The Effects of Information on Credit Market Competition: Evidence from Credit Cards

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Public credit information and competition

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  - If borrowers and lenders are asymmetrically informed, then lenders can acquire information about their own borrowers, which gives them market power ex post (e.g., Sharpe 1990, Petersen and Rajan 1995)
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- In theory, public credit information can decrease competition
  - Public credit information gives lenders the ability to detect deviations from collusive behavior (Green and Porter 1984, Vives 1990)
- Direct evidence is hard to obtain. Need:
  - 1) data that track lenders operating in different informational environments, *and*
  - 2) plausible exogenous variation in information setting

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- Identification: a retailer (the "Lender") was acquired by a bank
  - Plausibly exogenous variation on information setting

Findings

- Evidence that public credit information *increases* competition:
  - After the transaction, other banks lend more to the Lender's borrowers
  - *Within* Lender's borrowers, more lending to those whose predicted default drops because of the change in the information structure
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  - Similar results in full cross-section of new borrowers
- Key takeaway: public credit information increases competition but at the cost of reducing credit to riskier populations

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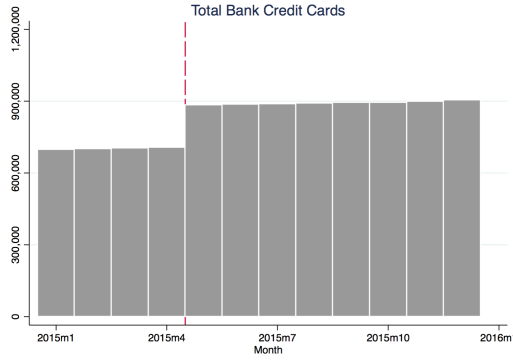
- Retailers and other non-banks
  - Funded through commercial paper
- Both lenders treated symmetrically by personal bankruptcy law implemented in 2014

Natural experiment: sale of retailer lender to bank

- In May 2015, one of the largest retailer lenders (the "Lender") sold its existing credit card portfolio and origination business to a bank



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- Implement a difference in differences test, comparing limits before and after the transaction relative to the same effect for other retailer borrowers
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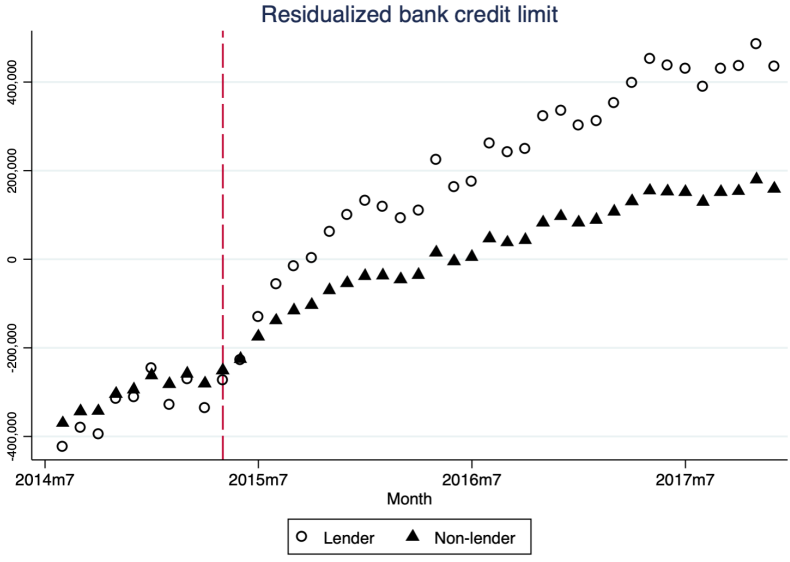
- One challenge is that on average, "controls" are poorer and have fewer cards
  - Robustness includes a fixed effect that interacts 5-year age bins, marital status, income bin, retail default status, retail credit limit quartiles, bank credit limit quartiles, number of bank accounts, total number of accounts, and bank default

Existing borrowers get more credit from other banks



In regression form: diff-in-diffs

$$Limit_{i,t,j} = \beta Lender_i \times Post_t + X_{i,j,t} + \epsilon_{i,t}$$

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	(1)	(2)	(3)
	Limit	Limit	Limit
Lender x Post	106.13***	9.03***	
	(6.67)	(1.31)	
Lender x Bank x Post			97.10***
			(6.74)
Sample	Banks	Retail	All
Dep. variable Mean	2,383.36	933.02	1,658.19
Observations	7,569,285	7,569,285	15,138,570
R-squared	0.95	0.93	0.98
Clusters	504,619	504,619	504,619

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- Next we implement a treatment intensity strategy that compares within the Lender's borrowers those borrowers who are heterogeneously exposed to the information shift

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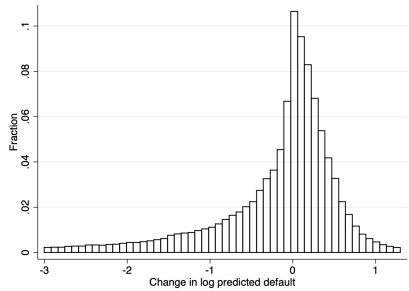
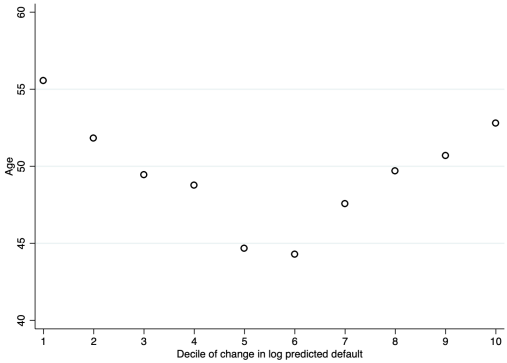
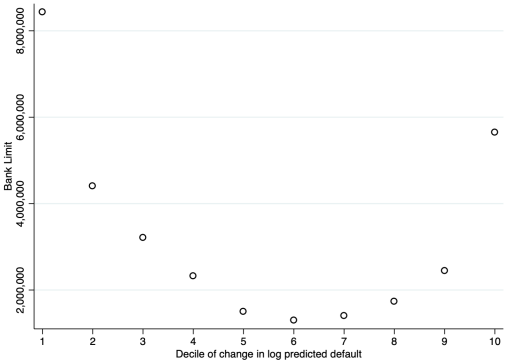
  - $\hat{C}_{i,post}$ adds Lender limits and usage
- Compute change in predicted default as $log\left(\hat{C}_{i,post}\right) - log\left(\hat{C}_{i,pre}\right)$

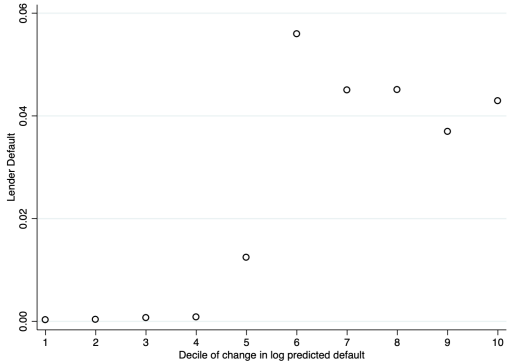


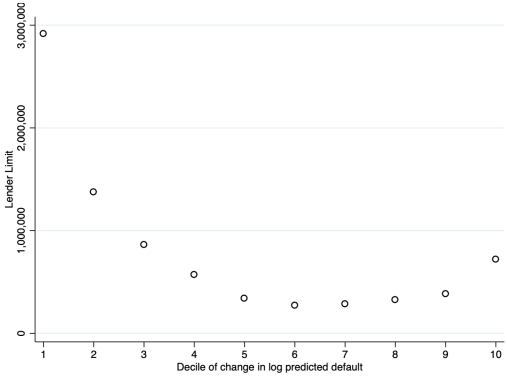
Visualizing pooling





Visualizing pooling (2)





Second diff-in-diffs

- Intuitively, credit limits should increase more for borrowers exposed to drops in predicted default
- Construct a difference-in-differences test within the Lender's borrowers
- Define Drop $= 1\left[log\left(\hat{C}_{i,post}\right) - log\left(\hat{C}_{i,pre}\right) < 0\right]$
- Run diff-in-diffs interacting quarter dummies with Drop

$$Limit_{i,t} = \beta Post_t \times Drop_i + X_{i,t} + \epsilon_{i,t}$$

Effects stronger when predicted costs drop: DiD

$$Limit_{i,t} = \beta Post_t \times Drop_i + X_{i,t} + \epsilon_{i,t}$$

$$Limit_{i,t,j} = \beta Post_t \times Drop_i \times Bank_j + X_{i,t,j} + \epsilon_{i,t}$$

	(1)	(2)	(3)
	Limit	Limit	Limit
Pred. Def. Drops × Post	187.63***	14.74***	
	(12.52)	(2.29)	
Pred. Def. Drops × Bank × Post			172.89***
			(12.64)
Sample	Banks	Retail	All
Dep. variable Mean	3,641.12	1,195.67	1,896.53
Observations	2,500,260	2,500,260	5,000,520
R-squared	0.93	0.94	0.53
Clusters	166,684	166,684	166,684

How does information affect originations?

- Without credit information, lenders can afford to lose money in the first period of lending because they expect to earn profits in the second one
- Under public credit information (banks) relative to no information (retailers), we expect to see
  - lower rates,
  - initial limits are larger,
  - observably safer populations get credit

Empirical strategy for new originations

- Compare changes in originations for the Lender borrowers before and after the transaction to originations by banks and by retailers

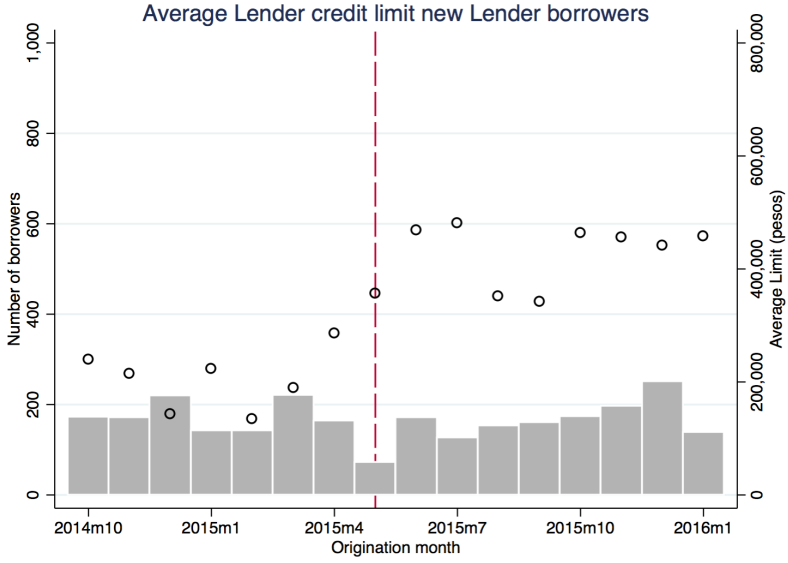
$$Outcomes_{i,t} = \beta Lender_i \times Post_t + X_{i,t} + \epsilon_{i,t}$$

A small but significant effect on interest rates

$$Rates_{i,t} = \beta Lender_i \times Post_t + X_{i,t} + \epsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	Rate	Rate	Rate	Rate
Lender x Post	−0.0016**	−0.0007	−0.0008	−0.0024***
	(0.0007)	(0.0005)	(0.0008)	(0.0009)
Control group	Retailer	Retail	Banks	Banks
Fixed effect		YES		YES
Dep. variable Mean	0.0256	0.0256	0.0187	0.0187
Observations	810,746	810,741	1,238,191	1,238,103
R-squared	0.0085	0.4120	0.0856	0.4245
Clusters	450	450	452	452

Lender originates higher limits



Lender's borrowers are wealthier and as safe

$$Outcome_{i,t} = \beta Lender_i \times Post_t + X_{i,t} + \epsilon_{i,t}$$

	(1)	(2)	(3)	(4)
	Income bin	In income bin 1	Limit	Default
Lender × Post	0.0391*	−0.0368***	216.64***	−0.0132
	(0.0202)	(0.0136)	(16.80)	(0.0170)
Dep. variable Mean	1.0732	0.9011	210	0.2846
Observations	67,708	70,337	70,337	70,337
R-squared	0.0021	0.0019	0.0232	0.0025

Results hold for the entire cross section

- We compare the credit terms for *all* new retailer and bank borrowers
  - New borrowers are individuals who borrow for the first time in their lives during our sample period
- We find that:
  - Retailers lend to riskier individuals
  - Retailers lend lower initial limits
  - Retailers increase credit limits more over time to those borrowers who do not default

Alternative interpretations

- Causal effect of information on default?
  - No effect on retail credit (and no effect on default–not shown here)
- Banks make money cross-selling to better customers?
  - Why do other banks lend more to the Lender's clients?
- Retailers bundle credit with purchases of products or ease of payment, thereby attracting a different population?
  - Cannot explain why Lender, still affiliated with department store, starts originating to safer populations
- Banks have lower cost of funds?
  - Does not explain why banks do not lend to riskier populations

Conclusion

- We study the effects of sharing information on credit market competition and outcomes
  - Exploit retailer is acquired by bank, plausible exogenous shock to information: borrowers get more credit and Lender starts originating larger limits to safer borrowers
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  - In the cross section, retailers lend lower initial limits that increase more to poorer, riskier borrowers
- Results parsimoniously explained by effect of information on credit market competition
  - Rationalize lenders' lack of interest towards riskier populations and potentially, of policies that encourage banks to invest in identifying good borrowers among them
  - Potential deleterious effects of credit registries: lack of competition can sometimes be desirable