

The Dark Side of Decentralized Banks: Market Power and Credit Rationing in SME Lending *

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Abstract

Using loan-level data from Mexico, we study the relationship between the organizational structure of banks and the terms of lending to small businesses. We find that banks with decentralized lending structures — where branch managers have autonomy over the terms of lending — give larger loans to small firms and those with more "soft information". However, decentralized banks are also more responsive to the competitive environment when setting loan terms. They are more likely to cherry pick customers and restrict credit when they have market power, even more so to smaller firms that have fewer outside options for external finance. These findings highlight a 'darker side' to decentralized banks and suggest that the relative benefit of a decentralized bank structure for small business lending depends critically on the nature of the competitive environment in which banks are located.

JEL Classification: G21, H81, L22, L26.

Key Words: Banks, Organizational Structure, Small Business, Entrepreneurship

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1 Introduction

Small banks are believed to play a critical role in financing young and small businesses in the economy. In addition to their ability to engage in relationship banking (Petersen and Rajan, 1994; Berger and Udell, 1995), it is suggested that the decentralized structure inherent in small banks gives them an important advantage when lending to small firms. The decentralized structure implies that branch managers in small banks have far greater autonomy over adjudication and lending decisions than in large banks, thereby giving them an incentive to collect and use “soft information” when setting the loan terms (Stein, 2002). Since much of the information used in lending to small businesses may be "soft", decentralized banks have an advantage in small-business lending compared with the centralized decision making structure in large banks.

These differences in the organizational structure of banks can have important consequences for the real economy. For example, Berger et al (2005) show that small businesses located in US MSAs with a majority of large banks were more likely to face credit constraints than firms located close to small, decentralized banks. Likewise, Mian (2008) shows that decentralized banks consistently engage in more lending activity to small firms in markets with weak contract enforceability. The general image that emerges from this literature, therefore, is that decentralized banks are the better answer for credit-constrained small firms that may otherwise be excluded from bank finance.

Using a loan-level dataset on SME lending in Mexico, we find that this positive picture of decentralized banks does not always hold true. While our results are consistent with prior work in this literature, we show that the same discretion that allows branch managers of decentralized banks to act on soft information also allows them to be more responsive to their own competitive environment when setting loan terms. This can be beneficial for small businesses in competitive banking markets where decentralized banks can help alleviate credit constraints. But it also implies that decentralized banks might better-exploit their market power in concentrated banking markets by restricting credit or charging higher interest rates to small businesses.

Our empirical analyses are based on a comprehensive, loan-level panel dataset on small

and medium enterprise (SME) loans in Mexico, covering the period 2002 to 2006. We find that small firms and those that tend to rely more on ‘soft information’ get larger loans from decentralized banks. These results were even stronger when using instrumental variables, indicating that the differences across banks lie not just in the terms of lending, but also in the types of firms that get approved for a loan. In concentrated banking markets, however, decentralized banks were more likely than centralized banks to cherry pick the best firms and give them smaller loans. This was particularly true for smaller firms and firms in the services sector, that provide less “hard information” to banks, have less collateral, and hence tend to have fewer outside options for external finance.

Our results highlight that decentralized banks indeed have access to soft information that provides them with a greater sensitivity to local institutional environments. However, we show that this can have both positive and negative consequences for small firms. While some of our results complement prior findings by showing the benefits of decentralized banks, the results also highlight that there may be a darker side to decentralized bank lending. Put differently, the relative benefit of decentralized bank structures for small business lending may depend on the institutional and competitive environment in which banks are located.

A novel feature of our analysis is that it allows us to get direct measures of organizational structure without relying on the size of the banks. Since our results are based on banks that have large, national presences but differ in their organizational structure, we can also show that it is in fact the organizational structure of banks that drives the observed patterns in our data as opposed to some other factor that may be correlated with bank size (e.g. Brickley et al 2003).

This paper therefore ties together two literatures related to small business lending. On the one hand, it is related to studies examining how competition in the banking industry impacts credit constraints of small, constrained startups (Black and Strahan 2002; Cetorelli and Strahan 2006; Kerr and Nanda, 2009). On the other, it is related to studies examining how bank structure affects lending outcomes (Stein 2002; Berger et al 2005). In tying together these two literatures, our findings may also explain why entrepreneurship *increased* significantly following the cross state US banking deregulations from the late 1970s through the early 1990s, despite the fact that the deregulations led to a wave of M&A activity where

the number small banks fell dramatically . The increase in entry following the deregulation is seen as a puzzle by some, as a fall in small banks is usually associated with a decline in entrepreneurship. Our result highlights that the increase in entrepreneurship in this instance may thus have occurred precisely because small banks had been effective in exploiting their monopoly power in the period before the deregulation, leading the competition between large banks – still a second best outcome – to still be a better outcome for entrepreneurs than monopolist small banks.

The rest of the paper is structured as follows: In section 2, we outline the theoretical considerations for the paper. In Section 3, we outline our estimation design and the series of institutional features we exploit in our analysis. Section 4 provides an overview of the Data and the descriptive statistics. Section 5 outlines our regression results. Finally, in Section 6 we have a brief discussion of our results, and conclusions.

2 Theoretical Considerations

Bank credit is the most important source of external finance for young firms and small and medium enterprises (SMEs). Still, given that these ventures are associated with high degrees of asymmetric information, otherwise viable small businesses may face credit constraints that prevent them from growing or force them to prematurely shut down.

The vast majority of firms in the economy are small¹, highlighting the extent to which this is an important concern. Accordingly, a large literature on bank lending to small firms has focused on how the organizational structure or the competitive environment of banks may affect small firms' access to credit (Petersen and Rajan 1994, 1995; Berger and Udell, 1996; 2002; Black and Strahan, 2000).

While much of the literature on bank structure has focused on the ability for smaller banks to maintain lending relationships with small businesses, more recent papers have argued that in addition, small banks may be better at alleviating credit constraints for small businesses because they are more effective at processing the "soft information" of young and small firms (Stein, 2002). According to this view, a key distinguishing factor of small business

¹For example, of the 6 million firms in the US with at least one employee, 5.3 million (89%) have less than 20 employees (US Small Business Administration, 1996)

lending is that it relies heavily on information that cannot be easily verified by others. For that reason, branch managers of decentralized banks, who have more autonomy over lending decisions, will invest more energy *ex ante* in processing the ‘soft information’ available for small firms. Given that these managers bear full responsibility over lending choices, they have higher powered incentives to gather –and react to– soft information from their clients. Branch managers in centralized banks, in contrast, rely more heavily on ‘hard information’ such as credit scoring models. As a result, banks with a decentralized lending structures will have a comparative advantage in lending to young and small businesses with predominantly unverifiable information, even if larger banks can recreate some of the benefits of lending relationships that small banks have.

In this paper, we build on the same intuition, but also examine the interaction between bank structure and the competitive environment in which the banks are located. We hypothesize that branch managers in decentralized banks should also be more responsive to their own competitive environment when setting deal terms, as they have greater incentives to do so compared with managers of centralized banks. In some instances, this may be beneficial to small businesses because branch managers can set terms based on the actual (rather than expected) propensity to pay back the loan. However, in other instances –such as when banks have market power– decentralized banks may be able to extract more of the surplus from small firms than centralized banks, by charging higher rates or restricting access to credit.

3 Estimation Design

Empirically testing the hypothesis that banks with different organizational structures have different lending terms – that also vary by the institutional environment – poses several challenges. First, we need a measure of bank organizational structure that allows us to distinguish between banks that use a centralized vs. a decentralized lending model. Second, we need to account for the fact that the observed lending terms are endogenous, since they are a function of lending terms conditional on selection of firms by banks. Since decentralized banks may lend to different types of firms than centralized banks, comparing lending terms across the bank types without accounting for this selection will lead to biased results. In addition, we need to account for the fact that the distribution of bank branches for central-

ized and decentralized banks may vary systematically across competitive environments in relation to the SME lending opportunity. Comparing lending terms across the institutional environment for banks may again conflate this selection of markets by banks with the lending terms conditional on entering that market.

In order to get an accurate measure of the banks' organizational structure, one of the authors conducted extensive interviews in each of the major banks in Mexico, at both the corporate and the branch-level, to gain an insight into the degree of autonomy that branch managers had over adjudication and lending process. In particular, during interviews with branch managers and especially with the SME credit managers for each bank, we asked them to describe the loan approval process. Based on those interviews, we created an index that reflects the extent to which lending decisions are taken at the bank's central offices or at the branch level. We include capital budgeting, loan adjudication, client acquisition, loan amount, loan size, interest rate, and collection decisions. Table 1 shows that the index varies from a minimum of 7 for HSBC (the most centralized) to a maximum of 20 for Bajio (the most decentralized). It also shows that there is a clear split between Santander and Banorte, which allows us to use a dummy variable to group the two sets of banks into distinct categories for our analysis, where those banks with a score of 10 or below are coded as being centralized.

We rely on important historical features of the Mexican banking industry to address the issues of selection outlined above. As we outline in greater detail below, a series of factors impacting the Mexican banking market effectively wiped out SME lending across all the major banks over the decade prior to our study. In 2002, there was a renewed push from the government to initiate lending to SMEs in Mexico, which led to the re-emergence of a small business lending market subsequent to that period. We argue that the complete lack of SME lending in the decade prior to our study implies that the distribution of centralized and decentralized bank branches across markets was not driven by selection into better or worse SME markets but by other factors such as the need to collect deposits. Given this fact, we use the pre-existing distribution of bank branches in 2002 as plausibly exogenous and hence also use the share of decentralized banks in the firm's local banking market to instrument for the selection between bank types and firms.

Since our identification strategy relies critically on showing that banks did not select into

markets, we provide both a historical account of the Mexican banking sector as well as some checks on the validity of our identification strategy in the section below.

3.1 The Mexican Banking Sector and SME Lending: 1990-2002

The Mexican banking industry has had a tumultuous history marked by a consistent restriction of credit. From its origins, Mexican banks have been at the center of the Mexican political system, and have monopolized the country's financial resources. Their relative lack of competitiveness only worsened when severe macroeconomic mismanagement led López Portillo's government to expropriate all private banks in 1981² (Haber 2004).

Accordingly, when the government decided to privatize banks as part of its broader privatization strategy in 1991, there still remained a fear of expropriation among investors. Given the government's desperate need for resources due to aggressive expansionary policies, it sought to auction the existing banks at the highest possible price. To attract investors, the government granted them a protected oligopoly shielded from internal and external competition (Haber 2004) and sold the banks to the highest bidder irrespective of managerial experience (Unal and Navarro 1999). As a result, Mexican banks sold with a premium of 45 percent over the value of their equity (Unal and Navarro 1999). An impenetrable oligopoly ran by less experienced managers was created which, due to moral hazard, pervasive tunneling, and mis-reporting of non-performing loans was highly volatile (Haber 2004).³ The natural end result was the collapse of the banking sector in 1994 that continued the protracted years of restricted lending and Mexico's distinction as a poor financing environment.

Aside from the resultant crisis, the institutional setup had other practical implications. Between the nationalization of 1981, the privatization of 1991, and the years leading up to the 1994 crisis, most banks lost their credit analysis capabilities and the incentive to engage in commercial lending. As the banks were first expropriated and later re-privatized, their administration was increasingly centralized. What little discretion was still available to branch managers was lost when the 1994 crisis led to a complete restriction of lending, an

²This was in fact the third time that banks were expropriated since 1915. The two previous times, however, occurred during the highly turbulent times that followed the Mexican Revolution and preceded the creation of the national economic and political pact that gave rise to Mexican corporatism and the PRI's hegemony

³Most of these managers did not have previous banking experience. Rather, they emerged out of trading companies and investment banks that developed during the stock exchange boom.

expensive governmental bailout of all banks, and a desperate need for capitalization of the system. Mexican banks were opened to foreign investment in 1997 and foreign ownership increased from 16 percent in 1997 to 83 percent by 2004 (Haber and Musacchio 2005). The market was also further concentrated, where the five largest banks gained control of around 70 percent of the market. While the capital injection increased the centralization of practices, it did not increase lending; in fact, the opposite occurred (Haber 2004; Haber and Musacchio 2005).

At the same time, the privatization of the early 1990s led to the emergence of new regional banks which, given that they were in their emergence stage during the crisis, did not suffer from the mismanagement associated with the bidding wars of the larger financial groups. Banks such as Banco Mercantil del Norte—which later became Banorte—and Banco del Bajío emerged as new, private, regional operations during the privatization era. As other banks collapsed during 1995 and were sold to foreign owners, these regional operations found themselves as the sole providers of credit to the government and grew vertiginously throughout the country to national or quasi-national operations. This also shielded them from the aggressive entrance of international capital during the 1997 wave, and they thus retained the decentralized structures that they grew with.

The period from 1997 to 2000 was one of greater stability, where both centralized and decentralized banks were able to maintain high levels of profitability without engaging in much commercial lending – by lending to the government, their own shareholders, and by charging extremely high fees and commissions to account holders (Haber and Musacchio 2005). That commercial lending was not a priority for banks is reflected in the continued downward trend in the activity, with private sector lending as a percentage of GDP falling from 14.5% in 1997 to 9.2% in 2001.

The retraction of credit affected Mexican SMEs disproportionately. Up to 1985, development banks in Mexico such as NAFINSA and Banrural played a central role in business financing through several government-sponsored funds. While their aim was to complement the role of commercial banks, in most cases they actually substituted all SME financing. Due to several structural and contextual factors (including the repeated financial and macroeconomic crises) these agencies lowered their activity considerably during the decades of the 80s

and 90s. During the privatization of the early 1990s, some credit did reach SMEs, but given the organizational factors described above, loans were mostly given with aggressive property collateral requirements and were often denominated in dollars. As a result, the credit crunch combined with the currency crisis affected SMEs —especially those in nontradable sectors—disproportionately, further decreasing their already scant access to credit (Krueger and Tornell 1999; Tornell and Westermann 2003). Mexican businesses thus perfected the art of survival without financing. Around seventy percent of Mexican businesses finance their operations through trade and supplier credit, which carries costs of 60 to 150 percent per year (Banco de México, 2007). An extra 15 percent of business financing comes from alternative credit sources (sometimes coded in surveys as SME loans) such as personal credit cards or personal mortgage loans, which are equally inefficient.

In sum, SME credit has historically not been a priority for any bank in Mexico. Rather, banks have based their profitability on extremely high commissions for retail banking and on government lending. Accordingly, branching decisions have been based on opportunities for retail banking. Mexican banks basically entered the new millennium with little lending to the commercial sector, but with two different – and equally successful– organizational structures for retail banking: fully centralized and decentralized. In Appendix 1, we show that the share of branches of centralized and decentralized banks remain stable across the entire period with respect to the SME lending opportunity, and moreover are also similar in more versus less concentrated banking markets.

4 Data

The data for this study is drawn from a proprietary loan-level database maintained by the ministry of the economy of Mexico. In 2002, there was a renewed push from the government to initiate lending to SMEs in Mexico. The Ministry of the Economy was reformed to include a sub-ministry for the development of SMEs, which determined SME access to bank credit as one of the main priorities of the ministry. The initiatives to bring credit to SMEs were grouped under the National SME Financing System (SINAFIN, for its initials in Spanish). While the program evolved and changed considerably from its inception in 2001 and its initial implementation in 2002, its initial incarnation consisted of a government-funded guarantee

system that covered banks' SME loan losses. The program included both a first-losses product that covered a set percentage of a bank's SME loan portfolio, and a traditional guarantee that covered up to 75 percent of each loan that defaulted, but that had a cost of around two percent of the guaranteed amount.

The SINAFIN program provided an incentive for the banks to experiment with a segment that they had traditionally overlooked while they focused on less risky but still profitable investments. As the banks developed pilot products for SMEs and started testing the segment, they discovered that there was a much larger demand for loans, at much better repayment rates, than they had anticipated. During its first five years of operation, and even though it is a relatively small program (US\$150 million were invested between 2001 and 2006) it generated very positive results.

Over the period that we study, all SME loans given by private-sector banks through the program are included in this database. It is important to note that, given that this was the first effort by the banks at creating a SME-specific product, in fact the database is a good approximation on all loans granted to SMEs in the period.⁴ The database includes unique firm- and bank- identifiers, basic firm-level information such as the firm size, industry, and location as well as a set of loan-level characteristics such as the purpose of the loan (working capital vs. fixed asset investment), the amount of the loan and the interest rate that was charged. A separate database also maintains whether a firm defaulted on its loan.

We use the information on firm size to bucket firms into one of three categories — firms with less than 15 employees are classified as "Micro", those with more than 15 but less than 30 employees are classified as "Small", and those with more than 30 employees are classified as "Medium".⁵ Table 2A provides descriptive statistics on the firms in our sample. As can be

⁴Starting in 2007, the rules around the guarantee program and SME lending operations of some banks changed, so that not all loans for each bank were included in the data. However, interviews with both the ministry of the economy and officials at each of the major banks have confirmed that over the period we study, the database is comprehensive for all SME-specific credit products. Other loans were surely granted to SMEs, but they would have taken the form of mortgage loans or personal consumer loans received by the entrepreneurs and funneled to their business. These personal loans are often coded as SME loans in survey data.

⁵As defined by the Ministry of the Economy. Not all firms in the database have an estimate of the number of employees, but branch managers were required to provide an estimate of the firm size when giving the loan. Our categorization maps onto this logic, and hence we use the branch managers' estimate of the category for the firm in instances where we do not have the data to calculate it ourselves.

seen from Table 2A, almost 60% of the firms in this sample are Micro firms, with an average size of 6 employees. A further 23% are Small firms with an average size of 21 employees and the remaining 19% are classified as Medium firms with an average size of 52 employees. Table 1A also highlights differences in the share of loans each type of firm takes for fixed asset loans, compared to working capital; and differences in the industry composition across different types of firms.

In table 2B, we provide descriptive statistics by banks' lending structure. As outlined in the section above, the large national banks in Mexico vary in the lending structure they followed for retail lending prior to 2002, where some used centralized and some decentralized structures. When the SINAFIN program was implemented, banks ported this lending technology to the SME sector.

The descriptive evidence in table 2B is consistent with the hypothesis that decentralized banks are better at processing "soft information". Although 19% of all the loans in the database are given by decentralized banks, they account for 44% of the loans given to firms in the service sector — which tends to be associated much more with soft information than firms that are engaged in either manufacturing or in trading/ commerce. Moreover, while less than half a percent of centralized banks' loans are given for fixed asset investments, nearly a quarter of decentralized banks' loans are used for this purpose. While it may seem that fixed asset loans may involve less soft information as part of the approval decision, they often tend to be more risky in this context because the liquidation value of collateral that SMEs can post is usually of little value to the banks.⁶ Further, as can be seen from Table 1A, the vast majority of these loans are given to Micro firms which tend to be less established, less structured, and have less solid financial information.

5 Regression Results

5.1 Bank Lending Structure and Deal Terms

In Table 3, we report estimates from loan-level regressions where the dependent variable is the size of loans to small businesses. The estimations take the form:

⁶This is especially true for small manufacturing firms. There is very little a bank can do, for example, with a specialized plastic injection machine.

$$\begin{aligned}
\ln(SIZE) = & \phi_s + \tau_t + \delta_b + \psi_i + \beta'_1 \mathbf{X} \\
& + \beta'_2 SMALL + \beta'_3 MICRO \\
& + \beta'_3 DEC * SMALL + \beta'_4 DEC * MICRO + \varepsilon_{s,t,b,i}
\end{aligned} \tag{1}$$

In these regressions, $\phi_s, \tau_t, \delta_b, \psi_i$ refer to state, year, bank and industry fixed effects. State fixed effects capture systematic differences in the lending environment across states (such as bankruptcy laws) that may affect loan sizes. Bank fixed effects account for fixed differences in the lending policies and practices across banks. Similarly year fixed effects and industry fixed effects (controlling for manufacturing, commerce and retail firms) control for systematic differences in loan characteristics across these industry types, or across years. *SMALL* and *MICRO* refer to dummy variables indicating the type of firm receiving the loan, and *DEC * SMALL* and *DEC * MICRO* refer to the interaction between the dummy variable for decentralized banks with the dummy variables of firm type. Note that the main effect of dummy of decentralized banks is absorbed by the bank fixed effects and hence is not reported. The matrix \mathbf{X} refers to other characteristics of the loan, such as whether it was a fixed asset or working capital loan as well as the HHI index of bank concentration associated with the municipality in the which the firm is located.

Columns 1-3 of Table 3 show that even after controlling for covariates, Micro and Small firms continue to get smaller loans. These differences are robust to including the full range of fixed effects. Column 4 includes the interaction with the decentralized bank dummy and shows that, consistent with the descriptive statistics, decentralized banks give larger loans to small and micro firms. T-tests for the difference in the loan amount are significant at the 5% level of significance.

Naturally, these results could simply reflect that the different lending technologies of decentralized and centralized banks lead to systematic differences in the *types* of firms that are granted credit. We therefore interpret the results of Model 4 with caution, since they are likely to be biased by these selection effects.

To address potential selection biases we need to instrument for whether a firm gets a loan from a decentralized bank. As we outline in the section above, we use the share

of decentralized banks in the municipality where the firm is located as an instrument for whether the firm actually receives a loan from a decentralized bank. In other words, in a municipality where decentralized banks have a very high proportion of the total bank branches, firms are much more likely to have been served by a decentralized bank, regardless of their characteristics. We argue that this identification strategy is valid because as we discussed in Section 3, the branching patterns across municipalities was driven by retail banking (deposits, checking accounts, credit cards), and not SME lending. Moreover, since the lending structures across the two different types of banks were driven by factors unrelated to the emergence of the SINAFIN program, the share of decentralized banks should proxy for the probability that a firm was matched with a decentralized bank, but should be unrelated to systematic differences in the quality of firms and the terms that a given firm would expect to receive.⁷ Tables A1 and A2 in Appendix 1 test these assumptions empirically and find them to be valid. Table A1 compares the proportion of all centralized and decentralized bank activity—measured as bank branches—that is concentrated in states that have a population of SME firms above the median. Table A2 shows that the proportion of decentralized to centralized bank branches in the total market, as well as within more competitive or more concentrated markets, has remained constant through time. This is true even though the total number of branches in these different markets has increased. The results indicate that both types of banks have followed similar branching strategies. All these analyses show that there does not seem to be a significant and systematic difference in how centralized and decentralized banks allocate their activity to particular states or local banking markets, with respect to the SME lending opportunity.

We report the results of these IV regressions in Column 5 of Table 3. Comparing column 4 and column 5 of Table 3 highlights that after controlling for the selection bias, decentralized banks are seen to give even larger loans to Small and Micro firms. The direction of the bias suggests that decentralized banks are more likely to give loans to smaller firms within a given size category, consistent with the view that decentralized banks are better at processing soft information. In unreported regressions, we also find that this selection bias tends to be

⁷We also verify empirically that the share of decentralized banks across the different types of markets does not vary in ways that are statistically significantly different from variations in the share of centralized banks.

stronger for small and micro firms in the service sector (with more soft information) compared to firms engaged in manufacturing or commerce.

Further evidence of this selection bias is evident when looking at the OLS and IV regressions in Table 4, where we examine the interest rates charged to small and micro firms. The first 3 models in Table 3 highlight that small and micro firms tend to face higher interest rates than medium firms. In model 4, the OLS results show that decentralized banks charge more to small and micro firms. It is possible, however, that the higher interest rates may be driven by the smaller, ‘riskier’ firms that decentralized banks might be lending to (as noticed by results in Table 3). Comparing column 4 and column 5 of Table 3 shows that this is indeed the case. What model 5 suggests is that once we control for the selection bias in the types of firms that decentralized banks lend to, there is no meaningful difference in the interest rates that centralized and decentralized banks charge.

Our results in this section map closely to prior findings (e.g. Berger et al, 2005) that decentralized banks are far more effective at processing soft information, and hence better able to alleviate financing constraints for small firms. Previous research has typically relied on bank size as a proxy for decentralized lending structures. Since we are comparing banks that have national presence but have a direct measures of their organizational structure, we can confirm that it is decentralization –and not a different mechanism correlated with bank size—that accounts for our results. Interviews with credit brokers,⁸ branch managers, credit directors, and national product managers of the different banks confirmed these findings. Interviewees consistently referred to the comparative advantage for decentralized banks to provide more customized loans or to evaluate firms whose information was not as clear. In contrast, they suggested that centralized banks have an advantage in the standardization of their product and the speed with which their credit scoring system can determine lending decisions.

⁸Credit brokers –or “extension agents”—help firms structure their loan applications and advise them through the application process. They are, in most cases, financed by the state and are paid a small commission for loan applications submitted at banks and a larger commission for approved loans. They can take a prospective client to any bank.

5.2 Lending Terms by Bank Structure and the Institutional Environment

We now turn to the ability of banks to respond to the local environment in which they are located. Given the added discretion that branch managers of decentralized banks have, we might expect them to be more responsive to the local institutional environment compared to branch managers in centralized banks. In order to examine this further, we look at the competitive environment in each municipality to see if the deal terms offered by decentralized banks are systematically different from those offered by centralized banks across different environments. In order to do so we, estimate the following specifications:

$$\begin{aligned} \ln(SIZE) = & \phi_s + \tau_t + \delta_b + \psi_i + \beta'_1 SMALL + \beta'_2 MICRO \\ & + \beta'_3 HHI + \beta'_4 DEC * HHI + \varepsilon_{s,t,b,i} \end{aligned} \quad (2)$$

We measure bank competition using the log of the HHI concentration index calculated using the share of each bank's branches in a given municipality and year. The municipality-level regressions provide a measure of the concentration in the "local" banking market in which the firm is located and go beyond measures of concentration at the state-level (which may not be a good proxy of the actual choices that firms face in their local markets).

We now include an interaction between decentralized banks and our measure of local banking competition, captured by the variable $DEC * HHI$. As can be seen from Table 5, the coefficient on $DEC * HHI$ in columns 1 and 2 suggest that there is no difference in the lending practices between centralized and decentralized banks across market concentration.

However, comparing the results from the IV regressions Column 3 to Column 2 again shows the selection present in decentralized-bank lending across markets. Decentralized banks give significantly smaller loans in concentrated markets than centralized banks and moreover, the nature of selection suggests that they are lending to larger, "safer firms" in concentrated markets. This hypothesis is corroborated by looking at the interest rates charged by banks. Although it seems as if decentralized banks charge less in concentrated markets, this is in fact driven by selection. IV regressions show no difference in the rates charged, once selection is accounted for. As can be seen in Table 6, this is particularly true for small and micro firms. In fact, for some specifications, we also find evidence that

decentralized banks charge higher interest rates to these small and micro firms.

We provide further descriptive evidence of cherry picking in Table 7. Since our hypothesis is that decentralized bank managers are more reactive to the institutional environment than those in centralized banks, we should find that measures of lending activity should be more constant across markets in centralized banks than in decentralized banks. In Table 7, we show the share of lending activity for the different types of banks, broken down by firm type and market concentration. We segment markets by those that are the 25% most concentrated, the 25% most competitive and those in the middle 50% of concentration. Table 7 shows that for centralized banks, the share of their loans across these market types track closely to the share of branches and moreover, are very similar for medium, small and micro firms. On the other hand, decentralized firms are more likely to be aggressive in lending in competitive markets, but to restrict credit access in concentrated markets. This is most true of micro firms (whereas for medium firms the pattern looks much more similar to the pattern in centralized banks). This "differences-in-differences" descriptive evidence where medium firms look similar but micro firms do not, suggests that this pattern for decentralized banks is not driven by a different relative share in branches for decentralized and centralized banks, but rather by the conscious actions by branch managers.

5.3 Robustness Checks

One concern with our results is that they may just reflect a differential tolerance for risk rather than a fundamental difference in the lending technology of different types of banks—even if this cannot be reconciled with the systematic differences observed across competitive environments.

To examine this further, we look at the default rates of firms across the different types of banks. One limitation with our default data is that it has patchy information on the bank associated with the default. That is, the database informs us whether a firm defaulted on a loan, but for firms holding several loans we do not know which particular loan they defaulted on. We therefore restrict our sample to firms that received a loan from only one bank. These constitute 92% of the firms in our sample. The results from these regressions are reported in Table 8.

In order to facilitate comparisons with the IV regressions, we first run linear probability models where the dependent variable is a dummy variable that takes the value of 1 if the firm defaulted on its loan. As can be seen from Table 8, small and micro firms tend to have higher default rates, highlighting the fact that they are more risky. However, the results also show that there are no differences in the propensity for loans given by type of bank to go default. These results suggest that the differences in the lending terms being observed across banks are a function of their lending technologies rather than differences in overall risk tolerance or actual risk. Moreover, they would seem to suggest that, holding firm characteristics and risk preferences stable, decentralized banks actually grant larger loans and manage to keep their default rates at lower levels in competitive markets. The fact that loan size is associated with higher default rates also suggests why decentralized banks seem to restrict credit in un-competitive environments in addition to cherry picking their loans.

A second concern may be that banks of one type are inherently “better” at all they do and, accordingly, our results only reflect these systematic performance differences. To rule this out, we compare performance metrics for centralized vs. decentralized banks. Figures 2A, 2B, and 2C in the Appendix show quarterly ROE, delinquency,⁹ and efficiency metrics for several banks as well as the weighted average of centralized and decentralized banks. It can be seen that there is no clear pattern that indicates a systematic difference between the two types of banks.¹⁰

Finally, one possible explanation for this may be the distinction between "foreign" and "domestic" banks as opposed to the lending structure per se. While we cannot rule out this possibility since foreign banks tend to have centralized lending structures while most of the domestic banks do not, we believe that our results point to a specific mechanism related to the organizational structure of foreign versus domestic banks (distinct from risk preferences) that might explain the differential results related to bank lending that have been found in prior work looking at bank lending in emerging markets (Mian, 2006; Detragiache et al 2008).

⁹Overall delinquency rates (of all lending activities) as reported to the National Banking Commission (CNBV).

¹⁰Comparisons of other metrics such as ROA, credit placement, default rates as well as performance by activity (retail vs. commercial banking, etc.) yielded similar results.

6 Discussion and Conclusions

Small firms are especially dependent on external financing for their survival. The vast majority of their financing—especially in developed markets—tends to come from banks. Given the size of such businesses, credit is often concentrated at a single intermediary where the borrower has a lending relationship (Petersen and Rajan, 1994; Fluck et al, 1998). Since small businesses, and particularly young small businesses, have little internal cash flow to finance their operations, but are also associated with significant asymmetric information, a potential concern for policy makers is that these businesses face credit constraints. This is certainly the case in Mexico, where smaller firms mostly have to rely on expensive trade credit or personal credit cards to finance their operations.

A large body of academic research has therefore focused on how the structure of the banking industry — both in terms of the competitive environment for banks and in terms of the organizational structure of banks themselves — is associated with product market outcomes for small businesses.

However, the two streams of study — one focused on banking competition and the other on bank structure — have remained largely independent of each other, and in fact, generated contradictory findings. On the one hand, research on the organizational structure of banks has focused on the benefits of a decentralized banking structure in the context of small business lending. On the other hand, research looking at the small business lending suggests that banking deregulation led to a widespread increase in entrepreneurial activity despite the wave of mergers that led small, decentralized banks to fall significantly following the deregulations (Black and Strahan 2000; Kerr and Nanda 2009). Viewed in the context of our findings, however, these apparently contradictory findings make sense: while decentralized banks are indeed better than centralized banks at alleviating credit constraints for small businesses in competitive markets, they are in fact *worse* than centralized banks in concentrated banking markets. Thus an increase in banking competition along-side an increase in centralized banks due to the mergers would still have had a positive impact on entrepreneurship since the reduction in monopoly power of small decentralized banks would have led to a positive effect on small business lending, even if it came with the presence of larger, more centralized.

Our findings may also shed light on the finding by Erel (2006) that the M&A activity following the US branch banking deregulations led to a sharp fall in the interest rates for firms, and particularly for small businesses.

Our approach in this paper brings together the literature related to the organizational structure of banks with the one looking at banking competition to look at how the *interaction* between these two factors impacts the deal terms offered to small businesses. Our results show that branch managers in decentralized banks are more sensitive to the local environment than branch managers in centralized banks. They give more attractive terms to firms in competitive banking markets, but are more likely to cherry pick firms and restrict credit in areas where they have market power. Thus the extent to which decentralized banks alleviate credit constraints depends critically on the competitive environment for banks.

Our results build on the empirical work of Berger et al (2005) who find that the organizational structure of banks can have important consequences for the small businesses that seek credit in a given market. While they proxy for the decentralized nature of the lending technology using bank size, our in-depth qualitative interviews with the major banks in Mexico allowed us to identify large banks with decentralized lending structures. Our results therefore also speak to the hypothesis that Berger et al (2005) raise in their conclusion that "a large organization might, at least to a degree, be able to enjoy the best of both worlds if it sets up the internal structure that achieves the right level of decentralization." We are also able to look at the rates of default for the different types of banks, so that we can show more directly that the differences in deal terms seem to be driven more by the lending technology of banks rather than other factors such as their inherent risk preferences.

Our findings have clear implications for public policy. Prior work has identified the relative benefit of decentralized (small) banks in alleviating credit constraints among small businesses — in the context of more competitive environments. It has thus argued that the key issue from a public policy standpoint may not be market power in the traditional Herfindahl-index sense, but more about the choice of banks that firms have access to. Our results suggest that both the organizational structure and the localized market power of a bank are relevant for SME lending, and they should not be considered independently. This implication is also related to other work looking at the importance of examining organizational structure within

the context of the institutional environment and not treating it in isolation (e.g. Raith 2003).

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TABLE 1: LEVEL OF CENTRALIZATION BY BANK

The level of centralization varies from 1 to 3 for each activity. 1 means that the decisions surrounding that activity are defined by the bank's HQ. 3 means that they are made entirely by the branch manager.

	Activity							Sum	Mean
	Capital Budgeting	Loan Type	Client Acquisition	Adjudication	Interest Rate	Amount	Collection		
Bajío	3	3	3	3	2	3	3	20	2.86
NBFI	1	3	3	3	3	3	3	19	2.71
Banorte	2	3	3	3	2	2	3	18	2.57
Santander	1	1	2	2	1	1	2	10	1.43
Bancomer	2	1	1	1	1	1	2	9	1.29
Banamex	1	1	1	1	1	1	1	7	1.00
HSBC	1	1	1	1	1	1	1	7	1.00

1	Centrally defined	Standardized Product	Bank-wide policy	Just parametric	Fixed rate	Parametric defined	Central office flags
2	Negotiated P&L		Parametric plus financials	Parametric defines range	Parametric defines range	Parametric defines range	General policies, branch decides
3	Each branch has own P&L	Potential to customize	Branch defined	Manager's decision	Customized	Full discretion (to limit)	Branch decides

TABLE 2A: DESCRIPTIVE STATISTICS BY TYPE OF FIRM

Descriptive Statistics are based on 74,947 loans over the period January 2002 to June 2006

	<i>Total</i>	<i>Medium</i>	<i>Small</i>	<i>Micro</i>
<i>Fraction of loans in database</i>	100%	19%	22%	58%
<i>Average Number of Employees*</i>	16	52	21	6
<i>Loan Size (USD)</i>				
Mean	29,738	43,661	31,327	24,704
25%	10,000	26,000	15,000	8,600
Median	22,000	47,000	23,000	15,700
75%	40,300	50,000	38,900	33,000
<i>Interest rate (%)</i>				
Mean	19.2%	18.4%	19.2%	19.5%
25%	17.0%	16.4%	17.0%	17.0%
Median	19.1%	17.8%	19.0%	19.5%
75%	22.0%	21.0%	22.0%	22.0%
<i>Fixed Asset Loan share</i>	4.6%	1.3%	1.0%	6.8%
<i>Fraction in Manufacturing</i>	39%	33%	32%	44%
<i>Fraction in Commerce</i>	38%	43%	52%	32%
<i>Fraction in Services</i>	23%	24%	16%	24%

* Calculated on a subset (~ 70%) of firms for which data available

TABLE 2B: DESCRIPTIVE STATISTICS BY BANKS' LENDING STRUCTURE

Descriptive Statistics are based on 74,947 loans over the period January 2002 to June 2006

	<i>Total</i>	<i>Decentralized Banks</i>	<i>Centralized Banks</i>
<i>Fraction of loans in database</i>	100%	16%	84%
<i>Fraction in Manufacturing</i>	100%	13.7%	86.3%
<i>Fraction in Commerce</i>	100%	9.0%	91.0%
<i>Fraction in Services</i>	100%	44.6%	55.4%
<i>Fixed Asset Loan Share</i>	4.6%	23.0%	0.4%
<i>Average Loan Size (USD)</i>			
All Firms	30,739	42,031	28,755
Medium Firms	44,718	49,714	43,825
Small Firms	31,054	45,019	29,537
Micro Firms	25,778	38,946	23,073
<i>Interest rate</i>			
Mean	19.0%	15.8%	19.6%
25%	17.0%	13.1%	17.0%
Median	19.0%	16.0%	19.2%
75%	21.9%	18.5%	22.0%

TABLE 3: LOAN SIZE BY BANKS' LENDING STRUCTURE

The dependent Variable is log of loan amount. All regressions include industry controls (Manufacturing, Commerce or Services) and year fixed effects. Models 2-5 include state fixed effects and Models 3-5 include bank fixed effects. Note that bank fixed effects imply that the main effect of decentralized banks is not identified, and hence is not reported in the tables. A firm is coded as "Micro" if the number of employees is under 15; "Small" if the number of employees is between 15 and 30. The omitted category, "Medium", is a firm with over 30 employees.

	<i>OLS Regressions</i>				<i>IV</i>
	(1)	(2)	(3)	(4)	(5)
Log Herfindahl index (at town level)	-0.025 (0.036)	-0.049 (0.043)	-0.061 (0.033)	-0.061* (0.032)	-0.060* (0.031)
Fixed Asset Loan	-0.556 (0.299)	-0.537 (0.288)	-0.969*** (0.121)	-1.104*** (0.146)	-1.147*** (0.140)
Micro Firm	-0.760*** (0.127)	-0.755*** (0.130)	-0.810*** (0.181)	-0.935*** (0.159)	-1.010*** (0.161)
Small Firm	-0.418* (0.181)	-0.416* (0.181)	-0.416* (0.193)	-0.487** (0.187)	-0.586*** (0.158)
Decentralized Bank x Micro				0.725*** (0.191)	1.196** (0.483)
Decentralized Bank x Small				0.399* (0.207)	1.220* (0.630)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	No	Yes	Yes	Yes	Yes
Bank Fixed Effects	No	No	Yes	Yes	Yes
F-Statistic on Decentralized x Micro					275.9
F-Statistic on Decentralized x Small					127.4
Observations	74,947	74,947	74,947	74,947	74,947
R-squared	0.15	0.16	0.24	0.25	0.24

Robust standard errors in brackets, clustered by bank

*** p<0.01, ** p<0.05, * p<0.1

TABLE 4: INTEREST RATES BY BANKS' LENDING STRUCTURE

The dependent Variable is log of the interest rate on the loan. All regressions include industry controls (Manufacturing, Commerce or Services) and year fixed effects. Models 2-5 include state fixed effects and Models 3-5 include bank fixed effects. Note that bank fixed effects imply that the main effect of decentralized banks is not identified, and hence is not reported in the tables. A firm is coded as "Micro" if the number of employees is under 15; "Small" if the number of employees is between 15 and 30. The omitted category, "Medium", is a firm with over 30 employees.

	<i>OLS Regressions</i>				<i>IV</i>
	(1)	(2)	(3)	(4)	(5)
Log Herfindahl index (at town level)	0.016* (0.008)	0.024** (0.008)	-0.001 (0.002)	-0.001 (0.002)	-0.001 (0.002)
Fixed Asset Loan	0.077 (0.071)	0.073 (0.067)	0.157*** (0.028)	0.137*** (0.026)	0.142*** (0.034)
Micro Firm	0.055** (0.017)	0.054** (0.016)	0.015 (0.018)	-0.003 (0.006)	0.001 (0.010)
Small Firm	0.034** (0.012)	0.033** (0.011)	0.018 (0.012)	0.007 (0.011)	0.011 (0.013)
Decentralized Bank x Micro				0.107*** (0.021)	0.081 (0.056)
Decentralized Bank x Small				0.063* (0.031)	0.040 (0.092)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	No	Yes	Yes	Yes	Yes
Bank Fixed Effects	No	No	Yes	Yes	Yes
F-Statistic on Decentralized x Micro					275.9
F-Statistic on Decentralized x Small					127.4
Observations	74,947	74,947	74,947	74,947	74,947
R-squared	0.11	0.12	0.59	0.59	0.61

Robust standard errors in brackets, clustered by bank

*** p<0.01, ** p<0.05, * p<0.1

TABLE 5: LENDING TERMS BY BANK STRUCTURE AND THE STRENGTH OF THE COMPETITIVE ENVIRONMENT

The dependent variables are log of loan size and log of the interest rate on the loan. All regressions include industry controls (Manufacturing, Commerce or Services) and year fixed effects and bank fixed effects. Models 2-3 and 5-6 include state fixed effects. Note that bank fixed effects imply that the main effect of decentralized banks is not identified, and hence is not reported in the tables. The variable "Log Herfindahl index" is a (time varying) HHI index of bank competition based on the number of branches of different banks in each town in each year. A firm is coded as "Micro" if the number of employees is under 15; "Small" if the number of employees is between 15 and 30. The omitted category, "Medium", is a firm with over 30 employees.

	Log Amount			Log Rate		
	OLS (1)	OLS (2)	IV (3)	OLS (4)	OLS (5)	IV (6)
Log Herfindahl index (at town level)	-0.025 (0.022)	-0.060 (0.033)	0.039 (0.036)	-0.001 (0.002)	0.000 (0.003)	-0.001 (0.005)
Fixed Asset Loan	-0.975*** (0.121)	-0.969*** (0.123)	-1.023*** (0.103)	0.159*** (0.030)	0.156*** (0.028)	0.157*** (0.028)
Micro Firm	-0.813*** (0.183)	-0.810*** (0.181)	-0.814*** (0.180)	0.016 (0.018)	0.015 (0.018)	0.015 (0.018)
Small Firm	-0.416* (0.194)	-0.416* (0.193)	-0.417* (0.192)	0.018 (0.013)	0.018 (0.012)	0.018 (0.012)
Decentralized Bank x Log Herfindahl Index	-0.020 (0.046)	-0.008 (0.035)	-0.794** (0.322)	-0.016** (0.005)	-0.014* (0.007)	-0.005 (0.029)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	No	Yes	Yes	No	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
F-Statistic			21.57			21.57
Observations	74,947	74,947	74,947	74,947	74,947	74,947
R-squared	0.23	0.23	0.23	0.60	0.61	0.59

Robust standard errors in brackets, clustered by bank

*** p<0.01, ** p<0.05, * p<0.1

TABLE 6: LENDING TERMS BY BANK STRUCTURE, STRENGTH OF THE COMPETITIVE ENVIRONMENT AND FIRM SIZE

	Log Amount				Log Rate			
	Small and Micro Firms		Medium Sized Firms		Small and Micro Firms		Medium Sized Firms	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Log Herfindahl index (at town level)	-0.061 (0.037)	0.036 (0.034)	-0.041** (0.013)	0.024 (0.050)	0.001 (0.003)	0.000 (0.002)	-0.005 (0.009)	-0.005 (0.010)
Fixed Asset Loan	-1.157*** (0.127)	-1.216*** (0.110)	0.049 (0.095)	0.046 (0.047)	0.147*** (0.029)	0.148*** (0.029)	0.076** (0.026)	0.076** (0.350)
Micro Firm	-0.457*** (0.082)	-0.460*** (0.083)			-0.005 (0.012)	-0.005 (0.011)		
Decentralized Bank x Log Herfindahl Index	0.006 (0.044)	-0.806* (0.416)	-0.098*** (0.026)	-0.504** (0.209)	-0.007 (0.006)	0.005 (0.021)	-0.029 (0.053)	-0.029 (0.064)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F-Statistic		14.3		20.2		14.3		20.2
Observations	60,884	60,884	14,063	14,063	60,884	60,884	14,063	14,063
R-squared	0.20	0.20	0.17	0.13	0.62	0.62	0.56	0.55

Robust standard errors in brackets, clustered by bank

*** p<0.01, ** p<0.05, * p<0.1

TABLE 7: SHARE OF TOTAL LOANS BY MARKET CONCENTRATION AND BANK STRUCTURE

	Centralized Banks			Decentralized Banks		
	25% most concentrated markets	25% most competitive markets	Total	25% most concentrated markets	25% most competitive markets	Total
Share of loans to Medium firms	24%	49%	100%	25%	46%	100%
Share of loans to Small firms	24%	50%	100%	24%	47%	100%
Share of loans to Micro firms	27%	51%	100%	21%	39%	100%

TABLE 8: LOAN DEFAULTS BY BANK STRUCTURE

The dependent variable takes a value of 1 if the firm defaulted on the loan. All regressions include industry controls (Manufacturing, Commerce or Services) and year fixed effects, state fixed effects and bank fixed effects. Note that bank fixed effects imply that the main effect of decentralized banks is not identified, and hence is not reported in the tables. The number of observations in these regressions are lower because the default database does not have consistent data on the bank associated with the default. We therefore restrict these regressions to those firms that only took a loan from a single bank. This constitutes the vast majority of *firms*, although a few firms are seen to take multiple loans from different banks.

	OLS Regressions		IV Regressions	
	(2)	(3)	(5)	(6)
Log Herfindahl index (at town level)	0.003 -0.002	0.003 (0.002)	0.003 (0.002)	-0.002 (0.008)
Fixed Asset Loan	-0.014 (0.011)	-0.012 (0.010)	-0.025 (0.027)	-0.009 (0.005)
Log amount	0.003* (0.001)	0.003* (0.001)	0.002 (0.001)	0.003* (0.002)
Log rate	-0.011 (0.008)	-0.01 (0.008)	-0.017 (0.014)	-0.009 (0.006)
Micro Firm	0.004** (0.002)	0.005** (0.002)	(0.003) (0.004)	0.006* (0.002)
Small Firm	0.003 (0.002)	0.004* (0.002)	0.004 (0.003)	0.004* (0.002)
Decentralized Bank x Micro	0.008 (0.005)		0.043 (0.046)	
Decentralized Bank x Small	0.006 (0.004)		-0.024 (0.059)	
Decentralized Bank x Log Herfindahl Index		0.000 (0.002)		0.044 (0.097)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes
F-Statistic on Decentralized x Micro			255.7	
F-Statistic on Decentralized x Small			120.2	
F-Statistic on Decentralized x HHI				20.3
Observations	69,344	69,344	69,344	69,344
R-squared	0.02	0.02	0.02	0.02

Robust standard errors in brackets, clustered at the bank level

*** p<0.01, ** p<0.05, * p<0.1

Appendix 1

TABLE A1: Share of branches in states with above median SME businesses per capita, by type of bank organization structure

<i>year</i>	<i>Decentralized</i>	<i>Centralized</i>
2002	76.20%	73.80%
2003	73.90%	73.70%
2004	81.70%	80.80%
2005	81.90%	81.10%
2006	82.30%	80.90%

TABLE A2: Ratio of the number of decentralized to centralized bank branches

<i>year</i>	<i>All municipalities</i>	<i>Municipalities with above median HHI</i>
2002	23.74%	20.96%
2003	24.10%	17.13%
2004	23.83%	15.96%
2005	24.42%	16.18%
2006	24.33%	15.51%