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**Contract Rights and Risk
Aversion: Foreign Banks
and the Mexican Economy,
1997-2004**

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Contract Rights and Risk Aversion: Foreign Banks and the Mexican Economy, 1997-2004

By Stephen Haber and Aldo Musacchio**

Abstract:

In 1997 Mexico allowed foreign banks unrestricted entry to the market. What impact did foreign mergers and acquisitions have on Mexico's banks? We find that all banks in Mexico have become increasingly risk averse, and that foreign banks are even more so. Foreign banks grant less credit, screen loans more intensively, and charge lower interest rate spreads. The cause is Mexico's weak contract rights environment. One would normally associate risk aversion with lower profits. We find, however, that foreign banks are more profitable than domestically owned banks because their market power allows them to charge higher service fees than domestic banks.

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In recent years, governments around the world have been opening up their banking systems to foreign competition. Academics and policymakers have therefore been exploring the impact of foreign bank entry on the efficiency and profitability of banking systems. The consensus view in the literature is that foreign entry has a positive effect on the efficiency of banking systems because it increases the contestability of markets. Most studies conclude that foreign entry reduces administrative costs and lowers net interest margins. Foreign entry therefore drives down bank rates of return.¹

Nevertheless, as Clarke, Cull, Martinez Peria, and Sánchez (2003) note, much of what we know comes from cross-country studies that are heavily weighted toward developed economies. As yet, there are very few detailed case studies of developing countries. This is particularly crucial, because the extant literature suggests that the impact of foreign entry varies with the level of economic development (Lenisk and Hermes 2004).

We therefore offer a detailed study of the impact of foreign entry in Mexico. We note that the Mexican case is of particular interest to scholars because of the rate at which foreign banks entered, and the extent to which they control, the market. Mexico had severely restricted foreign bank operations since the 1880s. In the wake of the banking system collapse of 1995-96, however, the government completely reformed the country's banking laws, allowing foreign banks to operate without restriction.² The reform set off a wave of

¹ For representative works see: Berger and Humphrey 1997; Demirgüç-Kunt and Huizinga 1998; Denizer 1999; Clarke, Cull, D'Amato, Molinari 1999; Barth, Caprio, and Levine 2000; Berger, DeYoung, Genay and Udell 2000; Barajas, Steiner and Salazar 2000; Claessens, Demirgüç-Kunt, and Huizinga, 2001; Levine, 2002; Mian 2003; Clarke, Cull, Martinez Peria, and Sánchez 2003, 2004; Lenisk and Hermes 2004; Demirgüç-Kunt, Laeven, and Levine 2004; Martinez Peria and Mody 2004; Sturm and Williams, 2004.

mergers and acquisitions that put all of Mexico's large commercial banks in the hands of Spanish, Canadian, British, and U.S. firms. At the time that these reforms went into effect in early 1997, foreign banks controlled 16 percent of Mexican bank assets. By December 2004, foreign-owned banks accounted for 83 percent of bank assets. (See Table 1).

What effects did the purchase of Mexico's largest banks by foreign firms have on their efficiency, lending strategies, and financial performance? In order to answer this question we construct a panel data set and compare the banks that were acquired or merged with foreign banks (which we denote as Foreign MA banks) to their domestically-owned competitors in two dimensions: those same banks before they switched to foreign ownership; and the set of banks that were domestically owned throughout the entire period under study.

The analysis we present contains some surprising answers to these questions. The evidence indicates that both domestically-owned and Foreign MA banks have become increasingly risk averse, allocating progressively less of their assets to loans for private consumption and investment. In December 1997, loans to households and business enterprises accounted for 50 percent of bank assets. The ratio of lending to assets then declined monotonically, reaching 30 percent in March 2004. It then recovered slightly, reaching 34 percent by December 2004. This decline is not just relative to the size of assets, it is an absolute decline in real terms (real non-government lending in December 2004 was eight percent below what it had been in December 1997). This result is particularly striking inasmuch as Mexico's banks in 1997 were still in the midst of recovery from the 1995-96 collapse. Indeed, real lending in December 2004 was less than half its December 1994 level.

² Until the 1997 reform, foreign ownership had either been entirely prohibited or had been subject to strict limits (Maurer 2002; Del Angel Mobarak 2002; Murillo 2002).

Within this general context of risk aversion, we also find, however, that Foreign MA banks tend allocate even less of their assets to loans for private consumption and investment than do domestically-owned banks.

The risk averse strategy of Foreign MA banks carries over into how they screen loans and price credit. We find that Foreign MA banks have much lower ratios of non-performing loans, which suggests more intensive screening. We also find that Foreign MA banks charge lower interest rate spreads than domestically-owned banks, which suggests that they price credit so as to attract the borrowers with the lowest default risk.

One would normally associate such a strategy of risk aversion with lower profitability. We find, however, that Foreign MA banks actually earn higher rates of return on equity than domestically-owned banks. The evidence also indicates that the higher profitability of foreign banks is not a product of greater administrative efficiency. Rather, the surprising ability of Foreign MA banks to earn higher rates of return with more risk averse strategies is a product of their market power, which allows them to charge higher fees and commissions for account maintenance and other services than their domestically-owned competitors (who, we hasten to note, have been increasing their fees and commissions as well).

Why Are Banks Risk Averse?

Readers may wonder why Mexican banks in general—and Foreign MA banks in particular—follow risk averse lending strategies. Why not grab market share (and increase rates of return in the process) by lowering service fees and making more loans? We argue that the risk averse strategies of banks are an outcome of Mexico's weak contract rights environment.

For most of Mexico's history, banks were essentially the financial arms of family-run industrial and commercial conglomerates. They provided little credit to arm's length borrowers. (Del Angel Mobarak 2002; Maurer and Haber 2004). The Mexican government expropriated this private banking system in 1982, using it as a vehicle to finance fiscal deficits. The government then privatized the banking system in 1991, by selling the banks to private investors at auction.

The owners of the privatized banks therefore inherited operations whose internal systems of credit analysis were virtually non-existent. They could also not draw on private credit reporting: the first private credit bureaus were not founded until 1993, and it was not until 1995 that rules were established governing their operation. (Mackey 1999; Negrin 2000).³ Making a bad situation worse, the owners of the privatized banks found that they could not easily repossess collateral. Bankruptcy procedures in Mexico are cumbersome in the extreme, which allows debtors can forestall the recovery of collateral for years. (Mackey 1999: 101).

Mexican banks and the Mexican government have, since the late 1990s, therefore carried out a series of reforms designed to make it easier to assess default risk and repossess collateral. First, a private credit bureau now exists, although it does not yet provide banks with the range or quality of information that is typically available in developed economies. (Negrin 2000). Second, banks (working with the executive and legislative branches of the government) have carried out a series of institutional innovations whose purpose is to sidestep

³ During the immediate post-privatization period (1991-95), Mexico's bankers were not terribly concerned about their inability to assess risk, because little of their own capital was actually at risk. Much of it, as Mackey (1999) has shown, had been borrowed—from the banking system itself, which created incentives to behave recklessly.

the country's inefficient bankruptcy courts by placing assets being collateralized outside of an individual's or firm's bankruptcy estate.

One example of this type of institutional innovation in Mexico has been “lease to own” contracts in automobile financing. Under these arrangements, a borrower does not technically purchase a car with financing from a bank. Instead, the bank purchases the car, and then “leases” it to the borrower. The depreciation rate and interest rate used to calculate the lease payments are then structured so that the bank recoups its principal and interest during the period of the lease. When the lease expires, the title passes to the borrower. Until that point, however, the bank holds title to the car, and can seize it as soon as a lease payment is missed.

A second example of this type of innovation was a 2001 reform of mortgage contracts that replaced liens on property with bilateral trusts—in which the bank is both the trustee and beneficiary of the trust. (Caloca González ND). When payments are missed, the bank can evict the debtor and sell the house at auction. Debtors can legally contest the repossession, but they are unable to remain in the house during that process, which gives them strong incentives to negotiate an amicable repossession with the bank.

The fundamental problem for Mexico's banks is that some types of assets are easier to assign to creditors than others. The ease with which an asset can be assigned depends on a number of criteria. The first is the degree to which the asset is tangible and identifiable. The second is the degree to which the asset has ongoing value (assets that depreciate quickly or are used up in production work less well than assets that depreciate slowly). The third is the degree to which there is a liquid market for that asset. The fourth is the cost of repossessing an asset relative to its market value. The farther an asset moves from being tangible, identifiable,

long-lived, liquid, and inexpensive to repossess, the more difficult it will be to assign it in a credit contract.

In societies with efficient legal systems, these constraints tend not to be binding. Precisely because the cost of legal enforcement is low, all kinds of intangible assets can be assigned to creditors (Kieff and Paredes 2004). In societies with inefficient legal systems, however, these constraints are binding.

At one end of the spectrum are assets such as automobiles. These are tangible, identifiable (by VIN number), have ongoing value, and can be sold in a liquid market for used cars. Moreover, the cost of repossessing a car (the rental rate of a tow truck, two pairs of large biceps, and a baseball bat) is low relative to the value of the asset.

Assets in the form of real property, however, are more difficult to assign to creditors. In the first place, Mexico does not have an efficient (or accurate) real property register. Thus, there is typically uncertainty about whether a borrower has clear title. (Joint Center for Housing Studies 2004). In addition, borrowers can draw on a number of legal and extra-legal institutions to frustrate the enforceability of the new system of bilateral housing trusts, thereby raising the costs of repossession relative to the value of the house. For example, debtors can “lease” a house to a family member, who then cannot be removed by the bank because she is protected by Mexico’s favorable renters’ laws. The bank can, of course, repossess the house, but it must do so with the “renter” in it. When the bank puts up the house for auction, as the law specifies, the price it receives reflects the stream of rent available from the rental contract. Given that the contract between the owner and family member is typically fictitious in the first place (the mortgagee actually occupies the house) the net present value of the stream of rent is likely be far less than the market value of the house were it unencumbered by the rental

agreement. Moreover, the renter/borrower has incentives, once the bank has taken ownership of the house, to engage in activities (such as vandalism) that reduce the house' market value. Alternatively, debtors can pay a bribe or organize a public demonstration when the police come to enforce a court-ordered repossession. As a consequence, many court orders are not enforced.⁴

The assignment of assets works least well as an enforcement mechanism for commercial loan contracts. Some types of commercial assets closely meet the criteria of easily assignable assets—and thus can be financed through lease or bilateral trust arrangements. For example, trucks, cranes, and earthmoving equipment are tangible, individually identifiable, depreciate slowly, have secondary markets, and can be repossessed by driving them off the property. Other commercial assets, however, have characteristics that make them difficult to assign. Receivables, for example, are not tangible and can be difficult to identify.⁵ Inventories of raw materials or output, to cite another example, are near impossible to identify individually (is the pile of coal that has been assigned the one in warehouse A or the one in warehouse B?). Moreover, inventories of raw materials are used up in production. Even most production machinery departs from the criteria for easy

⁴ The police prefer not to subdue such demonstrations, because of the possibility that they will escalate into violence. Neighbors chose to participate in such demonstrations because they know that, should their loans go into default, the rest of the neighborhood will demonstrate on their behalf. As a consequence, non-bank financial entities that specialize in housing loans (known by the Spanish acronym, SOFOL) send agents directly to the homes of debtors immediately after a payment is missed. If they think that there is a high probability that the debtor will be unable to make the payment, they will then pay the debtor to vacate the house, rather than go through the lengthy legal process of foreclosure and repossession.

⁵ Firms can write sales contracts in such a way that their income is not credited to the category of receivables that has been assigned, but to some other category. The assignee can, of course, use the legal system to undo this subterfuge, but that presupposes the existence of an efficient legal system.

assignability. Production machines can, of course, be identified individually and they tend to depreciate slowly. The problem is that most machines are designed for specific tasks in a specific setting. As a result, they do not always have liquid secondary markets. Moreover, much of the cost of these machines is embodied in their installation, not in the cost of the machine per se. In short, much production machinery tends to be expensive to remove relative to its value in a secondary market.

Differences in the degree of assignability of collateral are compounded by differences in the ease with which banks can obtain information about borrowers' creditworthiness. Since 1995, Mexico's new private credit bureau has been gathering data on consumers and business enterprises. Nevertheless, it is far easier to track consumers than it is businesses. Consumers cannot (easily) change their identities. Business enterprises, especially small and mid-sized sole proprietorships and partnerships, can change their corporate identities virtually at will.

Confronted by these constraints, Mexican banks backward induct. They are eager to make easy-to-enforce loans for automobiles (and other consumer durables). They are quite a bit less eager to make loans on residential property, unless borrowers meet very stringent criteria. They are extremely reluctant to grant credit for commercial purposes.

Foreign MA banks follow the same general strategy as domestically-owned banks, but are even more risk averse. The difference is in degree, not of kind. One reason for this difference has to do with the process by which loans are screened. Foreign MA banks have local screening committees, but their recommendations are usually forwarded to the bank's home office, where the loan applications are vetted again. This second level of screening works to weed out loans that the local committee might deem acceptable, because of their

specialized knowledge of the local market or of individual borrowers, but which do not meet the bank's standards, strictly speaking.

Methods

This paper builds upon a broad literature on the relationship between banking market structure, foreign bank entry, and bank performance.⁶ We draw, in particular, on the methods developed by Martinez Peria and Mody (2004) in their study of the impact of foreign ownership and market concentration on interest rate spreads in Latin American banks.⁷

We build upon and go beyond the extant literature in three ways. First, most studies of the impact of foreign bank entry lump all foreign banks together.⁸ This is problematic, because there are actually two different types of foreign banks operating in most countries: representation offices or small subsidiary operations of foreign banks that specialize in making large loans to blue chip corporations or providing investment banking services; and foreign-owned commercial banks that provide a broad range of consumer, small business, and housing loans, as well as engage in investment banking. We therefore truncate our data set, removing those foreign banks that are engaged in boutique banking. We note that these

⁶ For representative works on the impact of foreign bank entry, see footnote 1.

⁷ One criticism that is made of these methods is that they assume that the price of financial services is dictated solely by the supply of credit. (Demand for credit enters into the regressions only as control variables for inflation, GDP growth, or the money market interest rate). We note that this criticism loses much of its force when the case under study is unambiguously in the midst of a credit crunch. The existence of a credit crunch in Mexico has been econometrically demonstrated by González Anaya 2003.

⁸ Martinez Peria and Mody 2004 is a notable exception.

boutique banks accounted, on average, for only four percent of Mexico's bank assets during the period under study.⁹

Second, the detailed nature of our data set means that we can estimate regressions with more precision than is generally the case in the literature. We can, in particular, control for the allocation of assets among different types of loans, as well as between loans and investments in securities.

Third, the detailed nature of the data allows us to address a range of questions that are usually not examined in the literature. Most studies focus on two issues: the impact of foreign entry on administrative efficiency and interest rate spreads (net interest margins). Some studies also address bank rates of return. We are able to explore these issues, and, in addition, explore the impact of foreign entry on borrower screening and portfolio allocation.

Phases of Foreign Bank Entry: Methodological Implications

There were three phases of foreign entry into the Mexican market, and these have implications for how we construct and code the data set. In the first phase, which took place from 1991 to 1995, foreign banks set up representation offices or subsidiaries in Mexico. These operations tended to be very small, specialized in investment banking or corporate lending, and had client lists that typically were composed of a few dozen very large firms. Following Martinez Peria and Mody (2004) we code these banks as "Foreign de Novo." We

⁹ Inasmuch as Foreign de Novo banks disappear as reporting units from our data set when their parent firms purchase a Mexican bank (which are then coded as Foreign MA), leaving the Foreign de Novo banks in the panel decreases its balance. We note that our results are not materially affected, however, by separately coding the Foreign de Novo banks and including them in the regressions.

exclude them from our analysis because they produced different products and competed in different markets from domestic banks.¹⁰

In the second phase of foreign bank entry, which largely took place during 1996, some Foreign de Novo banks purchased small domestic banks and established themselves as retail lenders. The impact of these mergers was fairly limited: as late as December 1996, the combined market share of these Foreign MA banks was only four percent. Nevertheless, these Foreign MA banks operated in the same markets as domestically owned banks. We include these Foreign MA banks in our analysis.

The third phase of foreign entry took place from 1997 to 2004, when changes in regulations allowed Mexico's largest banks to be acquired by foreign banks. These mergers and acquisitions include the purchase of Banco Confia by Citibank in 1998, the purchase of Inverlat by Scotiabank in 2000, the purchase of Banca Serfin by the Banco de Santander in 2000, the purchase of Bancomer by the Banco de Bilbao y Vizcaya in 2000, the purchase of Banamex by Citibank in 2002, and the purchase of Banco Bital by HSBC in 2002.

In an ideal world, we would begin our analysis prior to the entry of any Foreign MA bank—which is to say 1996 or before. Instead, we begin our analysis in September 1997, and do so for two reasons. First, the macroeconomic instability of 1995-96, coupled to widespread debtor defaults and ensuing bank interventions by the government, means that we would not expect stable relationships among variables across the periods 1995-96 and 1997-2004. Second, as a consequence of the insolvency of many banks in 1995-96, the government carried out a reform of bank accounting standards that was not fully implemented until the last

¹⁰ We note that the addition of these banks to our data set, and the addition of a dummy variable to control for their different characteristics, does not have a material effect on the regression results.

two quarters of 1997. It is therefore difficult to link 1995-96 accounting categories with those from 1997-2004. (Del Angel-Mobarak, Haber, and Musacchio 2004).¹¹

Nevertheless, our data set captures the period in which the greatest changes in Mexican bank ownership occurred. At the beginning of the period under study (September 1997), only three of Mexico's 19 reporting banks were Foreign MA (GE Capital Bank, Banco Bilbao Vizcaya, and Santander Mexicano). These three banks accounted for only 13.9 percent of bank assets (Foreign de Novo banks accounted for an additional 1.7 percent). At the end of the period under study, seven of Mexico's 19 reporting banks were Foreign MA (GE Capital Bank, Santander Mexicano, Santander Serfin, Bital, Banamex, BBV Bancomer, ScotiaBank Inverlat). These seven banks controlled 78.4 percent of bank assets. Foreign de Novo banks accounted for an additional 4.8 percent of assets. (See Table 1).

Variables:

Capturing the marginal impact of changes in ownership from domestic to Foreign MA requires that we employ a series of dummy variables and interactions of those dummies with time. The panel procedure that we employ tracks each bank across each cross section, by giving it a unique identification code. As a first step in capturing changes in ownership of banks, we add a Foreign MA dummy variable, which takes a value of 0 if a bank is domestically owned, and a value of 1 if that bank is acquired or merged with a foreign bank.¹²

¹¹ The most difficult problem in linking accounting categories across the two periods has to do with the treatment of non-performing loans. Prior to 1997, Mexico's banks had been allowed to roll over the principal of non-performing loans. In 1997, the CNBV required banks to either allocate these evergreen loans to their performing loan portfolios or declare them as non-performing. The process of reallocating these loans was not complete until September 1997.

¹² Our coding rule was as follows. Foreign MA was coded as 1 if a foreign bank purchased a controlling interest in a domestic Mexican bank. This usually meant the merger of a small

The interpretation of the coefficient on *Foreign MA* is straightforward in those cases in which the bank changed ownership (from domestic to Foreign MA) prior to our first observation (September 1997), but it is not straightforward for those banks that changed ownership during the period after September 1997. One interpretation of the *Foreign MA* dummy would be that it captures the change in the behavior or performance of a bank after it is purchased by a foreign firm. Another interpretation, however, would be that the bank had already changed its behavior or performance in order to make itself an attractive target for acquisition by a foreign firm. Given that the *Foreign MA* dummy by itself is just picking up differences in the means of domestic and Foreign MA banks, the quarters in which the domestic bank was changing its behavior would be masked by the data for that bank from earlier quarters.

We therefore added a second dummy variable, *Foreign MA Expected*, for those banks that changed ownership after September 1997. *Foreign MA Expected* receives a value of 1 for the eight quarters prior to the change in ownership to *Foreign MA*, and then continues to be coded as 1 for as long as the bank is coded as *Foreign MA*. The simultaneous use of the two dummies (*Foreign MA Expected* and *Foreign MA*) allows us to differentiate between attempts by banks to make themselves attractive acquisition targets from changes in their behavior or performance once they have been acquired. We note that the difference between Foreign MA and domestic banks is the sum of the coefficients on both dummy variables.

One might argue that the impact of foreign acquisition might be occurring over time. Our dummy variables, however, are measuring differences in means. We therefore interact

Foreign de Novo bank with a larger domestic bank. At this point, the foreign de novo bank almost always ceases to exist as an independent reporting unit. The domestic bank continues to exist as a reporting unit, and we code it as Foreign MA.

Foreign MA with time (measured as the number of quarters since the bank was acquired), which we denote as *Foreign MA*Age*, in order to capture these dynamic effects. One might argue, however, that this interaction might just be picking up changes that are occurring over time for all banks. Indeed, one might imagine that the acquisition of a domestic bank by a foreign firm would be likely to have an effect on the strategies and performance of all other banks, as it would put them under increased competitive pressure. We therefore add a variable for *Time* (measured as the number of quarters from September 1997) to capture the changes that are occurring over time to all banks. *Foreign MA*Age* therefore captures the residual effects that are peculiar to Foreign MA banks.

One might also argue that the *Foreign MA* dummy might be picking up changes in the competitive structure of the banking market caused by consolidation. We therefore control for market consolidation by introducing a variable for *Market Share* (the share of the loan market controlled by each bank).

Finally, one might think that changes in the macroeconomy might be driving the results we obtain on our ownership dummies and their interactions with time. We therefore include three macroeconomic variables. *Industrial Output Growth* measures quarterly changes in industrial production, capturing changes in the business cycle.¹³ *Money Market Rate* (the short term money market interest rate) is included to control for the impact of the cost of funds faced by banks. It also controls for “crowding out” effects caused by potential increases in demand for finance by government. *Inflation* is included because changes in the inflation rate potentially affect bank strategies (particularly the term structure of loans) and

¹³ Ideally, we would employ the growth in GDP rather than industrial output. The IMF, however, reports quarterly GDP figures one quarter after it reports industrial output. Using GDP would therefore force us to drop our observations for December 2004. We note that the substitution of industrial output for GDP does not materially affect our results.

bank profit margins (particularly if deposit interest rates and loan interest rates do not adjust to changes in inflation at identical speeds).

Depending on the left hand side variable of interest, we also introduce variables that control for the characteristics of banks that are independent of their ownership. For example, banks with higher equity ratios tend to be more risk averse, because stockholders have more of their own capital at risk. We therefore add a control for bank equity ratios (*Equity*—the share of owner’s equity to total assets). Similarly, banks with higher liquidity ratios will grant fewer loans, because more of their assets are tied up in cash. We therefore add a control for *Liquidity* (the ratio cash and deposit balances in other banks to total assets). *Administrative Cost* is the ratio of administrative expenses (including payrolls) to total assets.

Depending on the left hand side variable of interest, we include variables to control for the term structure and riskiness of a bank’s portfolio. We control for the composition of bank assets with five variables: *Housing Loans over Assets*, *Commercial Loans over Assets*, *Consumer Loans over Assets*, *SOFOL Loans over Assets*, and *FOBAPROA over Assets*. The first four variables are the ratios of each of those types of loans to a bank’s total assets.¹⁴ *Fobaproa over Assets* is the percent of a bank’s assets that is comprised of promissory notes issued by the government’s deposit insurance agencies (FOBAPROA and IPAB). These promissory notes were swapped for non-performing (or otherwise weak) loans during the

¹⁴ Mexican banking law allows the operation of non-bank banks, a Sociedad Financiera de Objeto Limitado (known by their Spanish acronym, SOFOL). A SOFOL is prohibited from providing the full set of services offered by banks (such as accepting deposits, clearing checks, carrying out foreign exchange transactions, or investing in securities or derivatives). Its operations are restricted to lending in prescribed market niches, most particularly home mortgages and automobile loans. SOFOLES overwhelmingly fund their loan books with borrowed funds. Some of these loans come from government development banks. Some also comes from commercial banks. Our *SOFOL Loans over Assets* variable captures these types of loans made by commercial banks to SOFOLES. Given that the SOFOLES then re-lend these funds, we treat bank loans to SOFOLES as credit for private purposes.

bailout of Mexico's banks. The omitted categories are securities held by banks and direct loans to government entities. Thus, our portfolio variables simultaneously control for the distribution of assets between loans and investments in securities, and for the distribution of loans by type. One might argue that these variables measure risk ex ante (they capture how banks chose to invest their assets, given what the bank perceives to be the relative risks and returns associated with those investments). We therefore add a measure of ex post default risk: the ratio of non-performing loans to total loans (*NPL over Loans*).

Finally, in order to control for the possibility that outliers might drive our regression results we cull those cases in which the value of the dependent variable falls in either the top or bottom one percent of the distribution.

Table 2 contains a description of the variables used in our analysis. Table 3 presents the means and standard deviations of each variable.

SOURCES

We obtained, and put into machine readable form, balance sheets, income statements, and loan portfolios on a quarterly basis for every bank from September 1997 to December 2004. This data was gathered by Mexico's CNBV for the purpose of regulating the banks, and was then published in the CNBV's Boletín Estadístico de Banca Múltiple. The most recent quarters of data were available from the CNBV's website.¹⁵ For some reporting periods, some of the data was published by the CNBV in cumulative form (each quarter's data was the sum of that quarter's activity, plus the activity of the previous quarter). Undoing these

¹⁵ WWW.CNBV.gob.mx. The CNBV website includes data from 1998 to 2004. Readers who may wish to replicate or extend our results should be cautioned not to rely on the website alone, because the CNBV deletes historical data for banks that later merged with other banks or otherwise exited the market. Simply downloading the 1998-2004 data from the CNBV website will produce a truncated sample of surviving, merged banks.

cumulative totals was, after identifying the cases, a straightforward process. Some of the data for some reporting periods was also published by the CNBV in deflated form (where the data had been first run through a price index). After identifying the cases, un-deflating the data was a straightforward process. We identified those banks that had been subject to mergers and acquisitions (both by other domestic banks and by foreign banks) from information compiled by Mexico's Comisión Nacional para la Protección y Defensa de los Usuarios de Servicios Financieros (CONDUSEF), and posted to their website.¹⁶

EMPIRICAL RESULTS:

Bank Strategies:

There is no doubt that Mexican banks have constrained credit since the financial system collapse of 1995-96. As Table 4 demonstrates, the proportion of assets that banks have allocated to credit for households and private business enterprises steadily declined from 50 percent in the fourth quarter of 1997 to 30 percent in the first quarter of 2004. It then rose slightly, to 34 percent by the fourth quarter of 2004. This decrease is not just relative to the stock of bank assets, it is an absolute decrease in real terms.

Is the retreat from private credit markets the product of foreign bank entry, or is it caused by some other factor? One might argue that the decline in the ratio of private loans to assets in Mexico's biggest banks is a consequence of changes in the macroeconomy that might have made credit extension more risky. One might also argue that the decline in private lending is the consequence of the fact that until 1999 Mexico's largest banks (which later became Foreign MA banks) were able to transfer many of their weakest loans to the

¹⁶ The URL for this site has changed over time. Its current location is: <http://sipres.condusef.gob.mx/home/SQLsectoresSHCP.asp?ID=40> .

government's deposit insurance agencies (FOBAPROA, and its successor IPAB). Finally, one might argue that foreign banks simply purchased Mexican banks that had already retreated from loan markets.

In order to know whether Foreign MA banks really are different from domestic banks in terms of credit allocation we estimate an OLS regression on private lending as a percentage of assets. Because the stock of private loans will be directly affected by the stock of loans that were transferred to FOBAPROA and IPAB, we control for the proportion of bank assets that are FOBAPROA or IPAB bonds. We also control for changes in the macroeconomy (with the aforementioned *Inflation*, *Money Market Interest Rate*, and *Industrial Output* variables). One might imagine that there are large economies of scale in lending. We therefore control for the fact that Foreign MA banks tend to be much larger than average with the *Market Share* variable. One might also imagine that banks have different tastes for risk, as a consequence of differences in their equity ratios. (When bank stockholders have more of their capital at risk, they prefer to make less risky loans). We therefore add our *Equity Ratio* variable. Finally, in order to control for the possibility that foreign banks purchased banks that were already curtailing private lending, we introduce the aforementioned *Foreign MA Expected* dummy variable, along with the *Foreign MA* variable. The results are reported in Table 5.

We find that, on average, Mexican banks have been reducing the amount of credit they extend (as a percentage of their assets) over time. The coefficient on *Time* is negative, statistically significant at the one percent level, and of large magnitude. The coefficient on *Time* of -.005 indicates that, all else being equal, banks have been reducing the share of their

assets that they extend as loans by 0.5 percentage points *per quarter*. Over 30 quarters the effect is huge—a drop of 14.5 percentage points.

We also find that Foreign MA banks have reduced the share of their assets that they allocate to private lending even more than domestic banks. The coefficients on both the *Foreign MA Expected* and the *Foreign MA* dummies are negative, significant at the one percent level, and of large magnitude. The data suggest that foreign firms purchased Mexican banks that already had lower ratios of private loans to assets (5.8 percentage points lower than other domestic banks, in fact) and then decreased the amount of lending even further (by an additional 6.0 percentage points). The data also indicate that there has been no recovery in lending by Foreign MA banks over time: the coefficient on *Foreign MA*Age* is not statistically significant. That is, even taking into account the big stepwise reductions in lending detected in the *Foreign MA* and *Foreign MA Expected* coefficients, the trend for Foreign MA banks is the same as for domestic banks—negative.¹⁷

Lending and Contract Rights

If the retreat from private lending is caused by the inability of banks to enforce contract rights, and if it is the case that some types of loan contracts are easier to legally enforce than others, then one might imagine that there is substantial variation in lending across loan types. One would imagine that banks in general—and Foreign MA banks in particular—would reduce their relative exposure to hard to enforce commercial loans. As a corollary, one would imagine that banks in general—and Foreign MA banks in particular—

¹⁷ We performed sensitivity analysis by removing control variables, individually and in groups (we wanted to check for possible endogeneities among the control variables and foreign ownership). The results on *Time*, *Foreign MA*, *Foreign MA Expected*, and *Foreign MA*Age* were not materially affected by these alternative specifications. The goodness of fit of the regression was, however, negatively affected.

would increase their exposure to relative easy to enforce consumer loans. Finally, one would imagine that mortgage lending would fall between the extremes of commercial and consumer lending.

Data on lending by loan type, presented in Table 4, are certainly consistent with the hypothesis that banks are allocating credit based on the ease with which they can enforce their contract rights. Lending for housing and commercial purposes fell dramatically (in both absolute and relative terms), while consumer loans more than doubled.

In order to assess this hypothesis in a systematic manner, and in order to know whether Foreign MA banks behave differently than domestically-owned banks, we turn to regression analysis. We estimate a series of OLS regressions in which we substitute each of the three loan sub-types (Consumer, Commercial, and Housing) for the *Private Lending over Assets* variable. (Other variables and specifications remain exactly the same).

Consumer Lending

The second column of Table 5 reports the results of our regressions on *Consumer Loans over Assets*. The coefficient on *Time* indicates that, on average, banks have been increasing consumer lending. The coefficient of .0029 (significant at the one percent level) indicates growth of .29 percentage points per quarter. Over 30 quarters, the effect is large: an 8.4 percentage point increase in consumer loans. Given that the sample mean is only .03, the implication is that Mexico's banks have moved into consumer loan markets aggressively.

The positive coefficient on *Foreign MA Expected* (and the non-significance of *Foreign MA*) indicates that foreign banks purchased Mexican banks that had higher than average consumer loan portfolios. The positive coefficient *Foreign MA*Age* (in the context of a positive coefficient on *Time*), indicates that foreign firms not only purchased banks with

higher levels of consumer loans, they then increased consumer lending somewhat faster than the already fast industry average (by an additional 0.15 percentage points per quarter). That is, the average bank increased its share of assets dedicated to consumer loans by 0.29 percentage points per quarter, while Foreign MA banks increased their shares by 0.44 percentage points per quarter (0.29 plus 0.15).¹⁸

Commercial Lending

Column 3 of Table 5 reports the results of a regression on *Commercial Loans over Assets*. The specifications are identical to the consumer lending regressions. The results, however, could not be more different: the coefficients switch signs.

The time trend is negative—and strongly so. The coefficient on *Time* of -0.0070, implies that, on average, banks have been decreasing the share of their assets devoted to commercial credit by .70 percentage points per quarter. Across 30 quarters, the effect is huge: a 20 percentage point drop in the share of bank assets allocated to commercial credit.

The coefficients on *Foreign MA*, *Foreign MA Expected*, and *Foreign MA*Age*, indicate that Foreign MA banks have been retreating from commercial lending even more aggressively than domestically-owned banks. The negative (and highly significant) coefficient on *Foreign MA Expected* suggests that foreign firms bought Mexican banks that had much lower commercial lending exposures (by 5.6 percentage points). After purchase, they reduced their commercial lending exposure even more: the coefficient of -0.079

¹⁸ We performed sensitivity analysis by removing control variables, individually and in groups (we wanted to check for possible endogeneities among the control variables and foreign ownership). The results on *Time*, *Foreign MA*, *Foreign MA Expected*, and *Foreign MA*Age* were not materially affected by these alternative specifications. The goodness of fit of the regression was, however, negatively affected.

(significant at one percent) on *Foreign MA* indicates that they reduced the share of their assets dedicated to commercial loans by an additional 7.9 percentage points.

The Commercial Lending regression does indicate one positive coefficient—that on *Foreign MA*Age*—but it must be interpreted carefully. In the context of a negative coefficient on *Time* of -0.0070, the coefficient of 0.0059 on *Foreign MA*Age* implies that after making a big stepwise reduction of 13.5 percentage points (the sum of the coefficients on *Foreign MA* and *Foreign MA Expected*), *Foreign MA* banks did not reduce their commercial loan exposure any faster than domestic banks. The four variables together indicate that *Foreign MA* banks allocate less of their assets to commercial loans, and that domestic banks are converging on the same strategy.¹⁹

Housing Lending

Column 4 of Table 5 presents the results of a regression on *Housing Loans over Assets*. The results suggest that banks view housing loans as falling in between consumer and commercial lending in terms of their attractiveness.

The small, but positive, coefficient on *Time* of 0.0008 indicates a modest increase in housing loans over time. Over 30 quarters, the net effect would be a 2.3 percentage point increase in the share of bank assets dedicated to housing loans.

The coefficients on *Foreign MA*, *Foreign MA Expected*, and *Foreign MA*Age*, indicate that *Foreign MA* banks have been even less enthusiastic about entering the housing loan market than domestically-owned banks. The negative coefficient on *Foreign MA*

¹⁹ We performed sensitivity analysis by removing control variables, individually and in groups (we wanted to check for possible endogeneities among the control variables and foreign ownership). The results on *Time*, *Foreign MA*, *Foreign MA Expected*, and *Foreign MA*Age* were not materially affected by these alternative specifications. The goodness of fit of the regression was, however, negatively affected.

Expected suggests that foreign firms purchased Mexican banks that had lower proportions of housing loans than the industry average (by 2.0 percentage points), and the negative coefficient on *Foreign MA *Age* suggests that they then reduced their exposure to housing loans over time (at the rate of 0.09 percentage points per quarter). Given the term structure of housing loans, this is what one would expect of a bank that was retreating from the mortgage market: the stock of loans would gradually decline.²⁰

Bank Performance:

Borrower Screening:

If Foreign MA banks are more risk averse than domestically owned banks, then it should logically follow that they subject borrowers to more intense screening. We cannot directly observe the process of borrower screening, but we can observe its outcome: a bank that screens borrowers more closely will have a lower ratio of non-performing to total loans.

As was the case with the data on bank portfolio allocation, we need to separate out the decline in non-performing loans that came from swapping some of them for FOBAPROA-IPAB promissory notes from the effect of being purchased by a foreign bank. We therefore estimate an OLS regression on the ratio of non-performing loans in which we control for the ratio of assets comprised of FOBAPROA-IPAB bonds. We also control for the distribution of loans among different categories (because different types of loans have different default

²⁰ We performed sensitivity analysis by removing control variables, individually and in groups (we wanted to check for possible endogeneities among the control variables and foreign ownership). The results on *Foreign MA*, and *Foreign MA *Age* were not materially affected by these alternative specifications. The results on *Time* and *Foreign MA Expected* were sensitive to the addition of the *Market Share* variable (without *Market Share*, the coefficient on *Foreign MA Expected* was positive and *Time* was no longer statistically significant). This suggests an endogenous relationship between the size of domestically owned banks and their propensity to make mortgage loans. We also note that dropping the *Market Share* and *Equity Ratio* variables substantially reduces the goodness of fit of the regression.

rates). One might argue that improvements in borrower screening are simply the result of changes in equity ratios (better capitalized banks are more risk averse), or that whatever technological improvements have occurred are peculiar not to Foreign MA banks, but to large banks (because there are scale economies in risk assessment technologies, and because banks with large branch networks can redirect credit from regions with locally high default rates to regions that have healthier local economies). One might also argue that our results are driven by differences in liquidity ratios: banks that hold large amounts of cash, by definition, have lower ratios of non-performing loans. We therefore add our *Equity Ratio*, *Market Share*, and *Liquidity* variables. Finally, we control for changes in the macroeconomy, because increases in non-performing loans might simply be driven by increases in inflation (many loans are variable rate), downturns in the business cycle, or decisions by the central bank to raise interest rates. We therefore introduce our three macroeconomic variables (*Inflation*, *Money Market Interest Rate*, *Industrial Output Growth*). The results are presented in Table 6.

The coefficient on *Time* yields a surprising result: there is no statistically significant time trend. That is, on average, banks have not become better at screening loans.²¹ The negative and highly significant coefficient on *Foreign MA*, however, indicates that Foreign MA banks are better at screening out borrowers who are likely to default. The coefficient of -0.03 suggests that Foreign MA banks have default rates three percentage points below domestic banks. Given that the sample mean is 0.063, the *Foreign MA* coefficient indicates a substantial difference in magnitude between bank types. The data also indicate that the improvements that were made in borrower screening occurred after banks were actually

²¹ We note that this result holds even when we drop the foreign ownership variables.

acquired, rather than being made in the quarters prior to acquisition (the coefficient on *Foreign MA Expected* is not significant).²²

Interest Rate Spreads

In an efficient market, risk averse banks charge lower interest rates. They allocate their portfolios to categories of loans that have relatively low rates of default or relatively easy processes of collateral recovery, and within those categories of loans they offer lower interest rates to the borrowers with the lowest probability of default.

One would therefore assume that more risk averse Foreign MA banks would charge lower interest rate spreads (the difference between what banks pay for deposits and charge for loans) than more risk neutral domestically-owned banks. One would also assume that a consequence of foreign bank entry in Mexico would be downward pressure on loan interest rates, which would cause interest rate spreads among all banks to decline over time.

We therefore estimate an OLS regression on net interest margins. Following Martinez Peria and Mody, our specifications include the factors that banks take into account when they choose the interest rate spread. Thus, we control for changes in the macroeconomy with variables for *inflation*, *industrial output growth*, and the short-term *money market rate*. We control for bank equity ratios, because the more highly leveraged a bank the weaker are its incentives to make loans that are low risk (and that therefore have lower interest rates). We

²² We performed sensitivity analysis by removing control variables, individually and in groups (we wanted to check for possible endogeneities among the control variables and foreign ownership). The results on *Time*, *Foreign MA*, and *Foreign MA*Age* were not materially affected by these alternative specifications. We did find, however, that the elimination of the *Market Share* variable produced a negative (and significant) coefficient on *Foreign MA Expected*. This suggests that, all things being equal, larger banks are better at screening loans. Nevertheless, this finding does not alter our qualitative results. Moreover, the addition of the *Market Share* (and other conditioning variables) improved the goodness of fit of the regression.

also control for bank liquidity ratios (the ratio of cash to assets), because banks that hold more cash charge higher interest rates in order to compensate for the fact that the portfolio allocated to cash earns little or no income. In addition, we control for bank market shares, because larger banks may be able to exercise market power. (Inasmuch as Foreign MA banks tend to be large, we want to isolate the independent effect of who owns and operates them from the fact that they may be able to influence prices). We control as well for administrative costs, because banks price these costs into the spread they charge borrowers. Finally, we control for default risk by introducing our loan portfolio variables (*Housing Loans over Assets*, *Commercial Loans over Assets*, *Consumer Loans over Assets*, *SOFOL Loans over Assets*, and *FOBAPROA over Assets*) and the ratio of non-performing loans (*NPL over Loans*). In short, the net interest margins we present in column 2 of Table 6 are risk-adjusted.

The coefficient on *Time* yields a surprising result: risk-adjusted net interest margins have been rising in Mexico. The coefficient on *Time* of .0004 (significant at the five percent level) indicates that banks have been able to increase their interest rate spreads by 0.04 percentage points per quarter. Over 30 quarters the effect is non-trivial: an increase of 1.2 percentage points (compared to a sample mean of .0165). It suggests that the arrival of foreign banks in Mexico did not increase competition and reduce interest rate spreads. Given the fact that Mexico had an extremely concentrated banking system both before and after foreign entry (the four firm ratio has hovered around 70 percent since privatization in 1991) this result should not seem terribly surprising.

The coefficients on *Foreign MA*, *Foreign MA Expected*, and *Foreign MA*Age* indicate that Foreign MA banks charge somewhat lower risk-adjusted interest rate spreads than domestically-owned banks. The coefficient on *Foreign MA* is negative, of large

magnitude (-.0045, compared to a sample mean of .0165), and is significant at the one percent level. Moreover, the results suggest that this reduction in interest spreads took place as a consequence of becoming a Foreign MA bank, not as a result of a Mexican bank making itself an attractive target for foreign acquisition. The regression suggests, in fact, that there was little difference between banks that were later acquired by foreign firms and the average bank: the coefficient on *Foreign MA Expected* is not only positive, but it is of small magnitude (.003) and is significant only at the ten 10 percent level.

One might argue that our net interest margin regression produces a positive coefficient on *Time* because we control for risk. In this view, the reallocation of loan portfolios since 1997 toward lower risk loan categories and toward lower risk borrowers, has actually caused net interest margins to fall. The result, however, is masked by our controls for portfolio allocation and the ratio of non-performing loans.

There is a straightforward way to test this view: run the same regression on net interest margins, but drop the loan portfolio and *NPL over Loans* variables. We present the results from this experiment in column 3 of Table 6. The result is inconsistent with the view that net interest margins have been falling. In fact, the coefficient on *Time* doubles in magnitude when we drop the loan risk variables.

The regression continues to support the results on risk adjusted net interest margins: Foreign MA banks seek lower risk loan categories and lower risk borrowers. The coefficient on *Foreign MA Expected* is positive and statistically significant, while the coefficient on *Foreign MA* is negative and significant. These results suggest that foreign firms acquired Mexican banks that charged higher interest spreads, and then lowered those spreads dramatically after acquisition. The evidence reported in tables 5 and 6 suggest that the

mechanism through which they did this to reallocate their portfolios toward lower risk loans and lower risk borrowers.

Administrative Efficiency:

A skeptical reader might argue that the lower interest spreads charged by Foreign MA banks are not the product of a strategy designed to lower their exposure to risk, but is simply the result of greater administrative efficiency. This explanation has one problem: it is not consistent with the evidence.

In column 4 of Table 6 we present the results of a regression on administrative costs over assets. We control for variables that influence administrative costs other than ownership. We therefore add our three macroeconomic variables, liquidity ratios (on the assumption that banks that hold more of their assets as cash or bank deposits have lower administrative costs), bank market shares (on the assumption that larger banks can capture scale economies), and the allocation of bank assets among different loan classes (on the assumption that different types of loans are more costly to administer than others, and that it is more costly to administer a loan portfolio than a securities portfolio). We note that these control variables enter the regression with the expected signs. In particular, we find that larger banks have lower administrative costs, and that consumer loans are particularly costly to administer.

We also find that Mexican banks, on average, have become somewhat more efficient over time. The coefficient on *Time* is $-.0002$, which implies that administrative costs have been falling at a rate of 0.02 percentage points per quarter. Over 30 quarters, the effect is non-trivial: a .58 percentage point decline in administrative costs, compared to a sample mean of 1.41.

The results also indicate, however, that Foreign MA banks are not more administratively efficient than their domestic competitors. Neither *Foreign MA*, *Foreign MA Expected*, nor *Foreign MA*Age* enter the regression as significant. The strongest argument that can be made is that foreign entry has encouraged all banks, domestic and foreign alike, to increase their efficiency. We note, however, that this mechanism is purely speculative, and that the lack of any significant coefficients on any of the dummies associated with foreign ownership suggests that another mechanism could be at work.

Rate of Return on Equity

If net interest margins are rising in Mexico, then it should logically follow that rates of return on equity are rising as well. It should also follow that if Foreign MA banks charge lower net interest margins than domestically owned banks, then they should earn lower rates of return. Surprisingly, only the first of these two hypotheses holds: Mexico's banks have become more profitable, but Foreign MA banks actually earn somewhat higher rates of return than their domestically-owned competitors.

In Table 7 we present a series of regressions on the rate of return on equity. In the first specification, we control only for changes in the macroeconomic environment. We find that rates of return have been increasing at a rapid clip: .25 percentage points per quarter. Over 30 quarters the effect is very large, a 7.25 percentage point increase in rates of return (when the sample mean is only 1.25). The regressions also indicate that Foreign MA banks are more profitable: the coefficient on *Foreign MA Expected* is positive (0.151, and thus larger than the sample mean). In the context of an insignificant coefficient on *Foreign MA*, this result suggests that foreign firms acquired Mexican banks that were more profitable than their competitors. The negative coefficient on *Foreign MA*Age* of -0.0011, in the context of

a positive coefficient on *Time* of 0.0025, suggests long run convergence in rates of return between Foreign MA and domestically owned banks.

What could explain the difference in profitability between Foreign MA and domestically-owned banks? It does not appear that the change from domestic to foreign ownership drives the difference (if that were the case, we would pick up a positive coefficient on *Foreign MA*, not on *Foreign MA Expected*). Rather, there is some quality that they had prior to acquisition. One obvious quality is their size. We therefore introduce the *Market Share* variable in the regression reported in column 2 of Table 7. Sure enough, controlling for firm size (as measured by market share) eliminates the statistical significance of the *Foreign MA Expected* variable. It also produces a positive coefficient on *Market Share* (significant at the one percent level) that implies that as market shares double, rates of return increase by 7.8 percent. That is, Foreign MA banks were more profitable in the eight quarters before acquisition, and continued to be more profitable afterwards, because being big conferred an advantage.

One might imagine a number of mechanisms through which size would affect profitability—which would in turn give Foreign MA banks higher rates of return. One might be tempted to argue that large banks are better able to screen for default risk among borrowers (either because there are scale economies in risk assessment technologies or because banks with large branch networks can redirect credit from regions with high default rates to regions that have healthier local economies). If that were the case, then we would expect that adding a control for the ratio of non-performing loans would eliminate (or reduce) the significance and/or magnitude of the *Market Share* variable. We would also expect the regression to produce a negative and statistically significant coefficient on *NPL over Loans*. When we add

the NPL over Loans variable, however, (in Column 3 of Table 7) the predicted result does not emerge: *NPL over Loans* is not statistically significant. The magnitude and significance of the coefficient on *Market Share* do decline somewhat, but the coefficient remains of large magnitude and is still significant at the five percent level.

Perhaps there are scale economies, but they are realized in the overall administration of banks, not just confined to the assessment and mitigation of risk? We therefore re-estimate our return on equity regression in column 4 of Table 7, adding our *Administrative Cost* variable. We find no strong evidence that scale economies in administration have any effect on rates of return. The coefficient on *Administrative Cost* is neither statistically significant, nor does its introduction improve the goodness of fit of the regression. It does drive down the significance of the market share variable, but it still remains significant at the 10 percent level.

If size does not raise the rate of return of Foreign MA banks by allowing them to take advantage of scale economies, then perhaps it is affording them market power? One usually thinks of market power as being exerted in the price that banks charge for loans or pay for deposits, but our regressions on interest rate spreads indicated that Foreign MA banks actually charge lower net interest margins than domestic banks. Banks also earn income, however, by charging service fees to maintain checking accounts, to use automated teller machines, to effect wire transfers, and the like. Perhaps Foreign MA banks (and the banks they acquired) are able to take advantage of their market power by setting high prices for these services?

There are two methods by which we can assess this hypothesis: by estimating a regression on the rate of return on equity that excludes service fees from bank income; and by estimating a regression on fee income alone. As we shall see, both experiments yield similar

results: large banks exercise market power through the fees they charge; as a consequence, Foreign MA banks, which tend to be bigger, earn higher rates of return.

In Column 1 of Table 8 we estimate a regression in which the dependent variable is the rate of return on equity, net of income of earned from service fees (we denote this measure of the rate of return as *ROE2*). Conceptually, we are measuring the profitability of banks on the basis of their income from their loan and securities portfolios only. We specify the regression exactly the same we specified the regression on *ROE1* in Column 2 of Table 7, with controls for changes in the macroeconomy and bank market shares.

The regression on *ROE2* indicates that, when we exclude fee income from bank earnings, rates of return are no longer influenced by bank market shares. Indeed, the coefficient on *Market Share* is not statistically significant. We also find that the coefficient on *Foreign MA Expected* switches sign: it is now negative, of large magnitude (it is larger than the sample mean), and statistically significant at the one percent level. That is, Foreign MA banks (as well as the banks that they acquired) were less profitable than their domestic competitors— when we exclude fee income from earnings.

The regressions reported in Column 1 of Table 8 produce a second striking result: the coefficient on *Time* is much smaller when we measure the rate of return as *ROE2*, as opposed to *ROE1* (reported in column 2 of Table 7).²³ The implication is that all banks in Mexico, not just Foreign MA banks, have been increasing their income from service fees in order to boost their rates of return.

A skeptical reader might argue that our regression on *ROE2* does not take into account the fact that Foreign MA banks tend to be more risk averse, which influences how they

²³ A T test confirms that the coefficients are statistically different from one another.

allocate their loan portfolios and screen borrowers for risk. According to this view, the lower rate of return on equity (net of fee income) that we detected in Foreign MA banks would disappear if we controlled for risk. We therefore estimate a regression on *ROE2* in column 2 of Table 8 in which we add our five loan portfolio variables, plus the *NPL over Loans* variable. When we do this, we find that the magnitude of *Foreign MA Expected* decrease somewhat, but still remains of large magnitude relative to the sample mean and is significant at the five percent level. That is, all things being equal, the rate of return (net of earnings from service fees) on equity was lower in those banks that were acquired by foreign firms, and that lower rate of return then persisted after the bank was acquired.

A particularly skeptical reader might argue that the best test of our argument—that Foreign MA banks are more profitable because their market power allows them to earn higher income from service fees—would be to run a regression on service fee income alone. We therefore estimate an OLS regression on service fees over equity in column 3 of Table 8. The results are striking. The coefficient on *Foreign MA Expected* and *Foreign MA* are positive and significant. They indicate that the banks that were later acquired by foreign firms had higher fee income than other domestic banks, and that fee income then increased even more after the bank was acquired. The combined effect of *Foreign MA Expected* and *Foreign MA* (recall that the impact of being a Foreign MA bank is the sum of the two variables) is a rate of return that is 3.7 percentage points higher than that of domestic banks.²⁴

²⁴ The coefficient on *Time* is positive, but of small magnitude and barely significant. The coefficient on *Foreign MA*Age* is significant at the one percent level, but is of small magnitude. Taken in context of one another, they indicate that the rate of return from service fee income has neither been increasing nor decreasing.

We hypothesized that much of the ability of Foreign MA banks to earn higher fee income comes from their market power. We therefore introduce the *Market Share* variable in Column 4 of Table 8. It confirms the market power hypothesis. The coefficient on *Market Share* enters the regression with the right sign, and is significant at the one percent level: as market shares double, the rate of return from fee income increases by 10.6 percent. Moreover, the addition of the *Market Share* variable causes the coefficients on *Foreign MA Expected* and *Foreign MA* to fall in magnitude.²⁵

CONCLUSIONS AND IMPLICATIONS:

Our case study of Mexico from 1997 to 2004 suggests that one of the major differences between developed and underdeveloped economies is the cost of enforcing contracts. Our findings indicate that, in an environment in which it is difficult to assess risk ex ante and enforce contracts ex post, foreign banks are likely to be particularly risk averse. In the Mexican case, this means that they prefer to hold securities and make loans to government, rather than extend credit to firms and households. It also means that they screen borrowers more intensively, and seek out borrowers with lower probabilities of default by offering lower interest rates.

Our results have three implications. The first concerns the need for more case studies of foreign bank entry in developing economies. Much of what we know about the impact of foreign bank entry comes from developed economies, where default risk is easy to assess and contracts are easy to enforce. We have yet to develop, however, a literature about how foreign banks adapt to economies in which it is difficult to assess default risk ex ante and enforce contracts ex post.

²⁵ A T test confirms that these coefficients are statistically different from one another.

The second concerns the problems that face Mexico because of the lack of bank credit. As a number of analysts have pointed out (González 2003; Tornell, Westermann, and Martínez 2003), Mexico's economic performance over the past decade has been sluggish because of the unavailability of credit. Our analysis indicates that foreign bank entry, in and of itself, is not a sufficient solution to this problem.

The third implication concerns the mechanisms by which the supply of credit might be increased. One might argue that the problem is foreign ownership. The evidence suggests, however, that Foreign MA banks do not follow different strategies from their domestically owned competitors: all banks in Mexico have followed risk averse lending strategies. The differences are of degree, not of kind. Moreover, the evidence also suggests that Foreign MA banks do a better job of screening than domestic banks, and reward high quality borrowers with lower interest rate spreads.

One might also argue that the problem in Mexico is the concentrated market structure, which allows the country's larger banks to earn significant income from service fees. In this view, increasing bank entry would encourage more competition and force banks to make more loans. Increasing competition might, however, just lower bank rates of return—and perhaps encourage bankers to make imprudent loans. Indeed, as Gruben and McComb (1997, 2003) have shown, the scramble for market share in the context of weak property rights was one of the principal reasons for the collapse of the Mexican banking system during 1991-96.

One might therefore argue that increasing the amount of credit requires strengthening property rights. The evidence we present is consistent with this view. In the sector where banker's property rights have been significantly strengthened (lending for consumer durables), banks have aggressively entered the market. Indeed, Foreign MA banks have been

even more aggressive in consumer loan markets than domestically-owned banks. Our results also suggest, however, that property rights cannot be enhanced at the stroke of a pen. Property rights systems are composed of numerous, mutually reinforcing institutions. Some of these can be reformed easily. Others (for example, judicial and police corruption, or the willingness of neighborhoods to demonstrate on the behalf of borrowers in default) are considerably more intractable. Their reform will come not as a consequence of who owns the banks, but as a consequence of the long, slow process of establishing rule of law.

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Table 1
Percent of Bank Assets Under Foreign Ownership in Mexico, 1997-2004

Year	Quarter	Total Bank Assets¹	Share of Foreign MA	Share of ForeignDeNovo	Total Foreign
1997	3	824,732	13.9%	1.7%	15.6%
	4	880,823	7.4%	3.8%	11.1%
1998	1	992,504	12.1%	4.1%	16.2%
	2	1,037,168	12.3%	4.3%	16.6%
	3	1,120,161	12.5%	5.0%	17.5%
	4	1,166,850	18.0%	2.1%	20.1%
1999	1	1,200,045	17.7%	1.9%	19.6%
	2	1,203,949	17.5%	2.0%	19.5%
	3	1,227,333	18.3%	2.1%	20.4%
	4	1,292,862	17.5%	1.9%	19.4%
2000	1	1,250,310	18.6%	1.9%	20.5%
	2	1,278,367	18.9%	2.4%	21.4%
	3	1,306,763	28.0%	2.0%	30.1%
	4	1,400,503	54.4%	2.6%	57.0%
2001	1	1,413,395	51.8%	6.6%	58.4%
	2	1,426,794	52.6%	6.1%	58.7%
	3	1,504,221	53.1%	6.2%	59.3%
	4	1,524,175	49.4%	5.1%	54.5%
2002	1	1,548,493	46.6%	5.1%	51.7%
	2	1,584,825	47.5%	5.7%	53.2%
	3	1,614,094	46.1%	5.8%	51.9%
	4	1,676,743	78.0%	3.9%	81.9%
2003	1	1,744,361	76.6%	5.1%	81.7%
	2	1,710,488	76.9%	3.9%	80.8%
	3	1,788,432	75.4%	6.3%	81.7%
	4	1,855,125	76.5%	5.7%	82.1%
2004	1	1,929,977	75.5%	6.5%	82.0%
	2	1,971,384	75.5%	6.2%	82.0%
	3	1,962,144	75.5%	5.4%	80.9%
	4	2,096,601	78.4%	4.8%	83.21%

1. Millions of current pesos.

Table 2
Variable Definitions

Macro Controls

Money Market Rate	Money Market Rate from IMF International Financial Statistics (IFS).
Inflation	Rate of Growth of CPI calculated year over year. CPI from IFS
Industrial Output Growth	Rate of growth of Industrial Output calculated year over year. [(Industrial Production in qtr X, year Y – Industrial Production in qtr X, Year Y-1)/ Industrial Production in qtr X, Year Y-1]. Industrial production from IFS.

Bank Variables

Mktshare Loans	Loans of reporting bank divided by total loans of all banks.
Cash over Assets	Cash plus deposits in other banks, divided by assets.
Loans over Assets	Loans divided by assets.
Equity Ratio	Stockholder's equity divided by assets.
NPL over Loans	Declared value of non-performing loans, divided by total loans.
Fobaproa over Assets	Value of FOBAPROA-IPAB promissory notes divided by assets.
Housing Loans over Assets	Housing loans divided by assets.
Commercial Loans over Assets	Commercial loans divided by assets.
Consumer Loans over Assets	Consumer loans divided by assets.
SOFOL Loans over Assets	Loans to Financial Intermediaries (SOFOL) divided by assets.
Private Lending over Assets	(Housing Loans + Commercial Loans + Consumer Loans + SOFOL Loans)/ Assets.
Deposits	Short & long term deposits, including interbank deposits
Interest over Loans	(Interest Income on Loans + Commissions and fee charges to get loans), divided by total loans.
Interest over Deposits	(Interest Paid on Deposits + Commissions paid by a bank to get a deposit from another bank), divided by deposits.
NIM (Net Interest Margins)	Interest rate spread, calculated as Interest over loans minus interest over deposits.
Admncost over Assets	Operational costs (administrative costs plus payroll) divided by assets.
Fees over Equity	Income from Commissions and Fees divided by Equity
ROE_1 (Return on Equity)	Net Earnings divided by equity.
ROE_2	(Net Earnings - Income from Commissions and Fees) / Equity
Time	Quarter number, which runs from 3 in 1997 Q3 to 30 in 2004 Q2
Foreign MA	Dummy for Foreign Merger and Acquisition Banks (a domestically owned bank that has been purchased by a foreign bank. Dummy is coded as 1 in the quarter when the merger goes through, not the quarter when the merger is announced.
Foreign MA Expected 8	Dummy for Foreign MA banks that were purchased during this time period and dummy for 8 quarters before bank purchase (This applies to Banamex, Bancomer, Serfin and Bital)
Foreign MA * Age	Foreign MA interacted with the number of quarters since merger (the latter captures the quarterly age of the Foreign MA bank after purchase)
Foreign de Novo	A representation office, subsidiary, or branch of a large foreign bank in Mexico. We cull Foreign de Novo banks from the data set.

Table 3
Summary Statistics for Mexican Bank Data Set, 1997-2004

Variable	Obs	Mean	Std. Dev	Min	Max
Macro Controls					
Money Market Rate	582	15.40	8.31	5.11	36.37
Inflation	582	0.0975	0.0537	0.0397	0.1921
Industrial Output Growth	582	0.0294	0.0422	-0.0471	0.1059
Bank Variables					
Market Share Loans	582	0.0506	0.0742	0.0000	0.2981
Cash over Assets	582	0.1466	0.0771	0.0001	0.5273
Loans over Assets	582	0.6423	0.1681	0.0214	1.0980
Equity Ratio	582	0.1540	0.1312	0.0320	0.8717
NPL over Loans	582	0.0463	0.0638	0.0000	0.4894
Private Lending over Assets	571	0.4739	0.2310	0.0057	0.9852
Commercial Loans over Assets	571	0.3647	0.2433	0.0000	0.8814
Consumer Loans over Assets	571	0.0300	0.0703	0.0000	0.6982
Housing Loans over Assets	571	0.0381	0.0478	0.0000	0.2064
Fobaproa ove Assets	571	0.1233	0.1922	0.0000	0.9090
Government Loans over Assets	571	0.0682	0.1063	0.0000	0.5900
SOFOL Loans over Assets	571	0.0410	0.0818	0.0000	0.5351
NIM	559	0.0165	0.0296	-0.1070	0.4886
Admncost over Assets	581	0.0141	0.0100	0.0017	0.0885
Commission&Fees over Equity	576	0.0302	0.0311	-0.0496	0.1895
ROE_1	581	0.0125	0.0892	-1.5567	0.2540
ROE_2	576	-0.0175	0.0930	-1.5975	0.1170

Quarterly data from September 1997 to Dec 2004 and the sample is restricted to domestic and Foreign MA banks, Foreign de Novo banks are culled.

Data for all dependent variables and controls are missing for Quadrum 2001

Loan portfolio variables are missing for Citibank(2000, 2001-Q1,Q2,Q3) and Quadrum (2000)

NIM missing for 1997-Q4, Citibank 2001-Q1, Q2,Q3, Scotiabank Inverlat 2000-Q4. Quadrum 1997-Q3

Admncost over Assets and ROE missing for Scotiabank Inverlat 2000-Q4

ROE_2 and Commission&Fees over Equity are missing for Del Bajio(1997-Q4), Citibank(2001-Q1,Q2,Q3), Scotiabank Inverlat(2000-Q4), Banpais(1999-Q4) and Quadrum(2000-Q4)

Table 4
Real Bank Lending in Mexico, 1997-2004

Year	Quarter	Millions 2004 Pesos		Loan Asset Ratios by Type						
		Assets	Private Lending ¹	Commercial	Housing	Consumer	SOFOL	Government ²	FOBAPROA-IPAB	Private Lending ¹
1997	3	1,458,680	667,005	27%	14%	3%	2%	5%	23%	46%
	4	1,509,997	760,938	32%	14%	3%	1%	7%	27%	50%
1998	1	1,618,515	767,025	30%	13%	3%	1%	6%	26%	47%
	2	1,638,029	776,378	32%	12%	3%	1%	6%	25%	47%
	3	1,713,656	772,422	30%	12%	2%	1%	6%	24%	45%
	4	1,701,476	749,615	28%	13%	2%	1%	7%	25%	44%
1999	1	1,650,053	677,417	26%	12%	2%	1%	7%	25%	41%
	2	1,613,091	652,897	25%	12%	2%	1%	7%	27%	40%
	3	1,612,012	603,332	23%	11%	2%	1%	7%	27%	37%
	4	1,658,092	607,348	22%	11%	3%	1%	7%	27%	37%
2000	1	1,555,107	563,444	22%	11%	3%	1%	7%	28%	36%
	2	1,563,590	564,503	22%	10%	3%	1%	10%	25%	36%
	3	1,574,117	551,306	22%	9%	3%	1%	10%	24%	35%
	4	1,649,133	589,531	23%	9%	3%	1%	11%	21%	36%
2001	1	1,635,953	562,127	21%	9%	3%	1%	11%	20%	34%
	2	1,632,932	552,819	21%	9%	3%	1%	10%	20%	34%
	3	1,709,837	559,263	20%	8%	3%	1%	10%	19%	33%
	4	1,705,765	555,381	20%	8%	4%	1%	10%	18%	33%
2002	1	1,711,202	535,103	18%	8%	4%	1%	10%	20%	31%
	2	1,731,113	552,717	19%	8%	4%	1%	12%	16%	32%
	3	1,743,237	560,171	19%	8%	4%	1%	12%	15%	32%
	4	1,781,274	582,882	19%	7%	5%	2%	12%	14%	33%
2003	1	1,826,256	570,023	18%	7%	5%	1%	12%	13%	31%
	2	1,783,828	566,147	18%	7%	5%	2%	12%	12%	32%
	3	1,855,977	569,453	17%	7%	6%	1%	12%	12%	31%
	4	1,895,450	585,583	17%	6%	6%	1%	11%	11%	31%
2004	1	1,938,889	583,913	16%	6%	6%	1%	11%	11%	30%
	2	1,971,384	610,768	17%	6%	7%	2%	10%	10%	31%
	3	1,943,189	636,180	17%	6%	8%	2%	10%	10%	33%
	4	2,033,617	699,388	18%	6%	8%	2%	8%	9%	34%

**Deflated to 2004-Q2 pesos with price index from the IMF International Financial Statistics database.

1. Includes Commercial, Housing, Consumer, and SOFOL Loans.

2. Does not include the value of government bonds, which are held in the securities portfolio.

Table 5
Lending Regressions

	Private Lending Over Assets	Consumer Loans Over Assets	Commercial Loans Over Assets	Housing Loans Over Assets
Money_Market_Rate	0.0014 (1.60)	-0.0003 (1.00)	0.0018 (3.16)***	0.0001 (0.55)
Inflation	-0.2495 (1.24)	0.2205 (2.36)**	-0.3821 (2.31)**	0.0449 (1.02)
Industrial_Output_Growth	-0.0857 (1.04)	0.1637 (4.14)***	-0.3409 (5.53)***	-0.0260 (1.51)
FobaproaLoans_over_Assets	-0.6408 (19.36)***	-0.0211 (4.12)***	-0.5529 (18.88)***	0.0630 (8.58)***
Mktshare_Loans	-0.1103 (1.42)	0.0701 (3.17)***	-0.4525 (9.12)***	0.4842 (14.34)***
Equity_Ratio	0.1604 (2.06)**	-0.0353 (2.74)**	0.2991 (3.52)***	0.0411 (3.87)***
Time	-0.0050 (5.69)***	0.0029 (8.69)***	-0.0070 (10.61)***	0.0008 (6.01)***
Foreign_MA	-0.0602 (3.09)***	-0.0025 (0.52)	-0.0792 (5.32)***	0.0071 (1.22)
Foreign_MA_Age	0.0019 (1.48)	0.0015 (2.67)**	0.0059 (5.55)***	-0.0009 (3.33)***
Foreign_MA_Expected_8	-0.0578 (3.56)***	0.0139 (3.50)***	-0.0559 (3.95)***	-0.0197 (6.83)***
Constant	0.6415 (19.88)***	-0.0463 (4.37)***	0.564 (18.65)***	-0.0159 (3.57)***
Observations	561	561	561	561
R-squared	0.41	0.25	0.44	0.62
F	577.17	505.40	520.56	671.01

Functional form is OLS. Observations are quarterly, September 1997 - Dec 2004. The 5 highest and lowest values of the dependent variable were dropped. The sample is restricted to Foreign MA and Domestic Banks, no Foreign De Novo banks. Robust t statistics in parantheses; * significant at 10%; ** significant at 5%; *** significant at 1%. (Standard errors are clustered at the quarterly level)

Table 6
Bank Performance Regressions

	NPL over Loans	NIM	NIM	Admincost over Assets
Money_Market_Rate	0.0002 (0.51)	0.0004 (2.60)**	0.0004 (1.90)*	-0.0000 (0.67)
Inflation	0.0051 (0.07)	0.0049 (0.13)	0.0283 (0.71)	0.0057 (0.47)
Industrial_Output_Growth	-0.0629 (1.93)*	0.0151 (0.90)	0.0090 (0.52)	0.0018 (0.35)
ConsumerLoans_over_Assets	-0.0114 (0.47)	0.0673 (2.56)**		0.1003 (5.25)***
HousingLoans_over_Assets	1.0009 (12.74)***	-0.0570 (4.03)***		0.0066 (0.60)
CommercialLoans_over_Assets	-0.0588 (5.74)***	-0.0037 (0.91)		0.0044 (2.84)***
SOFOLLoans_over_Assets	-0.0394 (3.30)***	-0.0205 (2.51)**		0.0151 (3.91)***
FobaproaLoans_over_Assets	-0.0353 (2.71)**	-0.0084 (2.34)**		0.0042 (2.53)**
Cash_over_Assets	0.0384 (1.88)*	-0.0084 (0.85)	-0.0182 (1.80)*	0.0149 (3.14)***
Equity_Ratio	0.1472 (3.67)***	-0.0125 (2.45)**	-0.0133 (2.92)***	
Mktshare_Loans	-0.2649 (6.19)***	0.0033 (0.48)	-0.0212 (2.96)***	-0.0162 (3.07)***
Admincost_over_Assets		0.9884 (6.61)***	1.2717 (7.83)***	
NPL_over_Loans		-0.0181 (1.62)		
Time	-0.0006 (1.66)	0.0004 (2.68)**	0.0007 (4.84)***	-0.0002 (3.98)***
Foreign_MA	-0.0300 (7.44)***	-0.0045 (3.12)***	-0.0059 (3.28)***	0.0021 (1.51)
Foreign_MA_Age	0.0007 (2.11)**	-0.0001 (0.61)	0.0001 (1.35)	-0.0001 (0.94)
Foreign_MA_Expected_8	0.0020 (0.39)	0.0023 (1.76)*	0.0047 (3.04)***	-0.0007 (0.64)
Constant	0.0340 (2.89)***	-0.004 (0.80)	-0.016 (3.10)***	0.0104 (5.46)***
Observations	561	541	549	560
R-squared	0.60	0.59	0.51	0.42
F	132.92	51.19	25.52	26.13

Functional form is OLS. Observations are quarterly, September 1997 - Dec 2004. The 5 highest and lowest values of the dependent variable were dropped. The sample is restricted to Foreign MA and Domestic Banks, no Foreign De Novo banks. Robust t statistics in parantheses; * significant at 10%; ** significant at 5%; *** significant at 1%. (Standard errors are clustered at the quarterly level).

Table 7
Rate of Return on Equity Regressions

	ROE1	ROE1	ROE1	ROE1
Money_Market_Rate	0.0005 (1.19)	0.0006 (1.27)	0.0006 (1.27)	0.0005 (1.12)
Inflation	0.2415 (2.28)**	0.2377 (2.24)**	0.2353 (2.20)**	0.2517 (2.42)**
Industrial_Output_Growth	-0.1151 (2.02)*	-0.1217 (2.13)**	-0.1168 (2.01)*	-0.1154 (1.98)*
Time	0.0025 (7.02)***	0.0026 (7.25)***	0.0026 (7.16)***	0.0026 (7.28)***
Foreign_MA	0.0084 (0.98)	0.0078 (0.92)	0.0086 (1.01)	0.0096 (1.24)
Foreign_MA_Age	-0.0011 (2.30)**	-0.0011 (2.38)**	-0.0011 (2.31)**	-0.0011 (2.49)**
Foreign_MA_Expected_8	0.0151 (3.65)***	0.0042 (0.73)	0.0051 (0.86)	0.0052 (0.88)
NPL_over_Loans			0.0445 (1.66)	0.0429 (1.62)
Mktshare_Loans		0.0783 (2.81)***	0.0675 (2.38)**	0.0605 (1.97)*
Admincost_over_Assets				-0.4356 (1.19)
Constant	-0.0560 (4.38)***	-0.0596 (4.65)***	-0.0615 (4.72)***	-0.0561 (3.98)***
Observations	571	571	571	571
R-squared	0.08	0.09	0.09	0.10
F	19.07	33.00	31.87	29.01

Functional form is OLS. Observations are quarterly, September 1997 - Dec 2004. The 5 highest and lowest values of the dependent variable were dropped. The sample is restricted to Foreign MA and Domestic Banks, no Foreign De Novo banks. Robust t statistics in parantheses; * significant at 10%; ** significant at 5%; ***significant at 1%. (Std. Errors clustered at the quarterly level)

Table 8
Fee Income Regressions

	ROE2	ROE2	(Fees over Equity)	(Fees over Equity)
Money_Market_Rate	0.0004 (0.66)	0.0005 (0.96)	0.0001 (0.26)	0.0001 (0.60)
Inflation	0.1401 (0.90)	0.0823 (0.58)	0.0285 (0.51)	0.0233 (0.42)
Industrial_Output_Growth	-0.1208 (1.78)*	-0.0985 (1.58)	0.0126 (0.75)	0.0032 (0.19)
Time	0.0016 (3.45)***	0.0017 (3.56)***	0.0005 (2.55)**	0.0006 (3.23)***
Foreign_MA	0.0079 (0.81)	0.0023 (0.24)	0.0066 (2.30)**	0.0060 (2.00)*
Foreign_MA_Age	-0.0011 (1.85)*	-0.0009 (1.80)*	-0.0005 (2.69)**	-0.0005 (2.85)***
Foreign_MA_Expected_8	-0.0180 (3.25)***	-0.0141 (2.17)**	0.0311 (17.16)***	0.0163 (4.47)***
Mktshare_Loans	-0.0041 (0.16)	-0.1289 (4.49)***		0.1061 (6.97)***
NPL_over_Loans		-0.1748 (3.92)***		
ConsumerLoans_over_Assets		-0.1152 (1.89)*		
HousingLoans_over_Assets		0.2905 (3.98)***		
CommercialLoans_over_Assets		-0.0003 (0.02)		
FobaproaLoans_over_Assets		-0.0026 (0.17)		
SOFOLLoans_over_Assets		-0.0428 (1.31)		
Constant	-0.0528 (3.10)***	-0.0414 (1.93)*	0.0123 (1.97)*	0.0071 (1.14)
Observations	566	558	566	566
R-squared	0.04	0.09	0.19	0.24
F	8.36	17.19	62.11	102.44

Functional form is OLS. Observations are quarterly, September 1997 - Dec 2004. The 5 highest and lowest values of the dependent variable were dropped. The sample is restricted to Foreign MA and Domestic Banks, no Foreign De Novo banks. Robust t statistics in parantheses; * significant at 10%; ** significant at 5%; ***significant at 1%. (Standard Errors are clustered at the quarterly level)