

08-101

# **Bank Structure and the Terms of Lending to Small Businesses**

**Rodrigo Canales  
Ramana Nanda**

Copyright © 2008 by Rodrigo Canales and Ramana Nanda

Working papers are in draft form. This working paper is distributed for purposes of comment and discussion only. It may not be reproduced without permission of the copyright holder. Copies of working papers are available from the author.

# Bank Structure and the Terms of Lending to Small Businesses\*

Rodrigo Canales  
MIT Sloan

Ramana Nanda  
Harvard Business School

June 1, 2008

## 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" - particularly in states with weak legal enforcement of financial contracts. However, decentralized banks are also more responsive to the competitive environment when setting loan terms. They are more likely to restrict credit and to charge higher interests rates when they have market power, 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, Institutions, Entrepreneurship

---

\*We are extremely grateful to the Mexican Ministry of the Economy as well as to Elfid Torres from FUNDES for sharing the data used for this paper. We are grateful to Lamont Black, David McKenzie, Mitchell Petersen, Costas Stephanou, Gregory Udell, Chris Woodruff and the participants on the World Bank Conference on Small Business Finance for their feedback on this paper. Please send your comments to rcanales@mit.edu and RNanda@hbs.edu. All errors are our own.

# 1 Introduction

A vast literature on the organizational form of banks has documented the important role that small banks play in financing young and small businesses (Berger and Udell, 2002). In addition to their ability to engage in relationship banking (Petersen and Rajan, 1994; Berger and Udell, 1995), a key distinction between small and large banks that has been highlighted in this context is that the lending decision in small banks tends to be decentralized. That is, since their branch managers have autonomy over lending decisions, they are able to use the “soft information” on small businesses in their lending decisions, while the hierarchical nature of large banks gives them a disadvantage in lending to such firms (Stein, 2002). 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 in the US that were located in MSAs with a majority of large banks were more likely to face credit constraints for their businesses than those located close to small, decentralized banks.

In this paper, we argue that the same ability of decentralized banks to act on soft information should also make them more responsive to the local environment when setting terms of their loans. While this can be beneficial for small businesses in competitive markets, it also implies that the organizational structure of decentralized banks might allow them to better-exploit their market power in concentrated banking markets by restricting credit or charging higher interest rates from small businesses.

Our empirical analysis is based on a comprehensive, loan-level panel dataset on SME loans in Mexico, over the period 2002 to 2006. We find that small firms and those with more ‘soft information’ were more likely to get larger loans from decentralized banks, particularly in environments where the legal enforcements of contracts was relatively weak. These results were even stronger when using instrumental variables, highlighting that the differences across banks lie not just in the terms of lending (the intensive margin), but also in the types of firms that get approved for a loan (the extensive margin). On the other hand, however, decentralized banks were also more likely than centralized banks to cherry pick the best firms, give smaller loans and charge higher interest rates in concentrated banking markets. This was particularly true for firms in the services sector, where small and micro firms with

"soft information" had fewer outside options for external finance.

Our results highlight that the access to soft information and the greater sensitivity of decentralized banks to the local institutional environment can have both positive and negative consequences for small firms. While some of our results complement prior findings by showing the benefits of decentralized lending in weak legal environments, the results also highlight that there may be a dark side to decentralized bank lending in certain instances. The relative benefit of decentralized bank structure for small business lending may therefore depend critically on the institutional and competitive environment in which banks are located.

These findings also highlight a different perspective on the role of the US banking deregulations for entrepreneurship. Several recent studies have documented the fact that 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 (Berger et al, 1995; Black and Strahan 2002; Cetorelli and Strahan 2006). These studies have cited better lending technology of large banks as a factor that helped them overcome the disadvantage they faced in lending to small startups after they acquired smaller banks. Our findings suggest another, complementary, explanation. They suggest that small banks may have been able to exploit their market power in the period prior to the deregulations even more effectively than large banks, thereby restricting entry of new businesses. The increase in entry following the deregulation may thus have occurred precisely because small banks were not able to exploit their monopoly powers as easily once they faced increased competition for business. This view complements the prior explanations and provides another perspective for the increase in entrepreneurship following the deregulations was so large and emerged relatively soon following the deregulations (Kerr and Nanda, 2007).

The rest of the paper is structured as follows: In section 2, we outline the theoretical considerations for the paper. In Section 3, we provide some context on the Mexican banking sector, 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 estimation design and regression results. Finally, in Section 6 we have a brief discussion of our results,

and conclusions.

## 2 Theoretical Considerations

Given the high degree of asymmetric information associated with young and small firms, an important concern with such businesses is that they may face credit constraints that prevent them from growing as efficiently as they may like to or force them to prematurely shut down. Since banks are the most important source of external finance for young and small businesses, a large literature on bank lending to small firms has focused on the how the competitive environment for banks and the organizational structure of banks may affect small firms' access to credit (Petersen and Rajan 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, a more recent addition to the literature has argued 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 lending is that it relies heavily on information that cannot be easily verified by others. In such a context, branch managers of decentralized banks – who have more autonomy over the adjudication process and the terms of lending – will invest more *ex ante* in processing the soft information inherent in small firms while branch managers in centralized, or hierarchical firms rely much more heavily on 'hard information' such as credit scoring models. According to this model, therefore, banks with a decentralized lending structure will have a comparative advantage in lending to young and small businesses with predominantly "soft information" even if larger banks are able to recreate some of the benefits of lending relationships. Berger et al (2005) test this theory using survey data from the US and find that, consistent with this model, small businesses located in markets with predominantly large banks were much more likely to face credit constraints than those who had access to capital from smaller, more decentralized banks.

We build on this intuition in this paper, but also examine the interaction between bank structure and the institutional environment in which firms are located. Since branch man-

agers in decentralized banks have higher powered incentives to gather – and react to – soft information, we hypothesize that decentralized banks should be more responsive to their local environment when setting deal terms. In some instances, such as when there are weak institutions, 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, 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.

Aside from our loan-level data, two features of our setting make it particularly attractive to study such a question. First, like the US, Mexico is governed by a federal system, so that each of its 32 state governments has separate jurisdiction over the legal enforcement of contracts, bankruptcy laws and other legal institutions that have important implications for bank lending to small businesses. The competitive environment for banks also differs across different states. We can therefore exploit cross-sectional variation in both the legal and competitive environment across Mexico for our analysis and study how the interaction between these environments and the organizational structure of banks impacts lending outcomes.

Second, we exploit a series of shocks to the Mexican banking sector prior to our study that provide us with variation in banks’ organizational structures that are exogenous with respect to SME lending. Since it is very likely that under normal circumstances, bank lending practices — including the bank structures — are equilibrium responses to a given institutional environment, our use of this exogenous variation in bank structure facilitates a more causal interpretation of our results relating bank structure to lending outcomes. We outline these in greater detail in the section below:

### **3 The Mexican Banking Sector and SME Lending: 1990-2006**

The Mexican banking industry has had a tumultuous history marked by a consistent restriction of credit. The sector, in fact, has been historically concentrated and uncompetitive. From its origins, Mexican banks have been at the center of the Mexican political system, and have monopolized the country’s financial resources (Centeno and Maxfield 1992; Schneider 1997). Their relative lack of competitiveness only worsened when severe macroeconomic mismanage-

ment led López Portillo's government to expropriate all private banks in 1981 in an attempt to "blame the country's desperate economic situation on the country's bankers, rather than on his government's mismanagement of the economy."<sup>1</sup> (Haber 2004). Accordingly, when the Salinas 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. At the same time, investors were weary both because of the poor administrative condition of the banks and the impending threat of expropriation. To attract investors, Salinas granted them a protected oligopoly shielded from internal and external competition (Haber 2004), sold the banks to the highest bidder irrespective of managerial experience (Unal and Navarro 1999), did not bring Mexico's accounting standards in line with generally accepted accounting standards to allow banks to under-report non-performing loans (Haber 2004), allowed investors to pay for up to 75% of the negotiated value with debt acquired through loans given by the same bank (Mackey 1999), and unofficially promised extremely generous deposit insurance.

As a result, Mexican banks sold with a premium of 45 percent over the value of their equity (Unal and Navarro 1999); and an impenetrable oligopoly<sup>2</sup> ran by less experienced managers was created which, due to pervasive tunneling, misreporting of non-performing loans, and moral hazard was highly volatile (Gonzalez-Hermosillo et al. 1997; Haber 2004). What followed the privatization was a dramatic lending boom fueled both by the careless lending of inexperienced bankers and by the currency appreciation of the nineties that only further destabilized the financial sector (Tornell and Westermann 2003). The end result was the collapse of the banking sector that brought back the protracted years of restricted lending and Mexico's distinction as a poor financing environment (see Fig. 1).

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

---

<sup>1</sup>This 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.

<sup>2</sup>Most 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.

in commercial lending. This resulted from the fact that, in previous decades, lending had been carried out at the branch level, following a traditional model of relationship lending. As the banks were first expropriated and later re-privatized, the administration was increasingly centralized and much of that expertise was lost. What little discretion was still available to branch managers was lost when the 1994 crisis led to a complete centralization and tightening of lending. This was exacerbated with the crisis, which led to an 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).

However, the privatization of the early 1990s also led to the emergence of new regional banks, which did not suffer from the mismanagement associated with the bidding wars for the larger banks. 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; Musacchio and Read Forthcoming). The low priority of the commercial sector for banks was reflected in the continued downward trend in commercial lending over this period, with private sector lending as a percentage of GDP falling from 14.5% in 1997 to 9.2% in 2001 (CNBV, 2005).

The retraction of credit affected Mexican SMEs disproportionately. Up to 1985, devel-

opment 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 within the import substitution philosophy of the 70s and 80s. 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 boom 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. As a result, the credit crunch combined with the currency crisis affected SMEs—especially those in non-tradable sectors—disproportionately, further decreasing their already scant access to credit (Krueger and Tornell 1999; Tornell and Westermann 2003). While it is true that private credit began to take off after 2003, its amount in 2005 was only 71 percent of that in 1997, and the trend did not reach SMEs. 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 100 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.

Therefore, SME credit has not been a priority for any bank in Mexico, and branching decisions have thus been based largely on the retail sector. This will become important in our identification strategy described below. Mexican banks basically entered the new millennium with little lending to the commercial sector, but with two different — and equally successful — lending structures for the retail sector: fully centralized and decentralized.

### **3.1 The SINAFIN Program**

Starting in 2002, there was an important push from the government to initiate lending to the SME segment in Mexico. The Ministry of the Economy was reformed to include an undersecretary for the development of SMEs, who 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 to focus 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. From a base of just over 300 loans in 2002, the banks lent nearly 6,000 loans in 2003, 30,000 loans in 2005 and 90,000 loans in 2007. About 200,000 loans have been granted through the program through 2007, with a total value of close to USD 6 Billion. Because the Ministry of the Economy was involved in this initiative, it collected the details of all SME loans given out by private sector banks starting in 2002. It is this data that forms the basis of our analysis.

## 4 Data

The data for this study is drawn from a proprietary loan-level database maintained by the ministry of the economy of Mexico. 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.<sup>3</sup>

---

<sup>3</sup>Starting 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 entrepreneur and funneled to her business. It is important to note that these personal loans are often coded as SME loans in survey data.

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". 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. Table 1A provides descriptive statistics on the firms in our sample. As can be seen from Table 1A, 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 1B, we provide descriptive statistics by banks' lending structure. As outlined in the section above, the large national banks in Mexico followed both a centralized and decentralized lending structure for their retail lending prior to 2002. When the SINAFIN program was implemented, they ported this lending technology to the SME sector. As part of this research, one of the authors of this paper 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 lending outcomes.

In instances where branch managers had autonomy over the adjudication process as well as greater flexibility on the lending terms that they gave to small businesses, we classified banks as decentralized. Where the adjudication decision was largely based on a centralized credit scoring model, and where branch managers did not have flexibility in setting deal

terms, we classified banks as being centralized. In addition to the regional banks, the two main national banks that we classified as decentralized were Bajio and Banorte. The foreign banks, such as BBVA, Banamex (Citibank), HSBC and Santander were all classified as using a centralized lending structure.

The descriptive evidence in table 1B suggests that decentralized banks may be 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 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 adjudication 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. Further, as can be seen from Table 1A, the vast majority of these are given to Micro firms and hence are also more risky. However, consistent with Stein's (2002) model, table 1B shows that for a small number of fixed asset loans that centralized banks do process, the size of their loans to Micro firms is in fact *larger*. That is, in the event that centralized banks choose to give fixed asset loans to Micro firms, they are likely to be for firms with a lot of hard information, and hence the loan size is significantly larger than for the fixed asset loans that decentralized banks give to Micro firms.

## 5 Estimation Design and Regression Results

### 5.1 Bank Lending Structure and Deal Terms

In Table 2, we report estimates from regression where the dependent variable is the size of loans to small businesses. As can be seen from Table 2, Micro and Small firms get smaller loans on average after controlling for the industry in which the firm operates and the individual bank that gave the loan (and also including state and year fixed effects). Similar to the descriptive statistics, Column 4 also shows that decentralized banks give larger loans to small and micro firms. Of course, these results are correlations and as the descriptive

statistics in table 1B highlighted, the different lending technologies of decentralized and centralized banks may lead to systematic differences in the types of firms that are given credit at all. We therefore need to be careful in how we interpret our regression estimates in model 4, since they are likely to be biased by the systematic selection of certain types of firms by the two different types of banks. In order to account for these selection biases therefore, we report the results of instrumental variable regressions in column 5, where we instrument for whether a firm gets a loan from a decentralized bank by using the fraction of decentralized bank branches in the state. We argue that this identification strategy is valid because as we discussed in Section 3, the branching patterns across states was driven by retail credit, rather than 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 not be related to systematic differences in the quality of firms and hence the terms that a given firm would expect to receive.<sup>4</sup>

Comparing column 4 and column 5 of Table 2 highlights that decentralized banks are more likely to give loans to smaller firms within a given size category, so that after controlling for this selection bias, they are seen to give *even* larger loans to Small and Micro firms. As we show in Appendix 1, this selection bias is stronger for small and micro firms in the service sector compared to firms in engaged in manufacturing or commerce.

Further evidence of this selection bias is evident when looking at the OLS and IV regressions in Table 3, 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 the selection biases in Table 2). 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

---

<sup>4</sup>We also verify empirically that the share of decentralized banks across the different types of markets is not statistically significantly different from the share of centralized banks.

in the interest rates that centralized and decentralized banks charge. Appendix 2 segments the results in models 4 and 5 by the type of industry. It shows that the results continue to hold across both types of industries, although the coefficients on the IV regressions suggest that decentralized banks may charge slightly more to firms in the Service sector in return for the larger loans that they give them (although this is not statistically significant). 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.

## 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 higher powered incentives that the branch managers of decentralized banks face, 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 two aspects of the institutional environment – the strength of legal institutions and the competitive environment in each state – to see if the deal terms offered by decentralized banks are any different from those offered by centralized banks across different institutional environments.

Although laws governing financial contracts are set at the federal level in Mexico, the enforceability of contracts varies significantly by state (e.g. Laeven and Woodruff, 2007). We therefore proxy for this de-facto variation in the enforceability of financial contracts by using an index of contract enforceability across Mexico in 2001 created by Moodys.<sup>5</sup> Table 4 reports the results of regressions looking at the terms of lending by bank structure and the strength of the legal environment. Models 1 and 2 report the coefficients in OLS regressions where the dependent variable is loan size. The coefficients on OLS regressions suggest that decentralized banks do not lend any differently in weak legal environments compared to centralized banks. The coefficient in Model 3, however, rises sharply (although so do the standard errors, due to the IV) suggesting that after controlling for the selection of firms into different types of banks, decentralized banks may be giving somewhat larger loans to

---

<sup>5</sup>We thank Chris Woodruff for providing us this data.

firms in weak legal environments. Models 4, 5, and 6 report coefficients from regressions where the dependent variable is the interest rate. Again, they reflect a similar pattern. While the OLS regressions suggest that there is no difference in the interest rates charged by decentralized banks in states with weak contract enforceability, the IV regressions show that in fact, correcting for the selection bias, decentralized banks charge significantly less than centralized banks in weaker legal environments. That is, decentralized banks seem to charge less for similar firms, but in addition are able to lend to riskier firms in states with weaker legal environments— so that the OLS results suggest an apparent similarity in the lending terms of centralized and decentralized banks. Once we control for the selection bias however, we find that decentralized banks charge less, and may also give somewhat larger loans to firms in states with weak contract enforceability.

In Table 5, we turn to the relationship between bank structure and the competitive environment. We measure bank competition using the log of the HHI index calculated using the share of each bank’s branches in a given state and year. As can be seen from Table 5, decentralized banks give smaller loans in more concentrated markets. Although the coefficient is less precisely estimated in the IV regression, the coefficient estimate remains similar. When looking at the interest rate charged by decentralized banks in concentrated markets, the IV regressions suggest that decentralized banks charge significantly more. Moreover, a comparison of the OLS and IV regressions also suggest that decentralized banks tend to select less risky firms in concentrated banking markets, leading to the lower coefficient on the OLS regressions in Models 4 and 5, compared with Model 6. These results suggest that branch managers in decentralized banks seem to be more reactive to the competitive environment in which banks are located compared with branch managers in centralized banks, and able to extract more from the firms that they lend to - both in terms of restricting access to credit and by charging more.

In order to examine this hypothesis further, we look at whether these effects are stronger for smaller firms and those in the services sector, that may have more soft information and hence have fewer outside options for external finance outside of decentralized banks. These results are reported in Tables 6 and 7. In Table 6, we highlight that the results in Table 5 are in fact strongest for firms in the services sector. The OLS and IV regressions on both

the loan size and the interest rate are even more extreme versions of the results seen in Table 5, while the results for firms in manufacturing and the services sector are less strong. In Table 7, the results show that the pattern is much stronger for small and micro firms than for medium-sized firms, again suggesting that decentralized banks are more likely to extract the surplus in concentrated markets from firms that have fewer outside options for external finance.

### 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. In order to examine this further, we look at the default rates of firms across the different types of banks, provided to us through a separate database from the ministry of economy in Mexico. One limitation with our default data is that it has patchy information on the bank associated with the default. We therefore restrict our sample to firms that received a loan from only one bank. These constitute 92% of the firms in our sample (and 85% of the total loans). The results from these regressions are reported in Table 8. The dependent variable in Table 8 is a dummy variable that takes the value of 1 if the firm defaulted on its loan. As with the previous tables, we report the interaction between the organizational structure of the bank, and both the size of firms that received a loan and the measures of the institutional environment. With the exception of micro firms, where decentralized banks seem to experience a 10% higher default rate, the default rates across banks are remarkably similar. In fact, may even be lower for decentralized banks in concentrated markets where (as was seen in Table 5-7) they seem better able to cherry pick their clients relative to centralized banks. 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 risk tolerance or risk.

## 6 Discussion and Conclusions

The vast majority of external finance for small firms tends to come from banks, and this is often concentrated at a single institution 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 (and are also associated with significant asymmetric information), a potential concern for policy makers is that these businesses may face credit constraints. A large body of academic research has therefore focused on how both 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.

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 somewhat contradictory findings. In this paper, we combine both aspects of the banking industry, and look at how the interaction between the organizational structure of banks and the institutional environment in which they are located impacts their deal terms to small businesses.

We use a unique loan-level database from Mexico for our analysis, that covers all loans given to small businesses by private sector banks over the period January 2002 to June 2006. Consistent with Stein's (2000) model in which branch managers of decentralized banks have higher-powered incentives to process "soft information", we find that decentralized banks are more likely to give larger loans to small and micro firms, and firms in the services industry. In addition, we find that branch managers of decentralized banks are more sensitive to the institutional environment of the branch when setting deal terms – they give better deal terms in states with weaker legal enforcement of contracts, but on the other hand, give firms worse terms when they have market power. This is particularly true of small and micro firms and firms in the services industry.

Our results build on the empirical work of Berger et al (2005) who find that the predominant 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."<sup>6</sup> 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 risk preferences.

Our findings are also related to the literature examining the relative benefits of small banks for small business lending, particularly in the context of the US branch banking deregulations. While several authors have pointed out the numerous benefits of small banks in lending to entrepreneurs and small businesses, others have found that the removal of local monopolies in the US – which resulted in a wave of M&A activity where small banks consolidated – actually led to an *increase* in entrepreneurship (Black and Strahan 2002; Kerr and Nanda, 2007). It 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.

Lastly, our findings also have implications for public policy. Prior work has identified the relative benefit of small (decentralized) 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 it is the *interaction* between the market power and the organizational structure of banks that is relevant. While small, decentralized banks are better at alleviating credit constraints in markets where there is a more competition, the fact that they are more reactive to the local environment implies that – ironically – they may in fact be more effective monopolists when they have market power. The public policy implications of this result is that it may not be enough to give small firms access to decentralized banks in order to alleviate credit constraints – rather it is important to promote competition between decentralized

---

<sup>6</sup>We are in the process of having discussions with the centralized office and branch managers of these Mexican banks to understand the capital budgeting process and how they are able to achieve this level of decentralization in lending.

banks in order to truly achieve the benefits associated with credit access for small businesses, or those with more "soft information".

## References

- [1] Banerjee, A. V., S. Cole and E. Duflo (2003). "Bank Financing in India" , MIT Working Paper.
- [2] Banerjee, A. V. and E. Duflo (2004). What do Banks (not) do?, MIT Working Paper.
- [3] Beck, T. and R. Levine. 2002. "Industry growth and capital allocation: Does having a market - or bank - based system matter?" *Journal of Financial Economics*, 64:2, pp. 147-80.
- [4] Beck, T., R. Levine, and N. Loayza. 2000. "Finance and the sources of growth." *Journal of Financial Economics*, 58:1-2, pp. 261-300.
- [5] Berger, A. N., A. K. Kashyap, and J. M. Scalise. 1995. "The transformation of the US banking industry. What a long, strange trip it's been." *Brookings Papers on Economic Activity*, 2, pp. 55-218.
- [6] Berger, A. N., L. F. Klapper, and G. F. Udell. 2001. "The ability of banks to lend to informationally opaque small businesses." *Journal of Banking & Finance*, 25:12, pp. 2127-67.
- [7] Berger, A. N., N. H. Miller, M. A. Petersen, R. G. Rajan, and J. C. Stein. 2005. "Does function follow organizational form? Evidence from the lending practices of large and small banks." *Journal of Financial Economics*, 76:2, pp. 237-69.
- [8] Berger, A. N. and G. F. Udell. 1995. "Relationship lending and lines of credit in small firm finance." *Journal of Business*, 68:3, pp. 351-81.
- [9] Berger, A. N. and G. F. Udell. 2002. "Small business credit availability and relationship lending: The importance of bank organisational structure." *Economic Journal*, 112:477, pp. F32-F53.

- [10] Bertrand, M., A. Schoar, and D. Thesmar. 2007. "Banking deregulation and industry structure: Evidence from the French banking reforms of 1985." *Journal of Finance*, 62:2, pp. 597-628.
- [11] Black, S. E. and P. E. Strahan. 2002. "Entrepreneurship and bank credit availability." *Journal of Finance*, 57:6, pp. 2807-33.
- [12] Centeno, M. A. and S. Maxfield (1992). "Marriage of finance and order: changes in the Mexican political elite." *Journal of Latin American Studies* 24: 57-85.
- [13] Cetorelli, N. 2004. "Real effects of bank competition." *Journal of Money, Credit and Banking*, 36:3, pp. 543-58.
- [14] Cetorelli, N. and P. E. Strahan. 2006. "Finance as a barrier to entry: Bank competition and industry structure in local U.S. markets." *Journal of Finance*, 61:1, pp. 437-61.
- [15] Davis, S., J. Haltiwanger, R. Jarmin, and J. Miranda. 2006. "Volatility and dispersion in business growth rates: Publicly traded versus privately held firms." NBER Working Paper 12354.
- [16] Erel, I. 2006. "The effect of bank mergers on loan prices: Evidence from the U.S." Fisher College of Business Working Paper No. 2006-03-002.
- [17] Evans, D. S. and B. Jovanovic. 1989. "An estimated model of entrepreneurial choice under liquidity constraints." *Journal of Political Economy*, 97:4, pp. 808-27.
- [18] Fazzari, S. M., R. G. Hubbard, and B. C. Petersen. 1988. "Financing constraints and corporate investment." *Brookings Papers on Economic Activity*, 1, pp. 141-95.
- [19] Fluck, Z., D. Holtz-Eakin, and H. S. Rosen. 1998. "Where does the money come from? The financing of small entrepreneurial enterprises." NYU Stern Working Paper.
- [20] Gamboa-Cavazos, M. and A. Musacchio, 2006. *Lost Judgement: Challenges in Debt Collection through Mexican Courts*, Working Paper.
- [21] Gamboa-Cavazos, M. and F. Schneider. 2007. *Bankruptcy as a Legal Process*, Working Paper.

- [22] Gonzalez-Hermosillo, B., C. Pazarbasioglu and R. Billings. 1997. "Determinants of Banking System Fragility: A Case Study of Mexico." IMF Staff Papers 44(Sept): 295-314.
- [23] Haber, S. 2003. Banks, Financial Markets, and Industrial Development: Lessons from the Economic Histories of Brazil and Mexico. Latin American Economic Reforms: The Second Stage. J. A. Gonzalez, V. Corbo, A. O. Krueger and A. Tornell. Chicago, University of Chicago Press: 257-292.
- [24] Haber, S. 2004. Mexico's Experiments with Bank Privatization and Liberalization 1991-2003, Stanford University Working Paper.
- [25] Haber, S. and A. Musacchio. 2005. Foreign Banks and the Mexican Economy, 1997-2004, Stanford Center for International Development Working Paper.
- [26] Hurst, E. and A. Lusardi. 2004. "Liquidity constraints, household wealth, and entrepreneurship." Journal of Political Economy, 112:2, pp. 319-47.
- [27] Janicki, H. and E. Prescott. 2006. "Changes in the size distribution of U.S. banks: 1960-2005." Federal Reserve Bank of Richmond Economic Quarterly, 92:4, pp. 291-316.
- [28] Jayaratne, J. and P. E. Strahan. 1996. "The finance-growth nexus: Evidence from bank branch deregulation." Quarterly Journal of Economics, 111:3, pp. 639-70.
- [29] Kane, E. J. 1996. "De Jure interstate banking: Why only now?" Journal of Money, Credit and Banking, 28:2, pp. 141-61.
- [30] Kerr, W. R. and R. Nanda. 2007 "Democratizing Entry: Banking Deregulations, Financing Constraints, and Entrepreneurship". HBS Finance Working Paper No. 07-033
- [31] King, R. G. and R. Levine. 1993b. "Finance, entrepreneurship, and growth - Theory and evidence." Journal of Monetary Economics, 32:3, pp. 513-42.
- [32] Krueger, A. O. and A. Tornell (1999). The Role of Bank Restructuring in Recovering from Crises: Mexico 1995-1998, NBER Working paper.
- [33] Laeven, L. 2000. "Does financial liberalization relax financing constraints on firms?" World Bank Working Paper 2467.

- [34] Laeven, L. and C. Woodruff. 2007. "The Quality of the Legal System, Firm Ownership, and Firm Size." *The Review of Economics and Statistics*, 89:4, pp 601-614.
- [35] Levine, R. 1997. "Financial development and economic growth: Views and agenda." *Journal of Economic Literature*, 35:2, pp. 688-726.
- [36] Levine, R., N. Loayza, and T. Beck. 2000. "Financial intermediation and growth: Causality and causes." *Journal of Monetary Economics*, 46:1, pp. 31-77.
- [37] Mackey, M. W. 1999. Report of Michael W. Mackey on the Comprehensive Evaluation of the Operations and Functions of the Fund for the Protection of Bank Savings 'FOBAPROA' and the Quality of Supervision of the FOBAPROA Program 1995-1998",
- [38] McMillan, J. and C. Woodruff (1999). "Interfirm Relations and Informal Credit in Vietnam." *Quarterly Journal of Economics* 114(4): 1285-1320.
- [39] Paravisini, D. 2005. "Constrained banks and constrained borrowers: The effect of bank liquidity on the availability of credit." Working Paper.
- [40] Petersen, M. A. and R. G. Rajan. 1994. "The benefits of lending relationships - Evidence from small business data." *Journal of Finance*, 49:1, pp. 3-37.
- [41] Petersen, M. A. and R. G. Rajan. 1995. "The effect of credit market competition on lending relationships." *Quarterly Journal of Economics*, 110:2, pp. 407-43.
- [42] Rajan, R. G. and L. Zingales. 1998. "Financial dependence and growth." *American Economic Review*, 88:3, pp. 559-86.
- [43] Sah, R. K. and J. E. Stiglitz. 1986. "The architecture of economic systems: Hierarchies and polyarchies." *American Economic Review*, 76:4, pp. 716-27.
- [44] Schneider, B. R. (1997). *Big Business and the Politics of Economic Reform: Confidence and Concertation in Brazil and Mexico. Business and the State in Developing Countries.* B. R. Schneider and S. Maxfield. Ithaca, Cornell University Press.
- [45] Stein, J. C. 2002. "Information production and capital allocation: Decentralized versus hierarchical firms." *Journal of Finance*, 57:5, pp. 1891-921.

- [46] Tornell, A. and F. Westermann (2003). Credit Market Imperfections in Middle Income Countries. Financial Market Development in Latin America. Center for Research on Economic Development and Policy Reform, Stanford University.
- [47] Unal, H. and M. Navarro 1999. "The Technical Process of Bank Privatization in Mexico." Journal of Financial Services Research 16(Sept): 61-83.
- [48] Zarutskie, R. 2006. "Evidence on the effects of bank competition on firm borrowing and investment." Journal of Financial Economics, 81, 503-37.

**TABLE 1A: DESCRIPTIVE STATISTICS BY TYPE OF FIRM**

Descriptive Statistics are based on 81,583 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%	23%	58%
<i>Average Number of Employees*</i>	16	52	21	6
<i>Loan Size (USD)</i>				
Mean	30,091	44,735	31,155	24,908
25%	10,000	28,500	15,000	8,700
Median	22,000	49,000	23,000	16,000
75%	41,200	50,000	35,000	34,000
<i>Interest rate (%)</i>				
Mean	19.0%	18.2%	18.9%	19.4%
25%	16.9%	16.4%	16.9%	17.0%
Median	19.0%	17.6%	18.6%	19.3%
75%	21.7%	20.9%	21.9%	22.0%
<i>Fixed Asset Loan share</i>	4.6%	1.3%	1.0%	7.1%
<i>Fraction in Manufacturing</i>	39.2%	32.8%	32.0%	44.0%
<i>Fraction in Commerce</i>	38.3%	43.5%	52.0%	31.4%
<i>Fraction in Services</i>	22.5%	23.8%	16.0%	24.6%

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

## TABLE 1B: DESCRIPTIVE STATISTICS BY BANKS' LENDING STRUCTURE

Descriptive Statistics are based on 81,583 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%	19%	81%
<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 - Working Capital Loans (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>Average Loan Size - Fixed Asset Loans (USD)</i>			
All Firms	16,665	15,240	34,856
Medium Firms	46,031	46,371	44,943
Small Firms	41,234	47,717	32,643
Micro Firms	13,510	12,654	32,652
<i>Interest rate - Working Capital Loans (%)</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%
<i>Interest rate - Fixed Asset Loans (%)</i>			
Mean	19.4%	19.3%	19.9%
25%	20.4%	20.4%	18.2%
Median	20.4%	20.4%	19.0%
75%	20.4%	20.4%	22.5%

**TABLE 2: 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. Standard Errors are clustered at the state level.

	<i>OLS Regressions</i>				<i>IV</i>
	(1)	(2)	(3)	(4)	(5)
Log Herfindahl index (at state level)	0.221* (0.124)	0.316 (0.332)	0.338 (0.332)	0.367 (0.402)	0.371 (0.400)
Log share of branches in state	-0.138*** (0.039)	-0.152*** (0.040)	-0.009 (0.030)	-0.006 (0.036)	-0.005 (0.035)
Fixed Asset Loan	-0.556*** (0.187)	-0.553*** (0.194)	-0.933*** (0.204)	-1.041*** (0.228)	-1.022*** (0.187)
Micro Firm	-0.796*** (0.034)	-0.794*** (0.035)	-0.834*** (0.046)	-0.960*** (0.023)	-0.969*** (0.067)
Small Firm	-0.439*** (0.037)	-0.436*** (0.038)	-0.437*** (0.042)	-0.506*** (0.028)	-0.569*** (0.039)
Decentralized Bank x Micro				0.661*** (0.049)	0.758* (0.390)
Decentralized Bank x Small				0.383*** (0.030)	0.925*** (0.240)
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
Observations	81,583	81,583	81,583	81,583	81,583
R-squared	0.17	0.18	0.23	0.25	0.24

Robust standard errors in brackets, clustered at the state level

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

**TABLE 3: INTEREST RATES BY BANKS' LENDING STRUCTURE**

The dependent Variable is log of 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. Standard Errors are clustered at the state level.

	<i>OLS Regressions</i>				<i>IV</i>
	(1)	(2)	(3)	(4)	(5)
Log Herfindahl index (at state level)	-0.077 (0.058)	0.026 (0.160)	0.065 (0.082)	0.069 (0.071)	0.064 (0.082)
Log share of branches in state	0.107*** (0.015)	0.108*** (0.014)	0.067*** (0.015)	0.067*** (0.014)	0.067*** (0.015)
Fixed Asset Loan	0.141*** (0.026)	0.136*** (0.026)	0.181*** (0.025)	0.165*** (0.022)	0.189*** (0.028)
Micro Firm	0.067*** (0.005)	0.067*** (0.005)	0.015*** (0.002)	-0.004* (0.002)	0.018 (0.014)
Small Firm	0.032*** (0.002)	0.031*** (0.002)	0.017*** (0.002)	0.006*** (0.002)	0.007 (0.008)
Decentralized Bank x Micro				0.098*** (0.013)	-0.004 (0.063)
Decentralized Bank x Small				0.055*** (0.008)	0.093 (0.083)
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
Observations	81,583	81,583	81,583	81,583	81,583
R-squared	0.25	0.26	0.61	0.61	0.61

Robust standard errors in brackets, clustered at the state level

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

**TABLE 4: LENDING TERMS BY BANK STRUCTURE AND THE STRENGTH OF THE LEGAL 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 "Weak Enforcement of Legal Contracts" is based on an index based on data provided by Moody's, where each state is coded on a scale from 1-5. The higher the number, the worse the enforcement of legal contracts. This measure does not vary by state, and hence is absorbed for the regressions with state fixed effects. 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. Standard Errors are clustered at the state level.

	Log Amount				Log Rate			
	OLS		IV		OLS		IV	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Herfindahl index (at state level)	0.119 (0.108)	0.347 (0.325)	1.045 (0.687)	-0.013 (0.029)	0.075 (0.082)	-0.144 (0.146)		
Log share of branches in state	-0.002 (0.029)	-0.005 (0.032)	0.25 (0.189)	0.069*** (0.014)	0.071*** (0.014)	-0.009 (0.043)		
Fixed Asset Loan	-0.927*** (0.200)	-0.931*** (0.205)	-0.824** (0.364)	0.190*** (0.025)	0.183*** (0.025)	0.149* (0.084)		
Micro Firm	-0.837*** (0.045)	-0.834*** (0.046)	-0.832*** (0.047)	0.016*** (0.002)	0.015*** (0.002)	0.015*** (0.004)		
Small Firm	-0.438*** (0.042)	-0.437*** (0.042)	-0.438*** (0.044)	0.017*** (0.002)	0.017*** (0.002)	0.017*** (0.004)		
Weak Enforcement of Legal Contracts	-0.001 (0.008)			-0.002 (0.001)				
Decentralized Bank x Weak Enforcement	0.014 (0.022)	0.015 (0.023)	1.159 (0.887)	0.016 (0.011)	0.017 (0.011)	-0.342* (0.194)		
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	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	81,583	81,583	81,583	81,583	81,583	81,583	81,583	81,583
R-squared	0.23	0.25	0.26	0.60	0.61	0.61	0.61	0.61

Robust standard errors in brackets, clustered at the state level

\*\*\* 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 state 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. Standard Errors are clustered at the state level.

	Log Amount			Log Rate		
	OLS (1)	OLS (2)	IV (3)	OLS (4)	OLS (5)	IV (6)
Log Herfindahl index (at state level)	0.226** (0.109)	0.540** (0.261)	0.537 (0.686)	-0.037** (0.015)	0.035 (0.059)	-0.173 (0.107)
Log share of branches in state	0.005 (0.031)	0.000 (0.034)	0.000 (0.050)	0.064*** (0.013)	0.066*** (0.014)	0.057** (0.021)
Fixed Asset Loan	-0.902*** (0.216)	-0.903*** (0.220)	-0.904*** (0.258)	0.184*** (0.026)	0.177*** (0.027)	0.147*** (0.043)
Micro Firm	-0.837*** (0.045)	-0.834*** (0.046)	-0.834*** (0.046)	0.016*** (0.002)	0.015*** (0.002)	0.015*** (0.002)
Small Firm	-0.439*** (0.041)	-0.438*** (0.042)	-0.438*** (0.042)	0.017*** (0.001)	0.017*** (0.001)	0.018*** (0.002)
Decentralized Bank x Log Herfindahl Index	-0.489* (0.267)	-0.536* (0.263)	-0.527 (1.722)	0.087 (0.131)	0.079 (0.131)	0.629** (0.252)
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
Observations	81,583	81,583	81,583	81,583	81,583	81,583
R-squared	0.23	0.23	0.23	0.60	0.61	0.59

Robust standard errors in brackets, clustered at the state level

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

**TABLE 6: LENDING TERMS BY BANK STRUCTURE, STRENGTH OF THE COMPETITIVE ENVIRONMENT AND INDUSTRY**

	Log Amount				Log Rate			
	Services (More Soft Information)		Manufacturing and Commerce (Less Soft Information)		Services (More Soft Information)		Manufacturing and Commerce (Less Soft Information)	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Log Herfindahl index (at state level)	0.912** (0.414)	1.715* (0.934)	0.272 (0.187)	0.244 (0.359)	-0.059 (0.076)	-0.366* (0.209)	0.006 (0.036)	-0.034 (0.081)
Log share of branches in state	-0.008 (0.064)	-0.096 (0.102)	-0.004 (0.026)	-0.01 (0.058)	-0.029** (0.013)	0.005 (0.040)	0.074*** (0.011)	0.065*** (0.018)
Fixed Asset Loan	-1.089*** (0.175)	-1.037*** (0.219)	-0.039 (0.054)	-0.037 (0.060)	0.178*** (0.019)	0.158*** (0.032)	0.041*** (0.010)	0.045*** (0.013)
Micro Firm	-0.536*** (0.083)	-0.534*** (0.084)	-0.912*** (0.030)	-0.911*** (0.029)	0.030*** (0.004)	0.029*** (0.004)	0.008*** (0.003)	0.009*** (0.003)
Small Firm	-0.290*** (0.081)	-0.288*** (0.083)	-0.487*** (0.028)	-0.486*** (0.026)	0.022*** (0.004)	0.021*** (0.003)	0.014*** (0.002)	0.015*** (0.002)
Decentralized Bank x Log Herfindahl Index	-0.655*** (0.223)	-2.119 (1.339)	-0.033 (0.291)	0.176 (2.097)	-0.101* (0.057)	0.459* (0.266)	0.032 (0.121)	0.33 (0.527)
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
Observations	18,330	18,330	63,253	63,253	18,330	18,330	63,253	63,253
R-squared	0.38	0.37	0.22	0.22	0.53	0.49	0.65	0.65

Robust standard errors in brackets, clustered at the state level

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

**TABLE 7: 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 state level)	0.626* (0.334)	0.682 (0.581)	0.137 (0.257)	-0.444 (0.388)	0.041 (0.062)	-0.071 (0.093)	-0.006 (0.062)	0.054 (0.118)
Log share of branches in state	0.039 (0.034)	0.042 (0.049)	-0.143*** (0.036)	-0.168*** (0.040)	0.064*** (0.014)	0.059*** (0.017)	0.071*** (0.011)	0.073*** (0.009)
Fixed Asset Loan	-1.062*** (0.225)	-1.053*** (0.271)	0.03 (0.064)	0.109 (0.075)	0.169*** (0.023)	0.151*** (0.035)	0.072*** (0.013)	0.064*** (0.018)
Micro Firm	-0.464*** (0.007)	-0.464*** (0.007)			-0.004* (0.002)	-0.005** (0.002)		
Decentralized Bank x Log Herfindahl Index	-0.505* (0.287)	-0.645 (1.506)	0.012 (0.169)	0.218 (1.089)	0.114 (0.126)	0.393* (0.226)	-0.096 (0.122)	-0.022 (0.409)
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
Observations	66,165	66,165	15,418	15,418	66,165	66,165	15,418	15,418
R-squared	0.2	0.2	0.17	0.13	0.62	0.62	0.56	0.55

Robust standard errors in brackets, clustered at the state level

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

**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. Standard Errors are clustered at the state level. 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 (Linear Prob Model)			IV Regressions		
	(1)	(2)	(3)	(4)	(5)	(6)
Log Herfindahl index (at state level)	0.020 (0.019)	0.019 (0.019)	0.036* (0.020)	0.021 (0.019)	0.000 (0.053)	0.104 (0.079)
Log share of branches in state	-0.016*** (0.004)	-0.017*** (0.004)	-0.016*** (0.003)	-0.016*** (0.004)	-0.023 (0.015)	-0.013** (0.005)
Fixed Asset Loan	-0.028*** (0.006)	-0.026*** (0.006)	-0.023*** (0.004)	-0.030*** (0.011)	-0.028*** (0.010)	-0.013 (0.014)
Micro Firm	0.001 (0.001)	0.002** (0.001)	0.002** (0.001)	0.000 (0.004)	0.002** (0.001)	0.002** (0.001)
Small Firm	0.001 (0.001)	0.002** (0.001)	0.002** (0.001)	0.003 (0.004)	0.002** (0.001)	0.001 (0.001)
Decentralized Bank x Micro	0.010** (0.004)			0.013 (0.019)		
Decentralized Bank x Small	0.003 (0.006)			-0.018 (0.039)		
Decentralized Bank x Weak Enforcement		-0.001 (0.002)			-0.026 (0.054)	
Decentralized Bank x Log Herfindahl Index			-0.041* (0.024)			-0.207 (0.166)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	69,272	69,272	69,272	69,272	69,272	69,272
R-squared	0.04	0.04	0.04	0.04	0.04	0.04

Robust standard errors in brackets, clustered at the state level  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## APPENDIX 1: LOAN SIZE BY BANK STRUCTURE AND TYPE OF INDUSTRY

The dependent Variable is log of loan amount. All regressions include year, state 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. 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. Standard Errors are clustered at the state level.

	<i>Services (More Soft Information)</i>		<i>Manufacturing and Commerce (Less Soft Information)</i>	
	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>
Log Herfindahl index (at state level)	0.637 (0.557)	0.755 (0.754)	0.292 (0.180)	0.261 (0.178)
Log share of branches in state	0.045 (0.076)	0.065 (0.080)	-0.008 (0.032)	-0.01 (0.025)
Fixed Asset Loan	-1.225*** (0.191)	-1.379*** (0.161)	-0.043 (0.065)	-0.02 (0.052)
Micro Firm	-0.756*** (0.068)	-1.062*** (0.115)	-0.993*** (0.018)	-0.892*** (0.071)
Small Firm	-0.429*** (0.067)	-0.635*** (0.059)	-0.523*** (0.022)	-0.546*** (0.038)
Decentralized Bank x Micro	0.591*** (0.079)	1.419*** (0.291)	0.648*** (0.070)	-0.058 (0.659)
Decentralized Bank x Small	0.364*** (0.075)	1.029* (0.591)	0.348*** (0.035)	0.578* (0.288)
Industry Fixed Effects	N/A	N/A	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes
Observations	18,330	18,330	63,253	63,253
R-squared	0.39	0.36	0.23	0.21

Robust standard errors in brackets, clustered at the state level

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

## APPENDIX 2: INTEREST RATE BY BANK STRUCTURE AND TYPE OF INDUSTRY

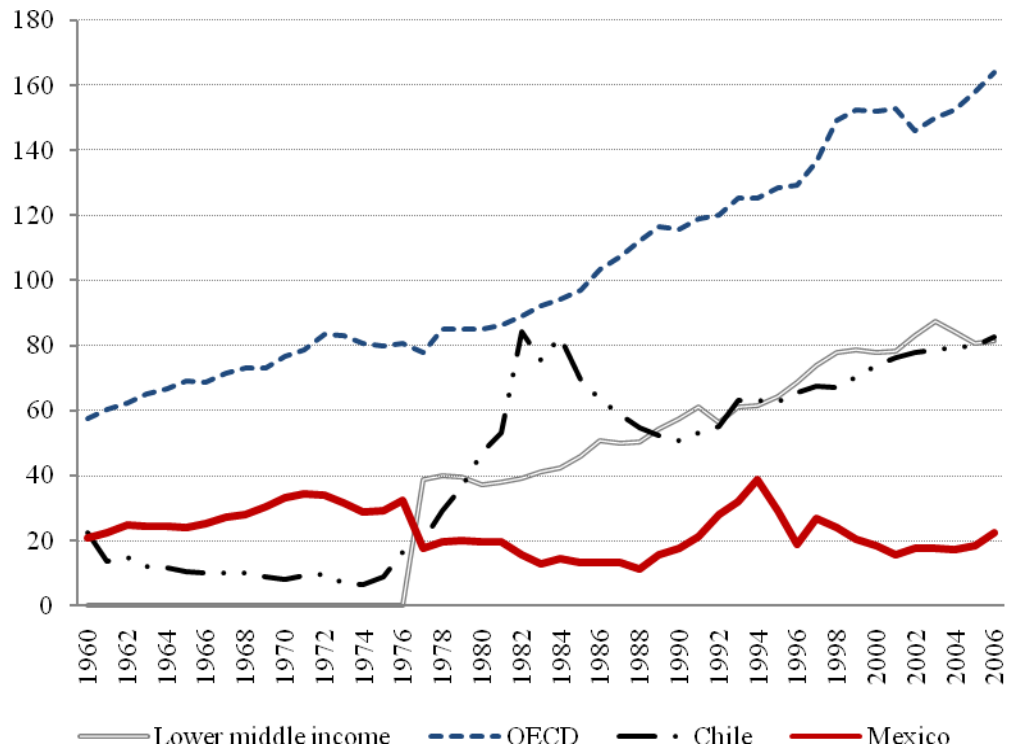
The dependent Variable is log of interest rate. All regressions include year, state and bank fixed effects. Note that bank fixed effects imply that the main effect of decentralized banks is not identified, and hence is not reported in the tables. A firm is coded as "Micro" if the number of employees 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. Standard Errors are clustered at the state level.

	<i>Services</i> <i>(More Soft Information)</i>		<i>Manufacturing and Commerce</i> <i>(Less Soft Information)</i>	
	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>
Log Herfindahl index (at state level)	-0.101 (0.082)	-0.111 (0.094)	0.013 (0.037)	0.010 (0.037)
Log share of branches in state	-0.021 (0.014)	-0.022 (0.014)	0.074*** (0.013)	0.075*** (0.013)
Fixed Asset Loan	0.157*** (0.018)	0.171*** (0.017)	0.040*** (0.010)	0.040*** (0.011)
Micro Firm	-0.005 (0.004)	0.023** (0.011)	-0.001 (0.002)	0.009 (0.011)
Small Firm	-0.002 (0.003)	0.013* (0.007)	0.009*** (0.002)	0.016** (0.006)
Decentralized Bank x Micro	0.095*** (0.008)	0.021 (0.027)	0.077*** (0.020)	-0.009 (0.080)
Decentralized Bank x Small	0.086*** (0.017)	0.055 (0.035)	0.049*** (0.013)	-0.013 (0.049)
Industry Fixed Effects	N/A	N/A	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes
Observations	18,330	18,330	63,253	63,253
R-squared	0.54	0.53	0.66	0.65

Robust standard errors in brackets, clustered at the state level

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

**FIGURE 1: PRIVATE CREDIT AS % OF GDP**



Source: IMF Financial Indicators