

Bank Competition amid Digital Disruption: Implications for Financial Inclusion

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Discussion by

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Overview

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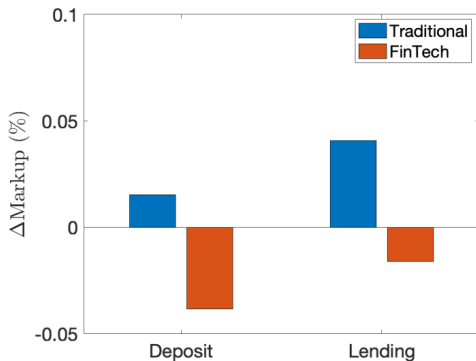
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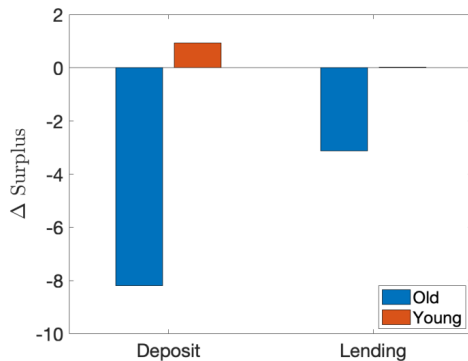
Data: Lots!

- FDIC Survey of Household Use of Banking and Financial Services
- 3G coverage at 1×1 km grid cells over time
- Frequency of lightning strikes (geocoded and timestamped)
- FDIC bank branch information
- Loan and deposit rates from RateWatch
- Mortgage origination data from HMDA

The paper in one picture

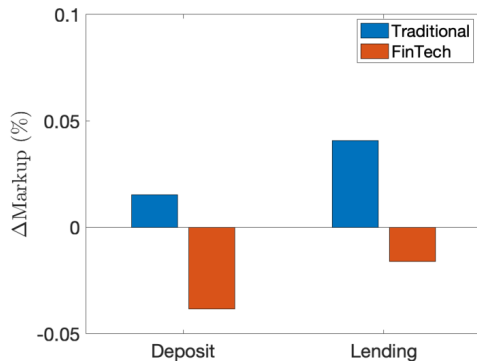


(a) Markups

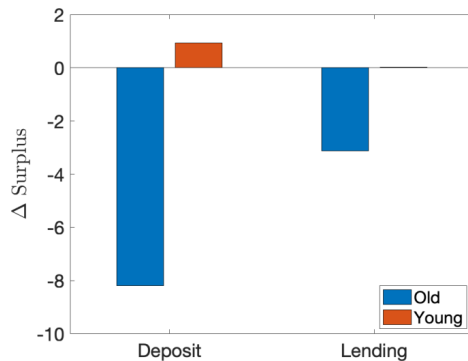


(b) Surplus

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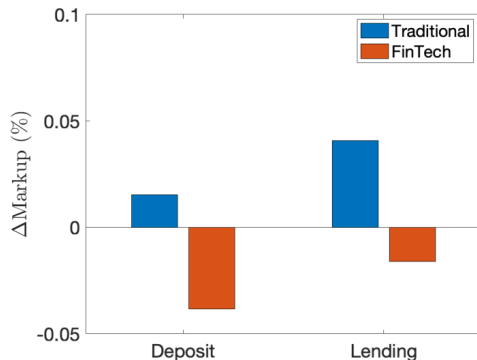
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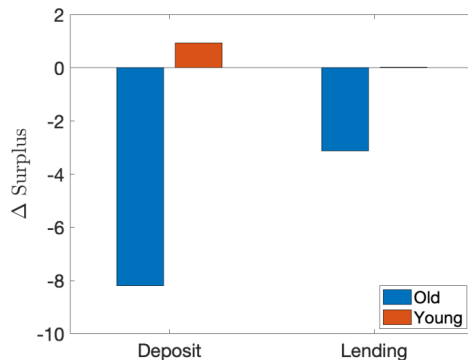
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More entry of fintechs $\Rightarrow$ lower fintech markups

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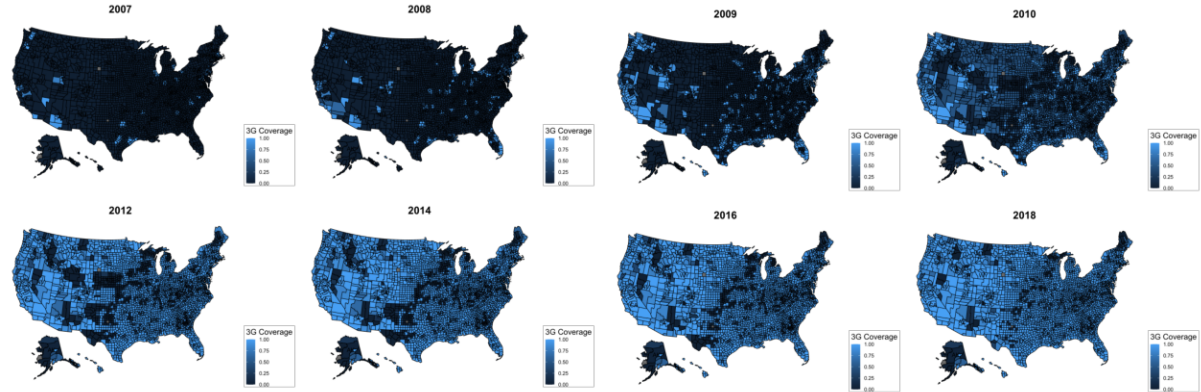
(b) Surplus

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Remaining traditional bank customers are stickier and some bank branches close $\Rightarrow$ higher traditional bank markups

Overview of identification strategy

- Exploit expansion of 3G over time



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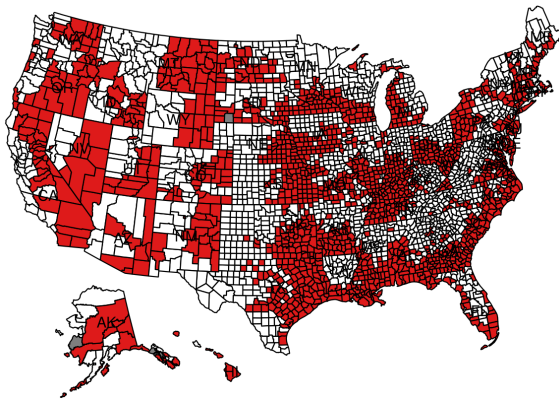
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- Map of above/below-median within-state population-weighted lightning:



Comments on identification strategy

“Lightning strikes may concentrate in certain areas (e.g., southeastern states) whose common characteristics can generate spurious correlations between lightning, 3G coverage, and bank decisions.”

- “To mitigate this concern, we we define high lightning frequencies *within a state*”

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“Lightning strikes may concentrate in certain areas (e.g., southeastern states) whose common characteristics can generate spurious correlations between lightning, 3G coverage, and bank decisions.”

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But couldn't the same geographic issues create endogeneity within state?

- e.g., the southern counties in states differ from remainder of state (NYC, Miami)
- In some other states the big cities are in the West, but this doesn't necessarily “balance out”

Comments on identification strategy

My suggestions: Show us what is correlated with lightning strikes before and after including state fixed effects

- Table IA.5 tests for balance, but only for 4 variables
- Show it for both levels and changes (pre-3G expansion) for as many variables as you can get data on at the county level

	log(CountyGDP)	log(TotalPop)	Unemployment Rate	Share of Pop Under 40
	(1)	(2)	(3)	(4)
$\mathbb{1}(\text{High Lightning}) \times \text{Year}$	-0.001 (-1.012)	0.0004 (1.533)	0.013 (0.986)	-0.00002 (-0.305)
County FE	✓	✓	✓	✓
State×Year FE	✓	✓	✓	✓
Observations	33,586	34,070	34,081	34,070
Adjusted R ²	0.993	1.000	0.915	0.984

And to better understand instrument, what is High Lightning_c correlated with (without interacting with *Year* and without including county FE)?

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First stage:

$$\begin{aligned} 3G \text{ Coverage}_{c,t} = & \beta_1 \text{High Lightning}_c \times t + \beta_2 \text{High Lightning}_c \times t^2 \\ & + \gamma X_{c,t} + \mu_c + \nu_{s,t} + \epsilon_{c,t}. \end{aligned}$$

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Why does this paper interact with quadratic time trend? Should show results with linear as that is standard in this literature

- And better justify quadratic based on empirical relationships in the data if that is your preferred specification

Overview of reduced form results

- ↑ digitization (3G coverage, instrumented by lightning) ⇒
- Bank branch closures and higher HHI of branches
 - More branch closures by “less branch-reliant” banks

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- Lower mortgage rates for younger borrowers; higher for older borrowers

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Table 7 shows some but only restricting to poor consumers (want to see overall first)

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	OLS			2SLS		
	(1)	(2)	(3)	(4)	(5)	(6)
	Log(1+Branch)	I(Branch)	Branch Exit	Log(1+Branch)	I(Branch)	Branch Exit
3G Coverage	-0.013*** (-4.304)	-1.378*** (-5.468)	1.701*** (8.565)	-0.386** (-2.171)	-32.035** (-2.127)	15.094* (1.735)
Adjusted R^2	0.894	0.843	0.931	-	-	-
Observations	458976	459000	262356	458976	459000	262356
County Controls	✓	✓	✓	✓	✓	✓
Bank-County FE	✓	✓	✓	✓	✓	✓
Bank-State-Year FE	✓	✓	✓	✓	✓	✓
Cragg-Donald Wald F-stats				141.209	141.240	85.025

What is the distribution of $3G\ Coverage_{ct}$?

- The reported effects are the effects of going from $3G\ Coverage_{ct} = 0$ (no 3G) to 1 (full 3G), so aren't these magnitudes very small?

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- Couldn't this be a violation of the exclusion restriction?
- Couldn't large magnitude be due to $\widehat{3G\ Coverage}_{ct}$ having much lower variance than $3G\ Coverage_{ct}$ after being residualized in first stage?
 - Unclear how to interpret effect of going from $3G\ Coverage_{ct} = 0$ to 1

Comments on reduced form results: heterogeneity

Measure “less branch-reliant” based on number of branches divided by number of deposits

- How is this measure correlated with deposits?
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“We classify non-branch reliant banks as those with the lowest quartile branch-reliant index and branch-reliant banks as the rest”

- Should first show above/below-median for transparency (as it's more standard)

Overview of structural model

Consumers make discrete choice between deposit accounts and discrete choice between loan products

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Banks

- Two types: traditional and “fintech”
 - Differ in marginal costs of deposit/loan/branch opening, digital service quality, cost of entry
- Make the following decisions:
 - Entry
 - Branch opening/closing
 - Pricing of deposits, loans

Comments on structural model

What is the outside option? (Inconsistent description)

- “The outside option is being unbanked” (seems to apply to both deposits and loans in the main description of the model)
- “We treat shadow banks as the outside option in the loan market” (estimation section)

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But if outside option is another loan, price of outside option is not 0 and r_j would need to be replaced with $(r_j - r_0)$ in the estimating equation:

$$\log(s_{ij}) - \log(s_{i0}) = -\frac{\alpha_i}{\lambda_t} r_j + \frac{\beta_i}{\lambda_t} b_j + \frac{\gamma_i}{\lambda_t} d_j + \frac{\xi_j}{\lambda_t} + (\lambda_t - 1) \log(Z_{i,t}).$$

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Very important research question!

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Nice combination of reduced form empirics and structural model to answer the research question