
Real growth of production	-0.0056 (1.71)*	-0.0057 (1.70)*	-0.0046 (1.37)	-0.0057 (1.34)	-0.0058 (1.33)	-0.0046 (1.06)	-0.0037 (0.71)	-0.0039 (0.74)	-0.0033 (0.61)
Real market interest rate	0.000003 (0.04)	-0.00002 (0.28)	0.000019 (0.27)	-0.000003 (0.04)	-0.000019 (0.26)	0.000023 (0.30)	0.000014 (0.10)	-0.000012 (0.09)	0.000016 (0.11)
Argentina	0.0066 (1.70)*	0.0015 (0.41)	0.006 (1.55)	0.0112 (2.60)**	0.0067 (1.81)*	0.0111 (2.65)***	0.0037 (0.57)	-0.0014 (0.23)	0.0024 (0.36)
Chile	-0.0004 (0.15)	-0.0048 (2.17)**	-0.002 (0.80)	0.002 (0.67)	-0.0027 (1.08)	0.0004 (0.14)	-0.0005 (0.09)	-0.0039 (1.01)	-0.0018 (0.42)
Colombia	0.0199 (4.53)***	0.0146 (3.70)***	0.0177 (4.44)***	0.0288 (6.06)***	0.0236 (5.69)***	0.0265 (6.27)***	0.0107 (1.41)	0.0058 (0.86)	0.0087 (1.25)
Mexico	-0.0108 (3.10)***	-0.012 (3.40)***	-0.0111 (3.18)***	-0.0047 (1.52)	-0.0057 (1.88)*	-0.005 (1.64)	-0.0172 (2.59)**	-0.0186 (2.76)***	-0.0177 (2.65)***
Constant	-0.0091 (0.88)	-0.0012 (0.12)	-0.0028 (0.30)	-0.0265 (2.51)**	-0.0207 (2.03)**	-0.0191 (2.09)**	0.0044 (0.24)	0.0142 (0.75)	0.0094 (0.58)
Observations	2618	2618	2618	1539	1539	1539	1079	1079	1079
R-squared	0.53	0.53	0.53	0.54	0.54	0.54	0.49	0.49	0.49

These estimations include all countries: Argentina, Chile, Colombia, Mexico, and Peru. Quarterly time dummies are included in all regressions, but not shown to save space. Robust t-statistics (calculated allowing for clustered standard errors by bank) are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 7: Panel estimations for administrative costs including all countries

Variables	All Banks			Domestic Banks			Foreign Banks		
	(7.1)	(7.2)	(7.3)	(7.4)	(7.5)	(7.6)	(7.7)	(7.8)	(7.9)
Foreign bank	-0.0029 (2.57)**	-0.0029 (2.57)**	-0.0029 (2.57)**						
Bank market share	-0.0546 (4.57)***	-0.0548 (4.58)***	-0.0549 (4.58)***	-0.0321 (3.12)***	-0.0322 (3.13)***	-0.0323 (3.14)***	-0.085 (2.76)***	-0.0853 (2.75)***	-0.0856 (2.77)***
Foreign M&A	0.0017 (1.52)	0.0017 (1.50)	0.0018 (1.56)				0.003 (2.31)**	0.003 (2.29)**	0.0031 (2.34)**
Foreign M&A x Age	0.000397 (0.16)	0.000353 (0.14)	0.000316 (0.13)				0.000027 (0.01)	-0.000046 (0.02)	-0.000029 (0.01)
Foreign de novo	0.0116 (0.70)	0.0115 (0.70)	0.0115 (0.70)				0.0133 (0.81)	0.0132 (0.80)	0.0132 (0.80)
Foreign de novo x Age	0.0035 (0.39)	0.0035 (0.39)	0.0035 (0.39)				0.003 (0.33)	0.003 (0.33)	0.003 (0.34)
Other M&A	0.0015 (2.83)***	0.0015 (2.79)***	0.0015 (2.87)***	0.0011 (2.06)**	0.001 (2.03)**	0.0011 (2.12)**			
Other M&A x Age	-0.001 (2.24)**	-0.001 (2.24)**	-0.001 (2.28)**	-0.0007 (1.41)	-0.0007 (1.40)	-0.0007 (1.48)			
Foreign share	-0.0165 (4.97)***	-0.0183 (5.51)***	-0.0185 (5.67)***	-0.0209 (4.45)***	-0.0226 (4.80)***	-0.0233 (5.01)***	-0.009 (2.02)**	-0.0113 (2.46)**	-0.0104 (2.41)**
Top 3 bank share	0.0448 (5.75)***			0.0411 (4.10)***			0.0503 (4.08)***		
Top 5 bank share		0.0278 (4.79)***			0.0249 (3.18)***			0.0338 (3.81)***	
Herfindahl index			0.000014 (5.72)***			0.000014 (4.56)***			0.000013 (3.34)***
Inflation	-0.026 (1.57)	-0.0185 (1.12)	-0.0285 (1.69)*	-0.0698 (3.47)***	-0.0623 (3.18)***	-0.0748 (3.59)***	0.0314 (1.08)	0.0387 (1.32)	0.0323 (1.09)
Real growth of production	-0.0106 (3.99)***	-0.0109 (4.05)***	-0.0098 (3.77)***	-0.0173 (4.46)***	-0.0178 (4.48)***	-0.0164 (4.29)***	-0.0029 (0.81)	-0.0031 (0.85)	-0.0023 (0.64)
Real market interest rate	0.000113 (3.16)***	0.0001 (2.85)***	0.000135 (3.59)***	0.000167 (3.55)***	0.000154 (3.37)***	0.000193 (3.97)***	0.000027 (0.54)	0.000013 (0.27)	0.000042 (0.79)
Argentina	0.015 (4.78)***	0.011 (3.79)***	0.015 (4.87)***	0.019 (6.29)***	0.0151 (5.42)***	0.0204 (6.83)***	0.0099 (1.75)*	0.0061 (1.17)	0.0077 (1.42)
Chile	-0.0075 (3.09)***	-0.0119 (5.62)***	-0.0089 (3.95)***	-0.0056 (2.76)***	-0.0097 (6.22)***	-0.0061 (3.41)***	-0.0105 (2.31)**	-0.0151 (3.66)***	-0.0132 (3.12)***
Colombia	0.003635 (1.37)	-0.00146 (0.64)	0.001709 (0.72)	0.004937 (1.88)*	0.000041 (0.02)	0.004434 (1.94)*	0.002926 (0.62)	-0.00211 (0.51)	-0.00107 (0.26)
Mexico	0.0026 (0.85)	0.001238 (0.40)	0.002388 (0.82)	-0.000028 (0.01)	-0.00139 (0.74)	0.000251 (0.13)	0.004398 (0.78)	0.003138 (0.55)	0.003509 (0.66)
Constant	-0.0025 (0.49)	0.0039 (0.81)	0.0043 (1.03)	-0.0033 (0.56)	0.0031 (0.55)	0.0008 (0.18)	-0.006 (0.70)	-0.0005 (0.06)	0.005 (0.70)
Observations	2982	2982	2982	1752	1752	1752	1230	1230	1230
R-squared	0.36	0.36	0.37	0.40	0.40	0.40	0.36	0.36	0.36
F test, Foreign + Foreign M&A=0	0.86	0.85	0.74						
p-value	0.36	0.36	0.39						

These estimations include observations for Argentina, Chile, Colombia, Mexico, and Peru. Robust t-statistics (calculated allowing for clustered standard errors by bank) in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.