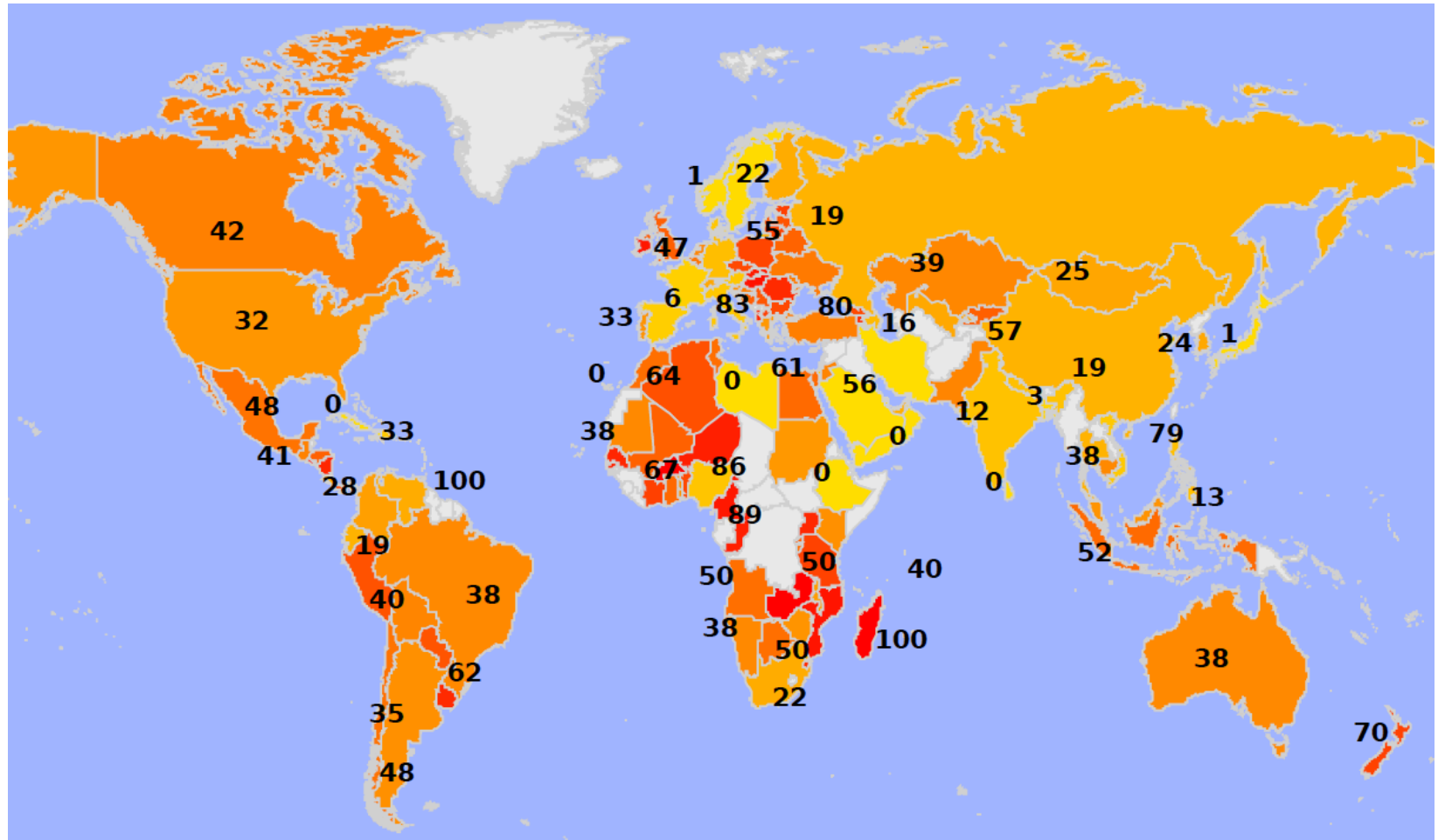


# Foreigners vs. Natives: Bank Lending Technologies and Loan Pricing

Thorsten Beck, Vasso Ioannidou and  
Larissa Schäfer



# Percentage of foreign banks among all banks in 2009



# Motivation

- Large increase in foreign bank participation across the globe over past 20 years
- What are implications for financial service provision, especially SME financing?
- Literature makes ambiguous predictions
  - Foreign banks better for large, transparent enterprises, relying on “hard information” (Stein, 2002)
  - Foreign banks may overcome their informational disadvantage using alternative transactional lending technologies for SMEs (Berger and Udell, 2006)
- No clear empirical evidence either way


# Contribution of this paper

- Two questions
  - Whom do foreign and domestic banks cater to?
  - What lending technologies do foreign and domestic banks use?
- Disentangle two by holding borrower sample constant
- **Question:** Do foreign and domestic banks use different lending techniques and loan pricing models for the same clientele in the same month?
- **Answer:** Yes! Even though they have different clientele, we find that they use different lending technologies to the same borrower

# The literature

- Negative effects of foreign bank presence on access to finance by SMEs: Detragiache et al. (2008), Mian (2006)
  - Foreign banks “cherry pick” large and transparent firms
  - Distance constraints and informational disadvantages in bank-borrower relationship
- Positive effects of foreign bank presence on SMEs: Beck et al. (2011), de la Torre et al. (2011)
  - Both foreign and domestic banks are suitable in catering to SMEs, but with different lending technologies

# Our dataset

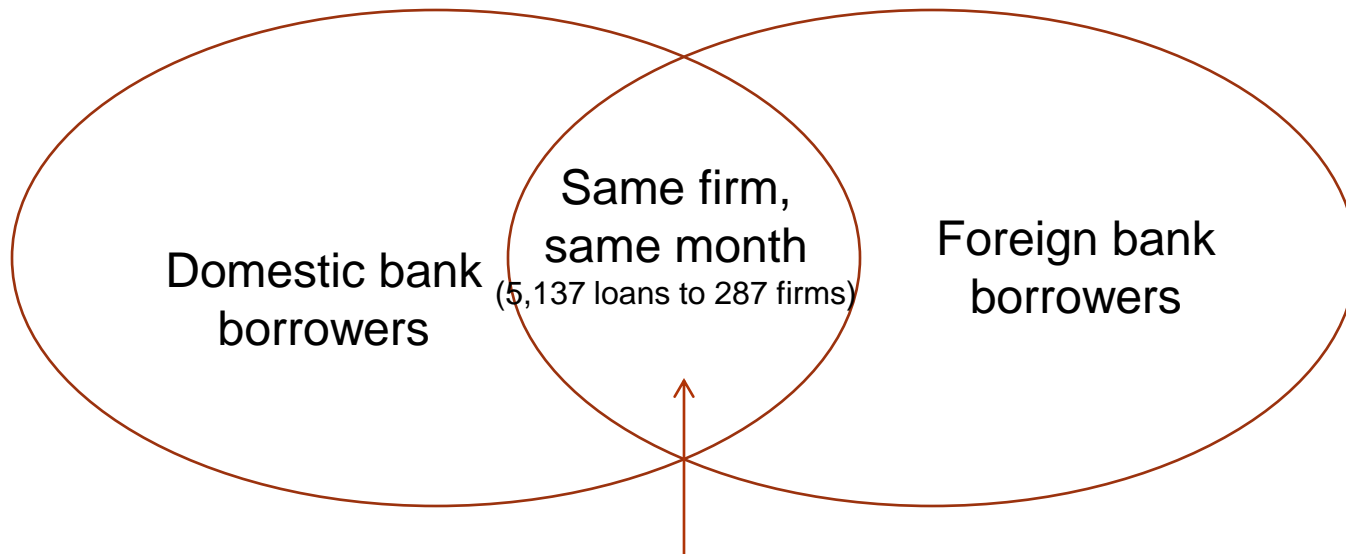
- Credit Registry of Bolivia
  - *Central de Información de Riesgos Crediticios*
- Our sample: January 1998 to December 2003
- Commercial banks (13 banks of which 7 are foreign banks) 
- Commercial loans denominated in U.S. dollar loans
- Resulting sample: 32,279 loans to 2,672 firms
  - Largest firms in Bolivia
  - More comparable to SMEs in more developed countries

# Summary statistics

- Foreign bank loans (relative to domestic):
  - Amount: 50% larger
  - Interest rates: 66 bps lower
  - Collateral: 133% more likely
  - Maturities: 4 months shorter
- Clients of foreign banks are, on average:
  - Larger
  - Riskier
  - With “weaker” lending relationships
- Differences in contract terms are consistent with different lending and loan pricings models as well as differences in firm composition



# Our identification strategy



# Empirical test

Are contract terms systematically different between foreign and domestic banks?

- Spread
- Maturity
- Collateral

$$\text{ContractTerm}_{ijkt} = a_1 + b_1 \text{ForeignBank}_{jt} + b_2 \text{Firm}_{jkt} + b_3 \text{Loan}_{ijkt} + h_j \hat{g}_t + e_{ijkt},$$

where  $i, j, k, t$  index loans, banks, firms, and time (month-year).

# Bank ownership and interest rates

	I	II	III	IV	V
	Benchmarks			smaller firms	larger firms
<b>Bank Characteristics</b>					
<i>Foreign Bank</i>	-0.887***	-0.893***	-1.068***	-0.961***	-1.126***
<b>Borrower Characteristics</b>					
<i>Rating 2</i>		0.468*	0.513**	0.067	0.632**
<i>Ratings 3 &amp; 4</i>		0.831	0.661	-0.429	1.099**
<b>Relationship Characteristics</b>					
<i>Rel Duration</i>		0.393	0.119	1.270**	-0.337
<i>Rel Duration-Square</i>		-0.096	-0.046	-0.307*	0.049
<i>Rel Scope</i>		0.223	0.121	0.209	0.103
<i>Primary Bank</i>		-0.491***	-0.326**	-0.614**	-0.147
<b>Other Contract Terms</b>					
<i>Installment</i>			0.542***	0.347	0.569***
<i>Loan Amount</i>			0.017	0.094	0.003
<i>Collateral</i>			-0.371**	-0.133	-0.428**
<i>Maturity</i>			-1.191***	-1.213***	-1.164***
<i>Constant</i>	9.617***	9.365***	11.783***	11.299***	12.010***
<b>Fixed Effects</b>					
<i>Borrower × Time Fixed Effect</i>	Included	Included	Included	Included	Included
R-squared	0.671	0.678	0.731	0.734	0.718
Observations	5,137	5,137	5,137	1,129	4,008

# Controlling for funding costs and market share

	I	II	III	IV	V
	Benchmarks			smaller firms	larger firms
<b>Bank Characteristics</b>					
<i>Foreign Bank</i>	-0.689***	-0.729***	-0.987***	-0.692**	-1.101***
<i>Cost of Deposits(%)</i>	0.107	0.082	0.064	0.185	0.045
<i>Market Share</i>	1.499	1.556	-0.201	2.309	-1.012
<b>Firm Characteristics</b>		Included	Included	Included	Included
<b>Other Contract Terms</b>			Included	Included	Included
<b>Fixed Effects</b>					
<i>Borrower × Time Fixed Effect</i>	Included	Included	Included	Included	Included
R-squared	0.673	0.680	0.731	0.737	0.719
Observations	5,131	5,131	5,131	1,126	4,005

# Bank ownership, maturity and collateral

	I	II	III	IV	V	VI
	Maturity			Collateral		
<b>Bank Characteristics</b>						
<i>Foreign Bank</i>	-0.188***	-0.191***	-0.329***	0.265***	0.272***	0.307***
<b>Borrower Characteristics</b>						
<i>Rating 2</i>		-0.016	-0.055		0.154***	0.143**
<i>Ratings 3 &amp; 4</i>		0.008	-0.165		-0.167*	-0.158
<b>Relationship Characteristics</b>						
<i>Rel Duration</i>		-0.231**	-0.159		-0.094***	-0.091***
<i>Rel Duration-Square</i>		0.047*	0.039			
<i>Rel Scope</i>		-0.015	-0.104*		-0.059	-0.044
<i>Primary Bank</i>		0.222***	0.149***		-0.118***	-0.137***
<b>Other Contract Terms</b>						
<i>Installment</i>			0.857***			-0.145***
<i>Loan Amount</i>			0.056**			0.020
<i>Collateral</i>			0.229***			
<i>Maturity</i>						0.114***
<i>Constant</i>	2.059***	2.243***	1.114***	0.192***	0.493***	0.081
<b>Fixed Effects</b>						
<i>Borrower×Time Fixed Effect</i>	Included	Included	Included	Included	Included	Included
R-squared	0.447	0.459	0.641	0.508	0.537	0.552
Observations	5,137	5,137	5,137	5,137	5,137	5,137

# Empirical test (2)

Do factors explaining loan interest rates vary systematically between foreign and domestic banks?

$$\begin{aligned} \text{Spread}_{ijkt} = & a_2 + g_1 \text{ForeignBank}_{jt} + g_2 \text{Firm}_{jkt} + g_3 \text{Loan}_{ijkt} \\ & + g_4 \text{ForeignBank}_{jt} \cdot \text{Firm}_{jkt} + g_5 \text{ForeignBank}_{jt} \cdot \text{Loan}_{ijkt} \\ & + h_j \cdot g_t + e_{ijkt}, \end{aligned}$$

where  $i, j, k, t$  index loans, banks, firms, and time (month-year).

# Bank ownership and loan pricing

	I	II	III
	Domestic	All Firms × Foreign	Cumulative
<b>Borrower Characteristics</b>			
<i>Rating 2</i>	0.168	0.478	0.646***
<i>Ratings 3 &amp; 4</i>	-0.900	2.097**	1.197**
<b>Relationship Characteristics</b>			
<i>Rel Duration</i>	0.299	-0.146	0.152
<i>Rel Duration-Square</i>	-0.091	0.052	-0.039
<i>Rel Scope</i>	-0.249	0.800***	0.551**
<i>Primary Bank</i>	-0.758***	0.840**	0.082
<b>Other Contract Terms</b>			
<i>Installment</i>	0.610**	-0.150	0.460**
<i>Loan Amount</i>	-0.046	0.112	0.066
<i>Collateral</i>	-0.127	-0.302	-0.429**
<i>Maturity</i>	-1.170***	-0.018	-1.188***
<i>Constant</i>	12.531***	-2.713**	9.818***
<b>Fixed Effects</b>			
<i>Borrower × Time Fixed Effect</i>	Included		
R-squared	0.738		
Observations	5,137		

- Foreign banks use credit ratings and collateral for pricing of their loans, especially for larger firms 




# Bank ownership and loan pricing

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<b>Fixed Effects</b>			
<i>Borrower×Time Fixed Effect</i>	Included		
R-squared	0.738		
Observations	5,137		

- Domestic banks based their pricing on the strength of the lending relationship, particularly for smaller firms 



# Additional analysis

- Foreign branches vs. subsidiaries 
  - Differences more pronounced for foreign branches independent of sample size.
- Result can be only partly explained by distance 
  - Similar differences for domestic bank-borrower pairs in different region.
- Opposite sample 
  - Differences continue to hold for the opposite sample
    - Sample of firms that did *not* have a loan from both a domestic and foreign bank in the same month

# Bank ownership and loan defaults

	I	II	III	IV	V	VI
	Benchmarks		No Collateral	Collateral	Mat<p50	Mat>p50
<b>Bank Characteristics</b>						
<i>Foreign Bank</i>	0.037**	0.040**	0.038	0.031	0.021	0.074**
<b>Borrower Characteristics</b>						
<i>Rating 2</i>		-0.045	-0.034	-0.076	-0.045	-0.074
<i>Ratings 3 &amp; 4</i>		0.020	0.037	-0.034	0.048	0.323
<b>Relationship Characteristics</b>						
<i>Rel Duration</i>		-0.001	-0.002	0.015	0.003	-0.013
<i>Rel Scope</i>		-0.019	-0.016	-0.044	-0.019	-0.002
<i>Primary Bank</i>		0.027	0.031	-0.004	0.016	0.056
<b>Other Contract Terms</b>						
<i>Installment</i>		-0.011	0.002	-0.013	-0.029	0.028
<i>Loan Amount</i>		0.008	0.005	-0.001	0.006	0.006
<i>Collateral</i>		-0.002			-0.010	0.034
<i>Maturity</i>		0.046***	0.033*	0.048		
<i>Interest Rate</i>		-0.001	0.000	0.002	-0.007	0.008
<i>Constant</i>	0.052***	-0.111	-0.062	-0.040	0.076	-0.121
<b>Fixed Effects</b>						
<i>Borrower×Time Fixed Effect</i>	Included	Included	Included	Included	Included	Included
R-squared	0.568	0.578	0.650	0.787	0.670	0.732
Observations	4,495	4,495	3,073	1,422	2,484	2,011

Also holds for opposite sample



# Robustness tests

- Which bank grants loan first – domestic or foreign?
  - Split sample, results holds for all samples
- Loans given at exactly same date – syndicated loans?
  - Results hold for both samples
- Results for each year or each quarter in sample
  - Differences persist through the sample period
- Sample of borrower with loans from foreign and domestic banks within a 30 day window
  - Results confirmed
- Use total bank size rather than market share
  - Results confirmed
  - Bank size negative in interest rate and positive in collateral and maturity regressions
- Control for time since entry of foreign bank
  - Results confirmed
  - Time since entry enters positively in interest rate and negatively in maturity regression

# Conclusions

- Domestic and foreign banks use different lending technologies to same borrowers
  - Foreign banks rely on transactional techniques (collateral, ratings)
  - Domestic banks rely on relationships and longer maturity
- Important policy repercussions
  - Important for foreign banks lending to local firms to have hard information and adequate collateral protection

Thank you!

# Bank characteristics



Bank	Entry/ Acquisition	Total Assets		Market Share		Cost of Deposits	
		Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
<b>Foreign Branches</b>							
Citibank*	01/01/66	975134.000	198429.000	0.069	0.024	3.034	1.634
ABN Amro*	07/08/98	530089.000	48568.000	0.014	0.007	4.721	0.454
Banco do Brasil*	07/01/61	76124.000	16741.000	0.018	0.012	3.938	1.324
Banco de la Nación Argentina*	04/28/58	14614.171	4031.653	0.016	0.012	5.320	1.361
<b>Foreign Subsidiaries</b>							
Banco Santa Cruz	07/17/98	833.479	354.155	0.105	0.044	3.003	1.686
Banco de Crédito de Bolivia	12/30/92	589.057	97.402	0.161	0.053	4.245	1.438
Banco Solidario	03/15/99	94.936	6.970	0.004	0.002	5.509	1.850
<b>Domestic</b>							
Banco Industrial		682.490	48.450	0.263	0.054	4.021	1.366
Banco Nacional de Bolivia		621.065	17.808	0.118	0.047	5.037	1.434
Banco Mercantil		598.895	31.616	0.108	0.038	4.691	1.514
Banco de la Unión		443.784	90.026	0.060	0.027	5.886	1.766
Banco Económico		284.716	36.613	0.039	0.020	6.265	1.503
Banco Ganadero		207.390	21.950	0.046	0.016	5.586	1.599

# Summary statistics

Variable Names	Population			Sample		
	All	Foreign	Domestic	All	Foreign	Domestic
<b>Loan Terms</b>						
<i>Installment</i>	0.470	0.500	0.450 ***	0.461	0.482	0.437
<i>Amount</i>	161,908	204,725	134,714 ***	251,098 ***	239,967 ***	263,231 ***
<i>Collateral</i>	0.245	0.376	0.161 ***	0.331 ***	0.461 ***	0.188 ***
<i>Maturity</i>	10.859	8.304	12.481 ***	8.817 ***	7.049 ***	10.744 ***
<i>Interest Rate</i>	13.448	13.041	13.706 ***	12.617 ***	12.203 ***	13.069 **
<i>Loan Spread</i>	9.949	9.352	10.328 ***	9.155 ***	8.774 ***	9.570
<b>Legal Structure</b>						
<i>Sole Proprietorship</i>	0.125	0.096	0.144 ***	0.046 ***	0.034 ***	0.060 ***
<i>General Partnership</i>	0.009	0.005	0.012 ***	0.005 ***	0.001 ***	0.009 *
<i>Limited Partnership</i>	0.130	0.139	0.125 ***	0.147 ***	0.166 ***	0.125
<i>Joint Stock Company</i>	0.229	0.273	0.201 ***	0.358 ***	0.381 ***	0.332 ***
<i>Limited Liability Company</i>	0.486	0.472	0.494 ***	0.428 ***	0.411 ***	0.446 ***
<i>Other</i>	0.020	0.014	0.025 ***	0.017 **	0.006 ***	0.028
<b>Bank Debt</b>						
<i>Outstanding Debt</i>	1,991,796	2,410,193	1,726,061 ***	5,452,792 ***	5,146,245 ***	5,786,901 ***
<b>Credit Quality</b>						
<i>Past Non-Performance</i>	0.209	0.246	0.186 ***	0.304 ***	0.284 ***	0.325 ***
<i>Rating 1</i>	0.873	0.860	0.882 ***	0.857	0.815 ***	0.903
<i>Rating 2</i>	0.098	0.096	0.100	0.119 ***	0.150 ***	0.085 ***
<i>Rating 3</i>	0.024	0.035	0.017 ***	0.023	0.033	0.012 **
<i>Rating 4</i>	0.004	0.008	0.001 ***	0.001 ***	0.001 ***	0 ***
<b>Relationship Characteristics</b>						
<i>Multiple Relationships</i>	0.555	0.620	0.514 ***	1	1	1
<i>Rel Duration</i>	22.079	20.840	22.866 ***	23.071 ***	23.407 ***	22.705
<i>Scope</i>	0.259	0.224	0.281 ***	0.255	0.206 **	0.310 ***
<i>Primary</i>	0.714	0.665	0.744 ***	0.283 ***	0.312 ***	0.252 ***
Observations	32,279	12,538	19,741	5,137	2,679	2,458

# Bank ownership and loan pricing (larger firms)

	VII	VIII	IX
	Domestic	Larger Firms × Foreign	Cumulative
<b>Borrower Characteristics</b>			
<i>Rating 2</i>	0.164	0.613	0.776***
<i>Ratings 3 &amp; 4</i>	-0.401	1.883*	1.482**
<b>Relationship Characteristics</b>			
<i>Rel Duration</i>	-0.323	0.172	-0.151
<i>Rel Duration-Square</i>	0.042	-0.008	0.035
<i>Rel Scope</i>	-0.261	0.763**	0.502*
<i>Primary Bank</i>	-0.548**	0.753*	0.205
<b>Other Contract Terms</b>			
<i>Installment</i>	0.698**	-0.263	0.435*
<i>Loan Amount</i>	-0.129	0.236**	0.106
<i>Collateral</i>	-0.121	-0.347	-0.468**
<i>Maturity</i>	-1.134***	-0.074	-1.209***
<i>Constant</i>	13.657***	-4.452***	9.205***
<b>Fixed Effects</b>			
<i>Borrower × Time Fixed Effect</i>	Included		
R-squared	0.727		
Observations	4,008		



# Bank ownership and loan pricing (smaller firms)

	IV	V	VI
	Domestic	Smaller Firms × Foreign	Cumulative
<b>Borrower Characteristics</b>			
<i>Rating 2</i>	0.334	-0.183	0.150
<i>Ratings 3 &amp; 4</i>	-2.518	3.440	0.922
<b>Relationship Characteristics</b>			
<i>Rel Duration</i>	1.570**	-0.618	0.952
<i>Rel Duration-Square</i>	-0.381**	0.127	-0.254
<i>Rel Scope</i>	-0.155	1.107	0.952*
<i>Primary Bank</i>	-0.895**	0.631	-0.264
<b>Other Contract Terms</b>			
<i>Installment</i>	0.206	0.176	0.382
<i>Loan Amount</i>	0.175	-0.109	0.066
<i>Collateral</i>	0.076	-0.310	-0.234
<i>Maturity</i>	-1.254***	0.132	-1.122***
<i>Constant</i>	10.584***	0.065	10.649***
<b>Fixed Effects</b>			
<i>Borrower × Time Fixed Effect</i>	Included		
R-squared	0.744		
Observations	1,129		

# Branches vs. subsidiaries

	I	II	III
	Loan Spread	Maturity	Collateral
<b>Bank Characteristics</b>			
<i>Foreign Branch</i>	-1.633***	0.070	0.416***
<i>Foreign Subsidiary</i>	-1.371***	-0.237***	0.165*
<b>Borrower Characteristics</b>			
<i>Rating 2</i>	0.306	-0.163	0.179**
<i>Ratings 3 &amp; 4</i>	-0.085	0.066	-0.461*
<b>Relationship Characteristics</b>			
<i>Rel Duration</i>	-0.181	-0.04	-0.171**
<i>Rel Duration-Square</i>	-0.092	-0.005	
<i>Rel Scope</i>	-0.02	0.049	-0.07
<i>Primary Bank</i>	-0.068	0.249*	-0.269***
<b>Other Contract Terms</b>			
<i>Installment</i>	0.257	0.572***	-0.042
<i>Loan Amount</i>	0.076	0.068**	0.006
<i>Collateral</i>	-0.288	(0.077)	
<i>Maturity</i>	-1.281***		0.067
<i>Constant</i>	12.049***	1.044***	0.558
<b>Fixed Effects</b>			
<i>Borrower × Time Fixed Effect</i>	Included	Included	Included
R-squared	0.706	0.511	0.468
Observations	689	689	689
T-test Branches vs. Subsidiaries	0.457	0.034	0.025

# Opposite sample

	I	II	III
	Loan Spread	Maturity	Collateral
<b>Bank Characteristics</b>			
<i>Foreign Bank</i>	-1.044***	-0.382***	0.214***
<b>Borrower Characteristics</b>			
<i>Rating 2</i>	0.348***	-0.061*	0.003
<i>Ratings 3 &amp; 4</i>	0.718***	-0.071	0.074*
<b>Relationship Characteristics</b>			
<i>Rel Duration</i>	-0.262***	-0.047	-0.029***
<i>Rel Duration-Square</i>	0.086***	0.004	
<i>Rel Scope</i>	0.043	-0.027	-0.018
<i>Primary Bank</i>	-0.408***	0.078***	-0.045***
<b>Other Contract Terms</b>			
<i>Installment</i>	0.640***	1.018***	-0.035**
<i>Loan Amount</i>	0.003	0.114***	0.027***
<i>Collateral</i>	-0.254***	0.242***	
<i>Maturity</i>	-1.194***		0.086***
<i>Constant</i>	12.826***	0.596***	-0.288***
<b>Fixed Effects</b>			
<i>Borrower Fixed Effect</i>	Included	Included	Included
<i>Time Fixed Effect</i>	Included	Included	Included
R-squared	0.718	0.695	0.517
Observations	27,142	27,142	27,142

# Loan default in opposite sample

	I	II	III	IV	V	VI
	Benchmarks		No Collateral	Collateral	Mat<p50	Mat>p50

ForeignBank	0.074*** (0.016)	0.068*** (0.015)	0.065*** (0.018)	0.072* (0.038)	0.041*** (0.016)	0.108*** (0.026)
R-squared	0.434	0.447	0.475	0.584	0.447	0.597
Observations	23306	23306	18445	4861	13581	9725

# Sample of firms with loans from a bank within and outside the same region

	Loan Spread	Maturity	Collateral
nonlocal	-0.831*** (0.152)	-0.039 (0.046)	0.094** (0.046)
ForeignBank	-0.768*** (0.225)	-0.231*** (0.056)	0.272*** (0.047)
R-squared	0.751	0.656	0.568
Observations	3874	3874	3874