Branching Out Inequality:
The Impact of Credit Equality Policies

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Policies to Promote Equal Credit Access

- Credit access is crucial for growth and employment but is unequal across regions
  - e.g., Chodorow-Reich (2014), Beck et al. (2010), Chen et al. (2017)

- A major intervention in many countries to promote equal credit access:

  regulating private institutions to supply credit to poorer areas

  - e.g., the Community Reinvestment Act (CRA) in the US, India's Priority Sector Lending, and South Africa's National Credit Act

The US Initiative: the Community Reinvestment Act (CRA)

- The CRA, enacted in 1977, mandates banks to lend to low-income neighborhoods in areas of their operation
- Policy reform is needed to address the rise of non-banks, technological advancement, and other changes in the financial landscape

What are the economic consequences of location-based lending regulations in the non-bank era?

This Paper

- The CRA widens disparities in credit access across regions
  - Banks subsidize underserved neighborhoods within rich areas under the CRA
  - The cost of compliance is too high in poor areas
    $\rightarrow$ banks close branches to circumvent the rules
    $\rightarrow$ lending reduction in the whole areas

- Expansion of non-banks makes compliance costlier
  $\rightarrow$ expanding the set of disadvantaged areas suffering from CRA-induced branch closures

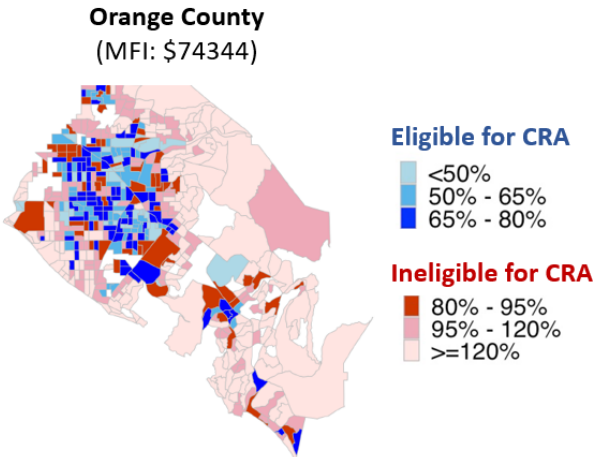
- Punchline: The CRA widens cross-region disparities in various economic outcomes as non-banks expand in the local mortgage market

CRA Rules and Model

CRA Rules

Sufficient lending and investment in CRA-eligible census tracts within a banking institution's CRA assessment areas

- Assessment area: MSAs (or counties if outside an MSA) in which the bank has its branches and deposit-taking ATMs
- CRA-eligible LMI regions: census tracts with median-family-income (MFI) lower than 80% of assessment area MFI
- Failed CRA: no M&A/new branches, public pressure

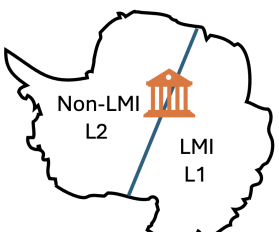


Model Setup - Bank's Decision in an MSA

$$\max_{L_1, L_2, b} \quad \pi(L_1, L_2, b) = \underbrace{r_1(L_1, b)L_1 + r_2(L_2, b)L_2}_{\text{Lending Profit}} - \underbrace{\delta(\bar{L} - L_1) \times \mathbb{1}(b > 0)}_{\text{Regulatory Cost}}$$

- Downward-sloping lending demand curve for each sub-region $i \in \{1, 2\}$

$$r_i(L_i, b) = \underbrace{\alpha + \alpha_i}_{\text{Demand}} - \underbrace{\beta}_{\text{Elasticity}} L_i + \underbrace{\gamma}_{\text{Branch preference}} b$$

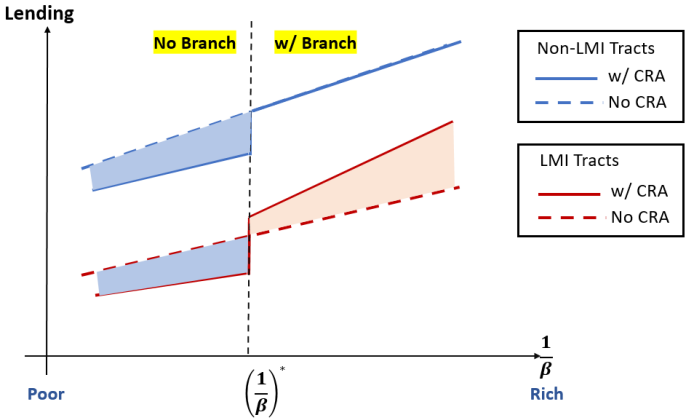


Model Solution

$$\Delta\pi = \underbrace{\frac{(2\alpha + \alpha_1 + \alpha_2 + \gamma)\gamma}{2\beta}}_{\text{Benefit of Branch}} \underbrace{-\delta(\bar{L} - \frac{\alpha + \alpha_1 + \gamma}{2\beta} - \frac{\delta}{4\beta})}_{\text{Regulatory Cost}}$$

- $\Delta\pi => 0 \rightarrow b = 1$
- $\Delta\pi < 0$, when Regulatory Cost is so high, $\rightarrow b = 0$

(Net) Effects of the CRA



- Cross-subsidization between LMI and non-LMI within rich areas (high $\frac{1}{\beta}$)
  $\rightarrow$ more lending in LMI within rich areas
- CRA-induced branch closures in poor areas (low $\frac{1}{\beta}$)
  $\rightarrow$ less lending in the poorest areas

Empirical Analysis

Does CRA compliance lead to branch closures?

$$\underbrace{\Delta\pi' - \Delta\pi}_{\text{Regulatory burden}} = \underbrace{\delta}_{\substack{\text{Cost of} \\ \text{CRA violation}}} \times \underbrace{(\bar{L} - \frac{\alpha + \alpha_1 + \gamma}{2\beta} - \frac{\delta}{4\beta})}_{\text{Lending gap}}$$

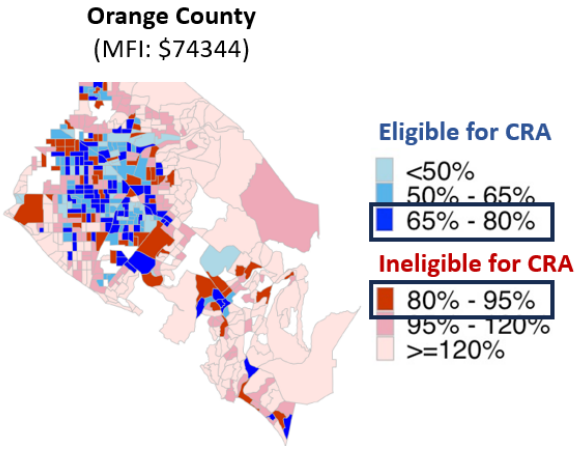
Lower demand for bank credit (α-shock) increases the lending gap. Compare branching decisions of banks w/ different δ in response to α-shocks

$$\Delta Y_{b,c,t} \sim \alpha\text{-Shock}_{c,t} \times \hat{\delta}_b + \mu_{b,t} + \nu_{c,t}$$

Estimating δ of banks: Regression Discontinuity Design

- Model: $(L_1^* - L_2^*)|_{b=1} = \frac{\alpha_1 - \alpha_2 + \delta}{2\beta}$
  - Census tracts with MFI just around the 80% threshold have $\alpha_1 = \alpha_2$
  - L_1^*: lending to tracts [65%, 80%)
  - L_2^*: lending to tracts [80%, 95%]

$$\Rightarrow (L_1^* - L_2^*)|_{b=1} = \frac{\delta}{2\beta}$$



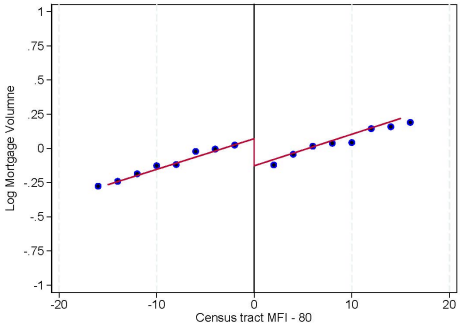
Estimating δ of banks: Regression Discontinuity Design (cont.)

Estimate $\hat{\delta}_b$ for each bank b across MSAs (counties if outside an MSA)

$$\log(\text{Loans})_{b,i,t} = \hat{\delta}_b \mathbb{1}(\text{LMI}_{i,t}) + \kappa_1(\text{MFI}_{i,t} - 80\%) + \kappa_2 \mathbb{1}(\text{LMI}_{i,t}) \times (\text{MFI}_{i,t} - 80\%) + \gamma_{m,t} + \epsilon_{b,i,t}$$

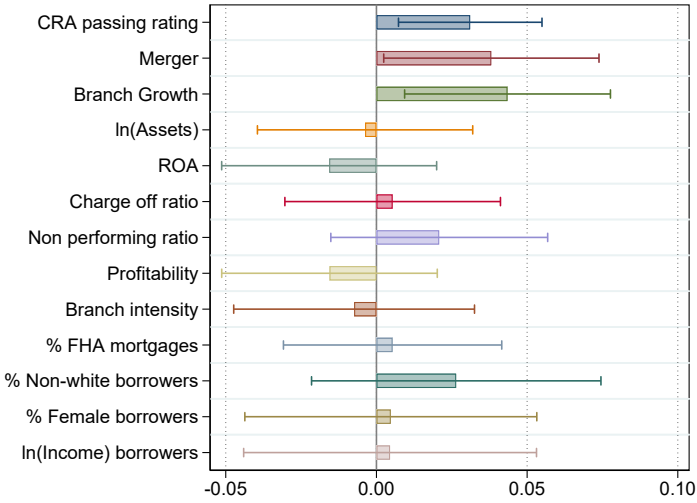
- Restrict to MSAs/counties where bank b has branches
- Pre-crisis data: 2005-2008
- Internal validity checks: No discontinuities in covariates or sorting of census tracts at the 80% threshold

Average Shadow Cost of CRA Violation (δ)



- Average δ: Banks' mortgage supply is 2% higher in neighborhoods with median income right below 80% of the assessment area's median income
- High $\hat{\delta_b}$: banks with $\hat{\delta_b}$ above median

What Drives $\hat{\delta}_b$ Variations across Banks



High $\hat{\delta}$ banks

- higher CRA rating
- higher need for structural changes
- not correlated with bank profitability or risk taking
- do not appear to have different technology (branch intensity), borrower base, or product market segments

α-Shock: Rise of Shadow Banks and Local Exposure

- Shadow banks' mortgage share grew from 25% to over 50%, driven by technology and regulatory arbitrage
- This represents a shock to bank credit demand ($\alpha \downarrow$)
- Local exposure to shadow banks is captured with a Bartik design:

$$\Delta \text{NonBank}_{m,t} = \text{NB Share}_{m,0508} \times \text{National NB Growth}_t$$

  - Internal validity: NonBank share is uncorrelated with demographics, income, housing prices, CRA exposure, etc.

Branch Closure and Lending

Branch Closure

	Δ Branch Presence	Δ log(1+# Branch)
SBank Shock $\times$ High $\hat{\delta}_b$	-0.134***	-0.077**
	(0.03)	(0.03)
Bank $\times$ Year FE	✓	✓
County $\times$ Year FE	✓	✓

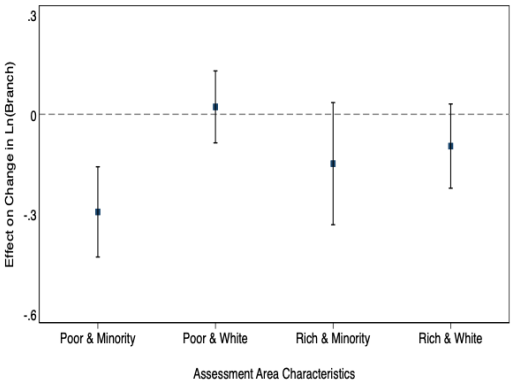
- High δ banks are more likely to close branches
- 30% increase in shadow bank market share
  $\rightarrow$ 3.9% higher likelihood of complete branch-withdrawal
  $\rightarrow$ 2.2% more branch closure

Effect on Bank Lending

	log(Mortgage)	log(SML)
SBank Share$\times$ High $\hat{\delta}_b$	-0.661***	-0.569***
	(0.10)	(0.10)
County$\times$ Year FE	✓	✓
Bank $\times$ FE	✓	✓

- 30% increase in shadow bank market share
  $\rightarrow$ 14.5% $\downarrow$ mortgage lending & 13.0% $\downarrow$ small business lending
- Higher rejection rate, higher withdrawal rate, and lower net origination rate
- SML reduction at market level Market-Level Results
  $\rightarrow$ Market adjustments fail to pick up bank-level lending slack

Adverse Effects Concentrate in Economically Disadvantaged Areas



- The adverse effects of the CRA concentrate in low-income areas with more minorities
- Similar patterns across various branch- and lending-related outcomes

Other Outcomes

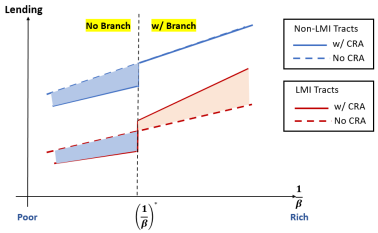
Economically disadvantaged counties are the marginal areas shifting from benefiting to suffering from the CRA as shadow banks expand

Net Effect on Bank Lending

Quantifying the Net Effect

Should we be concerned about the adverse impact of the CRA?

- Put empirical estimates back to our conceptual framework
- Net effects findings:
  - 44% of counties: 76% $\downarrow$ in LMI and 33% $\downarrow$ in non-LMI under the CRA
  - 56% of counties: 104% $\uparrow$ in LMI under the CRA
  - Net effect: 3.4% reduction in overall lending
- Quantification on the rise of shadow banks:
  - Shadow banks: 25% in 2011 $\rightarrow$ 55% in 2017
  - 43% of counties shift from benefiting to suffering from the CRA



Widened Geographic Disparities

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- CRA rules are more binding in less economically developed areas
- Widened gaps in economic outcomes between CRA binding and non-binding areas after the rise of shadow banks
  - $\uparrow$ Population living in bank desert
  - $\uparrow$ Unbanked rate among low-income households
  - $\downarrow$ Small business lending
  - $\downarrow$ Number of business establishments

Conclusion

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Two types of policies to promote equal credit access

- Public Scheme: e.g., direct transfers
- Private Scheme: regulating banks

Importance of considering supply-side adjustment for assessing such policies

- The CRA improves credit equality in the rich areas at the cost of the poorer areas by causing banks to withdraw
- The expansion of shadow banks compresses the set of areas benefiting from the CRA, further widening cross-region disparities in credit access

Thank You!