

All You Need Is a Card: Long-Term Impact of Early-Life Credit Access

H. Bach

P. Campa

G. De Giorgi

J. Nosal

D. Pietrobon

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Ph.D. Thesis Defense

Access to Credit

- Credit access extremely persistent over the life-cycle. (Bach et al., 2023).
- Can you get out of a low credit score? What is a credit score doing?
 - 1 **Identifies** borrower types.
 - 2 **Creates** borrower types.

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What is the impact of early-life decrease in credit access?

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Findings:

Long-term disruption in credit scores consistent with a credit poverty trap
(Low score → **Low access** → **low score**).

Literature

Sample: Young and Poor Entrants

Same data as in Bach et al. (2023).

Larger sample of individuals *born sup-prime*:

- 18-25 years old at entry.
- Low credit score at entry (< 600).

Sample: Young and Poor Entrants

	2004	2010	2016
Credit Score	526.92 (48.79)	551.39 (80.53)	582.62 (92.44)
Credit Score > 660	0.00 (0.00)	0.12 (0.32)	0.21 (0.41)
Credit Card with CLIM > 0	0.36 (0.48)	0.33 (0.47)	0.54 (0.50)
N of Credit Cards	2.41 (2.13)	3.25 (2.62)	4.24 (3.73)
Balance on C Cards	1,516.42 (2,967.07)	2,778.36 (4,308.27)	4,851.69 (7,200.38)
Credit Limit	2,048.45 (4,459.91)	6,453.11 (9,127.29)	13,332.85 (18,414.15)
Utilization %	76.56 (56.79)	54.88 (42.06)	53.03 (38.56)
+30d Delinquent C Cards	1.28 (1.59)	0.78 (1.44)	0.69 (1.48)
Observations	16,692	16,692	16,453

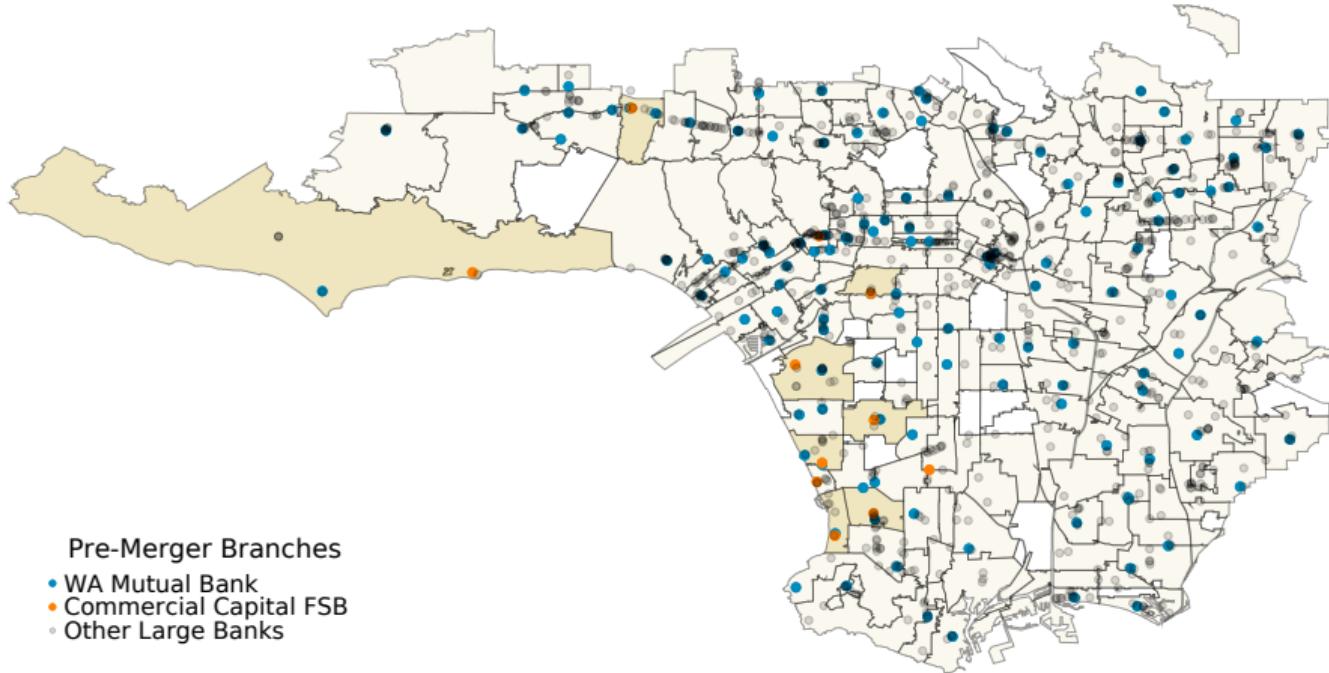
Bank Mergers as a Supply Shock

- Comparing individuals with and without early access to credit would not be informative: those might be different in many ways.
- We are after random shock to credit supply for young customers.

Bank Mergers as a Supply Shock

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- We are after random shock to credit supply for young customers.
- Nguyen (2019): **bank mergers** induce closure of **redundant** branches.
- Large merging banks are likely to have branches in the **same ZIP**.
- One of the two branches becomes redundant → **closure**.
- This is likely to worse access to credit (monopsony vs scale: empirical question).

WA Mutual Acquires Commercial Capital in 2006. Zoom in LA County

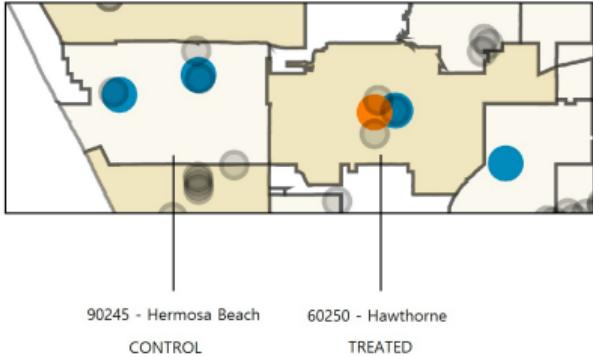


→ All Counties

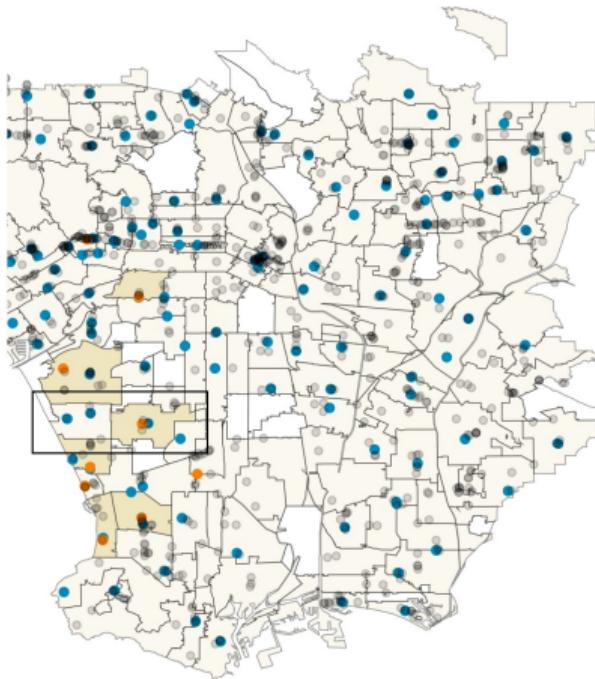
→ New York

→ FDIC Data

WA Mutual Acquires Commercial Capital in 2006. Zoom in LA County



Pre-Merger Branches
• WA Mutual Bank
• Commercial Capital FSB
• Other Large Banks



Identification strategy: Merger-induced closures

Compare outcomes for individuals living in two groups of zipcodes:

- **Treated** zip: branches from both buyer and target pre-merger.
- **Control** zip: only one or neither bank had a branch.

⇒**Identifying Assumption:**

- Geographic redundancy, not local conditions, drives post-merger closures.
 - ▶ Focus on mergers between large banks (top %10 assets).
 - ▶ 9% of Buyers' mergers are in overlapping zipcodes.
 - ▶ DiD strategy: pretrends are reassuring.
 - ▶ Placebo on older cohorts.

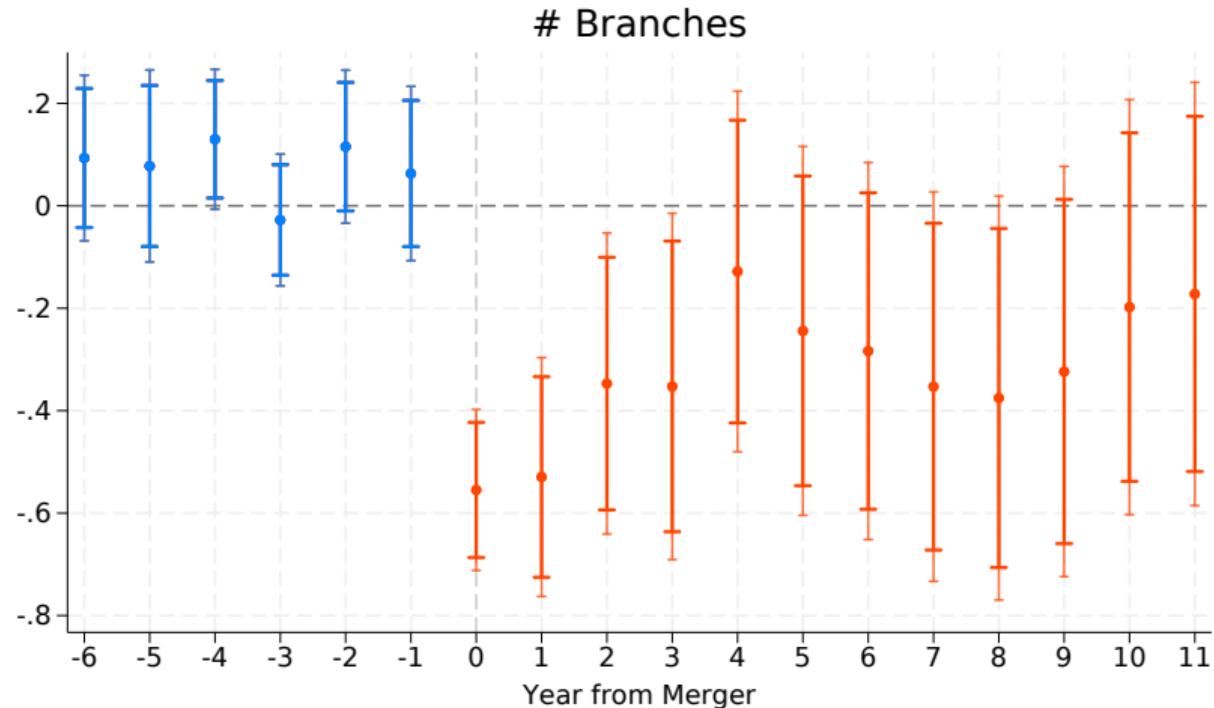
Graph

First Stage - Staggered DiD on Bank Activity

$$B_{r,t} = \alpha_r^\tau + \gamma_t^\tau + \sum_l \beta_l^\tau (Z_r^\tau \cdot \mathbf{1}\{t = \tau + l\}) + \lambda_t^\tau \mathbf{X}_r + \epsilon_{r,t}^\tau. \quad (1)$$

- $B_{r,t}$ is the outcome of interest (e.g. nr of branches) in zipcode r at time t .
- $\tau \in [2005, 2007]$ is the year of the merger.
- $Z_r^\tau = \mathbf{1}\{\text{in year } \tau - 1, r \text{ hosts branches from multiple banks merging in } \tau\}$.
- \mathbf{X}_r : zipcode controls (# of branches from large banks in 2004).
- Only counties with at least one overlapping zipcode.
- Callaway and Sant'Anna (2021) to aggregate across different years of mergers τ .

First Stage - Number of Branches



P Closure

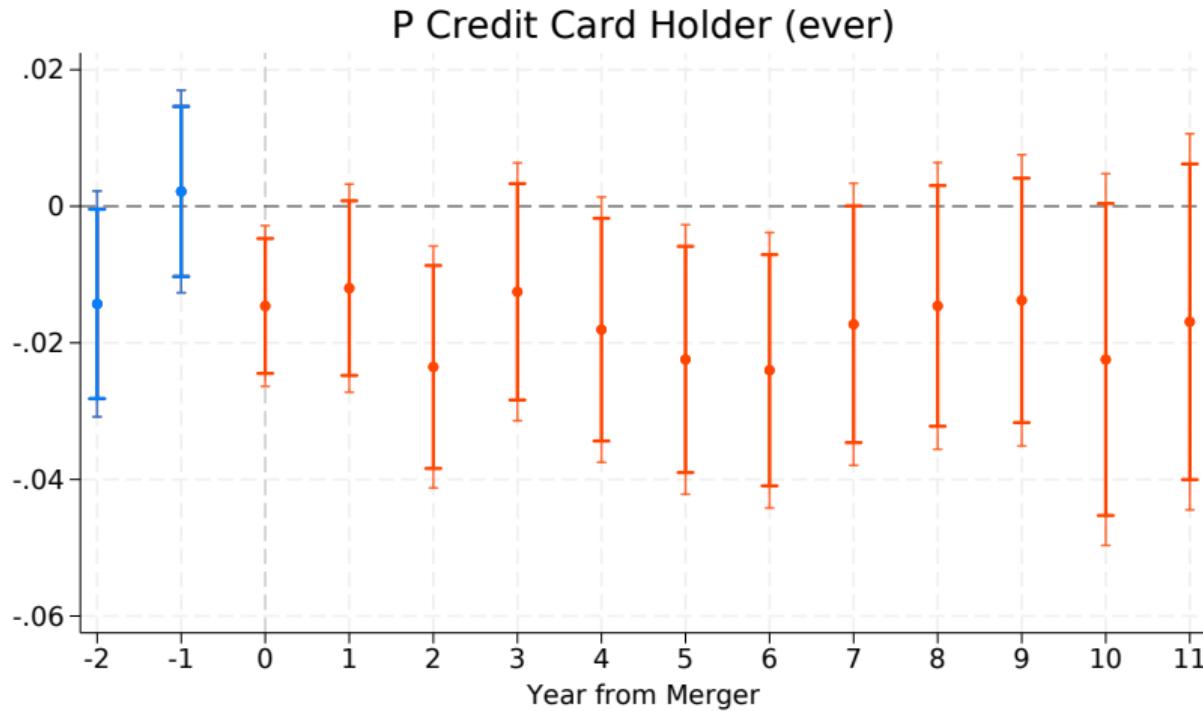
Large Banks

Reduced Form - Staggered DiD on Individual Outcomes

$$Y_{i,t} = \mu_i^\tau + \kappa_t^\tau + \sum_l \delta_l^\tau \left(Z_{r(i,\tau)}^\tau \cdot \mathbf{1}\{t = \tau + l\} \right) + \phi_t^\tau \mathbf{X}_{r(i,\tau-1)} + e_{i,t}^\tau. \quad (2)$$

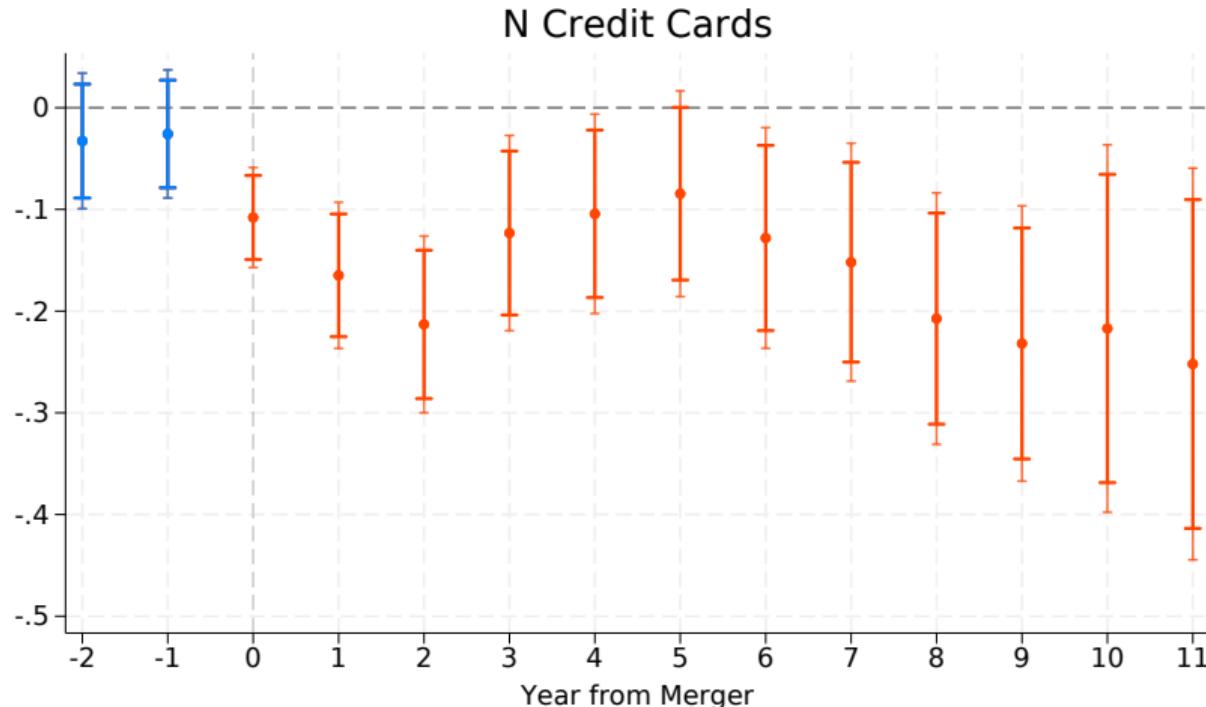
- $Y_{i,t}$: outcome of interest (e.g., credit score) for individual i at time t .
- $\tau \in [2005, 2007]$ is the year of the merger.
- $r(i, \tau)$: zipcode of residence of i at time t .
- $Z_{r(i,t)}^\tau = \mathbf{1}\{\text{in year } \tau - 1, r \text{ hosts branches from multiple banks merging in } \tau\}$.
- $\mathbf{X}_{r(i,\tau-1)}$: zipcode controls.
- Only individuals ever in counties with mergers between 2004–2007.
- Callaway and Sant'Anna (2021) to aggregate across different years of mergers τ .

Worsened Access to Credit 1/3: Less Credit Card Holders

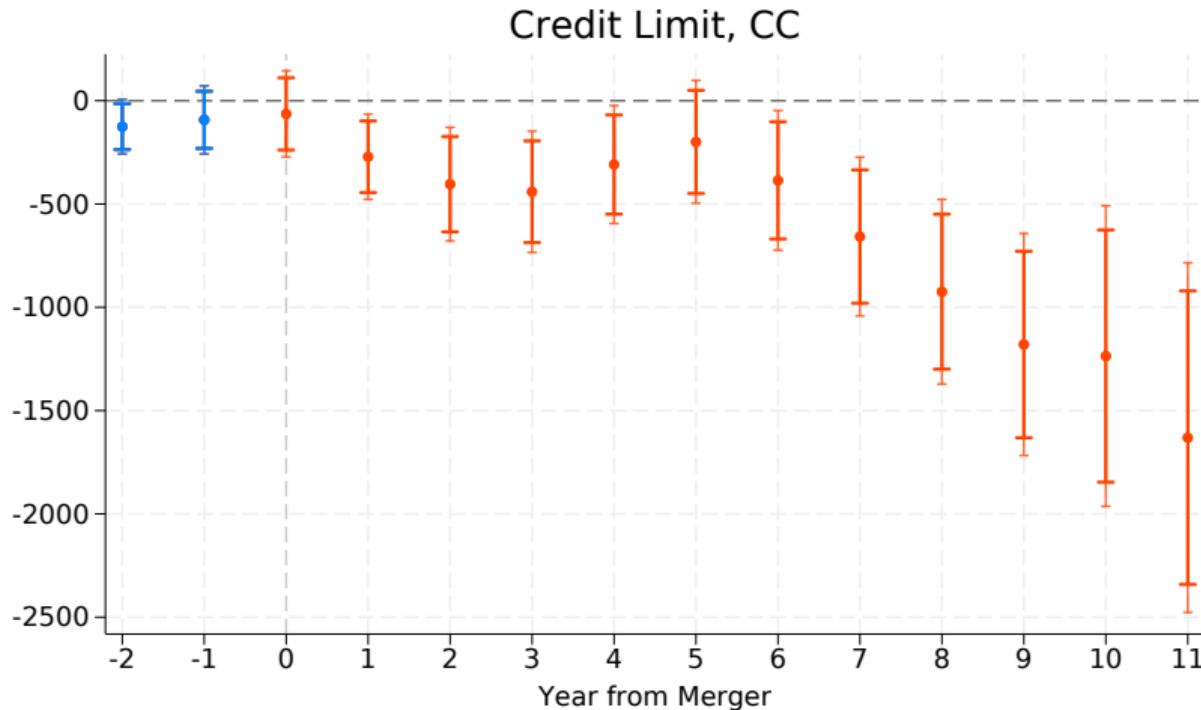


-2 p.p. (-5.6%) on impact.

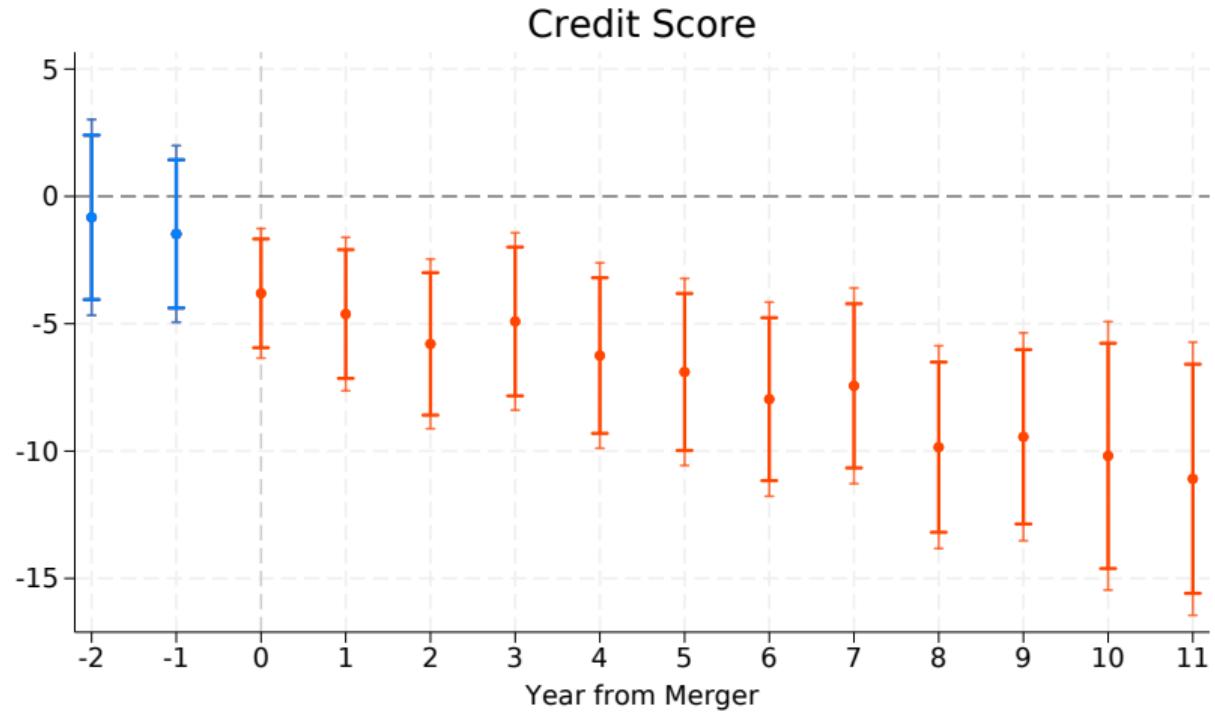
Worsened Access to Credit 2/3: Less Credit Cards



Worsened Access to Credit 3/3: Less Credit Available

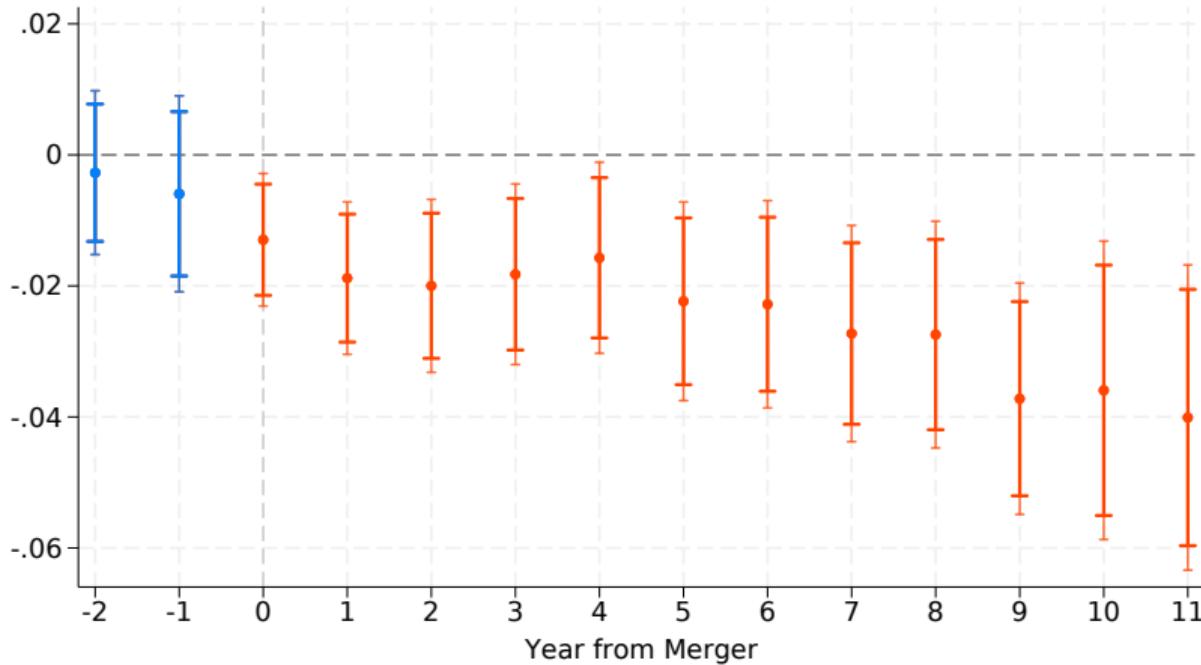


Long Lasting Effects: Credit Score



Long Lasting Effects: Credit Score

Good Credit Score (\$>660\$)



-4 p.p. (-20%) at endline.

More

Taking Stocks

- Bank mergers lead to **branch closures** in overlapping zipcodes.
- This translates into **worsened access to credit**.
- -2 p.p. in credit card ownership at entry.
- -4 p.p. in prime score status by the end of the sample.

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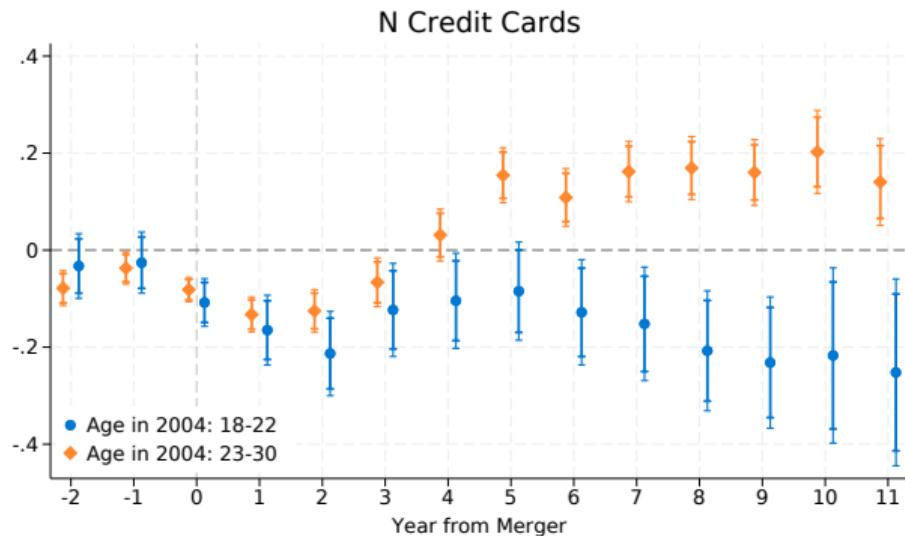
Next:

- Who is affected?
- Study the heterogeneity in the effects by **age** and **length of history** → mechanisms.

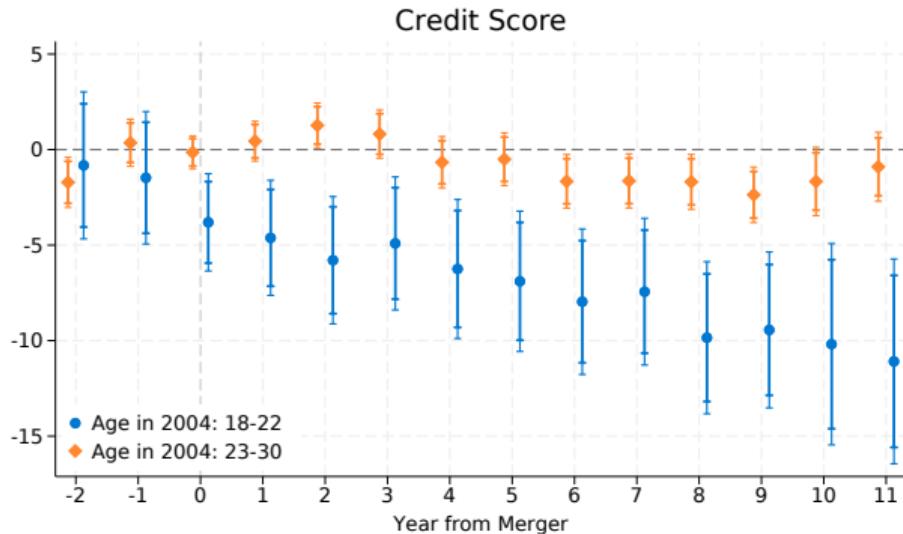
Older Cohorts

Older Cohorts:

- Similar **supply shock**;



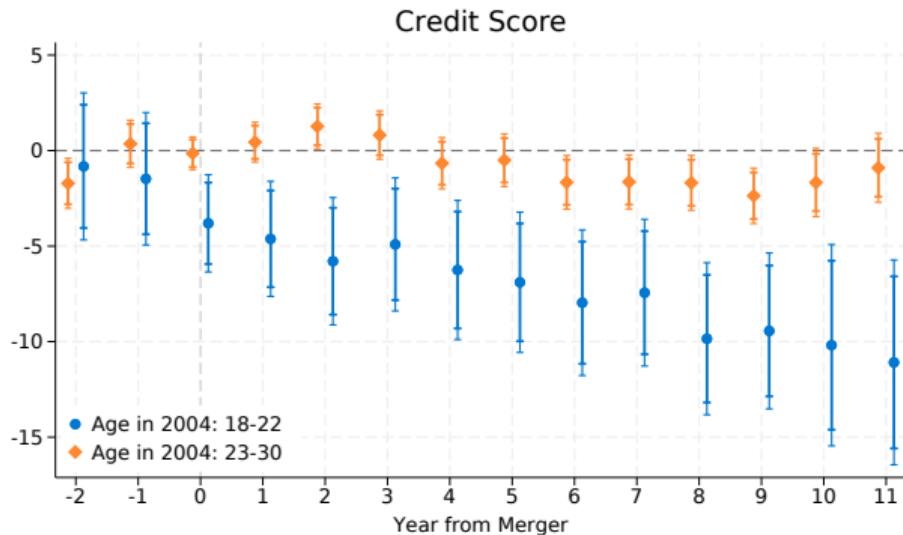
Older Cohorts



Older Cohorts:

- Similar **supply shock**;
- No **disruption in credit scores**.

Older Cohorts



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Suggests:

- ✓ Not driven by **contracting local labor markets**;
- **Longer credit histories** buffer against short-term shocks.
- Consistent with results on **History Length**

Conclusions

- Using **merger-driven branch closures**, we show that **early access to credit** shapes long-term outcomes.
- A **-2 p.p.** in credit card ownership at entry leads to a **-4 p.p.** in prime score status by the end of the sample.

⇒ **Access to credit is dynamic**, not static.

Conclusions

- Using **merger-driven branch closures**, we show that **early access to credit** shapes long-term outcomes.
- A **-2 p.p.** in credit card ownership at entry leads to a **-4 p.p.** in prime score status by the end of the sample.

⇒ **Access to credit is dynamic**, not static.

- Effects are strongest for **young and thin-file** borrowers.
- Worsened access to mortgages and auto loans. →
- Large drop in **mobility**, especially towards **high-income areas**. →

⇒ Evidence consistent with a **credit poverty trap**:
low access → worse outcomes → lower score.

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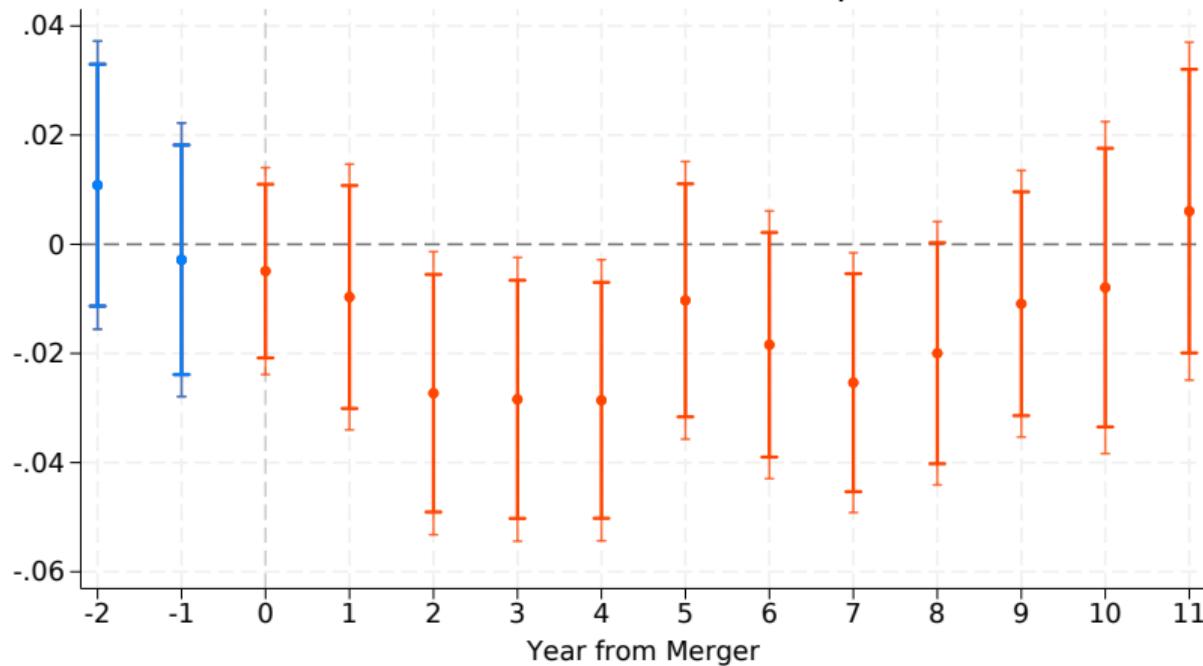
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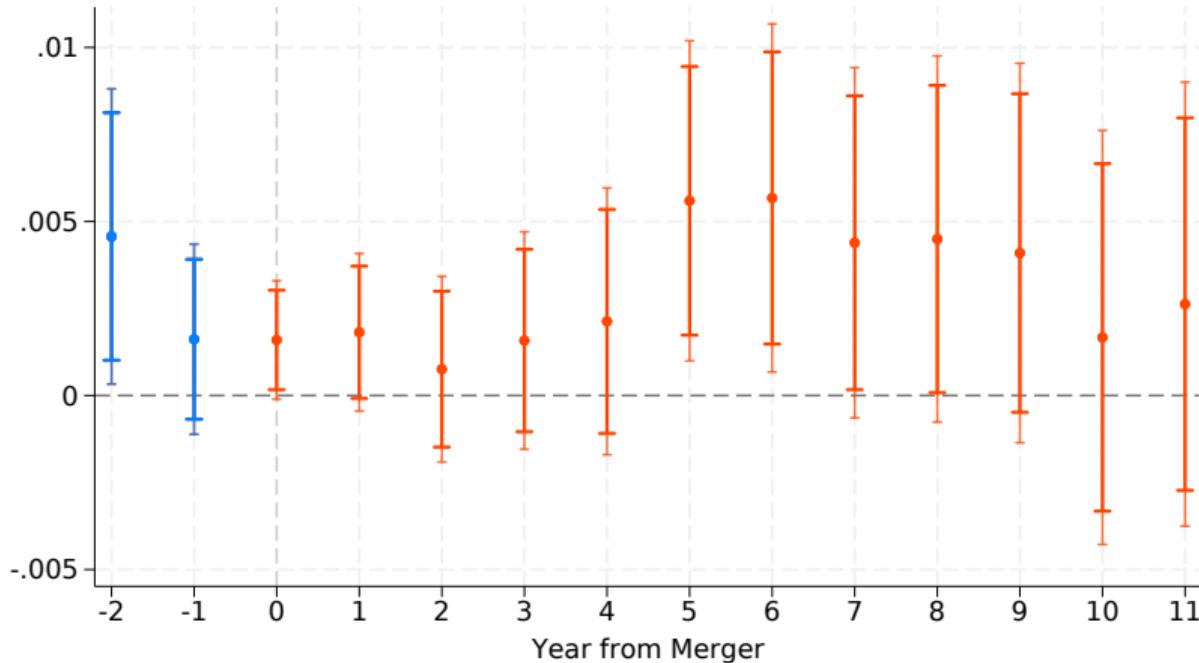


P Credit Card 90d+ Delinquent



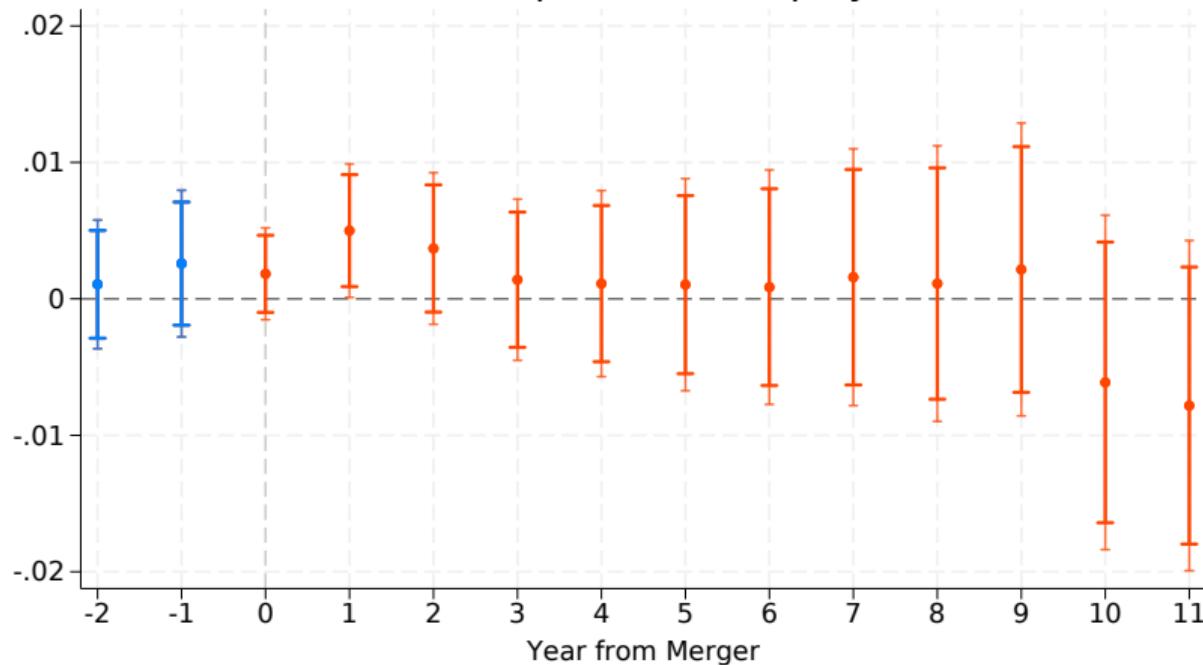


P: Chapter 13 Bankruptcy

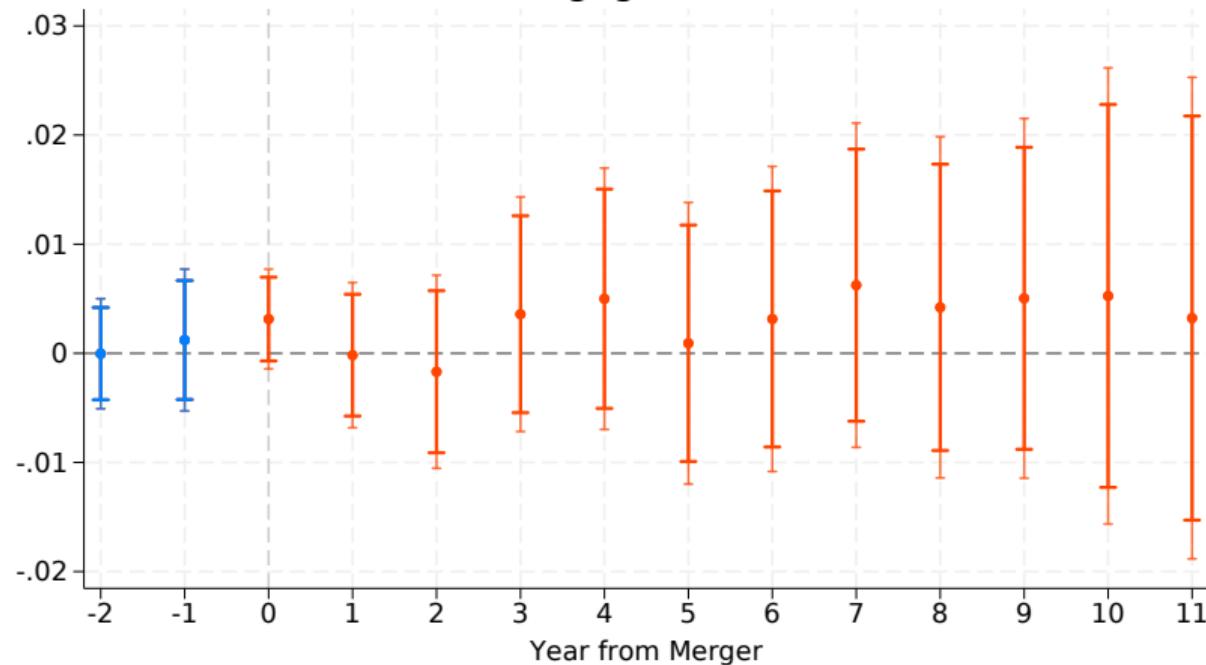




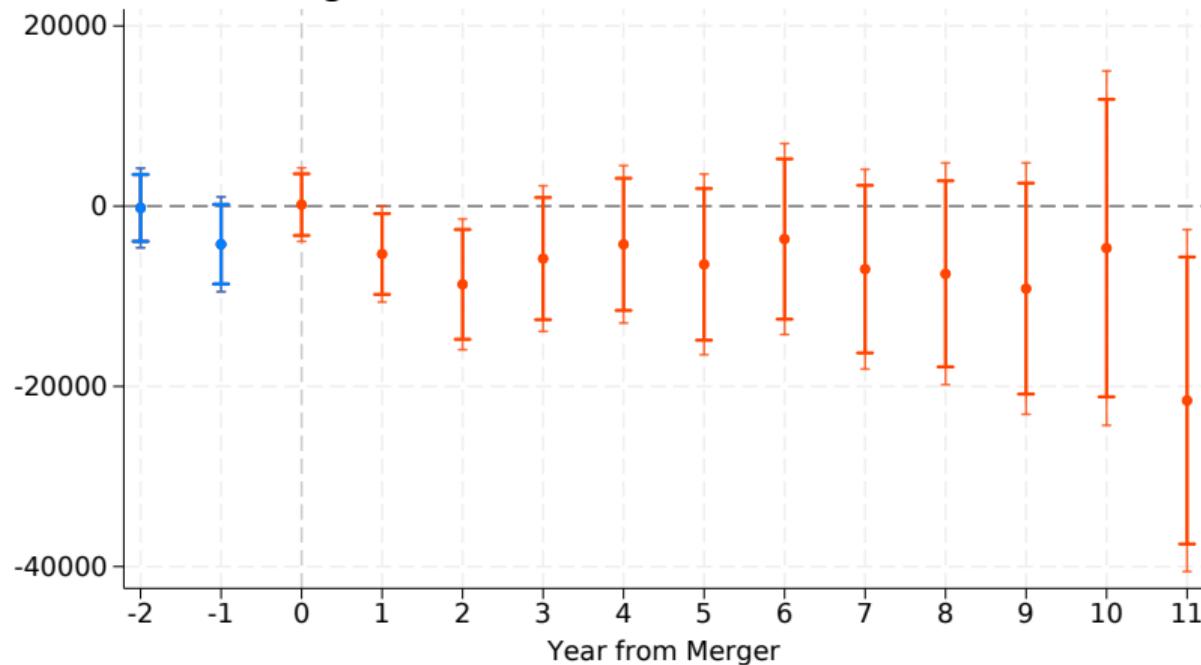
P: Chapter 7 Bankruptcy



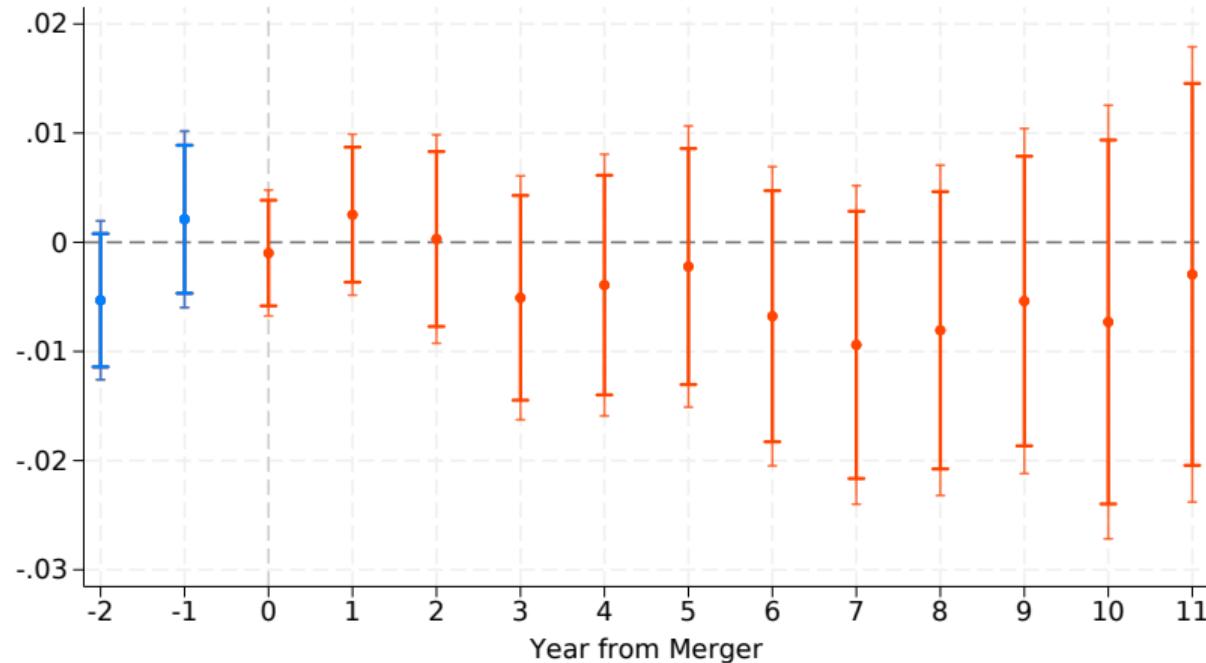
Mortgage: Access



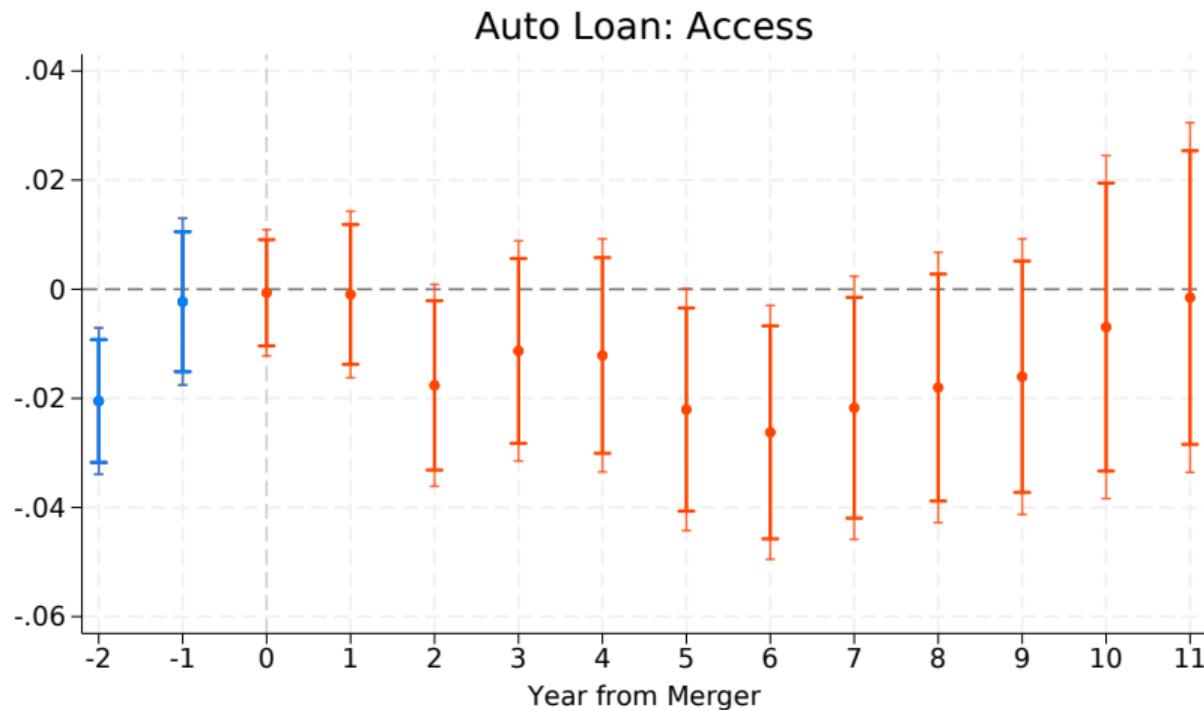
Original Loan, MTA - Conditional on Access



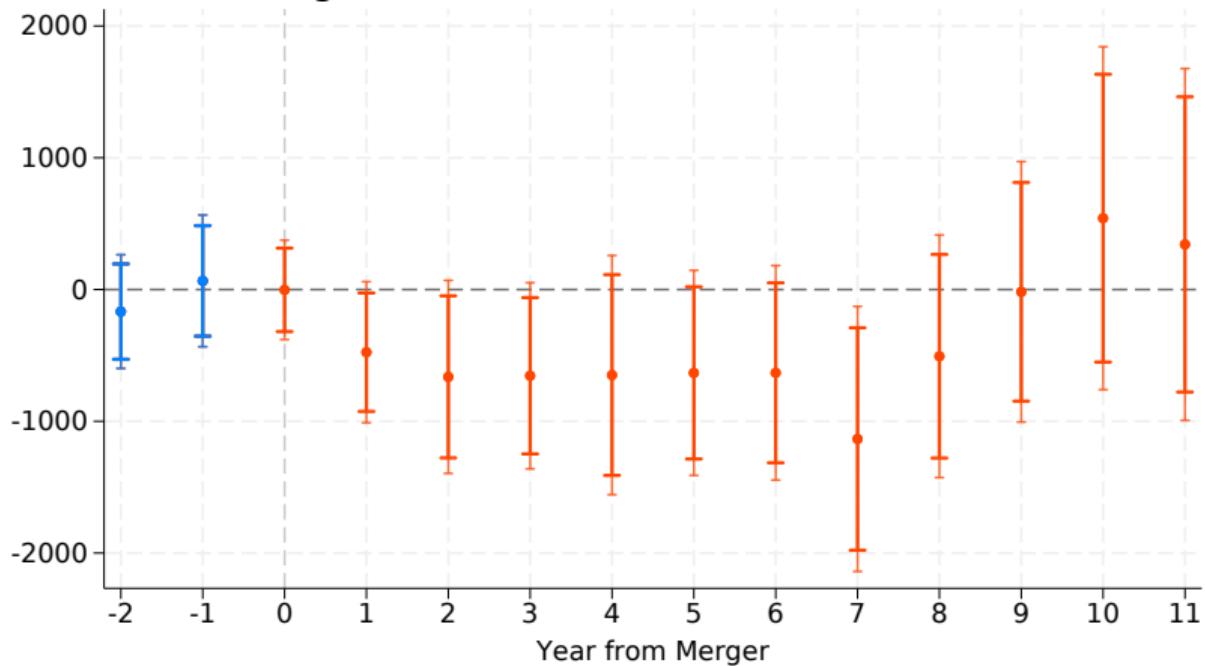
P 60d+ Delinquent, MTA



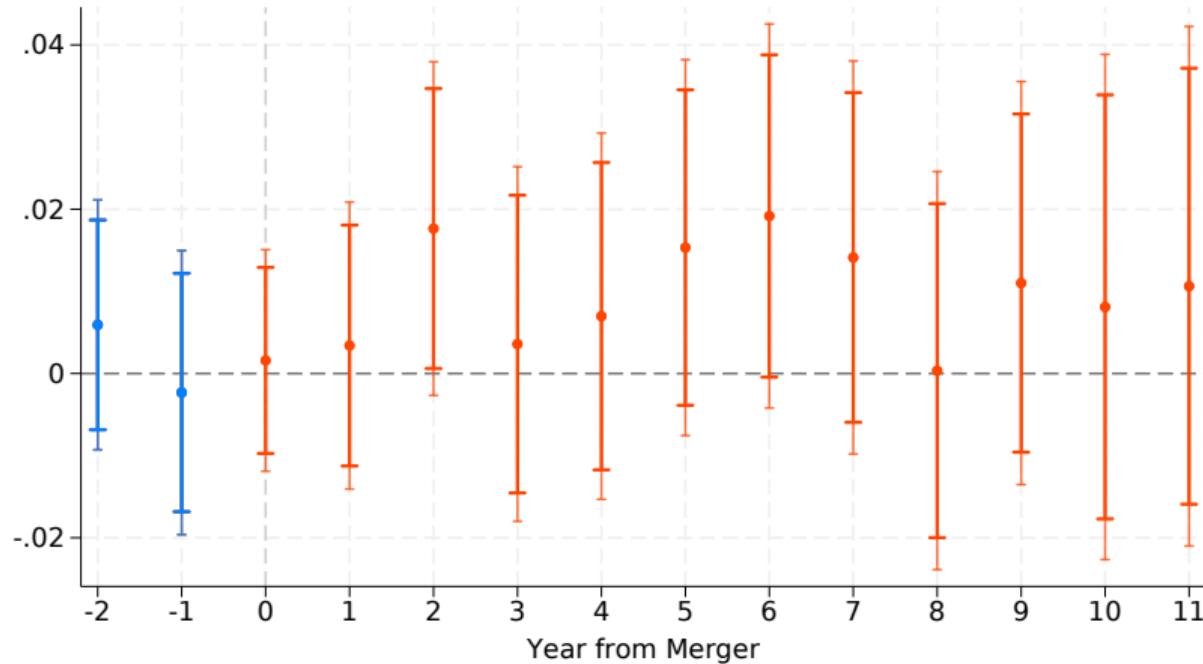
Auto Loan



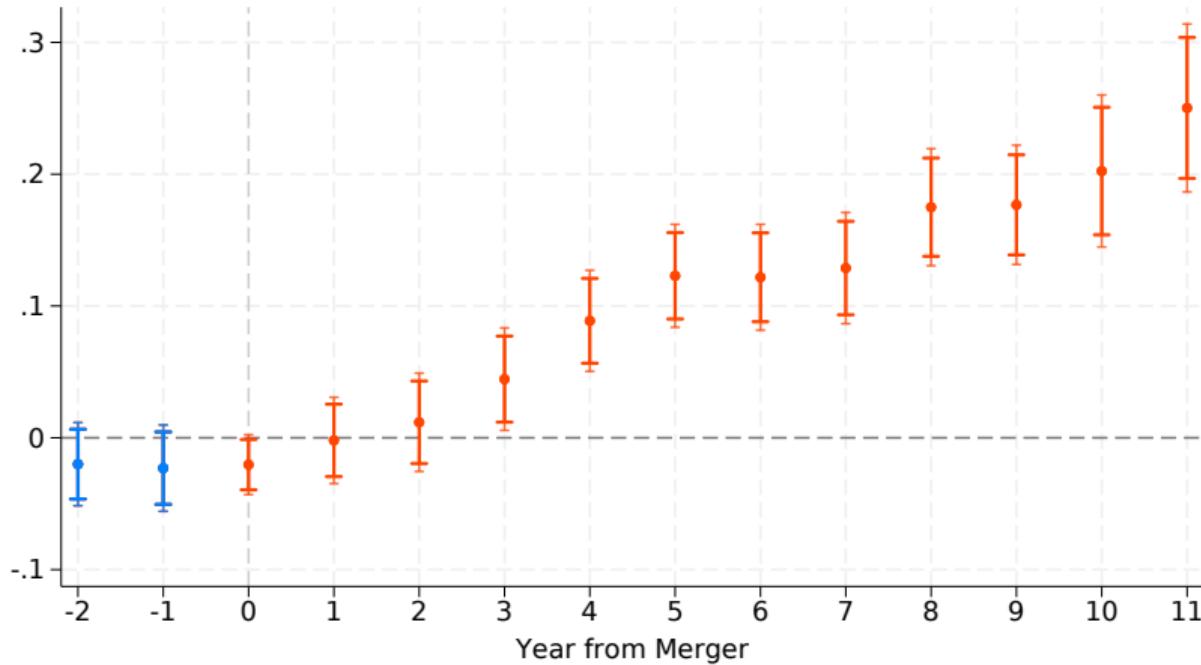
Original Loan, AUA - Conditional on Access



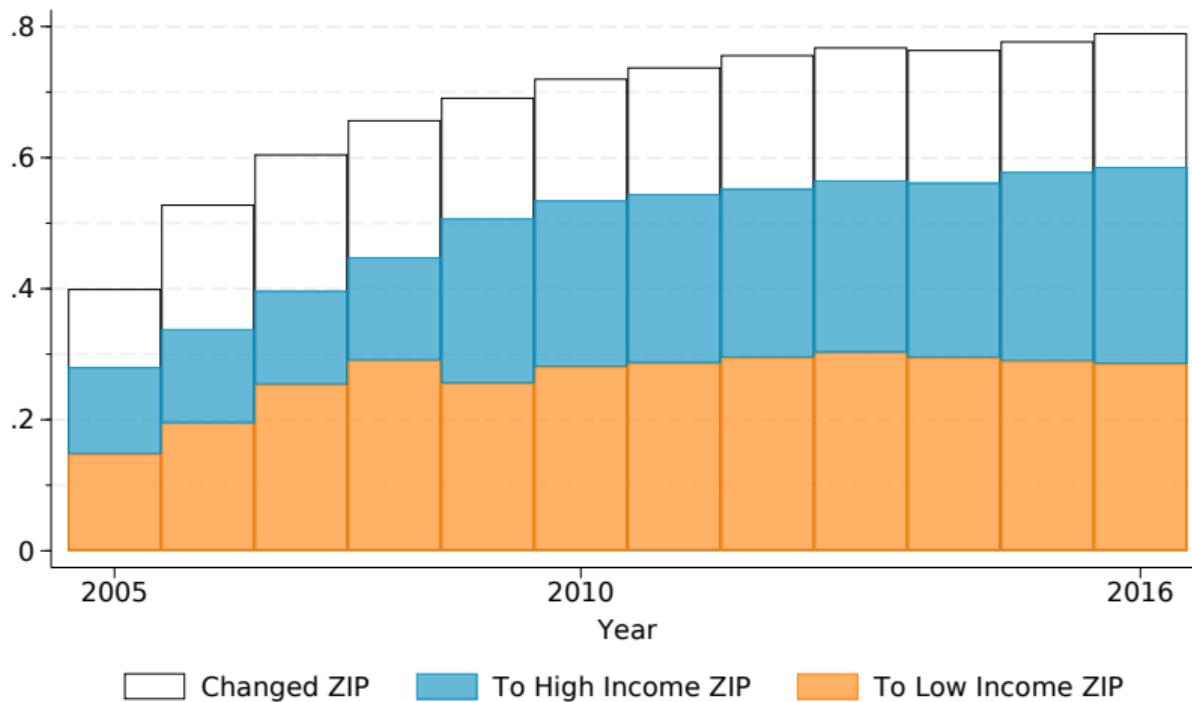
P 60d+ Delinquent, AUT



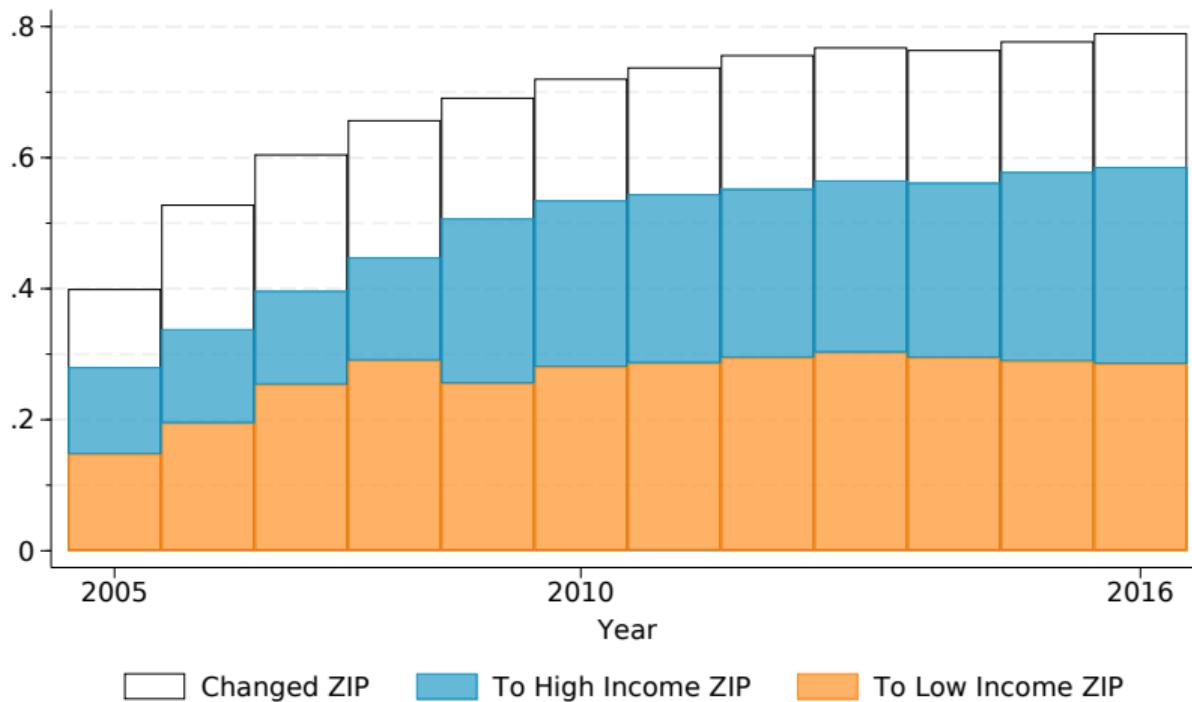
N Inquiries, AUT



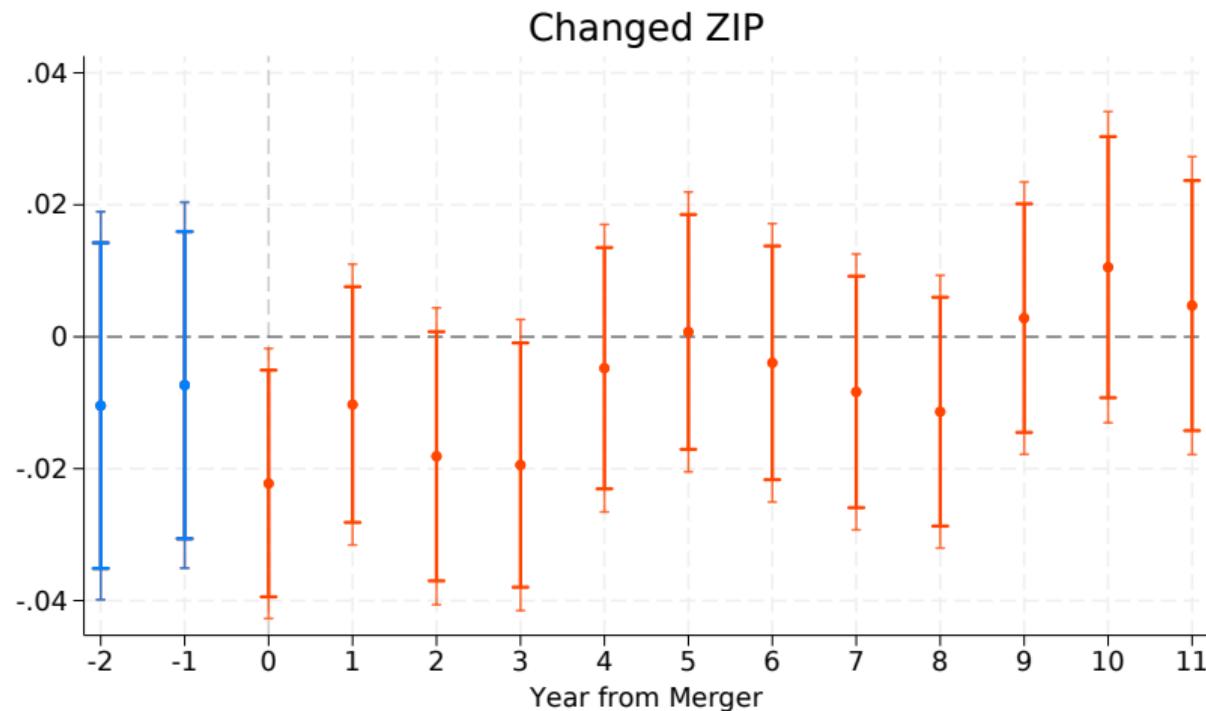
Geographical Mobility



Geographical Mobility

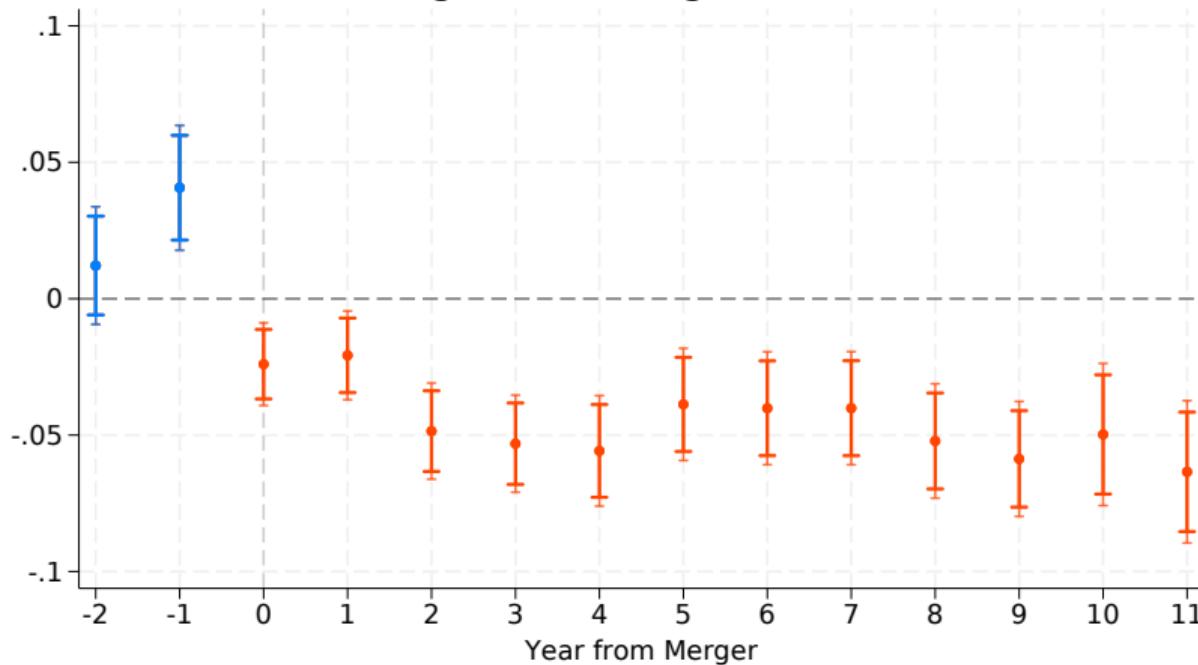


Geographical Mobility

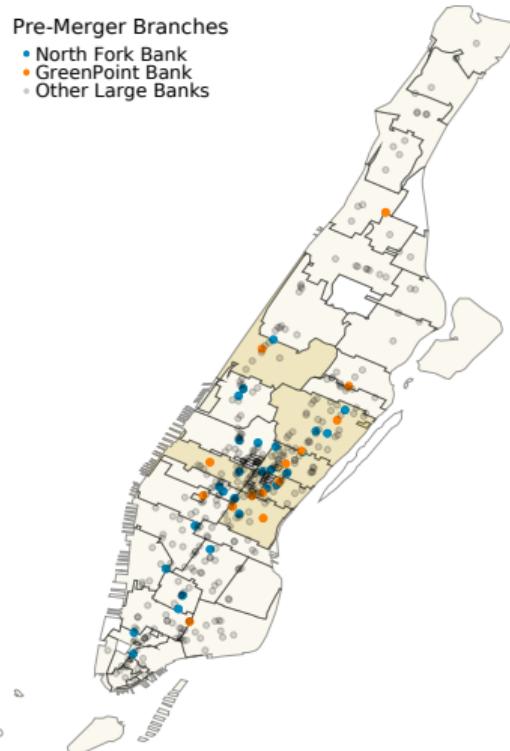


Geographical Mobility

Changed ZIP, to High Income ZIP



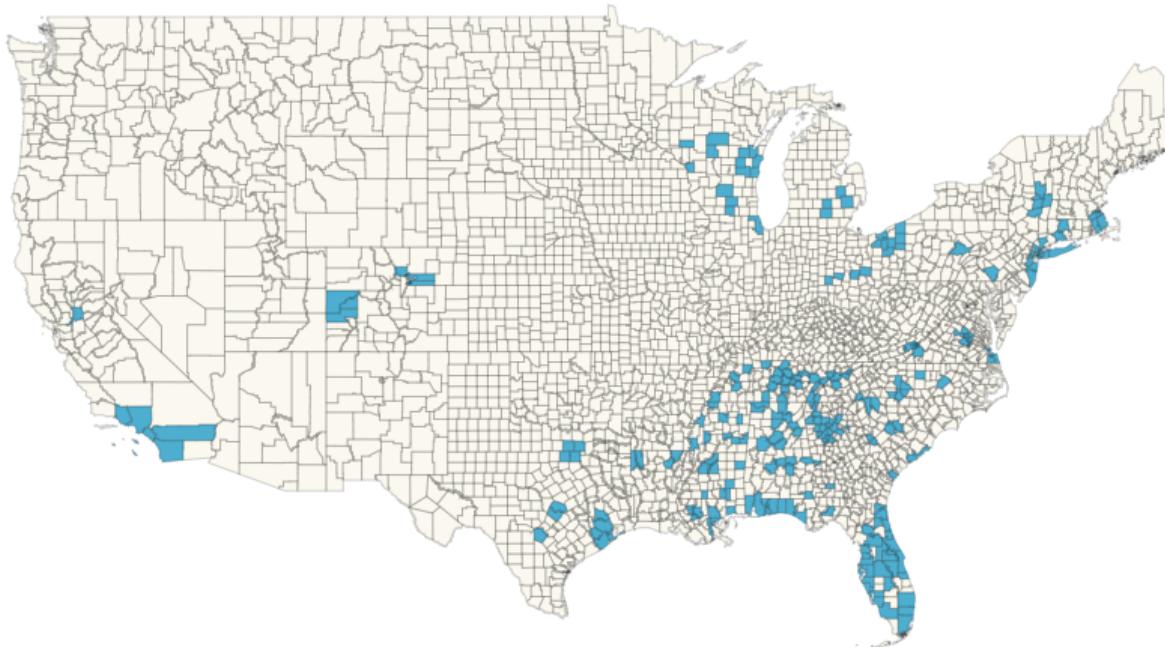
North Fork buys Green Point in 2005. Zoom in NY County



→ Back

Counties with Overlapping Branches 2005-2007

Counties with Overlapping Branches



→ Back

Data From Federal Deposit Insurance Corporation (FDIC)

- Yearly data on bank branches from 2000 to 2020.
- For each branch, we observe: bank name, address, and zip code.
- Data on mergers from the same source, covering the same period.
- Mergers among large banks (top 5% in terms of assets), between 2005 and 2007.

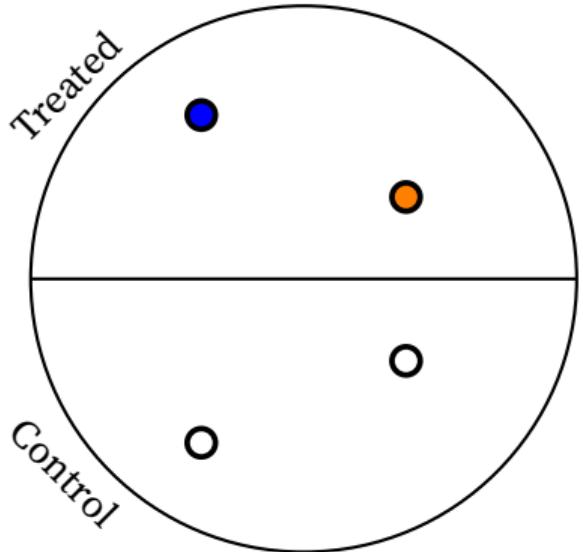
Data From Federal Deposit Insurance Corporation (FDIC)

Buyer	Target	Date
Sky Bank	The Second National Bank of Warren	02/07/2004
The Provident Bank	First Savings Bank	14/07/2004
Sovereign Bank	Compass Bank for Savings	23/07/2004
JPMorgan Chase Bank	Bank One, National Association	13/11/2004
Fifth Third Bank	First National Bank of Florida	01/01/2005
Wachovia Bank, National Association	SouthTrust Bank	03/01/2005
First Niagara Bank	Hudson River Bank & Trust Company	14/01/2005
North Fork Bank	GreenPoint Bank	22/02/2005
Associated Bank, National Association	First Federal Capital Bank	19/02/2005
Sovereign Bank	Waypoint Bank	11/02/2005
National City Bank	The Provident Bank	04/03/2005
SunTrust Bank	National Bank of Commerce	22/04/2005
Bank of the West	Commercial Federal Bank	03/12/2005
TD BankNorth, National Association	Hudson United Bank	31/01/2006
The Huntington National Bank	Unizan Bank, National Association	01/03/2006
Sovereign Bank	Independence Community Bank	09/09/2006
Washington Mutual Bank	Commercial Capital Bank, FSB	01/10/2006
MB Financial Bank, National Association	Oak Brook Bank	02/11/2006
Regions Bank	AmSouth Bank	04/11/2006
New York Community Bank	Penn Federal Savings Bank	02/04/2007
Citizens Bank	Republic Bank	28/04/2007

Data From Federal Deposit Insurance Corporation (FDIC)

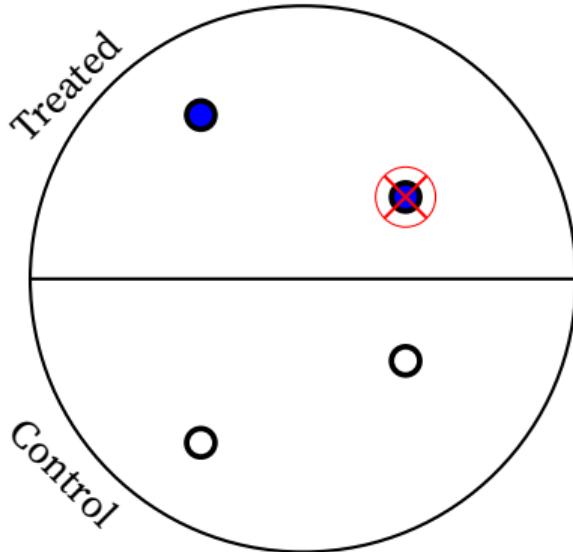
	Buyer	Target
N Branches	598.75 (658.22)	217.33 (349.30)
N Zip	460.60 (488.07)	166.43 (256.07)
Deposits	52,359.31 (75,159.85)	13,749.68 (28,253.01)
Share Overlapping Branches	0.09 (0.08)	0.25 (0.17)
Share Overlapping Zip	0.08 (0.07)	0.24 (0.17)
Share Overlapping Deposits	0.10 (0.11)	0.22 (0.17)
Observations	21	21

Comparing Treated and Control Zipcodes



$T = 0$

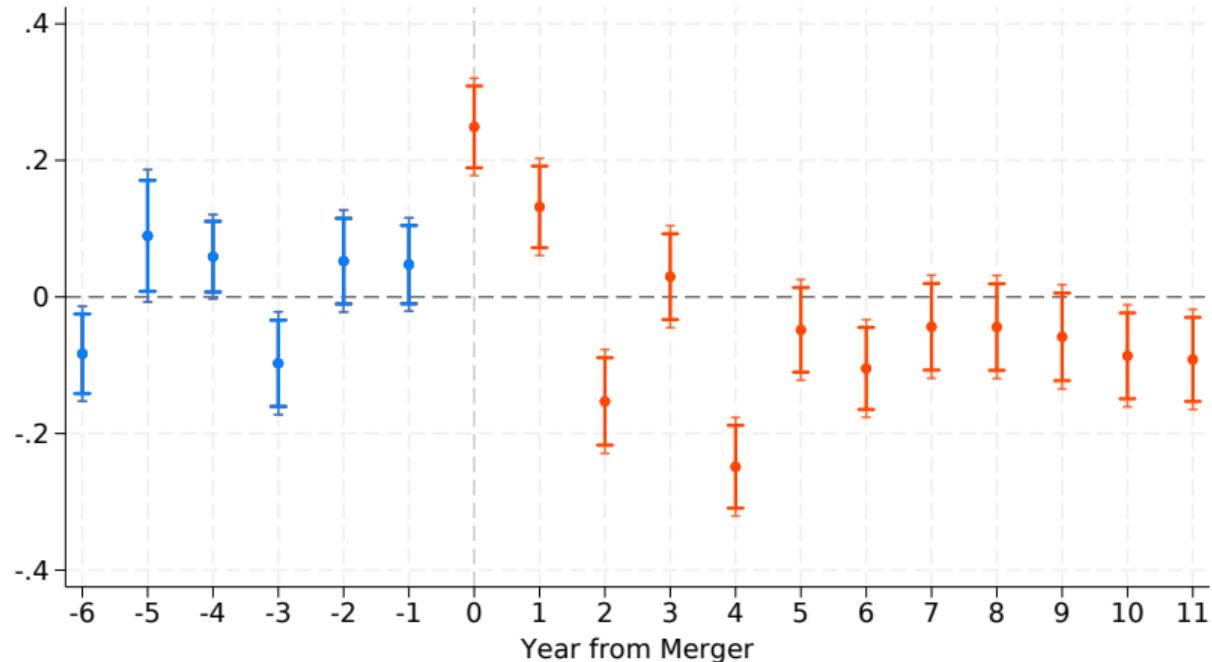
Blue Bank buys
Orange Bank



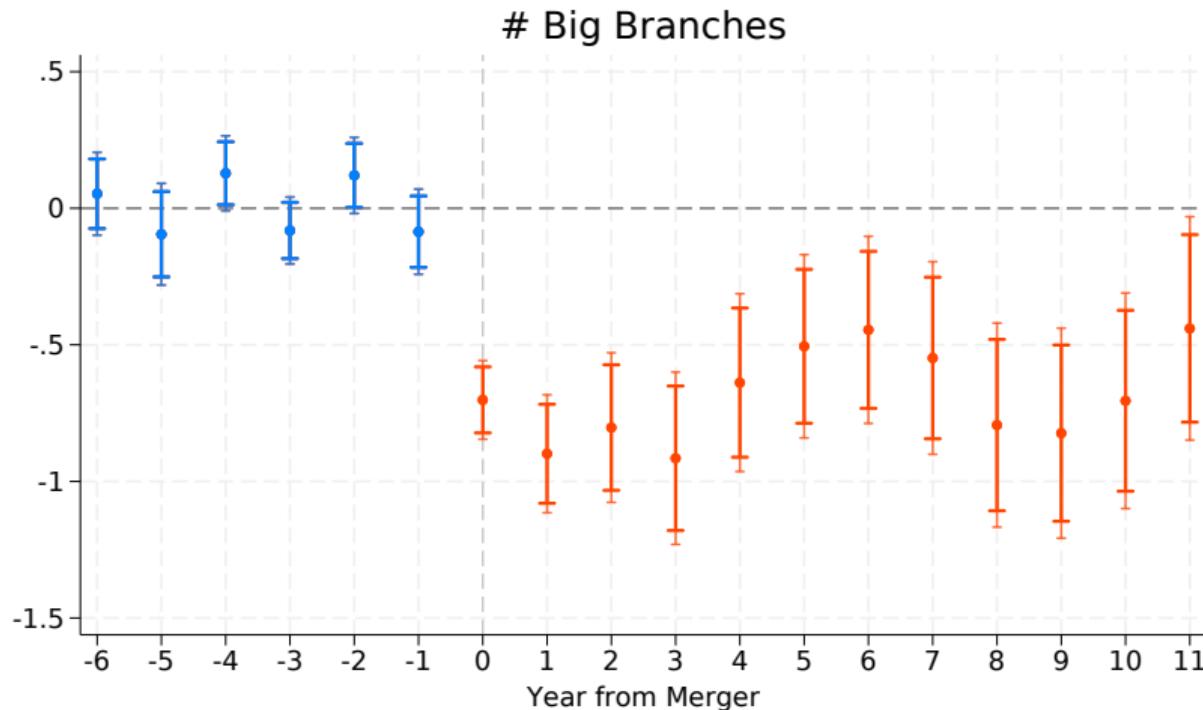
$T = 1$

First Stage

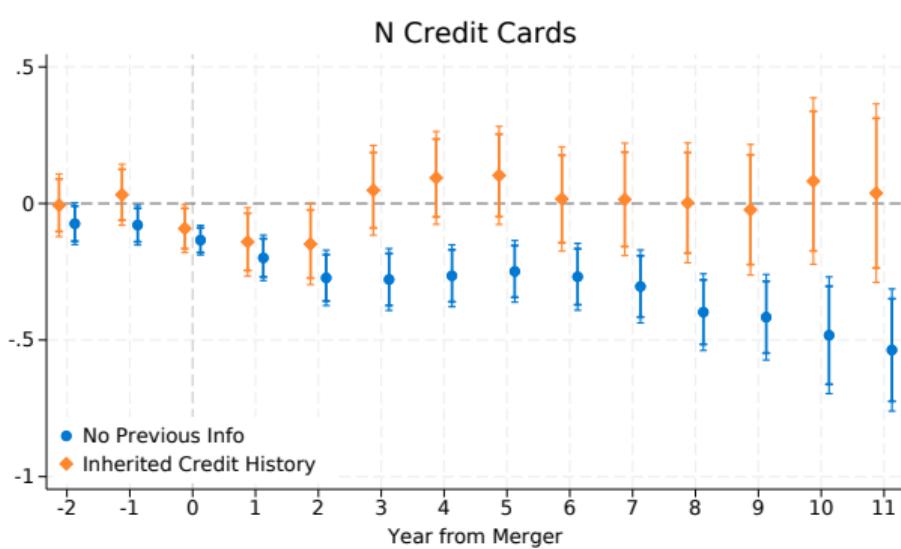
Probability of Branch Closure



First Stage



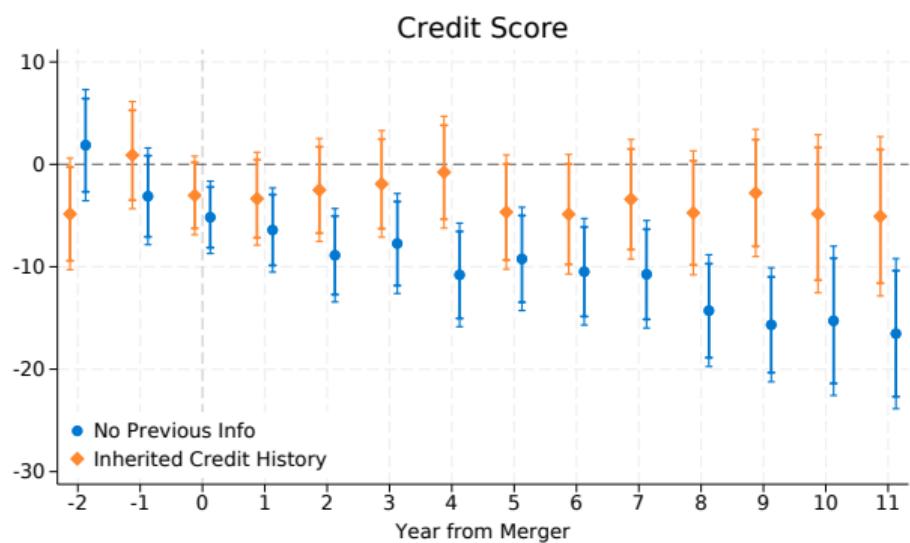
Pre-existing History



Those with pre-existing credit history:

- ~ no effect in access to credit;

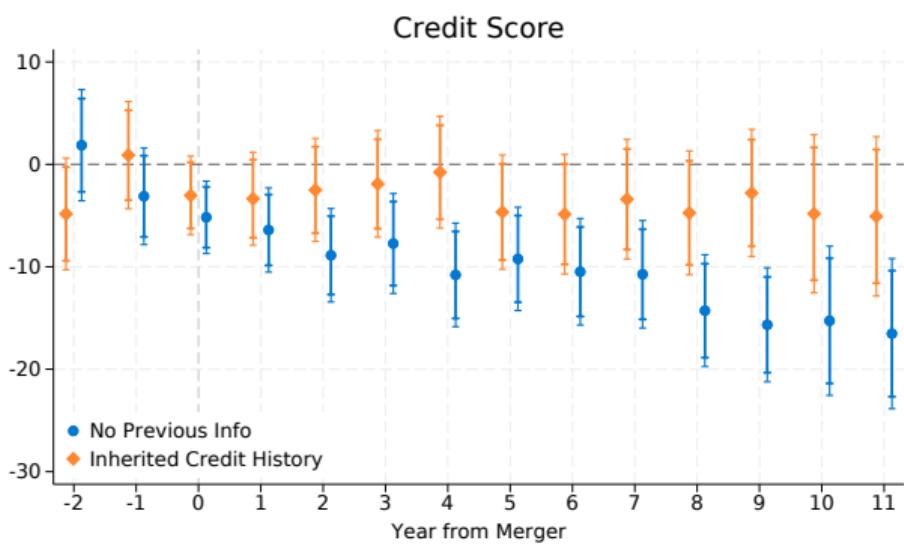
Pre-existing History ↔



Those with pre-existing credit history:

- ~ no effect in access to credit;
- No disruption in credit score.

Pre-existing History



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- No disruption in credit score.

Suggests:

- Length of history mutes the effect of the shock.
- Supply reduction is concentrated among thin-file borrowers.

Contribution

1. **Economic Mobility:** (Solon, 1992; Chetty et al., 2014; Jantti and Jenkins, 2015)
⇒ Investigate mobility on **on credit markets.** (Ghent and Kudlyak, 2016)
2. Long term effects of **early-life shocks** on credit access, consistent with **credit traps.**
(Bach et al., 2023; Bos et al., 2018)
3. **Local credit markets** determine access to credit.
(Guiso et al., 2004; Nguyen, 2019; Argyle et al., 2022; Anenberg et al., 2018)
4. Access to credit and **geographical mobility.**
(Bilal and Rossi-Hansberg, 2021; Giannone et al., 2023; Molloy et al., 2022; Chetty et al., 2016)

Machine Learning: Does Access to Credit Impact Credit Scores?

- Ideal experiment: credit cards randomly assigned to individuals.
- Compare i with the same Credit Score and financial behaviour (\mathbf{X}) but different access to credit (D).

$$CS_{i,t} = \theta_t D_{i,2005} + g_t(\mathbf{X}_{i,2004}) + u_{i,t}$$

$$D_{i,2005} = m_t(\mathbf{X}_{i,2004}) + \eta_{i,2005}$$

- $\mathbf{X}_{i,2004}$: high-dimensional credit behavior (K=124), CS, and demographics of i in 2004.
- $D_{i,2005} = \mathbf{1}\{\text{One credit card was opened in 2005}\}$.
- Use DDML (Chernozhukov et al., 2018) with Lasso to estimate m_t and g_t .
- Identify θ_t under the key assumption: $\mathbb{E}[D_{i,2005} | \mathbf{X}_{i,2004}] = 0$.

Machine Learning: Does Access to Credit Impact Credit Scores?

