Loan Syndication Structures and Price Collusion

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Anecdotal evidence suggests that collusive behavior is important in credit markets

- "Deutsche, Credit Agricole, Credit Suisse charged by EU over alleged bond cartel" (Reuters, 20 Dec. 2018)
  - "The four banks exchanged commercially sensitive information and coordinated on prices concerning U.S. dollar denominated supra-sovereign, sovereign and agency bonds, known as SSA bonds," the [European]Commission said in a statement.
- In Feb. 2018, 4 Spanish banks were fined for colluding on interest-rate derivatives attached to syndicated loans.
- The European Commission commissioned a study in 2017 on competition issues in the EU syndicated loan market.

Motivation

- Banks have become increasingly interconnected
  - Partly due to corporations growing funding needs
  - Syndicated loans are corporations' most important funding source
- However, banking industry is competitive by nature
- Banks face a fundamental question:
  - Whom should they collaborate with while competing with the rest?
- If banks differentiate competitors by similarity in lending expertise:
  - Should banks collaborate with close or distant competitors?

$\Rightarrow$ We relate banks' lending expertise to (i) loan syndication structures and (ii) loan pricing

This paper

- Research questions
  1. How do banks structure loan syndicates?
  2. How do they choose syndicate partners, allocate loan shares?
  3. How does the organizational form affect loan pricing (e.g. collusion)?
  4. How does market concentration affect price collusion?
- Setup
  - Panel data set of syndicated loan origination data for the U.S. market
  - Banks repeatedly interact, and both lead and participate in syndicates
  - Syndicate lender distance measure: close = high similarity
- Main findings
  1. Close syndicates associated with small and concentrated syndicates
  2. Very close lenders preferred, and allocated higher loan shares
  3. Closer syndicates can both reduce and increase loan pricing
  4. Low market concentration increases loan pricing for close syndicates

Institutional Setup

U.S. syndicated loan market

- Largest source of corporate borrowing
- Used by almost all publicly listed firms
- Median loan amount $116mn
- Total issuance volume in 2017: $2,900bn

Syndication process

1. Borrower awards mandate to lead arranger
2. Lead arranger forms syndicate
   - Syndicate structure
   - Loan distribution

$\Rightarrow$ We focus on syndicate formation by lead arrangers

Theoretical framework: Close syndicates

1. Effects of close syndicates: Improved borrower screening
   - Lenders produce borrower-specific information (Boot (2000))
   - More similar lending expertise might lower production costs

   Hypothesis 1: Lenders are more likely to reduce loan pricing if syndicates become closer.

2. Effects of close syndicates: Price collusion
   - Borrowers might be locked-in to lenders (Sharpe (1990), Rajan (1992))
   - Higher similarity in lending expertise might strengthen lock-in

   Hypothesis 2: Lenders are more likely to increase loan pricing if syndicates become closer.

Theoretical framework: Low market concentration

3. Low market concentration: Higher scope for price collusion
   - In markets with syndication, low market concentration fosters price collusion (Hatfield et al. (2017))
   - Leads might punish lenders that deviate from a collusive price
   - Punishment strategy more forceful in low market concentrations

Hypothesis 3: Below a certain level of market concentration, price collusion increases with reductions in market concentration.

Lender distance measure

- Distance between two lenders:

$$distance_{s,k,t} = \frac{1}{\sqrt{2}} \sqrt{\sum_{j=1}^{J} \left(w_{s,j,t} - w_{k,j,t} \right)^2}$$

- Lender distance in a syndicated loan:

$$Distance_{i,t} = \frac{1}{N_i} \cdot \sum_{n=1}^{N_i} distance_{s^n,k^n,t}$$

- Regression results are estimated via demeaned distances
  - Mitigates multicollinearity when testing for non-linear effects

Computational example | Top lead arrangers | Time variation of lender distance

Data description

Corporate syndicated loans

- Source: Thomson Reuters LPC DealScan
- Market: United States
- Total syndicated loans: 123,752
- Total firms: 30,722
- Sample period: January 1988 to March 2017

Borrower characteristics

- Standard borrower information: DealScan
- Borrower financial information: Compustat (up to 48,317 loans)

How do lead arrangers structure syndicates?

- How do lead banks structure syndicates? And what is the role of lending expertise?
- Close syndicates are associated with smaller and more concentrated syndicates
  1. Fewer lead arrangers, co-agents and participants
  2. Have a higher syndicate concentration (HHI)
- Lead arrangers are more likely to choose either very close or very distant lenders in more senior roles (that are possibly future lead arrangers)
- Choice of participant is more likely the closer lenders are

Distance and loan pricing

- Question: How does lender distance affect loan pricing?

$$Spread_{i,t} = \alpha + \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} + \gamma \cdot X_{i,t} + \varepsilon_{i,t}$$

- Non-linearity of lender distance justified by two opposing forces:
  - Close syndicates might have improved screening abilities (hypothesis 1)
  - Close syndicates might collude on loan pricing (hypothesis 2)

Distance and loan pricing

- Question: How does lender distance affect loan pricing?

$$Spread_{i,t} = \alpha + \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} + \gamma \cdot X_{i,t} + \varepsilon_{i,t}$$

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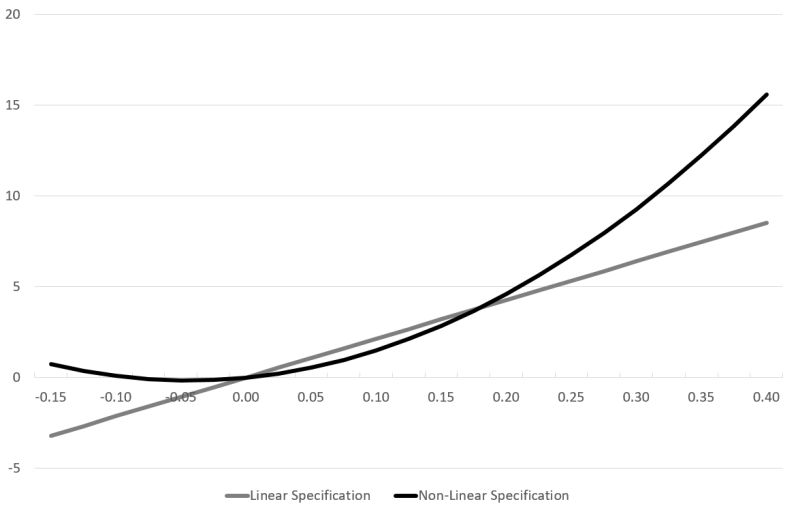
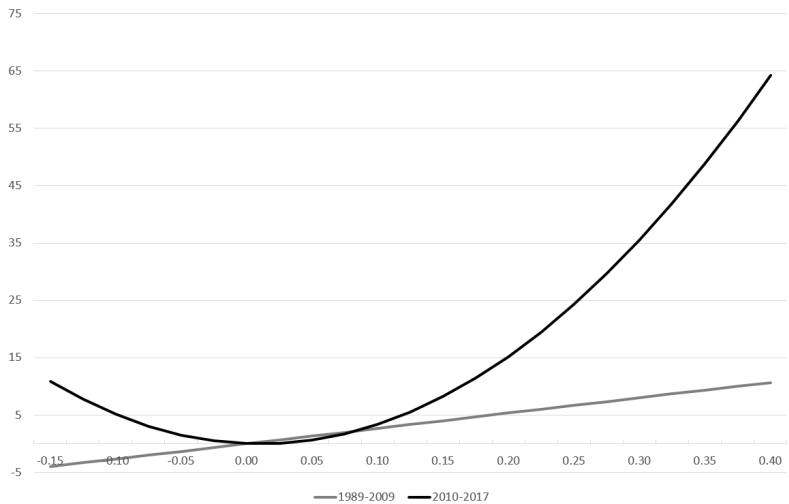


(a) Lender Distance and Loan Pricing: Full Sample



(b) Lender Distance and Loan Pricing: Sub-periods

Regression results

Improved screening versus price collusion

- Question: What are the stand-alone effects of improved screening and price collusion?

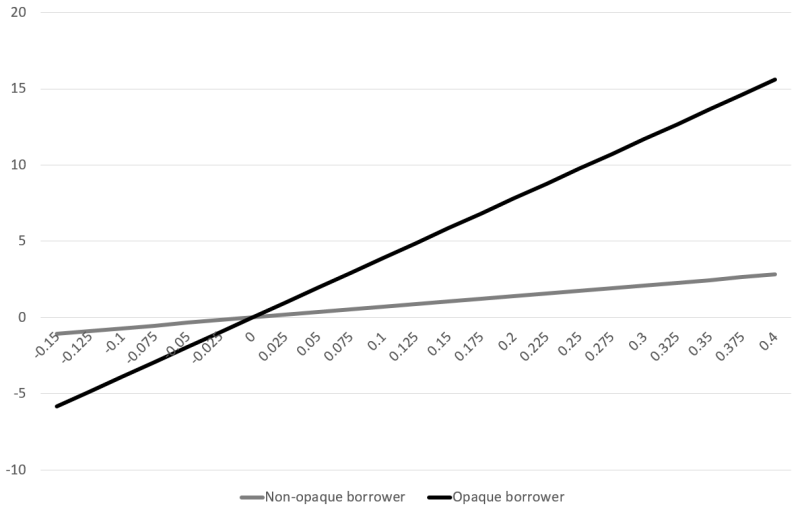
$$Spread_{i,t} = \alpha + \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} + \beta_3 \cdot \tilde{Distance}_{i,t} \cdot Opaque_i + \beta_4 \cdot \tilde{Distance}^2_{i,t} \cdot Opaque_i + \gamma \cdot X_{i,t} + \varepsilon_{i,t}$$

- Disentangle two opposing effects via cross-sectional variation
  - Net effect = improved screening effect + price collusion effect
  - If price collusion identical, delta captures improved screening effect

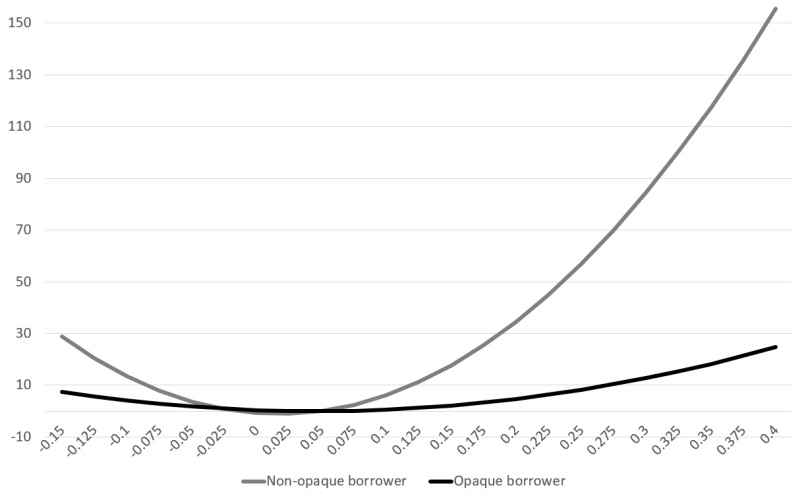
Improved screening versus price collusion

- Question: What are the stand-alone effects of improved screening and price collusion?

$$Spread_{i,t} = \alpha + \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} + \beta_3 \cdot \tilde{Distance}_{i,t} \cdot Opaque_i + \beta_4 \cdot \tilde{Distance}^2_{i,t} \cdot Opaque_i + \gamma \cdot X_{i,t} + \varepsilon_{i,t}$$



(a) Lender Distance and Loan Pricing: 1989 - 2009



(b) Lender Distance and Loan Pricing: 2010 - 2017

Regression results

Market concentration and loan pricing

- Question: How does market concentration affect loan pricing?

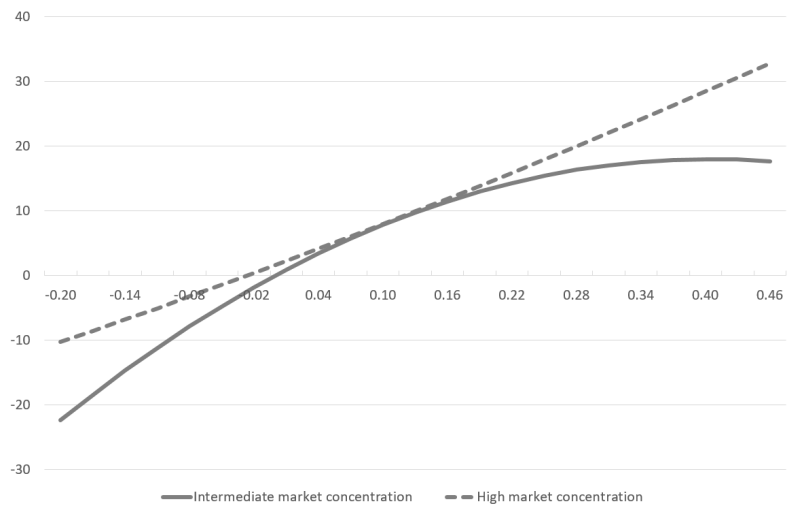
$$\begin{aligned} Spread_{i,t} = \alpha &+ \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} \\ &+ \beta_3 \cdot \tilde{Distance}_{i,t} \cdot MarketConcLow \\ &+ \beta_4 \cdot \tilde{Distance}^2_{i,t} \cdot MarketConcLow \\ &+ \beta_5 \cdot \tilde{Distance}_{i,t} \cdot MarketConcHigh \\ &+ \beta_6 \cdot \tilde{Distance}^2_{i,t} \cdot MarketConcHigh \\ &+ \gamma \cdot X_{i,t} + \varepsilon_{i,t} \end{aligned}$$

- Splitting market concentration justified by two opposing forces
  1. Lower market concentration might reduce pricing due to competition (standard IO theory)
  2. (Too) Low market concentration might increase pricing due to collusion (hypothesis 3)

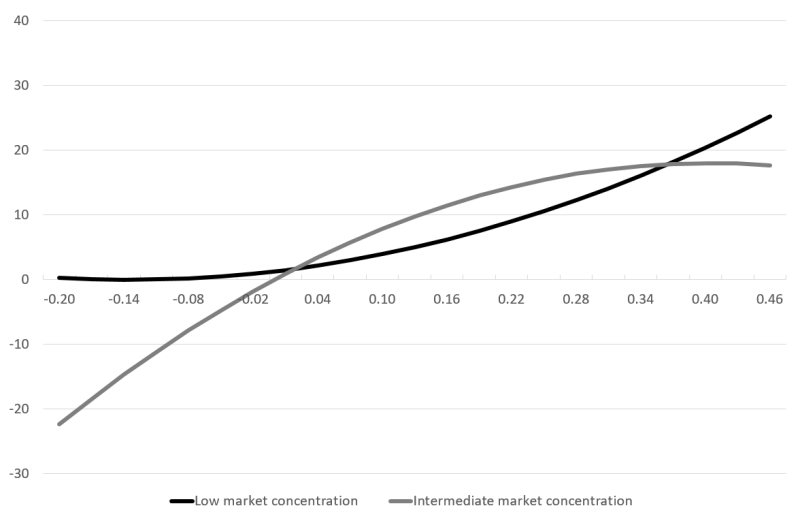
Market concentration and loan pricing

- Question: How does market concentration affect loan pricing?

$$Spread_{i,t} = \alpha + \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} + ...$$



(a) Lender Distance and Market Concentration: High vs. Intermediate



(b) Lender Distance and Market Concentration: Intermediate vs. Low

Regression results | Market concentration stand-alone | Time variation of market concentration

Price collusion and syndicate member choice

- Collusive loan pricing behavior might also affect member choice
- Price collusion theory in syndicates (Hatfield et al., 2017) predicts:
  - Penalize large lenders that undercut prices by exclusion from collusion loans
  - Rewarde lenders that do not participate in price undercutting by inclusion in collusion loans
- Empirical testing strategy:
  1. Estimate a residual loan spread by predicting the loan spread based on time, loan and borrower specifics Regression results
  2. Use the residual loan spread to categorize loans in undercutting (bottom 20 percentiles) and markup (top 20 percentiles) loans
  3. Calculate the share of loans with undercutting and markup loans that a lender was member of during the previous 12 months

Price collusion and syndicate member choice

- Question: Are large lenders that undercut (markup) prices excluded (included) in future markup loans?

$$\begin{aligned} Memb_{s,k,i,t} = \alpha &+ \beta_1 MarkupMember_{k,t} \cdot MarkupLoan_i \cdot LargeLender_{k,t} \\ &+ \beta_2 UndercutMember_{k,t} \cdot MarkupLoan_i \cdot LargeLender_{k,t} \\ &+ \gamma X_{s,k,i,t} + \varepsilon_{s,k,i,t} \end{aligned}$$

- $MarkupLoan_i = 1$ if the loan is identified as markup loan, i.e. residual loan spread is in the 80th percentile or higher
- $LargeLender_{k,t} = 1$ if the lender had a market share of more than 5% over the last 12 months
- $MarkupMember_{k,t}$= (# markup loan membership / # syndicated loan membership) over the last 12 months
- $UndercutMember_{k,t}$=(# undercut loan membership in/ #syndicated loan membership) over the last 12 months

Further evidence on price collusion

	(1) Syndicate Co-Lead Indicator	(2) Syndicate Co-Agent Indicator	(3) Syndicate Participant Indicator
Undercutting participated(%) X Markup Loan X Large Lender	-0.177**	-0.223***	0.035
Markup participated(%) X Markup Loan X Large Lender	0.202***	0.193***	-0.074**
2-digit SIC x Year FE	Yes	Yes	Yes
Lead Arranger FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N =	4,524,742	4,524,742	4,524,742
Adjusted R^2	0.1513	0.0794	0.0885

- Large lenders that participate in markup loans are more likely to become Co-Lead and Co-Agents in markup loans in the future
- Large lenders that participate in undercutting loans are less likely to become Co-Lead and Co-Agents in markup loans in the future

Full regression results

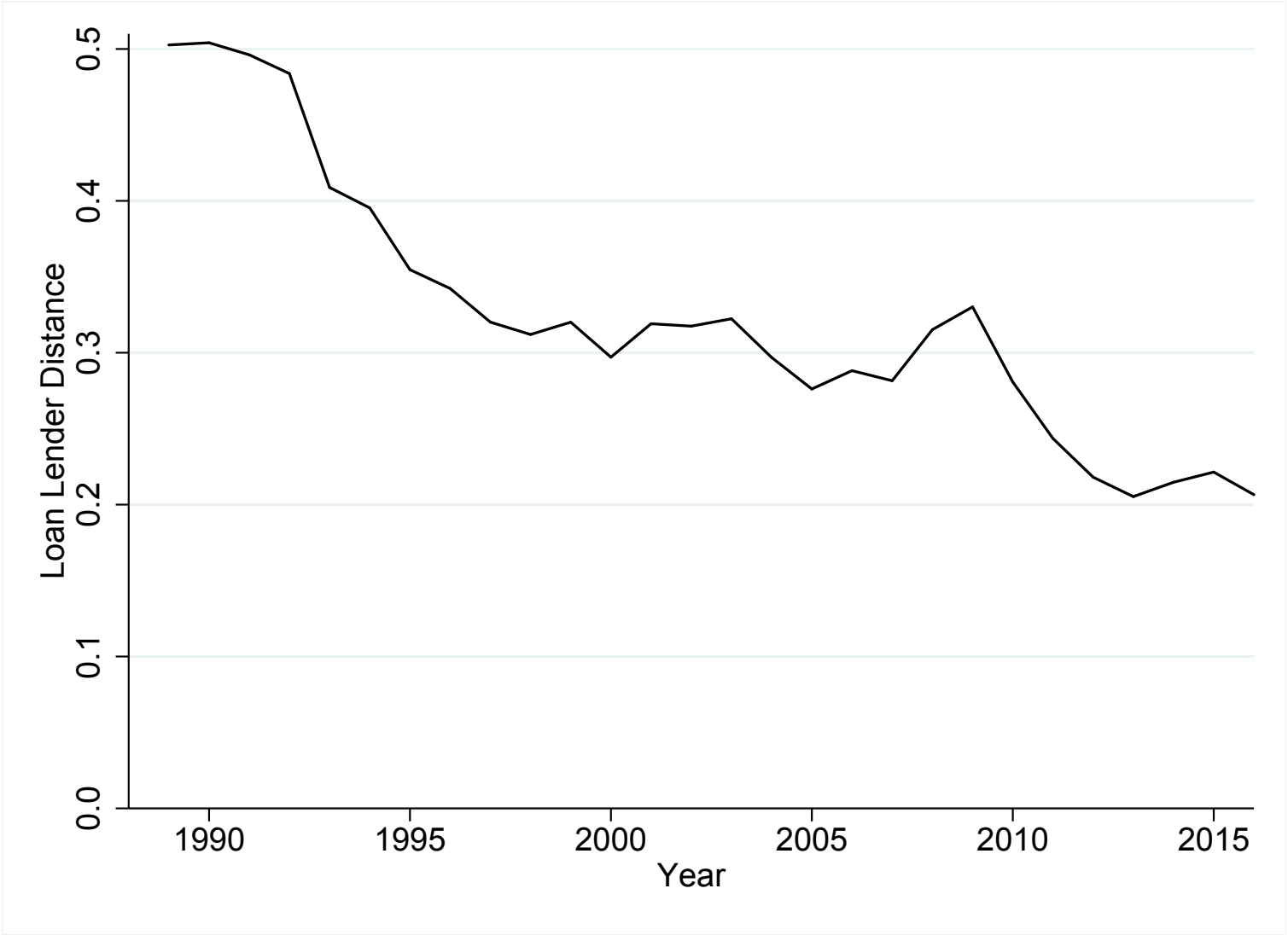
Conclusion

- Main findings
  1. Close syndicates associated with small and concentrated syndicates
  2. Very close lenders preferred, and allocated higher loan shares
  3. Close syndicates can both reduce and increase loan pricing
     - ★ Improved screening throughout the entire sample
     - ★ Price collusion since 2010
  4. Low market concentration increases loan pricing for close syndicates
  5. Price collusion behavior affects syndicate membership choice

- Puzzle and open questions
  - Why have banks started price collusion since 2010?
  - What are alternative measures for price collusion?
  - What has changed since 2010 (e.g. loan market, price level, low yields, bank capitalization)?
  - Are there alternative explanations (e.g. changed bargaining power)?

Appendix

Mean syndicated loan lender distance across time



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More borrower characteristics

Borrowers with Compustat data:

Total book assets ($mm)	46,533	12,317	71,769	107	1,158	17,643
Book leverage ratio	46,297	0.37	0.27	0.05	0.34	0.68
Earnings to asset ratio	44,022	0.06	0.24	-0.01	0.07	0.16
Debt rating indicator	48,317	0.56	0.50	0	1	1
Investment-grade rating ind.	48,317	0.29	0.45	0	0	1

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Lender distance measure: Computational example

Distance between two lenders:

	Wells Fargo (Lead)	JPMorgan Chase (Co-Agent)	U.S. Bancorp (Co-Agent)	Barclays (Participant)	Goldman Sachs (Participant)
Wells Fargo	-				
JPMorgan Chase	**0.097**	-			
U.S. Bancorp	**0.113**	0.103	-		
Barclays	**0.162**	0.104	0.154	-	
Goldman Sachs	**0.151**	0.124	0.132	0.167	-

Lender distance in a syndicated loan:

$$Distance_{s,t} = \frac{1}{N_s}\sum_{n=1}^{N_s} distance_{i^n,k^n,t}$$

$$= \frac{1}{4} \times (0.097 + 0.113 + 0.162 + 0.151) = 0.131$$

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Top lead arrangers by syndicated loan lender distance

(1) Close Syndicates		(2) Mid Syndicates		(3) Distant Syndicates	
Lead arrangers					
	# loans		# loans		# loans
Bank of America	2,054	Bank of America	827	Bank of America	1,912
JPMorgan Chase	1,794	JPMorgan Chase	667	JPMorgan Chase	1,682
Wells Fargo	1,544	Wells Fargo	490	Wells Fargo	1,327
Citigroup	823	KeyCorporation	476	Citigroup	835
Deutsche Bank	659	Bank of Montreal	389	Barclays	620
Total number of lead arrangers	12,583	Total number of lead arrangers	11,720	Total number of lead arrangers	15,563

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Distance and syndicate formation: Regression results

	(1) # Lenders	(2) # Leads	(3) # Co-Agents	(4) # Participants	(5) Herfindahl
Lender distance	28.606***	0.497***	4.713***	23.902***	-0.367***
	(0.525)	(0.068)	(0.210)	(0.451)	(0.024)
Lender distance^2	-70.180***	-0.693***	-12.609***	-57.526***	1.044***
	(1.669)	(0.178)	(0.571)	(1.415)	(0.067)
2-dig SIC x Year FE	Yes	Yes	Yes	Yes	Yes
Lead arranger FE	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes
N =	33,564	33,573	33,564	33,564	11,824
Adjusted R^2	0.4163	0.4973	0.2990	0.3026	0.4839

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Syndicate member choice: Regression results

	(1) Syndicate Co-Lead Indicator	(2) Syndicate Co-Agent Indicator	(3) Syndicate Participant Indicator
Distance from lead arranger	0.060***	-0.000	-0.028***
	(0.000)	(0.000)	(0.000)
Distance from lead arranger^2	0.264***	0.219***	0.137***
	(0.002)	(0.002)	(0.002)
2-dig SIC x Year FE	Yes	Yes	Yes
Lead arranger FE	No	Yes	Yes
Facility FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N =	9,502,513	7,954,145	11,962,979
Adjusted R^2	0.1918	0.1342	0.1626

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Allocation of loan shares: Regression results

	(1) % Held by Lead	(2) % Held by Co-Agent	(3) % Held by Participant
Lender distance	-35.663***	-27.023***	-13.532***
	(2.512)	(2.115)	(1.657)
Lender distance^2	105.271***	103.846***	40.836***
	(6.474)	(8.836)	(5.538)
2-dig SIC x Year FE	Yes	Yes	Yes
Lead arranger FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N =	11,985	7,137	11,169
Adjusted R^2	0.4806	0.4947	0.5489

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Allocation of loan shares: Within syndicate variation

	(1) % Held by Lead	(2) % Held by Co-Agent	(3) % Held by Participant
Distance from lead arranger	-4.365***	-10.020***	-8.145***
	(1.120)	(1.553)	(0.922)
Distance from lead arranger^2	5.669***	9.348***	5.515***
	(1.472)	(1.994)	(1.023)
2-dig SIC x Year FE	Yes	Yes	Yes
Lead arranger FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N =	52,602	25,258	62,362
Adjusted R^2	0.4695	0.3933	0.3488

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Distance and loan pricing: Regression results

	Spread on Drawn Funds (bps)					
	Full Sample		1989-2009		2010-2017	
	(1)	(2)	(3)	(4)	(5)	(6)
Lender distance	21.33***	7.06	26.71***	17.50*	-28.31	-8.89
	(6.88)	(8.29)	(7.36)	(9.08)	(23.91)	(24.12)
Lender distance^2		79.67***		47.37*		424.01***
		(25.37)		(27.34)		(106.09)
2-dig SIC x Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead arranger FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
N =	30,865	30,865	25,657	25,657	5,198	5,198
Adjusted R^2	0.5254	0.5255	0.5311	0.5311	0.5126	0.5143

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Improved screening vs. price collusion: Regression results

	Spread on Drawn Funds (bps)			
	1989-2009		2010-2017	
	(1)	(2)	(3)	(4)
Lender distance	7.03	-1.51	-65.59**	69.90
	(9.51)	(11.18)	(33.03)	(45.25)
Lender distance^2		61.99		1070.00***
		(41.71)		(279.56)
Lender distance x Opaque	31.94***	39.32**	64.78*	-68.16
	(11.06)	(15.33)	(39.32)	(49.37)
Lender distance^2 x Opaque		-53.92		-872.74***
		(52.06)		(301.38)
2-dig SIC x Year FE	Yes	Yes	Yes	Yes
Lead arranger FE	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes
N =	25,657	25,657	5,198	5,198
Adjusted R^2	0.5288	0.5288	0.5092	0.5116

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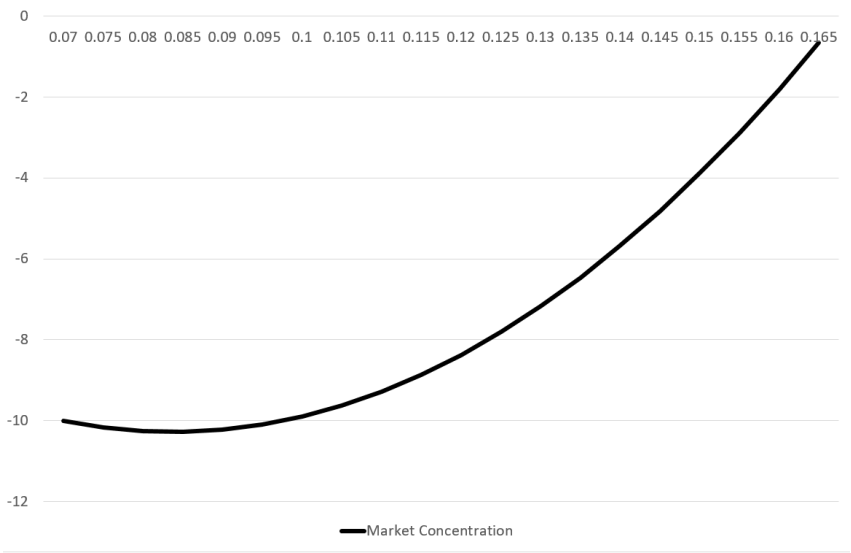
Market concentration and loan pricing: Stand-alone effect



Market Concentration

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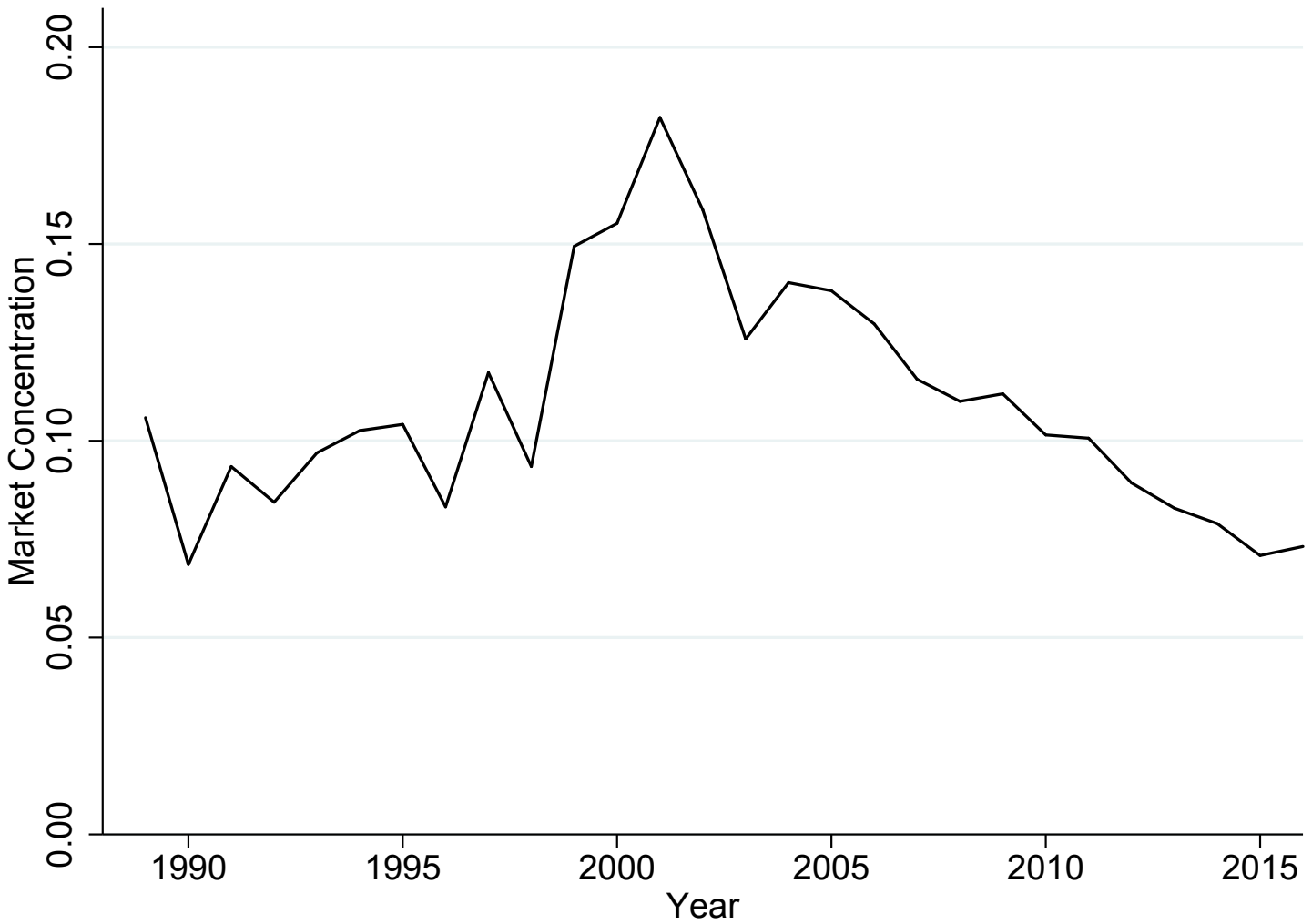
Market concentration in the U.S. syndicated loan market



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Market concentration and loan pricing: Regression results

	Spread on Drawn Funds (bps)		
	(1)	(2)	(3)
Lender distance	42.22***	42.46***	92.58***
	(8.05)	(8.06)	(13.74)
Lender distance^2	4.44	5.53	-97.36**
	(24.60)	(24.57)	(38.63)
Market concentration		-692.57***	
		(235.64)	
Market concentration^2		3740.87***	
		(945.29)	
Lender distance x Low market concentration			-71.33***
			(17.71)
Lender distance^2 x Low market concentration			170.55***
			(53.27)
Lender distance x High market concentration			-66.55***
			(16.91)
Lender distance^2 x High market concentration			94.80*
			(57.56)
2-dig SIC x 3 Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N =	30,986	30,986	30,986
Adjusted R^2	0.4944	0.4952	0.4948

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Loan spread residuals: Estimation coefficients

	Spread on Drawn Funds (bps)
Private borrower indicator	11.52***
	(3.74)
Unrated borrower indicator	-49.13***
	(4.80)
Investment-grade borrower indicator	-91.74***
	(4.46)
First borrower loan indicator	4.07*
	(2.42)
Ln[borrower's sales at closing]	-8.03***
	(1.77)
Ln[loan facility amount]	-17.32***
	(1.53)
Ln[loan maturity in days]	-10.55***
	(2.43)
Term loan indicator	64.35***
	(5.21)
Year FE	Yes
N =	31,024
Adjusted R^2	0.4537

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Further evidence on price collusion:Regression results

	(1) Syndicate Co-Lead Indicator	(2) Syndicate Co-Agent Indicator	(3) Syndicate Participant Indicator
Markup Member(%)	0.008***	-0.016***	-0.028***
Markup Member (%) X Large Lender	0.579***	-0.496***	0.039
Markup Member(%) X Markup Loan	-0.001	0.013***	0.029***
Markup Member(%) X Markup Loan X Large Lender	0.202***	0.193***	-0.074**
Undercutting Member (%)	-0.000	0.008***	0.026***
Undercutting Member (%) X Large Lender	-0.221*	0.318**	0.221***
Undercutting Member (%) X Markup Loan	-0.010***	-0.007***	-0.010***
Undercutting Member(%) X Markup Loan X Large Lender	-0.177**	-0.223***	0.035
2-dig SIC x Year FE	Yes	Yes	Yes
Lead arranger FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
N =	4,524,742	4,524,742	4,524,742
Adjusted R^2	0.1513	0.0794	0.0885

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Literature

- **Loan syndication and syndicate formation:** e.g. Sufi (2007), Cai (2010) and Altunbas and Kara (2011)
- **Syndicated loan pricing:** e.g. Ivashina (2009), Ferreira and Matos (2012), Lim et al. (2014) and Bruche et al. (2017)
- **Industrial organization and collusion:** e.g. Chen and Ritter (2000), Nocke and White (2007) and Hatfield et al. (2017)

Summary statistics: Lead arrangers and borrowers

Lead arranger characteristics:

	N	Mean	SD	10th	50th	90th
Market share (%), previous 12 months	33,861	1.00	3.14	0.00	0.08	1.97
# of loans as lead arranger	33,861	65.05	174.91	1	10	155
$ of loans as lead arranger ($mm)	33,861	11,288	40,244	43	703	21,792
Bank indicator	33,861	0.82	0.39	0	1	1
All lender pairs:						
Distance between two lenders	3,346,592	0.61	0.23	0.29	0.63	0.88

Borrower characteristics:

	N	Mean	SD	10th	50th	90th
All borrowers:						
Sales at closing ($mm)	69,357	3,541	18,683	59	500	6,881
# of previous syndicated loans	123,752	4.13	6.35	0	2	12
First borrower loan indicator	123,752	0.38	0.49	0	0	1
Private borrower indicator	106,976	0.64	0.48	0	1	1
Public borrower indicator	106,976	0.36	0.48	0	0	1

More borrower characteristics

Summary statistics: Syndicated loans

	N	Mean	SD	10th	50th	90th
Syndicated loan characteristics:						
Facility amount ($mm)	123,752	271	683	14	95	600
Maturity (months)	112,647	50	25	12	60	80
Spread on drawn funds (bps)	104,950	252	164	63	225	450
Term loan indicator	123,752	0.34	0.47	0	0	1
Purpose of loan indicators:						
Working capital/corporate	123,752	0.72	0.45	0	1	1
Refinancing	123,752	0.18	0.38	0	0	1
Acquisitions	123,752	0.22	0.42	0	0	1
Backup lines	123,752	0.05	0.22	0	0	0
Syndicate structure:						
Total number of lenders	123,752	6.04	6.83	1	4	13
Total number of lead arrangers	123,752	1.55	1.24	1	1	3
Total number of co-agents	123,752	1.30	2.56	0	0	4
Total number of participants	123,752	3.16	5.42	0	1	8
Concentration of syndicate (Herfindahl)	23,194	0.27	0.24	0.06	0.19	0.55
Loan distribution:						
% kept by lead arranger	23,633	31.37	23.94	8.10	24.00	64.00
% held by co-agents	11,679	14.68	10.77	5.18	11.55	28.45
% held by participants	20,847	14.70	13.39	3.23	10.00	33.33
Syndicated loan lender distance:						
Lender distance	100,015	0.29	0.14	0.15	0.26	0.47

Distance and syndicate formation

- Question: How does lender distance affect syndicate structure?

$$Synd_{i,t} = \alpha + \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} + \gamma \cdot X_{i,t} + \varepsilon_{i,t}$$

- Non-linearity of lender distance justified by two opposing forces:
  1. Improve screening and price collusion abilities of close syndicates
  2. Increased future competition for borrower-loans of distant syndicates

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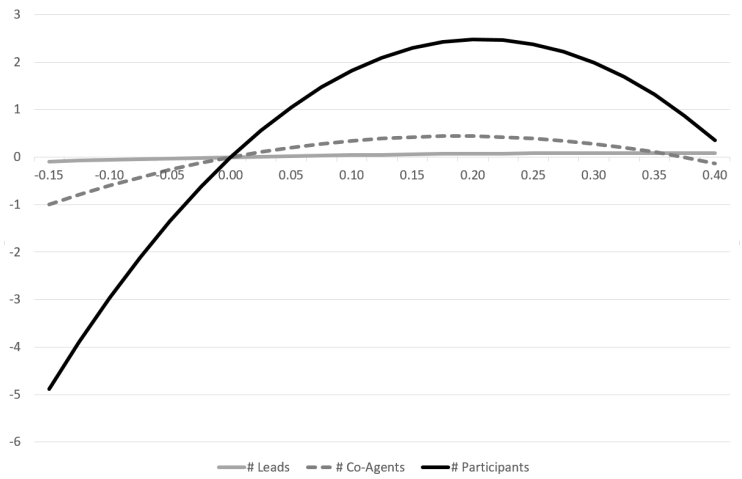
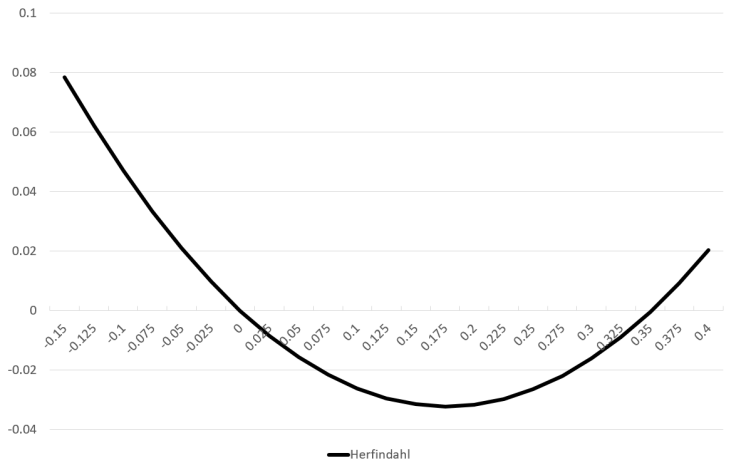


(a) Lender distance and # Leads, # Co-Agents and # Participants



(b) Lender distance and Syndicated Concentration

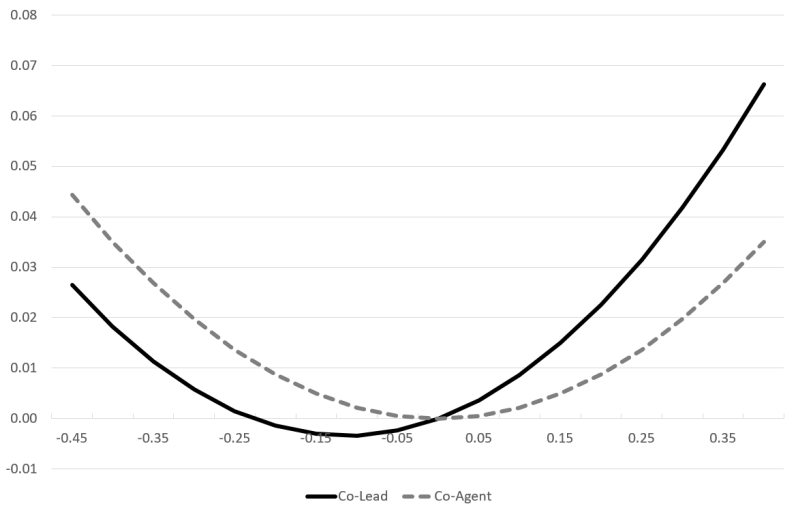
Regression results

Distance and loan distribution: Syndicate member choice

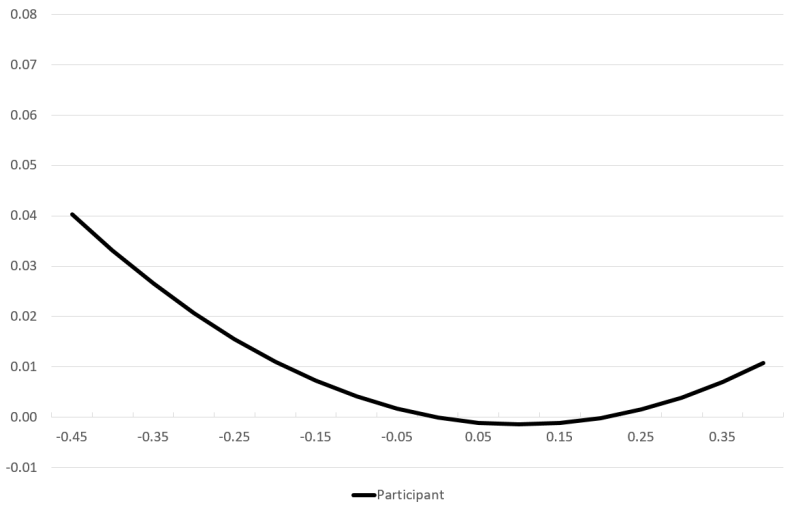
- Question: Whom do lead arrangers select into their syndicates?

$$Memb_{s,k,i,t} = \alpha_i + \beta_1 \cdot \tilde{distance}_{s,k,t} + \beta_2 \cdot \tilde{distance}^2_{s,k,t} + \gamma \cdot X_{s,k,i,t} + \varepsilon_{s,k,i,t}$$

- Same opposing forces justifying non-linearity as above



(a) Distance from Lead Arranger and Co-Lead and Co-Agent Choice



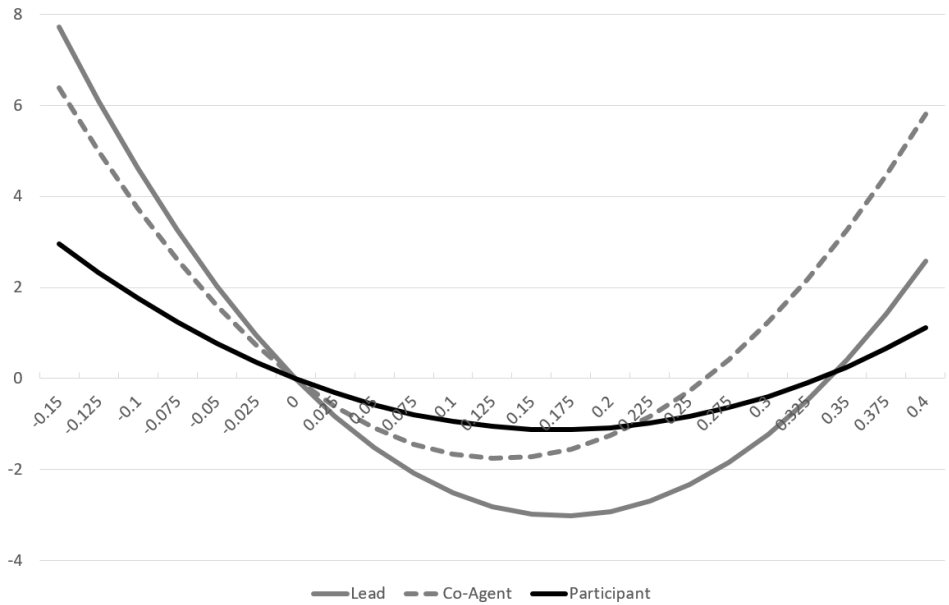
(b) Distance from Lead Arranger and Participant Choice

Regression results

Distance and loan distribution: Allocation of loan shares

- Question: How do lead arrangers allocate loan shares?

$$LoanShare_{i,t} = \alpha + \beta_1 \cdot \tilde{Distance}_{i,t} + \beta_2 \cdot \tilde{Distance}^2_{i,t} + \gamma \cdot X_{i,t} + \varepsilon_{i,t}$$



Lender distance and % held
by Lead, Co-Agent and Participant

Regression results | Within syndicate variation results

Close versus mid versus distant syndicates

	Syndicate Distance			Differences	
	Close	Mid	Distant	Close-Mid	Distant-Mid
	(1)	(2)	(3)	(4)	(5)
Borrower characteristics:					
Public borrower indicator	0.359	0.406	0.306	-0.047***	-0.100***
Debt rating indicator	0.627	0.667	0.521	-0.041***	-0.146***
# of previous syndicated loans	4.907	5.383	3.502	-0.477***	-1.881***
First borrower loan indicator	0.299	0.281	0.418	0.018***	0.137***
Sales at closing ($mm)	3,893	4,921	3,025	-1,028***	-1,895***
Syndicated loan characteristics:					
Facility amount ($mm)	312	399	221	-87***	-178***
Maturity (months)	48.627	50.940	51.294	-2.314***	0.354*
Term loan indicator	0.322	0.314	0.364	0.008**	0.051***
Spread on drawn funds (bps)	236	231	266	5***	35***
Syndicate structure:					
Total number of lenders	5.202	9.130	6.781	-3.928***	-2.349***
Total number of lead arrangers	1.659	1.821	1.556	-0.162***	-0.264***
Total number of co-agents	1.256	2.149	1.363	-0.892***	-0.786***
Total number of participant lenders	2.273	5.138	3.810	-2.865***	-1.328***
Concentration of syndicate (Herfindahl)	0.270	0.171	0.250	0.098***	0.079***
Loan distribution:					
% kept by lead arranger	31.437	21.316	29.776	10.121***	8.460***
% held by co-agent lender	17.661	12.124	15.531	5.537***	3.407***
% held by participant lender	16.479	10.200	15.578	6.279***	5.378***