The Rise of Finance Companies and FinTech Lenders in Small Business Lending

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Motivation

- 1. Drop in small businesses lending after 2008 financial crisis
 - Annual bank lending in 2016 around pre-crisis level
 - Four largest U.S. banks cut lending by 44%
 - Often referred to as "missing" bank lending
- 2. Small businesses critical for economic growth
 - Small and medium-sized enterprises account for 48% of employment and 95% of firms
 - Two out of three new jobs created by small businesses
 - Employment only back to 2008-level in 2014

Research Question

Did reduction in bank lending cause a slow recovery after 2008?

- 1. Role of financial sector in the post-2008 recovery
 - Importance of credit supply to bank-dependent firms during recovery
 - Ability of the financial sector to replace bank lending
- 2. Role of small businesses and bank lending
 - Reliance of small businesses on bank funding
 - Substitution to other sources of funding
- 3. Large government assistance to small business during crises
 - Covid-19 crisis resulted in allocation of \$792 billion to small businesses
 - Initial response focused on the banking sector

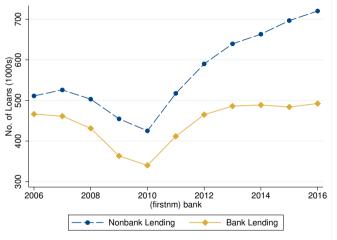
Empirical challenge

- 1. Measurement: Small business lending
 - Main datasets on small business lending focus exclusively on bank lending
 - Nonbank lenders have been growing since the 2008 crisis
 - Requires U.S.-wide data on all sources of small business financing
- 2. Identification: Disentangle credit supply vs. credit demand
 - Decline in small business lending may be caused by low credit demand
 - Need plausible quasi-exogenous variation in credit supply

This paper

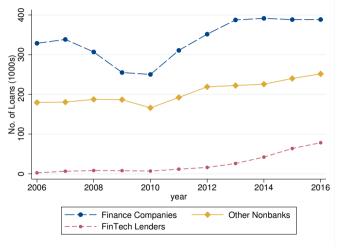
- 1. Measurement: Collect novel loan-level data on all secured, small business lending
 - Data based on from Uniform Commercial Code (UCC) filings
 - Total of 11.1 million business loans to 3.3 million firms
 - Includes all lenders (e.g., banks, finance companies, FinTech lenders)
 - Covers pre-crisis, crisis, and recovery (2006-2016)
 - Includes detailed data on industry, collateral
- 2. Identification: Use pre-crisis bank dependence to identify negative credit supply shock
 - Large negative shock to banking sector after 2008 financial crisis
 - Impact varied by geography due to difference in bank dependence
 - Examine effect of credit supply shock on lending and real outcomes
 - Additional: within-firm estimator, natural experiments, focusing on finance companies

Result I: Rise of Nonbank lending



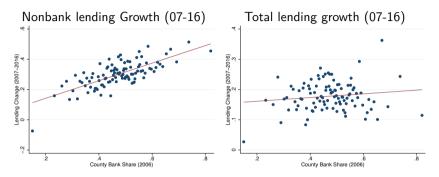
- 1. Nonbank lenders provide more loans than banks to small businesses
- 2. Large increase in nonbank lending starting in 2010

Result II: Rise of Finance Companies and FinTech lenders



1. Nonbank lending growth driven by Finance companies and FinTech lenders

Result III: No long-term difference in credit or real effects



- 1. Nonbank lenders grow more in areas with a larger bank dependence
- 2. Nonbank lending offsets decline in bank lending \Rightarrow total lending growth (bank + nonbank) does not vary with bank dependence

3. Find no long-term effect of credit supply shock on employment

Data

UCC Data

- 1. Uniform Commercial Code (UCC) Filings
 - UCC filings determine priority in bankruptcy
 - Made by lenders when originating a secured loan
 - Filings are publicly available via state-level UCC registries
 - Information on date of origination, borrower, lender, and collateral pledged Sample UCC Filing

2. Detailed coverage of SME lending

- Covers all secured, non-real estate U.S. business loans
- Includes all 50 states + DC; covers years 2006 to 2016
- Includes both loans and leases
- Includes detailed data on collateral
- Augment with firm-level data (industry, location, ownership)
- Does not include loan amount, price terms

⇒ Create U.S. credit-registry-type data, including nonbanks

UCC External Validity

- UCC Data includes all non-real estate, secured lending
- Unsecured credit nearly all small business lending is secured
 - Luck and Santos (2020) 96% of small business lending is secured
 - UCC misses credit card borrowing 1.4% of total borrowing (Federal Reserve Board (2010))
 - FinTech lenders advertise as unsecured but often include blanket lien
- Real estate lending
 - Luck and Santos (2020) 22% small business lending is secured by real estate
 - NFIB 13% to 22% of firms borrow against real estate between 2008-11
 - Federal Reserve Small Business Credit Survey (2020) only 19% firms own their business location

- Estimate UCC data covers 73% of small business lending (CRA data covers 43%)

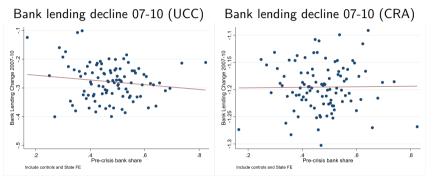
Empirical Analysis

Identification I: Bank dependence by county

- Concern: Credit Supply vs. Credit Demand
 - Supply: Negative shock to supply of bank lending after 2008
 - Demand: Decreased demand for bank lending after 2008
- **Solution:** Use geographic difference in bank dependence *before* financial crisis
 - Decline in bank lending due to national factors
 - Different areas affected differently because of historical variation in bank dependence
 - Control for industry or collateral-specific loan demand
- Identification Assumption: Geographic difference in bank dependence uncorrelated with nonbank lender demand

Aggregate banking sector shock

- Bank lending decline: $\frac{\Delta Bank \ Lending}{Bank \ Lending_{07}}$

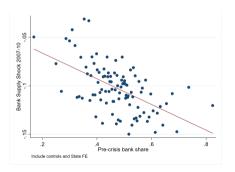


- 1. Decline in bank lending 07-10 attributed to capital losses, post-2008 regulation, and improved risk management
- 2. Bank lending decline is uncorrelated with bank dependence

Bank supply shock

- Bank supply shock: $\frac{\Delta \mathsf{Bank}\ \mathsf{Lending}_{07-10}}{\mathsf{Total}\ \mathsf{Lending}_{07}}$

= Bank lending decline \times Pre-crisis bank share = $\frac{\Delta Bank \ Lending_{07-10}}{Bank \ Lending_{07}} \times$ Pre-crisis bank share



Geographic variation in 2006 bank dependence

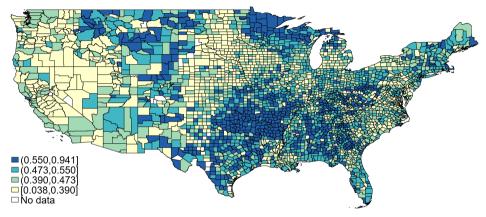


Figure: Geographical distribution of bank shares in the U.S. in 2006

- 1. Significant variation across U.S.
- 2. Use state fixed effect to address regional clustering

County-level estimation

$$\Delta Y_c = s + BankShare_{06,c} + \delta X_c + \varepsilon_c,$$

- ΔY_c : County lending growth or Δ market share, 2007-2016
- BankShare_{06,c}: Market share of banks in county c in 2006
- s: State fixed effects
- X_c: County-level characteristics, 2006
- Standard errors clustered at county-level
- Similar estimation at county-industry-level and county-collateral-level

County-level lending growth

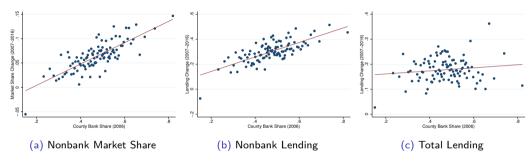


Figure: Binscatter plots of 2007–2016 county-lending change on 2006 bank market share

1. Nonbank lending replaces banks \Rightarrow no impact on total lending

County-level lending growth

		2007-2016	
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share ₀₆	0.218***	0.553***	0.026
	(0.024)	(0.077)	(0.059)
Controls	Υ	Υ	Υ
State FE	Y	Υ	Υ
Obs.	3,006	3,006	3,006
R^2	0.226	0.522	0.564

- 1. Move from 10th to 90th percentile of bank share (30.4% \rightarrow 63.4%) increases nonbank market share by 7.2 ppt and nonbank lending by 18.3%
- 2. Results similar on controlling for industry and collateral

Identification II: Within-firm estimator

- 1. Concern: Credit Supply vs. credit demand
 - Demand for nonbank loans correlated with 2006 bank dependence
- 2. **Solution:** Exploit lending by banks vs. nonbanks to the *same* firm
 - Sample: firms with loans from banks and nonbank lenders in 2006-07
 - Controls for firm-level credit demand
- Identification Assumption: No change in borrower preference for bank vs. nonbanks after 2008

Identification II: Within-firm estimator

$$RepeatLoan_{i,b} = i + Nonbank_b + \delta X_i + \varepsilon_c,$$

- *i*: Firm-fixed effects
- RepeatLoan_{i,b}: Indicator variable for repeat loan to firm i by lender b
- Nonbank_b: Indicator variable whether lender is nonbank
- X_i: Firm characteristics

Within-firm estimator

Sample: borrowers that borrow from both banks and nonbanks in 2006/07

$$RepeatLoan_{i,b} = i + Nonbank_b + \delta X_i + \varepsilon_c,$$

	(1)	(2)	(3)	(4)
Nonbank	0.034***	0.033***	0.043***	0.049***
	(800.0)	(0.006)	(0.006)	(0.006)
Firm FE	Υ	Υ	N	N
County FE	N	N	Υ	Υ
Industry FE	N	N	Υ	N
Weighted	N	Υ	Υ	Υ
Obs.	292,260	292,260	292,260	292,260
Cluster	County, Ind	County, Ind	County, Ind	County, Ind
R^2	0.646	0.701	0.088	0.032

Identification III: Natural Experiments

- Concern Pre-crisis bank share not exogenous may be correlated with other county-level characteristics
- **Solution** Use natural experiments for quasi-exogenous changes in bank lending after the 2008 financial crisis. Based on Tang (2019), Cortes et. al. (2020), and Buchak et. al. (2018)
 - Tang (2019) Post-crisis implementation of the accounting rule FAS 166/167 required banks to consolidate off-balance sheet vehicles. Lowered banks' regulatory capital and reduced lending.
 - Cortes et. al. (2020) exposure to bank stress tests as a negative shock to bank lending
 - Buchak et. al. (2018) required increase in bank capital due to the Dodd-Frank Act of 2010
 as a negative shock to the supply of bank lending.

Natural Experiments

Tang (2019) - Post-crisis implementation of the accounting rule FAS 166/167 required banks to consolidate off-balance sheet vehicles. Lowered banks' regulatory capital and reduced lending.

		2007-2016	
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
FAS Share ₀₇	0.303***	0.592***	0.009
	(0.058)	(0.147)	(0.122)
Controls	Υ	Υ	Υ
State FE	Y	Υ	Υ
Obs.	3,011	3,011	3,011
R^2	0.206	0.510	0.561

Natural Experiments

Cortes et. al. (2020) - exposure to bank stress tests as a negative shock to bank lending

		2007-2016	
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Stress-test Share ₀₇	0.265***	0.493***	0.016
	(0.044)	(0.127)	(0.099)
Controls	Υ	Υ	Υ
State FE	Υ	Υ	Υ
Obs.	3,011	3,011	3,011
R^2	0.208	0.510	0.561

Natural Experiments

Buchak et. al. (2018) - required increase in bank capital due to the Dodd-Frank Act of 2010 as a negative shock to the supply of bank lending.

		2007-2016	
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
$\Delta(Cap)_{07-16}$	0.027***	0.064***	0.007
	(0.004)	(0.011)	(800.0)
Controls	Υ	Υ	Υ
State FE	Y	Υ	Υ
Obs.	3,011	3,011	3,011
R^2	0.212	0.514	0.562

- Results extremely robust to different variations in bank supply

Identification IV: Bank-affiliated finance companies

- **Concern** Changes in bank lending is driven by post-crisis regulation or differences in loan types served by nonbank
- Solution Compare bank-affiliated finance companies to nonbank-affiliated finance companies. Serve similar borrowers but bank-affiliated finance companies are regulated as part of parent BHC.

Bank vs. Bank Affiliated Finance Companies

	2007-2	2016
	(1)	(2)
	Bank-Owned Finance Company	Independet Finance Company
	Market Share Market Share	
Bank Share ₀₆	-0.030***	0.049***
	(0.011)	(0.018)
Controls	Υ	Υ
State FE	Υ	Y
Obs.	2,213	2,213
R^2	0.122	0.578

1. Bank-affiliated finance companies exhibit similar lending patterns as banks

Real effects: county employment growth

	(1)	(2)	(3)	(4)
	$\Delta(Establishments)$	$\Delta(Employment)$	$\Delta(Wages)$	$\Delta(Expansion Rate)$
Bank Share ₀₆	-0.004	-0.038	-0.024	0.017*
	(0.016)	(0.028)	(0.018)	(0.009)
Controls	Υ	Υ	Υ	Υ
State FE	Υ	Υ	Υ	Υ
Obs.	3021	3021	3021	3021
R^2	0.315	0.140	0.211	0.188

- 1. No impact of bank dependence on long-term real outcomes
- 2. Results similar at county-industry level

Robustness

- Captive vs. Independent Finance Companies Captive finance company lending driven by parent company need to increase sales uncorrelated to bank lending drop: separate captive and independent finance companies Captive vs. Independent
- IV vs. Reduced form Results consistent when using "bank supply shock" instead of bank shares W
- Top4 Share Verify if nonbank growth is explained by Top4 bank lending drop Top4 Controls
- Large Counties Results robust to focusing on large counties (Large Counties)
- Per-capita Results Results robust to scaling by county population Per-capita
- HMDA controls Results robust to controlling for bank share in mortgage market

Conclusion

- 1. Introduce new dataset on universe of small business lending to study credit supply to SMEs in the aftermath of 2008 financial crisis
- 2. Finance companies and FinTech lenders can account for "missing" bank lending
 - Finance companies and FinTech lenders replaced bank lending after 2008 financial crisis
- 3. Negative bank lending supply shock had no long-term real effects
 - We find no long-term impact on establishment growth, employment, and wages
- 4. Finance and FinTech companies major provider to small businesses
 - Finance and FinTech companies make 60% of small business loans in 2016
 - Essential when measuring small business credit and when considering policies concerning small businesses (e.g., SBA program, Payment Protection Program during Covid)

Appendix

File Number: 20180091764K Date Filed: 9/5/201811:53:00 AM Elaine F. Marshall NC Secretary of State

UCC FINANCING STATEMENT

Springfield, IL 62703					
_		THE ABOVE SPA	CE IS FO	R FILING OFFICE USE O	NLY
		modify, or abbreviate any part of or information in t om 10 of the Fir			
is organizations name First Choice Landscaping, Inc.					
16. INDIVIDUAL'S SURNAME	FIRST PERSONAL NAME ADDITIONAL NAME(S)/INITIAL(S)			SUFFIX	
1c. MAILING ADDRESS	CITY STATE POSTAL		POSTAL CODE	COUNTRY	
596 BURRAGE ROAD	CONCOR	D	NC	28025	USA
 DEBTOR'S NAME: Provide only gog Debtor name (2s or 2b) (use exact, full in name will not fit in line 2b, leave all of item 2 blank, check here and provide t 		modify, or abbreviate any part of or information in item 10 of the Fir			
2s. ORGANIZATIONS NAME					
25. INDIVIDUAL'S SURNAME	FIRST PERSON	L NAME		NAL NAME(S)/INITIAL(S)	SUFFIX
2c. MALLING ADDRESS	CITY		STATE	POSTAL CODE	COUNTRY
3. SECURED PARTY'S NAME (or NAME of ASSIGNEE of ASSIGNOR SECURE	RED PARTY): Pro	vide only goe Secured Party nam-	(3a or 3b)	
3s. ORGANIZATION'S NAME					

4. COLLATERAL: This financing statement covers the following collateral:

This Financing Statement covers the equipment and other assets described below and/or on any annex, schedule and/or exhibit hereto (which is to be considered an integral part hereof), plus all existing and future replacements, exchanges and substitutions therefor, attachments, accessories, accessions and additions thereto, and insurance, lesse, sublease and other proceeds accessories, sublease and other proceeds

Equipment: OME (1) BOHCAY COMPACT THACK LOADEM, MODELS: T595 5/M: BBMR18740 OME (1) BOHCAT SOIL CONDITIONER, MODELS: 72:1 MYDRAULIC S/M: SCTE03123 ONE (1) BOHCAT THENCHER, MODELS: LT313 3FT DEFTH S/M: O45414032 ONE (1) BOHCAT SOIL CONDITIONER, MODELS: 54:1 MYDRAULIC S/M: ACTG03041



				ile Number: 20180 e Filed: 9/5/2018 11 Elaine F. Marsl NC Secretary of	:53:00 A
UCC FINANCING STATEMENT					
A. NAME & PHONE OF CONTACT AT FILER (optional)	\neg				
Corporation Service Company					
B. E-MAIL CONTACT AT FILER (optional)					
Filing Dept@cscinfo.com					
C. SEND ACKNOWLEDGMENT TO: (Name and Address) Corporation Service Company					
801 Adlai Stevenson Dr					
Springfield, IL 62703	- 1				
	_	THE ABOVE SPACE	E IS FO	R FILING OFFICE USE O	NLY
 DEBTOR'S NAME: Provide only one Debtor name (is or 1b) (use exact, ful name will not fit in line 1b, leave all of item 1 blank, check here. and provide 		odify, or abbreviate any part of t information in Bern 10 of the Fin			
1a, ORGANIZATION'S NAME			_		
First Choice Landscaping, Inc.					
OR 15. INDIVIDUAL'S SURNAME	FIRST PERSONAL	WWE	ADDITIO	NAL NAME(S)/INITIAL(S)	SUFFIX
1c. MAILING ADDRESS	CITY		STATE	POSTAL CODE	COUNTRY
596 BURRAGE ROAD	CONCORD)	NC	28025	USA
 DEBTOR'S NAME: Provide only gog Debtor name (2s or 2b) (use exact, ful name will not fit in line 2b, leave all of item 2 blank, check here and provide 	I name; do not omit, mo o the Individual Debtori	odify, or abbreviate any part of t information in item 10 of the Fin	he Debtor ancing St	is name); if any part of the Ind stement Addendum (Form UC)	vidual Debtor C1Ad)
2s. ORGANIZATIONS NAME					
OR 25. INDIVIDUAL'S SURNAME	FIRST PERSONAL	NAME	ADDITIO	NAL NAME(S)/INITIAL(S)	SUFFIX
2c. MULING ADDRESS	CITY		STATE	POSTAL CODE	COUNTRY
 SECURED PARTY'S NAME (or NAME of ASSIGNEE of ASSIGNOR SEC 36, ORGANIZATION'S NAME 	URED PARTY): Provid	te only <u>one</u> Secured Party name	(3a or 3b	i	
Wells Fargo Vendor Financial Services, LLC					
OR 35. INDIVIDUAL S SURNAME	FRSTPERSONAL	NAME	ADDITIO	NAL NAME(S)/INITIAL(S)	SUFFIX
Sc. MAILING ADDRESS	CITY		STATE	POSTAL CODE	COUNTRY
PO Box 35701	Billings		MT	59107	USA
4. COLLATERAL: This financing statement covers the following collateral:					
This Financing Statement covers the equipme	ent and othe	r assets describ	ed be	low and/or on ar	ıy

annex, schedule and/or exhibit hereto (which is to be considered an integral part hereof), plus all existing and future replacements, exchanges and substitutions therefor, attachments. accessories, accessions and additions thereto, and insurance, lease, sublease and other proceeds thereof.

Equipment: ONE (1) BOBCAT COMPACT TRACK LOADER, MODEL#: T595 S/N: B3NK18740 ONE (1) BORCAT SOIL CONDITIONER, MODEL#: 72:n HYDRAULIC S/N: S6TE03123 ONE (1) BOBCAT TRENCHER, MODEL#: LT313 3FT DEPTH S/N: 045414032 ONE (1) BOBCAT SOIL CONDITIONER, MODEL#: 84in HYDRAULIC S/N: A6TG03041

Date of Filing September 5th 2018



File Number: 20180091764K Date Filed: 9/5/201811:53:00 AM Elaine F. Marshall NC Secretary of State

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801 Adlai Stevenson Dr	
Springfield, IL 62703	- 1

THE ABOVE SPACE IS FOR FILING OFFICE USE ONLY

DEBTOR'S NAME: Provide only one Debtor name (1a or 1b) (use exact, full name will not fit in line 1b, leave all of Item 1 blank, dheck here and provide t					
18. ORGANIZATIONS NAME First Choice Landscaping, Inc.					
1b. INDIVIDUAL'S SURNAINE	FIRST PERSONAL NAME			SUFFIX	
MALING ADDRESS 6 BURRAGE ROAD	CONCORD	NC		USA	

2. DESTOR'S NAME: Provide cety gog Diabtor name (2s or 2b) (use exact, full name; do not omit, modify, or abbreviate any part of the Diabtor's name); if any part of the Individual Diabtor in the name of the land of the Diabtor in the name of the Diabtor in the name of the Diabtor in the name of the name o

OR	2s. ORGANIZATIONS NAME			
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20.	MAILING ADDRESS	ату	STATE POSTAL CODE	COUNTRY

3. SECURED PARTY'S NAME (or NAME of ASSIGNOE of ASSIGNOR SECURED PARTY). Provide only one Secured Party name (3s or 3b)

	PO Box 35701	Billings	MT	59107	USA
3	s. MAILING ADDRESS	CITY	STATE	POSTAL CODE	COUNTRY
	Sb. INDIVIDUAL'S SURINAME	FIRST PERSONAL NAME	ADDITION	NAL NAME(S)/INITIAL(S)	SUFFIX
,	Wells Fargo Vendor Financial Services, LLC				
	3a. ORGANIZATION'S NAME				

4. COLLATERAL: This financing statement govers the following collateral:

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EQUIPMENT: ONE (1) BOHCAY COMPACT THACK LOADER, MODELH: T595 5/M: BINK18740 ONE (1) BOHCAT SOIL CONDITIONER, MODELH: 72:n HYDRAULIC S/M: SFT203123 ONE (1) BOHCAT TRENCHER, MODELH: LT313 3FT DERTH S/M: 045414032 ONE (1) BOHCAT SOIL CONDITIONER, MODELH: S4In HYDRAULIC S/M: ASTG03041

Borrower

First Choice Landscaping Located in Concord, NC



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Corporation Service Company	- 1
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Springfield, IL 62703	- 1

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First Choice Landscaping, Inc.

OR	rifst Choice Landscaping, inc.				
UN	1b. INDIVIDUAL'S SURNAME	FIRST PERSONAL NAME	ADDITIO	NAL NAME(S)/INITIAL(S)	SUFFIX
16.	MAILING ADDRESS	CITY	STATE	POSTAL CODE	COUNTRY
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2. DEBTOR'S NAME: Provide only gag Debtor name (2s or 2b) (use exact, full name; do not omit, modify, or abbreviate any part of the Debtor's name); if any part of the Individual Debtor's name; will not \$1 in line 2b, leave all of line 2 black, check here. To determine the Individual Debtor information in item 10 of the Expecting State most Advisories (Figure 10.CCIAd).

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Lender Wells Fargo



Captive vs. Independent Finance Company

		2007-2016				
	(1)	(2)	(3)	(4)		
	Nonbank	Captive FC	Independent FC	Total		
	Market Share	Lending	Lending	Lending		
Bank Share ₀₆	0.219***	0.479***	0.578***	0.015		
	(0.024)	(0.103)	(0.112)	(0.059)		
State FE Controls	Y	Y	Y	Y		
Obs. R ²	3,006	2,975	2,921	3,006		
	0.230	0.248	0.466	0.566		



Bank Supply Shock (IV)

	2007-2016		
	(1)	(3)	
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Supply ₀₇₋₁₀	-1.653***	-4.193 ***	-0.206
	(0.302)	(0.993)	(0.458)
Controls	Υ	Υ	Υ
State FE	Y	Υ	Υ
Obs.	3,004	3,004	3,004
F-stat	25.523	25.523	25.523



Top4 Bank Share

		2007-2016			
	(1)	(2)	(3)		
	Nonbank Market Share	Nonbank Lending	Total Lending		
Bank Share ₀₆	0.218***	0.555***	0.028		
	(0.024)	(0.077)	(0.059)		
Top4 Deposit Share	0.047**	0.176***	0.109**		
	(0.020)	(0.068)	(0.051)		
State FE	Υ	Υ	Υ		
Controls	Υ	Υ	Υ		
Obs.	3,003	3,003	3,003		
R^2	0.229	0.524	0.566		



Large Counties (Top 100 Counties)

		2007-2016			
	(1)	(1) (2) (3)			
	Nonbank Market Share	Nonbank Lending	Total Lending		
Bank Share ₀₆	0.778***	1.593**	0.125		
	(0.133)	(0.670)	(0.567)		
Controls	Υ	Υ	Υ		
State FE	Υ	Υ	Υ		
Obs.	88	88	88		
R^2	0.720	0.714	0.676		



Per-capita Results

	2007-2016		
	(1)	(2)	(3)
	Bank Lending	Nonbank Lending	Total Lending
Bank Share ₀₆	-939.975***	1009.504***	-31.931
	(262.342)	(343.450)	(478.745)
Controls	Υ	Υ	Y
State FE	Υ	Υ	Υ
Obs.	3,006	3,006	3,006
R^2	0.184	0.382	0.365



Mortgage Lending

	2007-2016		
	(1)	(2)	(3)
	Nonbank Market Share	Nonbank Lending	Total Lending
Bank Share ₀₆	0.228***	0.566***	0.017
	(0.024)	(0.078)	(0.060)
Controls	Υ	Υ	Υ
State FE	Y	Υ	Υ
Obs.	2,941	2,941	2,941
R^2	0.237	0.534	0.575

