

Collateral down the Road: Test of the Lender-Based Theory of Collateral

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- Recent theoretical advances, however, have started to shift the paradigm explaining the use of collateral in bank lending from this borrower-based perspective to a lender-based view (Inderst and Mueller, 2007).
- While existing literature offers empirical evidence on the relevance of several borrower-based explanations for the use of collateral (e.g., Berger, Frame and Ioannidou, 2011; Berger et al., 2011), insights into the lender-based view are scant and offer only limited evidence on the theoretical predictions.

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- We rely on a unique, proprietary dataset that covers all loans made in 2004 and 2006 by a regional Italian bank to firms located in its two major geographical markets of operation (i.e., the province where our bank is headquartered and the neighboring province).
- Then, we consider the differential impact of bank-borrower physical proximity, as a measure of local information advantage, on collateral and interest rate as predicted by the lender-based theory.

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- The study also finds that the effect of organizational distance on the incidence of collateral is lower (and even positive) for young and small firms and for new borrowers, i.e. for loans granted to borrowers characterized by lower information advantage.

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 - ② We jointly estimate collateral and interest rate requirements: The interaction between these contract terms is fundamental to the arguments advanced by the lender-based (as well as borrowed-based) theoretical model and crucial for its proper identification.

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- Consistent with the theoretical trade-offs, loan interest rates are increasing in the physical distance between the contracting parties.
- The results of our tests offer insights that seem inconsistent with the lender-based theory for the use of collateral in small business lending, which predicts that collateral requirements should increase with the distance from the borrower.

Outline of the talk

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- Collateral arises as a mechanism that resolves this inefficiency.

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- In the presence of soft information and local knowledge, transactions lenders cannot compete effectively. This allows the local lender to keep a high interest rate and reduces the usefulness of collateral.
- As a result, the lender-based view of collateral predicts that, all else equal, loans for which the local lender's informational advantage is smaller will be more susceptible to competition from the distant transactions lenders, and thus characterized by higher collateral requirements and lower interest rates (Proposition 5).

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- In our empirical model we capture such informational advantage by using the physical proximity between borrowers and our local bank.
- Indeed, the quality of information available to the lending officer is directly related to the proximity between the officer and borrower's economic and social environment (Agarwal and Hauswald 2010).
- As informational advantage is inversely related with distance, the lender-based model stipulates that for the local lender the relationship between distance and collateral - conditional on interest rate - is positive: *As long as distance increases, the local lender increases collateral requirements and decreases the interest rate.*

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- We estimate equations (1) and (2) within a SUR framework (i.e. the errors in both equations are allowed to exhibit form of correlation), IV, and by using a 3-SLS to control for the endogenous nature of interest rate and collateral (Brick and Palia, 2007).

- Our analysis focuses on collateral pledged by non-financial corporations (firms) and sole proprietorships by means of a large proprietary dataset of loans granted by an Italian bank to SMEs in the period 2004-2006.

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- This dataset offers two distinct advantages.
 - ① As the lender-based view of collateral focuses on 'local lenders', it is important to ensure that the lending bank indeed exhibits such characteristics. By its business model, strategy to serve local SMEs, and geographic reach of operations, our bank conducts local business and represents well the modeling assumptions underlying the theory. See the Table [▶ Local Bank](#)

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 - ② It offers detailed information on bank-borrower lending relationships, borrower information, and lender characteristics. As a result, it allows us to examine the explanatory power of the above-mentioned arguments, while taking into account various factors that affect the bank-borrower interaction and loan contract terms. See the following Table [▶ Summary Statistics](#)

Empirical findings - SUR

- The SUR model allows for correlation of the error terms across both equations. The main focus is on the point estimate of the coefficient of the measure for physical proximity between borrower and our bank, i.e. *Branch-Firm Distance*.

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- Consistent with the signaling model by Chan and Kanatas (1985). Greater branch-firm distance would make pledging collateral more costly and lower collateral requirements (Proposition 2).
- In line with Besanko and Thakor (1987), which show that collateral is inversely related to interest rates in a competitive setting (Proposition 2).

Empirical findings - Instrumental Variables

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 - ② *Distance Sources*: the natural logarithm of the 25th percentile of the metric distances between the borrower and each of the banks operating in the regional credit market. It reflects the availability of alternative funding, which would affect borrower's reservation rate and eventually the interest rate (Degryse and Ongena, 2005; Bellucci et al., 2013).

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- The following Table shows estimation results of IV estimation of equations (1) and (2) [▶ IV Estimates](#)

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Empirical findings - Simultaneous Equations

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- The use of collateral entails costs associated with monitoring and repossession (Chan and Kanatas, 1985; Besanko and Thakor, 1987). If these costs are increasing with the distance between borrower and lender, collateral requirements (interest rates) should be higher (lower) in the vicinity of the lender, and lower (higher) for borrowers located farther away.

Thanks!!

Thanks for your attention.

Composition of local credit markets

	Mean	Min	Max	Std. Dev.
Nr. of Banks	14,8	1	39	11,4
Nr. of Banks of Big Groups	2,4	0	6	2,2
Nr. of Bank Branches	32,3	1	108	32,9
Nr. of Branches of Big Groups	7,2	0	33	10,5
Nr. of Branches of Banks owned by Big Groups	9,6	0	37	7,8
Nr. of Branches of Regional Banks	8	0	27	6,9
Nr. of Branches of Cooperative Banks	2,6	0	10	2,3

Note: Big Groups are the first eight Italian Banking Groups for Capitalization in 2006 and International Banking Groups (e.g. BNP Paribas, Deutsche-bank, etc.). We identify local credit market with the zip-code area.

Table 2 - Summary Statistics

The sample consists of 14,672 observations.

	Mean	St. Dev.
	(1)	(2)
<u>Dependent Variables</u>		
<i>Collateral</i>	0.31	(0.46)
<i>Percentage of Collateral</i>	0.22	(0.37)
<i>Interest Rate</i>	7.04	(2.43)
<u>Informational Advantage</u>		
<i>Branch-Firm Distance (km)</i>	5.065	(7,345)
<u>Control Variables</u>		
<i>Individual Firm</i>	0.43	(0.50)
<i>Corporation</i>	0.33	(0.47)
<i>Sales</i>	2.17	(1.55)
<i>D(Sales 1)</i>	0.54	(0.49)
<i>D(Sales 2)</i>	0.10	(0.31)
<i>D(Sales 3)</i>	0.14	(0.35)
<i>D(Sales 4)</i>	0.11	(0.32)
<i>D(Sales 5)</i>	0.08	(0.28)
<i>D(Sales 6)</i>	0.02	(0.16)
<i>D(Sales 7)</i>	0.01	(0.16)
<i>Credit Limit</i>	96,391	(417,793)
<i>Credit Used</i>	68,701	(293,190)
<i>Relationship Length (months)</i>	113	(90,75)
<i>Multiple Lending</i>	0.97	(0.18)
<i>Other Services</i>	0.91	(0.28)
<i>Portfolio</i>	0.10	(0.29)
<i>Decisional Level</i>	0.16	(0.37)
<i>Overdraw</i>	0.22	(0.41)

Table 4 - SUR Analysis of Collateral and Interest Rates

	Collateral (Fraction) (1)	Interest Rate (2)
Branch-Firm Distance	-0.004** (0.002)	0.060*** (0.015)
Multiple Lending	-0.105*** (0.015)	0.052 (0.112)
Other Services	-0.181*** (0.009)	-0.373*** (0.070)
Relationship Length	-0.000*** (0.000)	-0.001*** (0.000)
Portfolio	-0.069*** (0.013)	-0.464*** (0.104)
Decisional Level	0.109*** (0.009)	-0.234*** (0.067)
Credit Limit	0.000*** (0.000)	-0.000** (0.000)
Constant	0.362*** (0.060)	4.688*** (0.680)
Firm Size Dummies	Yes	Yes
Year FE	Yes	Yes
Branch FE	Yes	Yes
Market FE	Yes	Yes
Industry FE	Yes	Yes
N	14,672	14,672
R2/Pseudo R2	0.180	0.082

Table 5 - IV Analysis of Collateral and Interest Rate

	Collateral (Fraction)	Collateral (Indicator)	Collateral (Indicator)	Interest Rate
Interest Rate	0.183*** (0.026)	0.154*** (0.028)	0.505*** (0.094)	
Branch-Firm Distance	-0.012*** (0.004)	-0.011*** (0.004)	-0.035*** (0.013)	0.061*** (0.016)
Collateral (Fraction)				1.727 (1.219)
Overdraw_C				0.257** (0.127)
Other controls	Yes	Yes	Yes	Yes
N	14,616	14,616	14,603	14,670
<i>Instruments</i>				
Distance Sources	-0.049** (0.020)	-0.049** (0.020)	-0.048** (0.020)	
Overdraw_C	0.247*** (0.032)	0.248*** (0.032)	0.248*** (0.032)	
Individual Firm				0.035*** (0.006)
Bankruptcy Costs				-0.004*** (0.001)
<i>Diagnostics</i>				
F-test 1st Stage	34.45	34.45		21.31
Sargan Test (p-value)	0.330	0.200		0.650

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Table 6 - Simultaneous Equations Analysis

	Collateral (Fraction)	Interest Rate
Interest Rate	0.179*** (0.026)	
Collateral (Fraction)		1.735 (1.158)
Branch-Firm Distance	-0.012*** (0.003)	0.065*** (0.015)
Multiple Lending	-0.074*** (0.024)	0.113 (0.143)
Other Services	-0.126*** (0.018)	0.004 (0.223)
Relationship Length	-0.000*** (0.001)	0.000 (0.001)
Portfolio	0.015 (0.025)	-0.346*** (0.133)
Decisional Level	0.115*** (0.015)	-0.292** (0.121)
Credit Limit	0.055*** (0.004)	-0.162*** (0.047)
Other controls	Yes	Yes
N	14,616	14,616
<i>Instruments</i>		
Individual Firm	0.025*** (0.009)	
Bankruptcy Cost	-0.003** (0.001)	
Distance Sources		-0.024** (0.011)
Overdraw_C		0.174*** (0.063)