

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

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## ***Motivation***

- > **Large literature on the positive aspects of decentralized-bank lending for entrepreneurship**
  - > Better able to process soft information (Stein 2002)
  - > Particularly valuable for small firms with fewer sources of external finance (Berger et al 2005)
  
- > **Are decentralized banks more sensitive (than centralized banks) to their local environment when setting deal terms?**
  - > Beneficial for small firms in certain markets
  - > But potentially also more costly to small firms when banks have market power

## ***This Paper***

- > **Examine lending terms for centralized vs. decentralized banks**
  - > Comprehensive database covering all loans to SMEs in Mexico from 2002-2006
  - > Examine loan size; interest rates and loan defaults
  
- > **Exploit variation in Mexico's institutional environment to study structure-environment interaction**
  - > Federal structure implies variation across states in contract enforceability
  - > Differences in banks' competitive environment across states and over time

## ***Summary of Findings***

- > **Decentralized banks are better at processing soft information**
  - > Larger loans compared to centralized banks
  - > Difference is more pronounced for smaller firms and firms in the service industry (associated more with soft information)
  - > IV estimates suggest this is not just due to selection
  
- > **Decentralized banks are more responsive to their local environment when setting deal terms**
  - > Give smaller firms better deal terms in markets with weak contract enforceability
    - > Particularly true when use instrumental variables
  - > Exploit market power more effectively
    - > Charge higher rates to small and micro firms in concentrated banking markets, particularly so for those in service industry
    - > Robust to using instrumental variables

# *Agenda*

**I. Context: SME Lending in Mexico**

**II. Data**

**III. Results**

**IV. Conclusions**

## ***Context: SME Lending***

- > **Virtually no SME lending prior to 2002**
  - > Very little lending, even to large corporate clients
  - > Deep distrust of banks in private sector, specially small firms (96% of firms SMEs)
  - > Low, and falling private sector credit, large informal sector,
  - > High dependence on expensive trade credit (~10-15% a month)
  
- > **SME Loan Guarantee Program initiated in 2001**
  - > Federal program, run from a central government agency
  - > All banks invited to participate, involvement by all major banks in Mexico
    - > 28 of 30 banks represented in our data, but 6 banks constitute 95% of loans
  - > Credit decision solely with banks
  - > Main product covers SME loan losses on a first-loss basis up to a certain percentage of loan portfolio
  
- > **Dramatic Growth since 2002**
  - > About 300 loans in 2002 to 30,000 loans in 2005 to 90,000 loans in 2007
  - > ~15% of registered SME firms have received a loan

## ***Context: Variation in Bank Lending Structure unrelated to SME lending***

### **> Shaped by 1994 banking crisis**

- > 1994 banking crisis led to several (failed) banks being acquired by foreign banks
  - > 2 Foreign-owned banks in 1994 out of 33, 17 in 1995
- > Foreign banks instituted centralized lending structures for retail credit operations such as credit cards, mortgages, loans
- > Growth of regional banks in parallel that have national presence but decentralized lending structure

### **> Retail lending structure ported to SME lending**

- > Verified through field-based interviews of bank managers, looking at lending decisions by loan officers across all major banks
  - > All adjudication, loan-size and rate decisions for centralized banks come from headquarters; based on parametric models
  - > Adjudication decisions for decentralized banks happen at the branch-level. Branch manager has control over who gets approved, for how much and at what rate

## ***Context: Institutional Environment***

### **> Contract Enforceability**

- > Federal system: variation across 32 states in terms of legal enforcement of contracts
- > Data from Moodys; also judicial efficiency index from Laeven and Woodruff (2004)
- > Only cross-sectional variation by state

### **> Competitive Environment**

- > Calculated Herfindahl Index of concentration by state-year
- > Based on bank branches in each state
  - > Branch presence based on retail opportunity (no SME lending until 2002)
  - > No systematic relation to SME sector opportunity (in fact, share of small firms negatively correlated with number of branches, checking accounts, loans)

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## ***Overview of Data***

### **> Registry of all loans given by banks through the SINAFIN**

- > Comprehensive (all SME lending through the Program at present)
  - > 81,583 loans from Jan 2002 to June 2006
- > Unique bank and firm identifiers
- > Deal terms on each loan, basic information on firms
- > Separate database on defaults

### **> Over 200 qualitative interviews**

- > Ministry of the economy
- > Branch managers and loan officers
- > Business owners across states with different legal and competitive environments

## ***Descriptive Statistics on Firms***

	<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>Average Loan Size (USD)</i>	30,091	44,735	31,155	24,908
<i>Average Interest rate (%)</i>	19.0%	18.2%	18.9%	19.4%
<i>Fixed Asset Loan share</i>	4.6%	1.3%	1.0%	7.1%

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

# ***Descriptive Statistics on Banks***

	<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 ('000 USD)</i>			
All Firms	31	42	29
Medium Firms	45	50	44
Small Firms	31	45	30
Micro Firms	26	39	23
<i>Average Loan Size - Fixed Asset Loans ('000 USD)</i>			
All Firms	17	15	35
Medium Firms	46	46	45
Small Firms	41	48	33
Micro Firms	14	13	33

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# Loan Amount by Bank Structure

Dependent Variable is Log of Loan Amount

	<i>OLS Regressions</i>				<i>IV</i>
	(1)	(2)	(3)	(4)	(5)
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)
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

All models include industry and year fixed effects

Models (2), (3), (4) and (5) include state fixed effects

Models (3), (4) and (5) include bank fixed effects

# Interest Rates by Bank Structure

Dependent Variable is Log of Annualized Interest Rate

	OLS Regressions				IV
	(1)	(2)	(3)	(4)	(5)
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)
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

All models include industry and year fixed effects  
 Models (2), (3), (4) and (5) include state fixed effects  
 Models (3), (4) and (5) include bank fixed effects

# ***Lending Terms by Bank Structure and Strength of Legal Environment***

	<i>Log Amount</i>	<i>Log Rate</i>
	<i>OLS</i>	<i>OLS</i>
	<i>(1)</i>	<i>(3)</i>
Micro Firm	-0.834*** (0.046)	0.015*** (0.002)
Small Firm	-0.437*** (0.042)	0.017*** (0.002)
Decentralized Bank x Weak Enforcement	0.015 (0.023)	0.017 (0.011)
Observations	81,583	81,583
R-squared	0.25	0.61

Robust standard errors in brackets, clustered at the state level

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

All regressions include industry, year, state and bank fixed effects

# ***Lending Terms by Bank Structure and Strength of Legal Environment***

	<i>Log Amount</i>		<i>Log Rate</i>	
	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>
Micro Firm	-0.834*** (0.046)	-0.832*** (0.047)	0.015*** (0.002)	0.015*** (0.004)
Small Firm	-0.437*** (0.042)	-0.438*** (0.044)	0.017*** (0.002)	0.017*** (0.004)
Decentralized Bank x Weak Enforcement	0.015 (0.023)	1.159 (0.887)	0.017 (0.011)	-0.342* (0.194)
Observations	81,583	81,583	81,583	81,583
R-squared	0.25	0.26	0.61	0.61

Robust standard errors in brackets, clustered at the state level

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

All regressions include industry, year, state and bank fixed effects

# ***Lending Terms by Bank Structure and Strength of Competitive Environment***

	<i>Log Amount</i>	<i>Log Rate</i>
	OLS (1)	OLS (3)
Micro Firm	-0.834*** (0.046)	0.015*** (0.002)
Small Firm	-0.438*** (0.042)	0.017*** (0.001)
Log Herfindahl index (at state level)	0.540** (0.261)	0.035 (0.059)
Decentralized Bank x Log Herfindahl Index	-0.536* (0.263)	0.079 (0.131)
Observations	81,583	81,583
R-squared	0.23	0.61

Robust standard errors in brackets, clustered at the state level

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

All regressions include industry, year, state and bank fixed effects

# **Lending Terms by Bank Structure and Strength of Competitive Environment**

	<i>Log Amount</i>		<i>Log Rate</i>	
	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>
	(1)	(2)	(3)	(4)
Micro Firm	-0.834*** (0.046)	-0.834*** (0.046)	0.015*** (0.002)	0.015*** (0.002)
Small Firm	-0.438*** (0.042)	-0.438*** (0.042)	0.017*** (0.001)	0.018*** (0.002)
Log Herfindahl index (at state level)	0.540** (0.261)	0.537 (0.686)	0.035 (0.059)	-0.173 (0.107)
Decentralized Bank x Log Herfindahl Index	-0.536* (0.263)	-0.527 (1.722)	0.079 (0.131)	0.629** (0.252)
Observations	81,583	81,583	81,583	81,583
R-squared	0.23	0.23	0.61	0.59

Robust standard errors in brackets, clustered at the state level

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

All regressions include industry, year, state and bank fixed effects

# **Lending Terms by Bank Structure and Strength of Competitive Environment**

	<b>Log Amount</b>				<b>Log Rate</b>			
	<i>Small and Micro Firms</i>		<i>Medium Sized Firms</i>		<i>Small and Micro Firms</i>		<i>Medium Sized Firms</i>	
	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>	<i>OLS</i>	<i>IV</i>
Micro Firm	-0.464*** (0.007)	-0.464*** (0.007)			-0.004* (0.002)	-0.005** (0.002)		
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)
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)
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

All regressions include industry, year, state and bank fixed effects

# ***Robustness Check: Defaults***

- > **Separate database on defaults**
  - > Patchy data on the bank id
  - > Restrict to firms that took only one loan (92% of the firms; 85% of the loans)
  
- > **No major differences in default rates across organizational structures**
  - > Difference in deal terms seem to be driven by organizational structure/ capabilities rather than a differential tolerance for risk

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# ***Conclusions***

- > **Decentralized banks are better at processing soft information**
  - > Larger loans to small and micro firms
  - > Even more so for smaller firms in the service industry where soft information is more extreme
  
- > **Also more sensitive to external environment when setting terms of loan contracts**
  - > Better terms for small firms in markets where there is weak legal enforcement of contracts
  - > Higher rates in more concentrated markets, particularly for firms with fewer outside options for external finance
  
- > **Relative benefit of decentralized banks for small business seems to also depend on institutional environment**

## ***Implications***

- > **Interaction between organizational structure and institutional environment when considering lending outcomes**
  - > Prior research has tended to focus on one or the other
  - > Evidence of Stein model at play even in large, decentralized banks
- > **May shed light on US experience following banking deregulation**
  - > Why did entrepreneurship *increase* following US branch banking deregulation despite massive decline of small (decentralized) banks?
- > **Important policy Implications**
  - > Bank finance is one of the most important sources of external finance for startups and small businesses
  - > Is promoting decentralized lending models enough?