Crowding Out Banks: Credit Substitution by Peer-to-Peer Lending

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How Does Non-Bank Encroachment Affect Commercial Bank Lending?

Substitution

- Information Production Models
  - Informationally close lenders poach borrowers and poison the well for informationally distant lenders (Hauswald and Marquez 2006)
- Filling the Regulatory Vacuum
  - Buchak et al. (2019)

Credit Expansion

- New underwriting technology and alternative data to target borrowers outside traditional banking channel
  - Tang (forthcoming, RFS)
  - De Roure et al. (2016)
  - Balyuk (2018)

Is This a Significant Threat to Commercial Banking?

Increasing Scope

- Personal Unsecured
  - LendingClub, Prosper, Marcus, Marlette, Upstart, SoFi, Avant, CircleBack, LoanDepot
- Retail Mortgage
  - Quicken Loans, Amerisave Mortgage, Cashcall Inc., Homebridge Financial Services
- Student (Refinance)
  - SoFi, Earnest, CommonBond, College Avenue
- SME
  - FundingCircle, Kabbage, OnDeck
- Auto (Refinance)
  - LendingClub, SoFi

Increasing Scale

- TransUnion reports FinTech lending accounts for 30% of loans in personal unsecured 2017
- Buchak et al. (2018) show 13% of retail mortgage originations from FinTech lenders in 2015 (up from 4% in 2007)

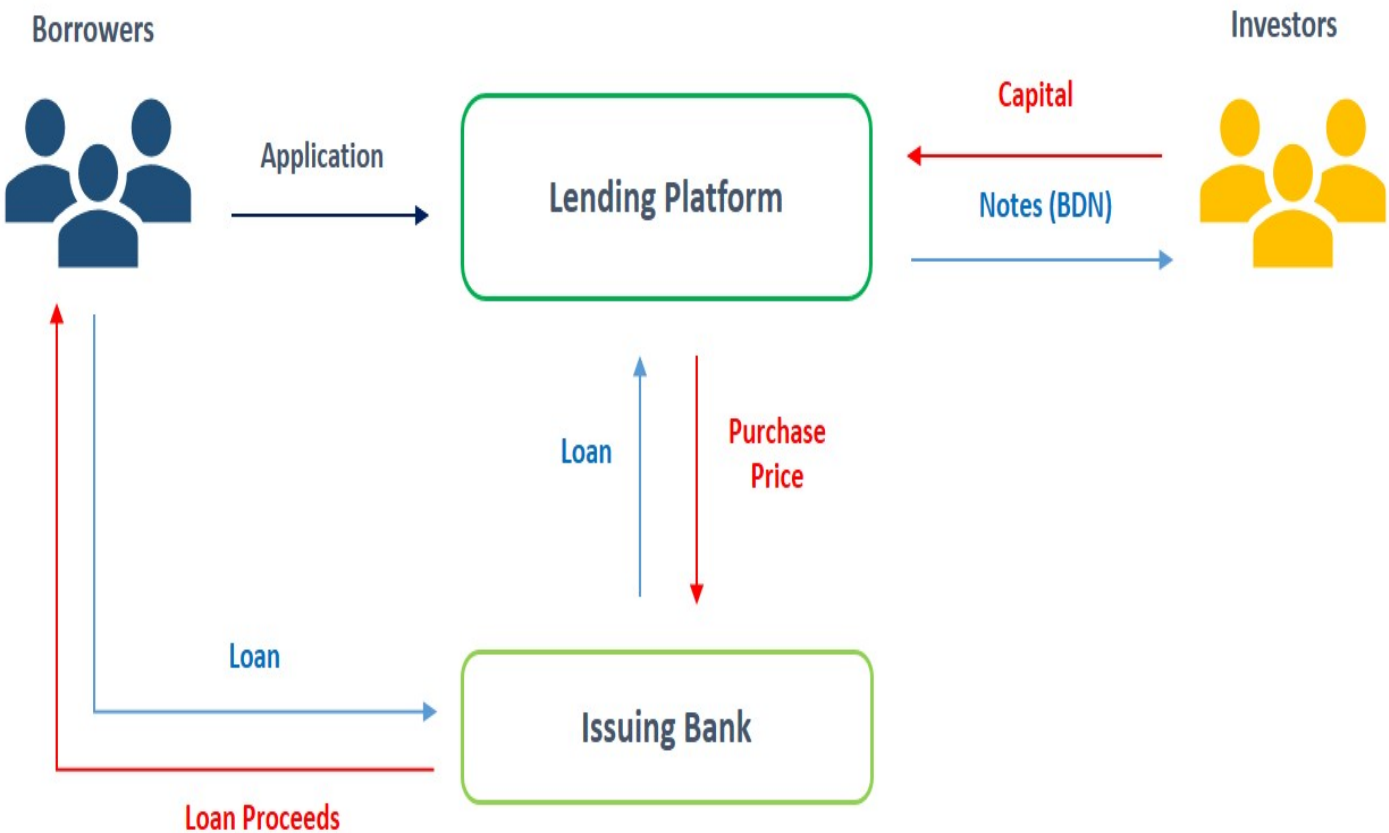
Main Results

- Small commercial banks bear the increase in competition from P2P
  - Loan losses $\sim$1.8% per σ in P2P lending (conservative estimate)
  - Similar results in low competition
- As a result of the P2P encroachment, commercial banks experience a 3.9–4.4% increase in charge off rate and 1.7% increase in 30–90 day delinquency
- P2P substitution with commercial banks appears strongest in low credit rating segments, implying credit expansion in higher credit rating segments
  - Opposite of Tang (forthcoming, RFS)
- A large fraction of the P2P loan volume (26.7%) displaces bank lending

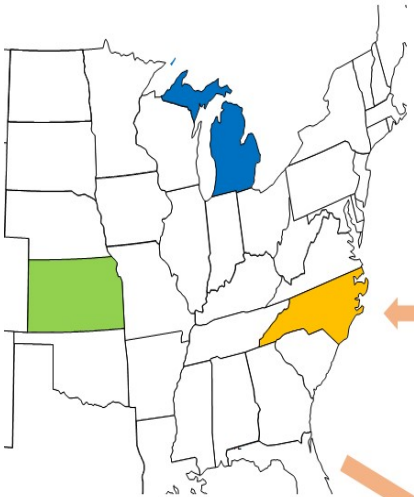
Data

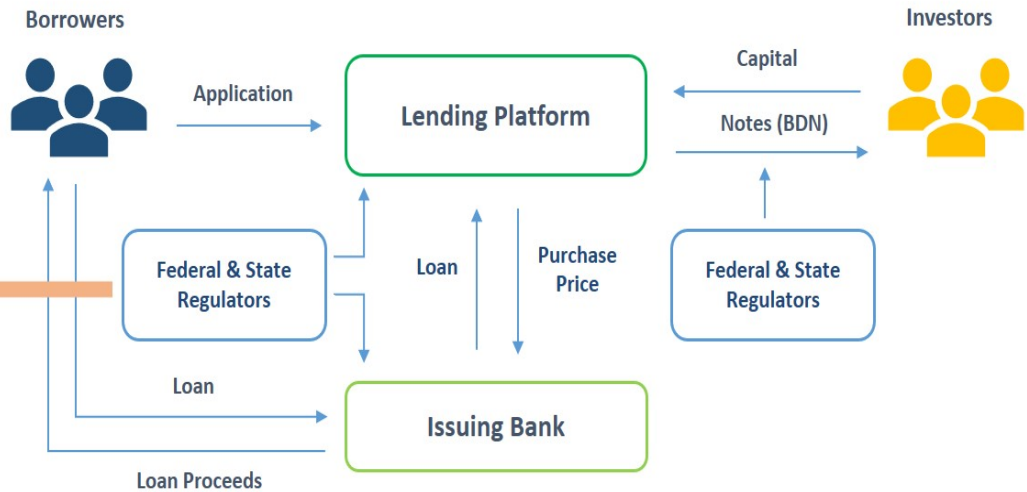
- Commercial Bank data
  - FDIC Condition & Income ("Call") Report – Quarterly bank financial data
  - FDIC Summary of Deposit Data – Annual bank branch & geography data
  - RateWatch Survey Data – Monthly bank interest rate for unsecured consumer loans
- P2P Loan data
  - Prospectus supplement filings (424(b)(3)) – EDGAR
- Security Registration dates
  - State security regulator interviews
- Local Economy
  - Bureau of Economic Analysis (BEA)

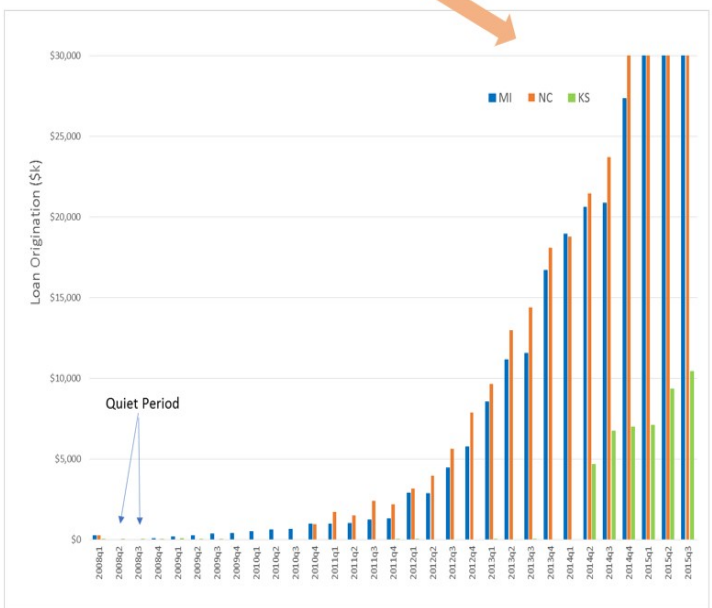
P2P Lending Basics



Empirical Strategy 1: OLS with Borrower Restrictions







Empirical Strategy #1

Time series of P2P platform entrance into states to initiate loans to borrowers

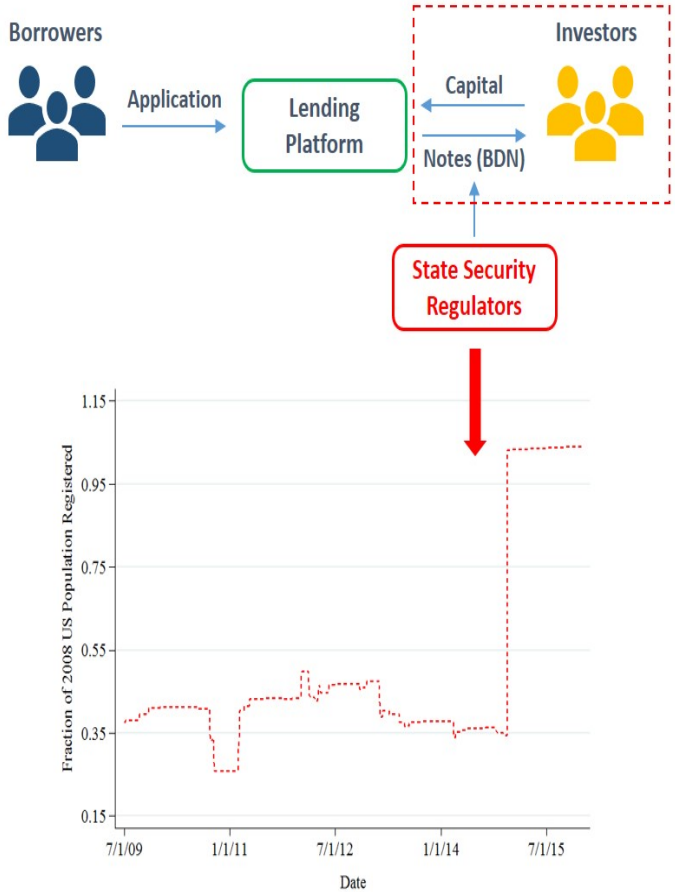
$$\text{Loan Volume}_{it} = \text{P2Pvolume}_{it} + \text{Bank}_{it} + \text{Local}_{it} + \text{Time}_{t} + \text{Bank}_{i} + \text{Error}_{it}$$

Loan Volume by Lender Size and Market Competitiveness

Loan Volume by Lender Size and Market Competitiveness [Table 8]

	Small	Large	Small Single	Low Competitiveness	High Competitiveness
	(1)	(2)	(3)	(4)	(5)
	PLoans	PLoans	PLoans (unscaled)	PLoans	PLoans
$P2PVolume_{it}$	-0.0212^{***}	-0.0059	-0.0032^{**}	-0.0157^{**}	-0.0112
	(-2.701)	(-0.694)	(-2.397)	(-2.095)	(-1.153)
Bank Characteristics	Yes	Yes	Yes	Yes	Yes
Local Economy	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
SE clustered	Bank	Bank	Bank	Bank	Bank
R^2	0.934	0.945	0.934	0.932	0.947
$Adj.R^2$	0.931	0.942	0.931	0.928	0.944
Obs.	116,632	48,078	113,630	82,313	82,398
Number of Banks	5,819	2,760	5,691	4,545	4,839

Empirical Strategy 2: Capital Supply IV's



$$P2Pvolume_{it} = Pop_{it} + PopLC_t + PopPR_t + Bank_{it} + Local_{it} + Time_t + Bank_i + Error_{it}$$

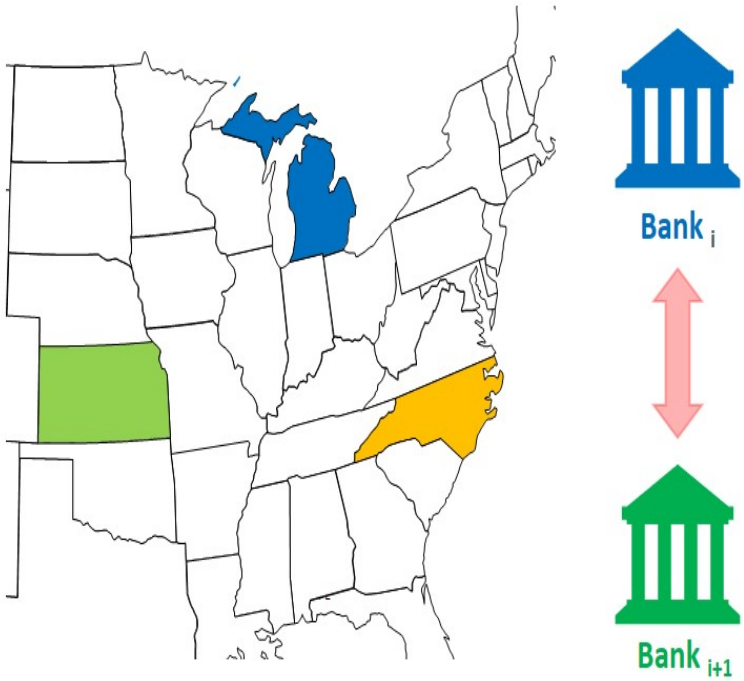
Instrument P2Pvolume

$$Loan\ Volume_{it} = P2Pvolume_{it} + Bank_{it} + Local_{it} + Time_t + Bank_i + Error_{it}$$

- Time-series measures (Pop_{LC}, Pop_{PR}) – the *fraction of US population* able to *invest* on a platform
  - State securities regulators allow residents to invest
    - Separate from banking regulators (Krozner & Strahan 1999)
  - VIOLATION – a confounding variable would need to correlate with the timing of state relaxation of investment restrictions (on both platforms) AND the variance in state population fractions

Empirical Strategy 2: Capital Supply IV's

$$\text{I(LC Michigan Investment)}_{12/12/14} \times \text{Population Fraction}_{MI} + \text{I(PR Michigan Investment)}_{1/8/13} \times \text{Population Fraction}_{MI}$$



$$\text{I(LC Texas Investment)}_{2/18/2011} \times \text{Population Fraction}_{TX} + \text{I(PR Texas Investment)}_{Never} \times \text{Population Fraction}_{TX}$$

$$\text{Loan Volume}_{it} = \text{P2Pvolume}_{it} + \text{Bank}_{it} + \text{Local}_{it} + \text{Time}_{t} + \text{Bank}_{i} + \text{Error}_{it}$$

- Cross Sectional measure (Pop_{it}) – the *fraction of US population* able to *invest* on a platform *in a bank's market*
  - P2P Investors have local bias (Lin & Viswanathan 2016) – when a state security regulator permits investment, local banks should be disproportionally affected
  - VIOLATION – a confounding variable would need to correlate with the cross-sectional differences in banks' exposure to local pressure AND its time series evolution AND the variance in state population fractions

Loan Volume: Robustness Test Using IV

Loan Volume: Robustness Test Using IV [Table 10]

	P2PVolume	PLoans		
	(1)	(2)	(3)	(4)
	First Stage	Full	Small	Large
$PopLC$	0.0158***			
	(31.991)			
$PopPR$	0.00525***			
	(10.418)			
Pop_{it}	0.114***			
	(4.724)			
$P2PVolume_{it}$		−0.0255	−0.0948***	0.0401
		(−0.884)	(−2.667)	(0.847)
Bank Characteristics				
$TotalAsset_{it}$	0.00104	0.00108***	0.00531	0.00057*
	(1.571)	(3.099)	(0.685)	(1.691)
$TotalEquity_{it}$	−0.0198***	0.0022	0.0026	−0.0111
	(−2.868)	(0.361)	(0.396)	(−0.653)
$NetIncome_{it}$	−0.0558***	0.0911***	0.0872***	0.0595***
	(−4.650)	(8.341)	(7.224)	(3.589)
$InterestExp_{it}$	−0.131***	−0.161***	−0.158***	−0.168***
	(−5.773)	(−8.144)	(−6.407)	(−6.346)
Local Economy	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
SE clustered	Bank	Bank	Bank	Bank
R^2	0.753	0.140	0.168	0.065
$Adj.R^2$	0.753	0.0971	0.125	0.008
Obs.	164,711	164,711	116,581	48,022
Number of Banks	7,758	7,758	5,768	2,703

▸ Table 4

Personal Loans Delinquency - Aggregate: Robustness Test Using IV

Personal Loans Delinquency - Aggregate: Robustness Test Using IV [Table 11 Panel A]

	(1)	(2)	(3)	(4)	(5)	(6)
	$PL30Past_t$	$PL30Past_{t+1}$	$PL30Past_{t+2}$	$PLChgOff_t$	$PLChgOff_{t+1}$	$PLChgOff_{t+2}$
$P2PVolume_{it}$	2.87**	5.68***	2.13	0.38	2.39**	3.52***
	(2.049)	(3.814)	(1.385)	(0.378)	(2.308)	(3.240)
Bank Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Local Economy	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
SE clustered	Bank	Bank	Bank	Bank	Bank	Bank
R^2	0.087	0.064	0.060	0.052	0.034	0.020
$Adj.R^2$	0.0413	0.0157	0.0102	0.0049	−0.0159	−0.0328
Obs.	164,711	157,309	149,524	164,711	157,319	149,543
Number of Banks	7,758	7,683	7,569	7,758	7,683	7,569

▸ Table 5

Conclusion

- We show evidence that P2P loan volume is substituting for commercial bank loans. We find a 1.8% decline in small/rural bank personal loan volume (per σ in P2P lending)
  - Conservative estimate of loan loss
  - Driven by low credit rating volume
- Loss in loan volume is accompanied by higher levels of delinquent loans ($\sim$2%) and charge off activity ($\sim$4%)
- A large fraction of the P2P loan volume (26.7%) displaces bank lending

Thank You

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Link to the paper on SSRN