

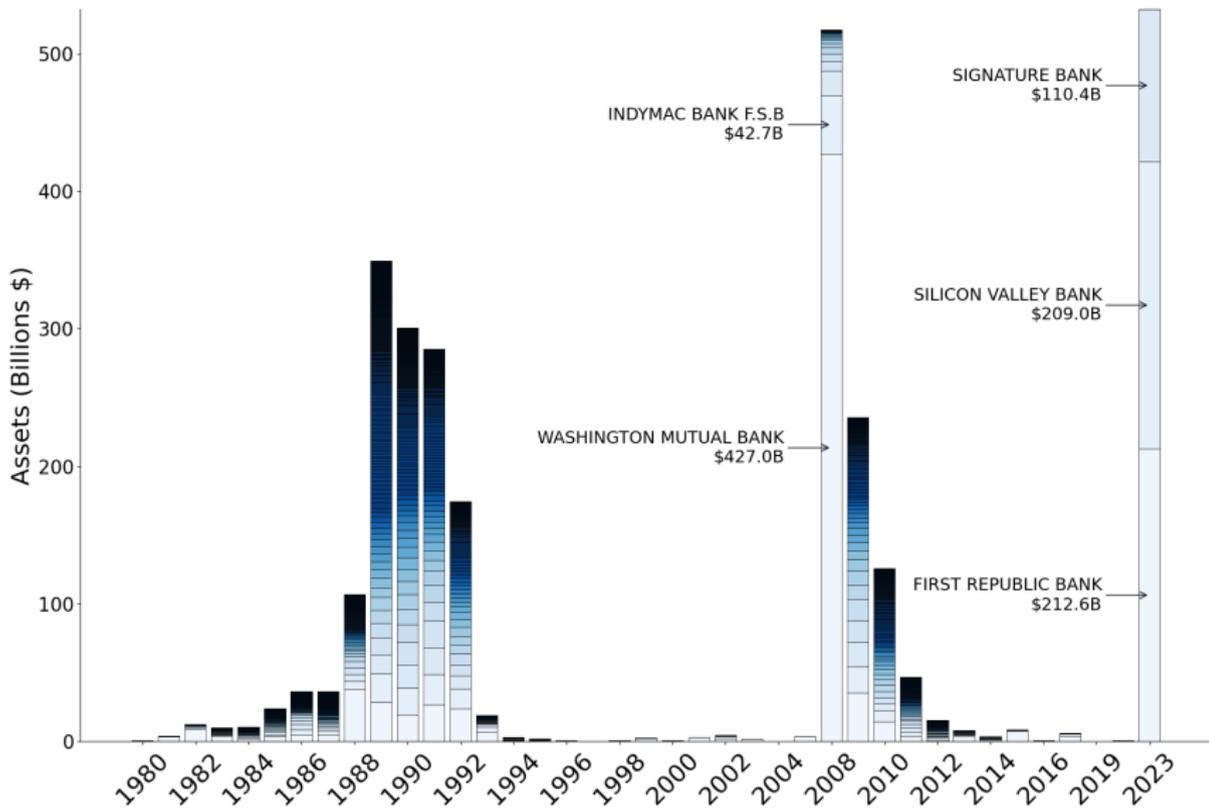
Bad Bank, Bad Luck?

Evidence From 1 Million Firm-Bank Relationships

Yannick Schindler (LSE)
Peter John Lambert (LSE)

May 2025

Bank failures are surprisingly common in the US...



...and smaller firms are particularly reliant on banks

Small firms rely on bank credit 🏛️, usually obtained from a single bank 1, via long-term relationships 🤝

And small firms important for job creation 📁, innovation 🔬, and growth 📈

Yet little known about firm-level consequences of bank shocks for small firms

How does bank failure affect small firms?

New data on firm-lender relationships in the US

- 36M loan documents (2000 through present)
- **1.5M firms** (D&B) ↔ **4K banks** (Orbis)

Empirical design

- Difference-in-differences (DiD) w/ 179 bank failures
- Two quasi-experiments
 - ① Failure of healthy bank
 - ② Sudden discovery of large-scale fraud

Small firms who borrow from a bank that fails experience:

- 6.7 percentage points (44%) **higher failure rate**
- 4.4 percentage points (32%) **lower employment growth**
- Effects are **persistent**: observed for up to 10 years after failure

But not all failures are created equal:

- **Large heterogeneity** across bank failures
- Some failures actually **improved** firm-performance
- Analyzing likely drivers of differences (work in progress)

Data

UCC FINANCING STATEMENT

FOLLOW INSTRUCTIONS

A. NAME & PHONE OF CONTACT AT SUBMITTER (optional) Sophia Guernsey 442-218-2550	
B. E-MAIL CONTACT AT SUBMITTER (optional) fulfillment@middesk.com	
C. SEND ACKNOWLEDGMENT TO: (Name and Address)	
<div style="border: 1px solid black; padding: 5px;"> Middesk, Inc. 85 2nd Street, Suite 710 San Francisco, CA 94105 </div>	
SEE BELOW FOR SECURED PARTY CONTACT INFORMATION	

FILED: JUN 30, 2025 08:47 AM
OREGON SECRETARY OF STATE



UCC LIEN NO. 94232492 LION AND OWL LLC

THE ABOVE SPACE IS FOR FILING OFFICE USE ONLY

1. DEBTOR'S NAME: Provide only one Debtor name (1a or 1b) (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 fit in line 1b, leave all of item 1 blank, check here and provide the Individual Debtor information in item 10 of the Financing Statement Addendum (Form UCC1Ad)

1a. ORGANIZATION'S NAME LION AND OWL LLC					
OR	1b. INDIVIDUAL'S SURNAME		FIRST PERSONAL NAME	ADDITIONAL NAME(S)/INITIAL(S)	SUFFIX
1c. MAILING ADDRESS 60 E 11th Ave			CITY Eugene	STATE OR	POSTAL CODE 97401-3538
				COUNTRY USA	

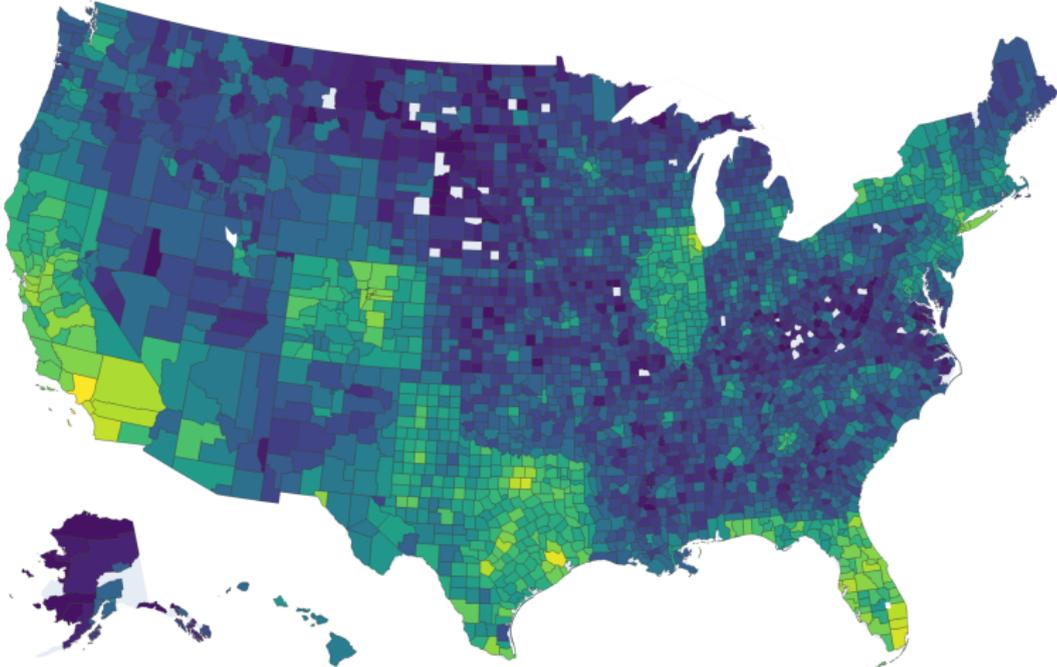
2. DEBTOR'S NAME: Provide only one Debtor name (2a or 2b) (use exact, full name; do not omit, modify, or abbreviate any part of the Debtor's name); if any part of the Individual Debtor's name will not fit in line 2b, leave all of item 2 blank, check here and provide the Individual Debtor information in item 10 of the Financing Statement Addendum (Form UCC1Ad)

2a. ORGANIZATION'S NAME					
OR	2b. INDIVIDUAL'S SURNAME		FIRST PERSONAL NAME	ADDITIONAL NAME(S)/INITIAL(S)	SUFFIX
2c. MAILING ADDRESS			CITY	STATE	POSTAL CODE
				COUNTRY	

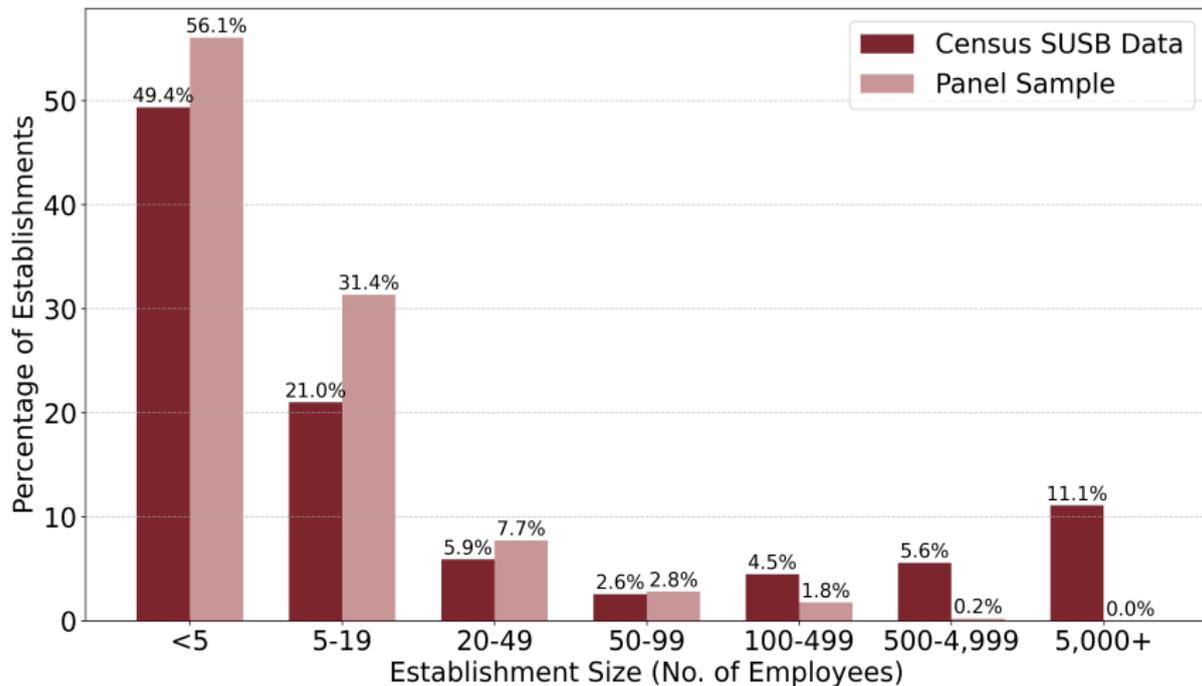
3. SECURED PARTY'S NAME (or NAME of ASSIGNEE of ASSIGNOR SECURED PARTY): Provide only one Secured Party name (3a or 3b)

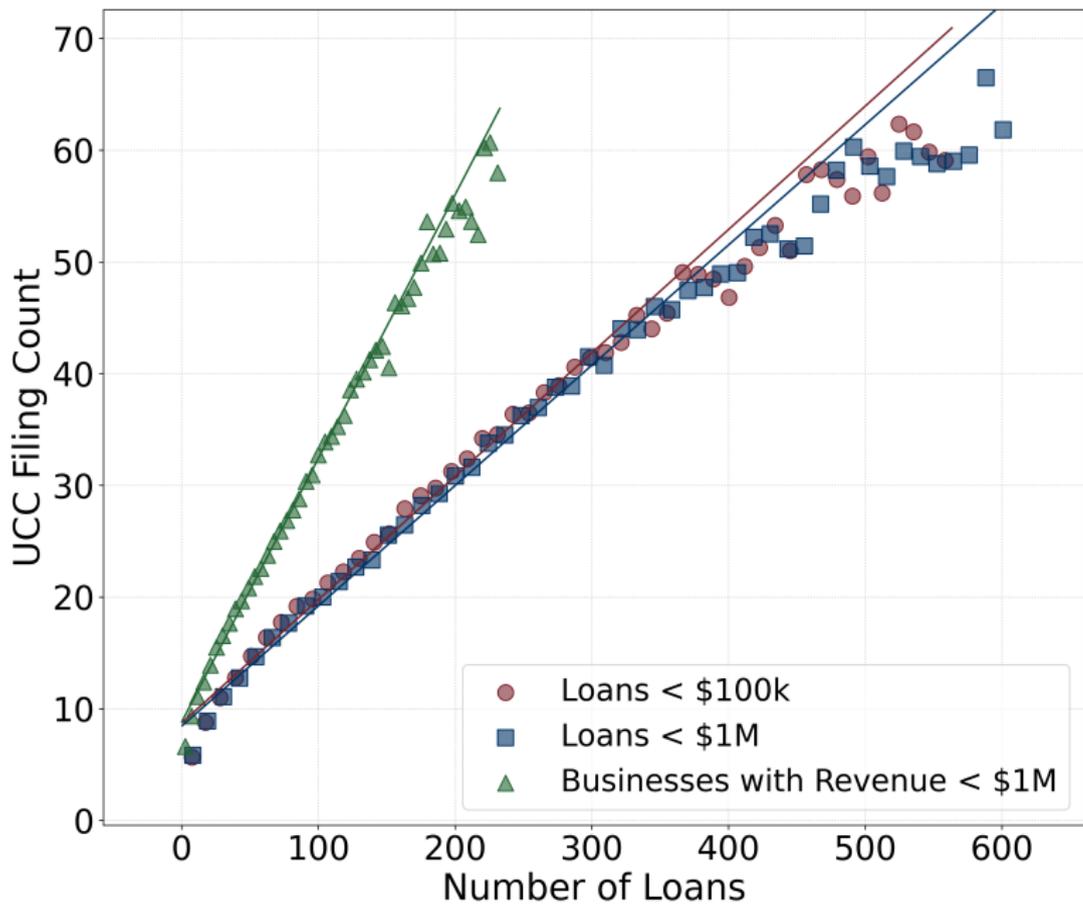
3a. ORGANIZATION'S NAME Square Financial Services, Inc.					
OR	3b. INDIVIDUAL'S SURNAME		FIRST PERSONAL NAME	ADDITIONAL NAME(S)/INITIAL(S)	SUFFIX
3c. MAILING ADDRESS 3165 E Millrock Dr, Suite 160			CITY Salt Lake City	STATE UT	POSTAL CODE 84121
				COUNTRY USA	

UCC Filings by County



Good coverage of micro establishments





Empirical Design & Results

Staggered treatment design: local projection DiD

Dube, et al. (2024)

$$y_{i,t+h} - y_{i,t-1} = \beta^h \Delta D_{i,t} + \gamma^h \mathbf{X}_{i,t} + e_{i,t}^h$$

i, t, h : firm, calendar year, time horizon

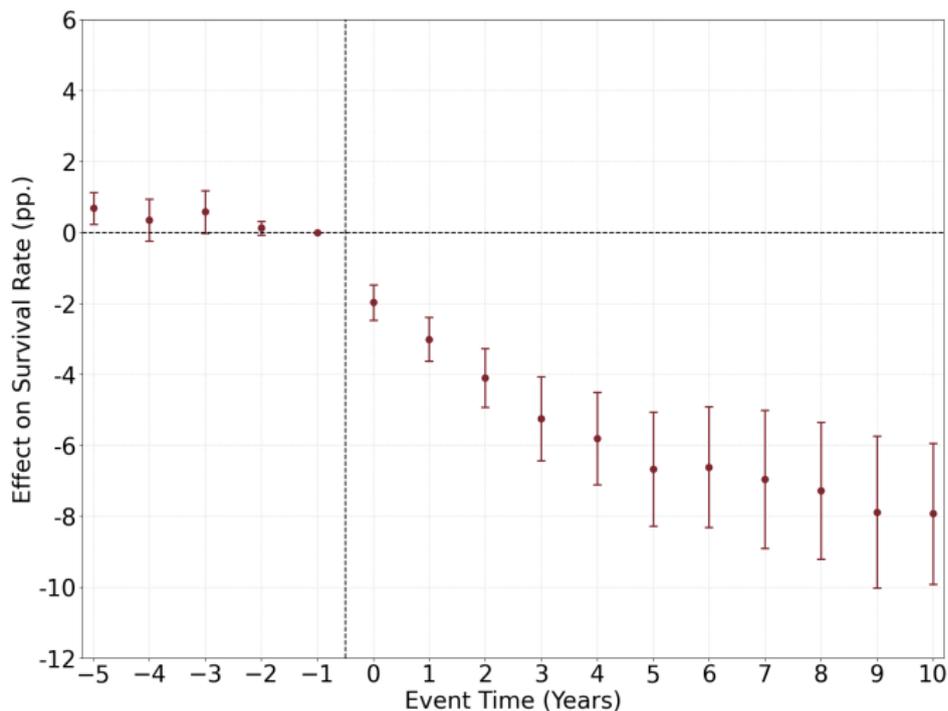
$y_{i,t}$: outcome variable

$D_{i,t}$: treatment indicator

$\mathbf{X}_{i,t}$: *firm age* + *firm age*² + *bank size* +
firm size × *year* × *industry* × *county* fixed effects

SE clustering : bank + year level

Affected firms much more likely to cease operating



SE clustering

Alt. estimators

Alt. bank-level controls

Alt. treatment definitions

Switching behavior

Varying match quality

Panel balancing

Non-stagger vs. full stagger

Event study

Placebo

Spatial spillovers

Scaled

Employment growth

Revenue growth

Identification: no anticipation & parallel trends

No anticipation

- Statistical tests of switching behaviour pre-failure
- Include switchers in treated group
- Flat pre-trend / event studies
- Deposits unresponsive pre-failure Correia, Luck, and Verner (2024)

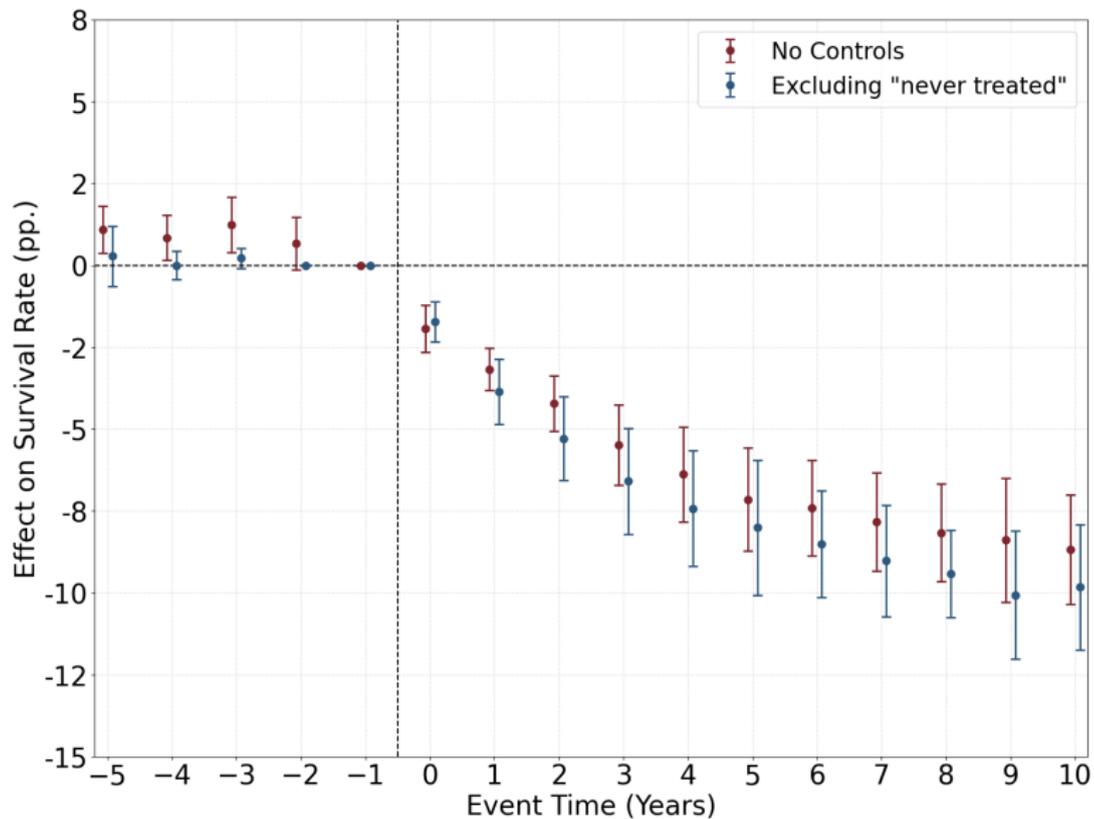
Reverse causality

- Flat pre-trend / event studies
- FDIC Inspector General reports

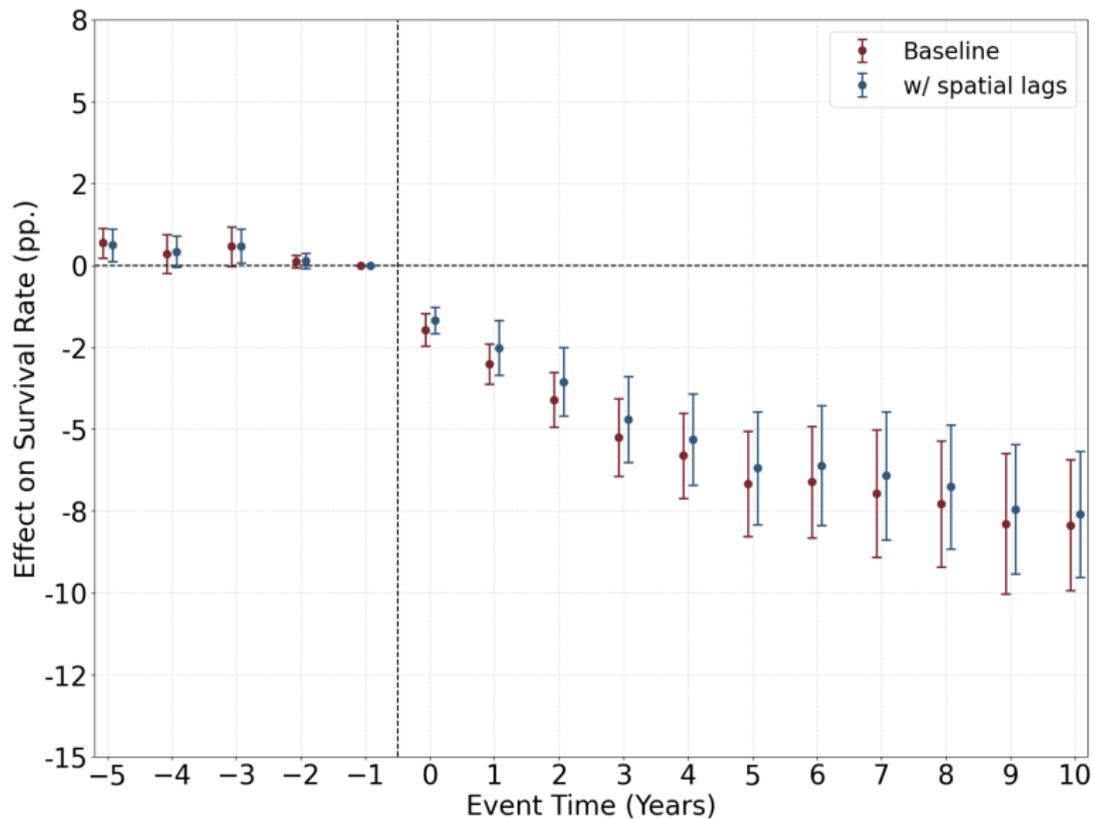
Parallel trends

- Exogeneity in timing of bank failure: FBOP & Colonial Bank

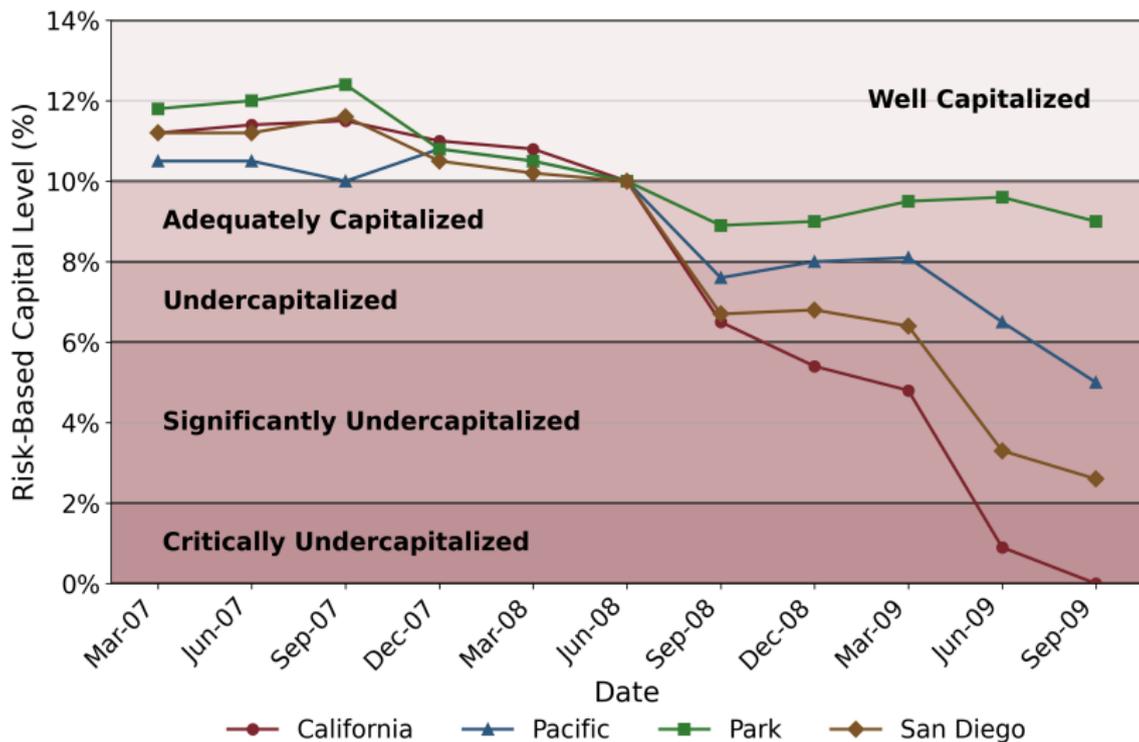
Alternative specifications



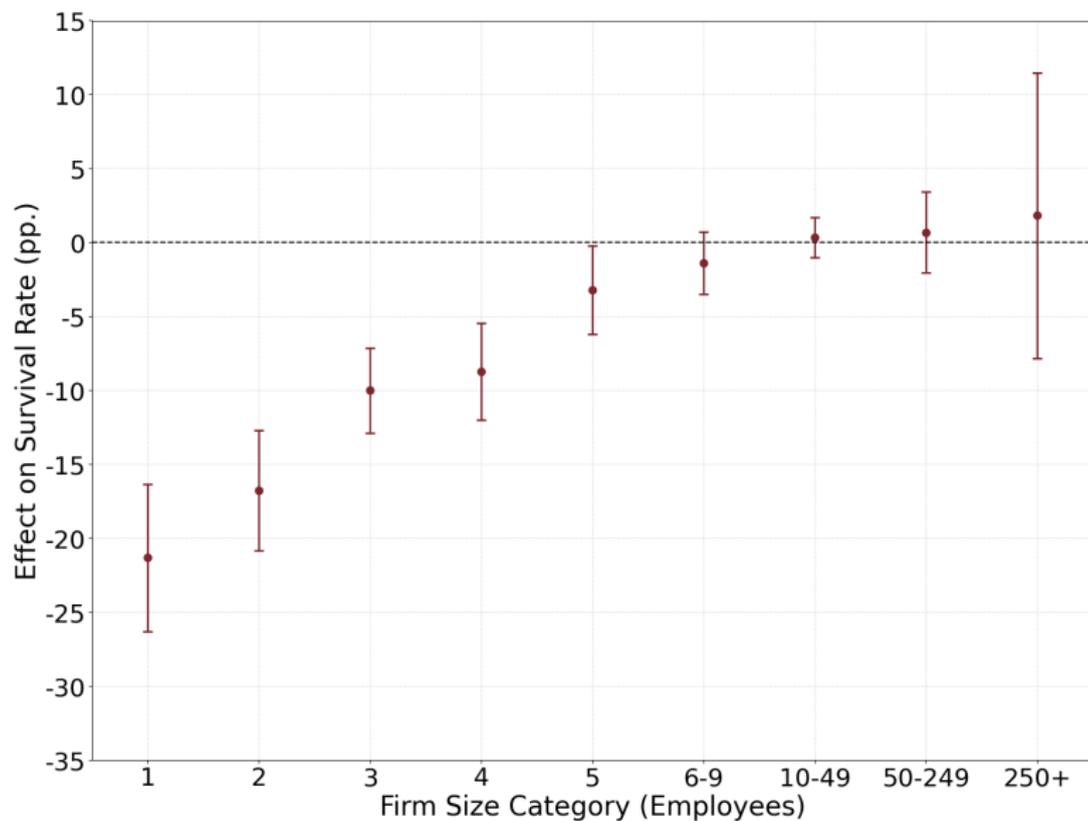
Controlling for spatial spillovers



When bad banks sink good ones

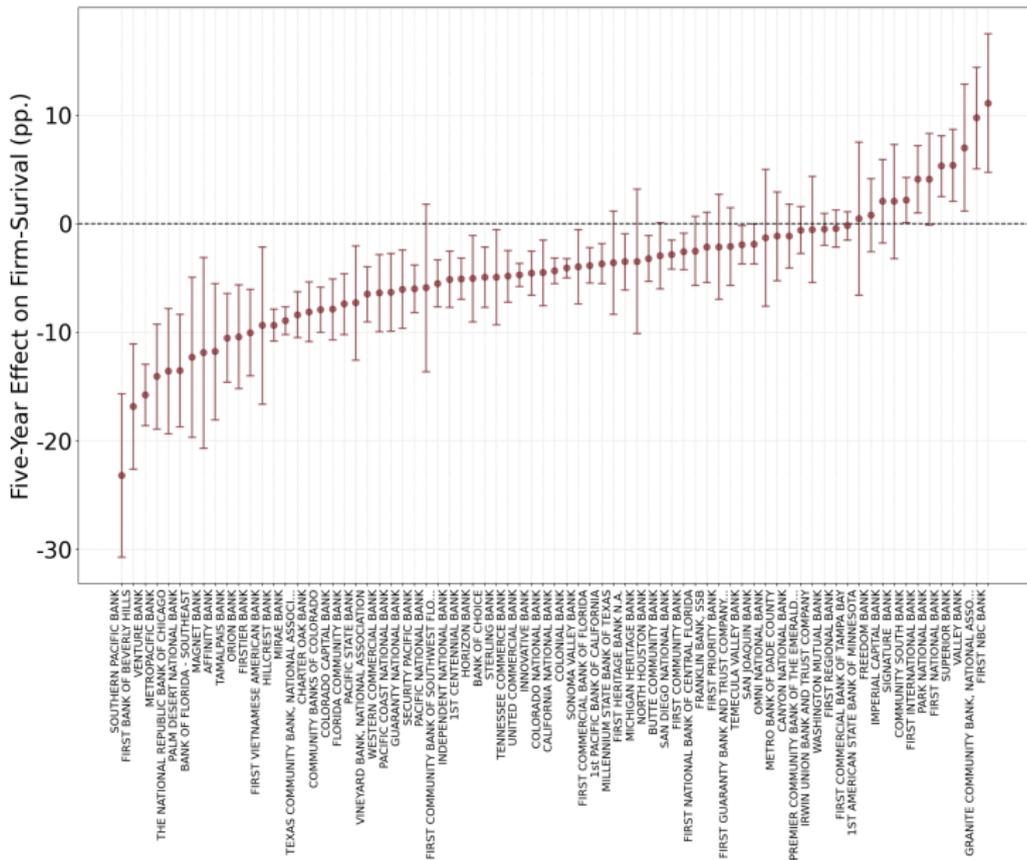


Effects concentrated at smallest firm sizes

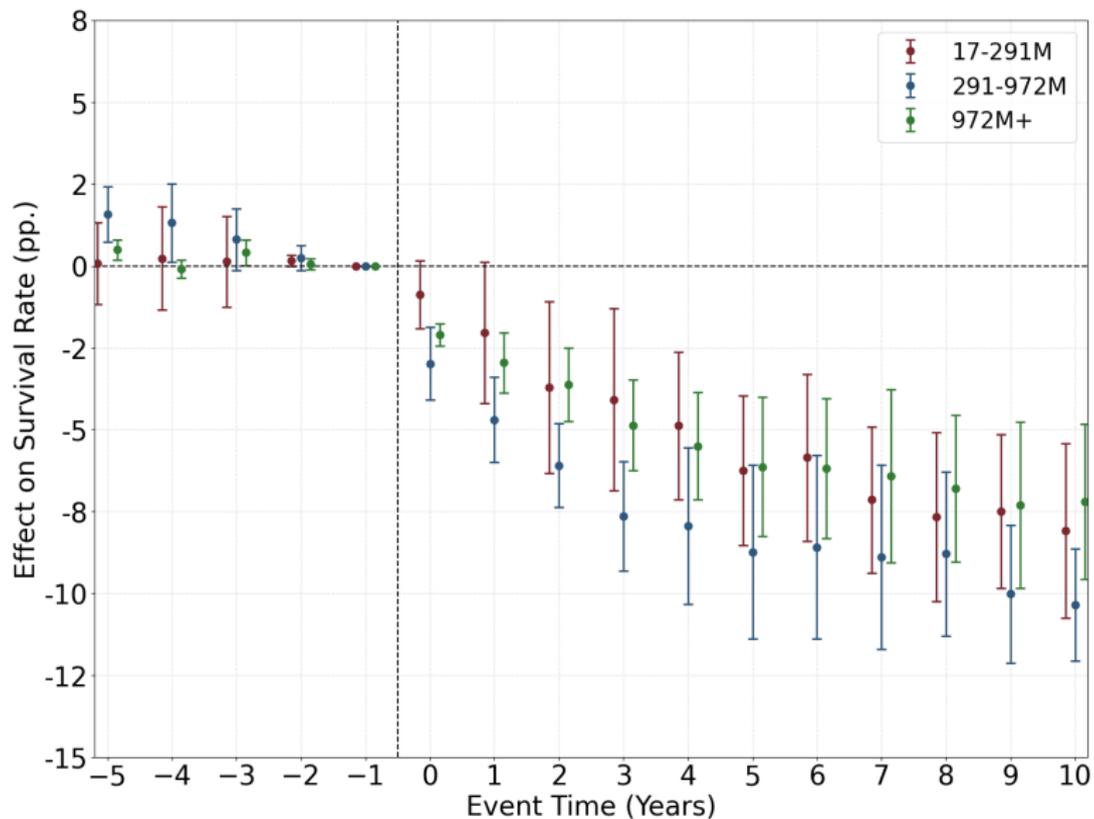


Failure-level heterogeneity

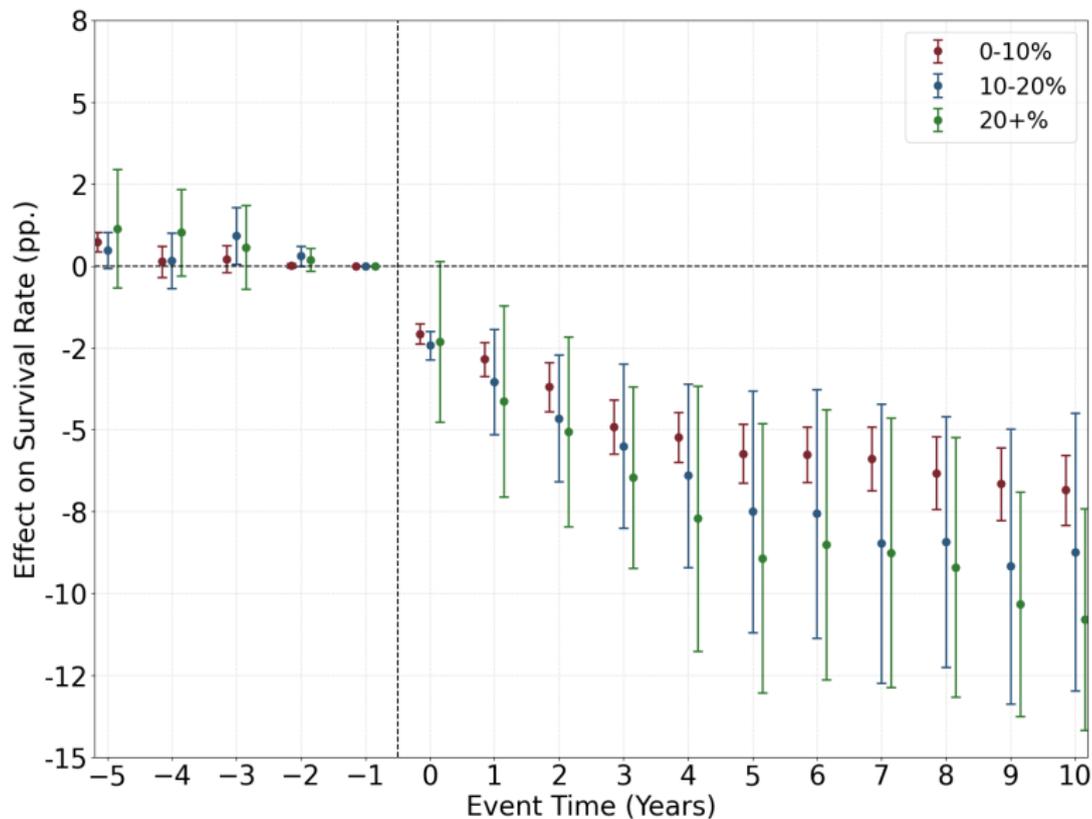
Some bank failures much more harmful than others



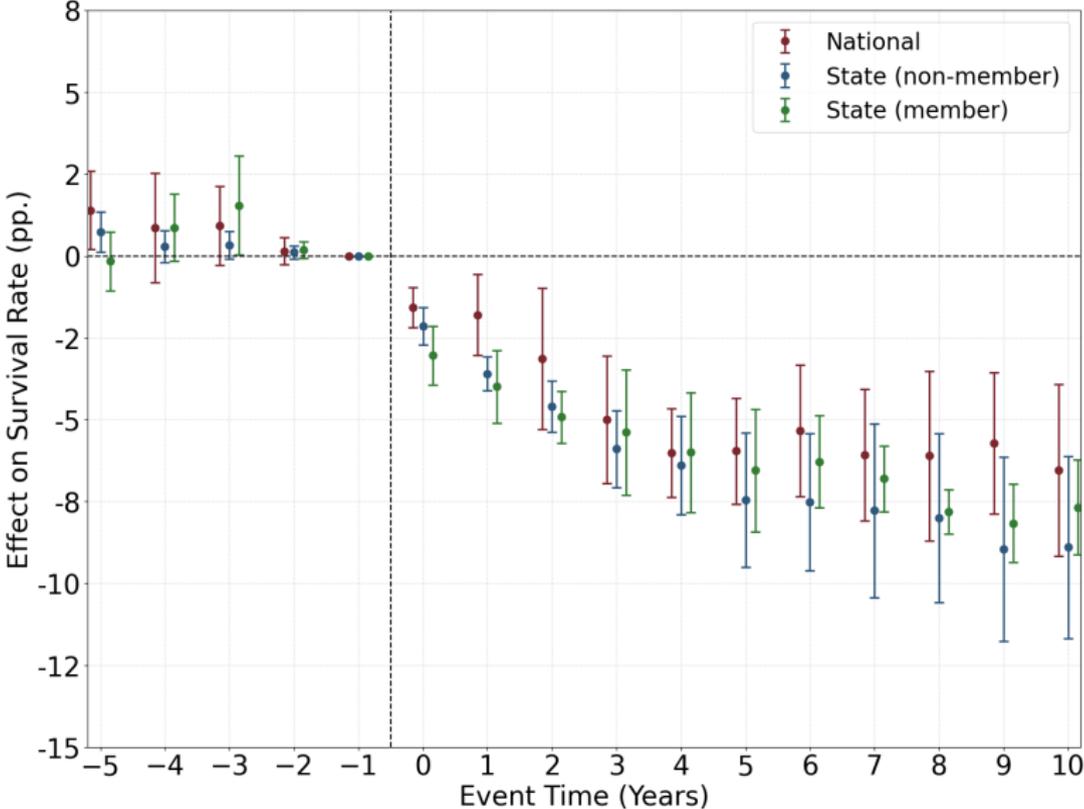
Bank size does not explain variation in effects...



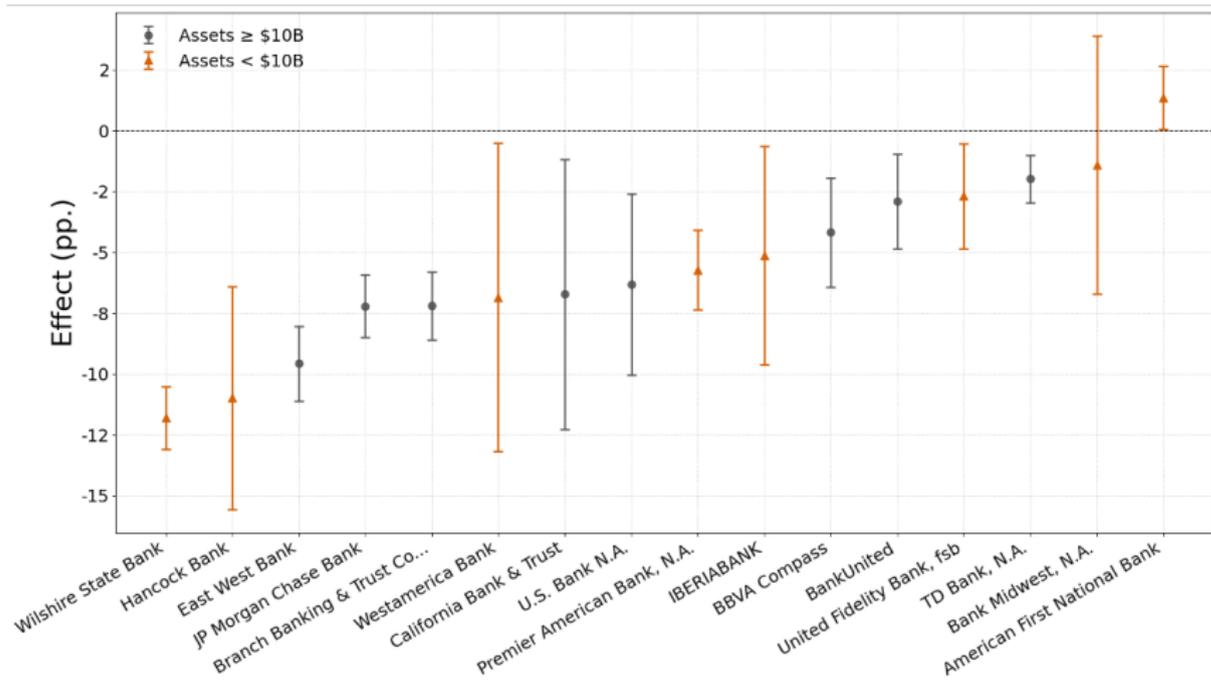
...neither does bank resolution cost...



...or charter type



The role of the acquiring bank



Findings

- Evidence of hidden harms of current US bank resolution process
- Substantial and lasting effects
- Small firms firms are most affected
- Large heterogeneity across bank failures

Current paper to-dos

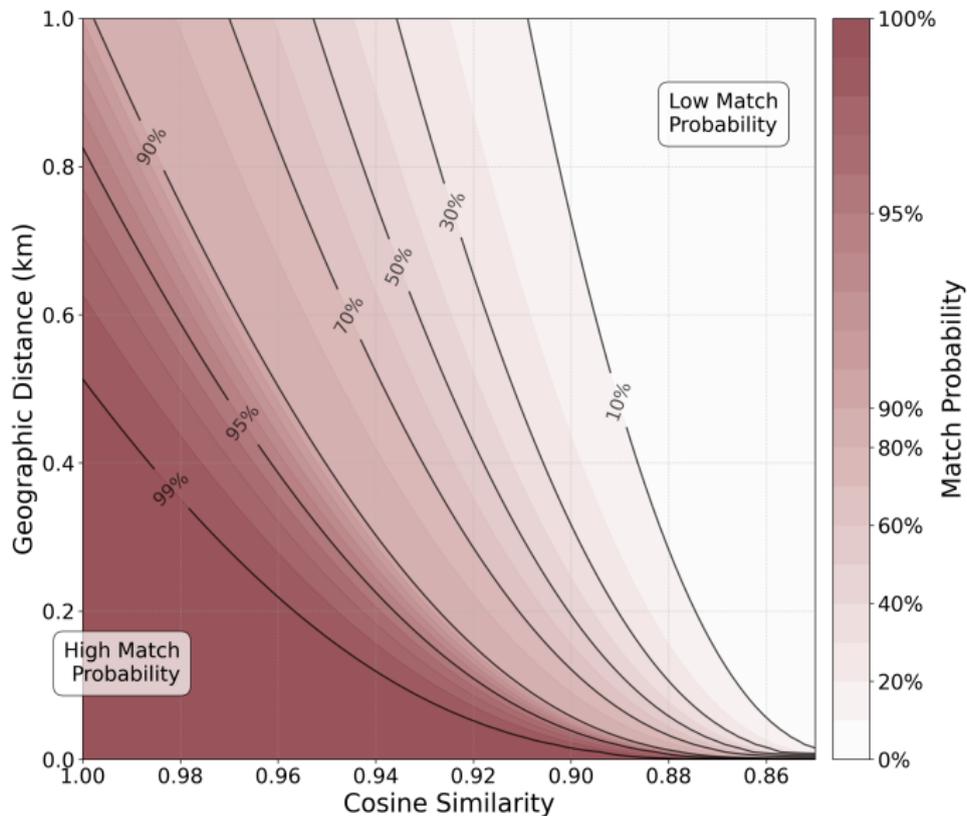
- Spatial spillovers
- Proper GE quantification (reallocation, entry margin, etc.)

New data! Much more research to do!

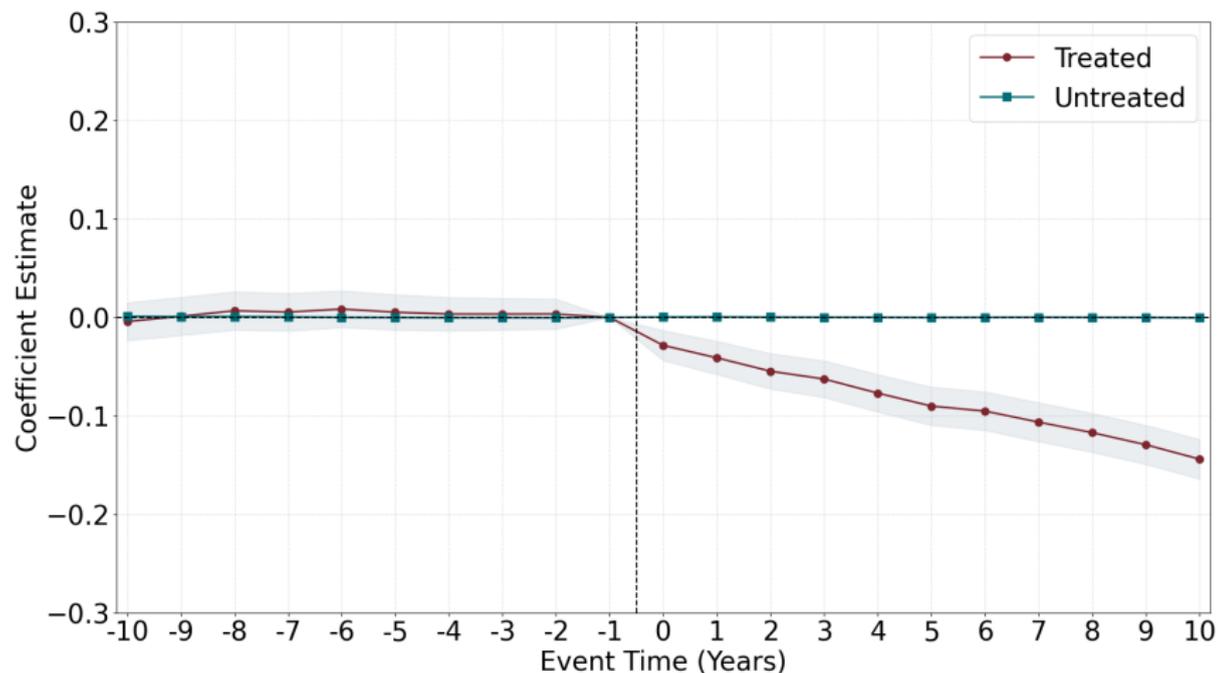
- Role of non-bank credit
- Community banks & climate disaster (shock internalization)
- Bank characteristics and startup success

Thank you!

Predicting record match probability



Firm survival event study

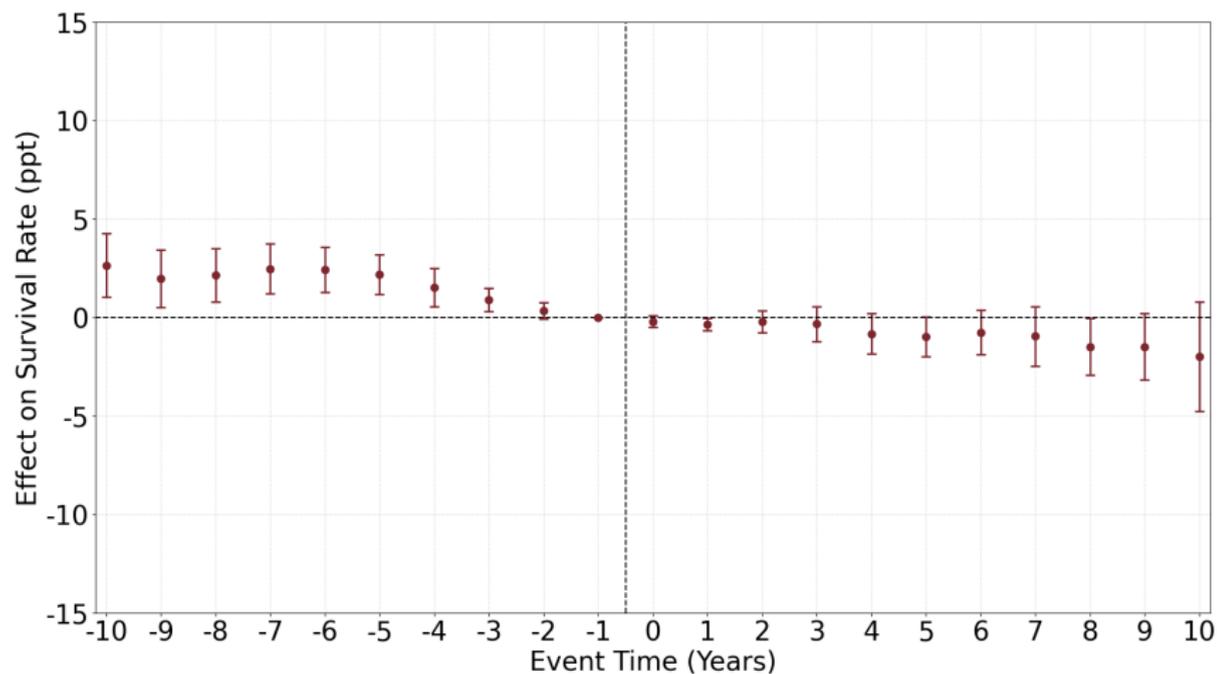


Back

Matching to “Bank of America”

OpenAI Embedding	Fuzzywuzzy
1. BofA (86)	1. Bank of South America (83)
2. Bank of America, National Association (81)	2. Bank of America, National Association (58)
3. Bank of South America (61)	3. BofA (42)

Effect on firm survival (placebo)



Back

Record linkage statistics

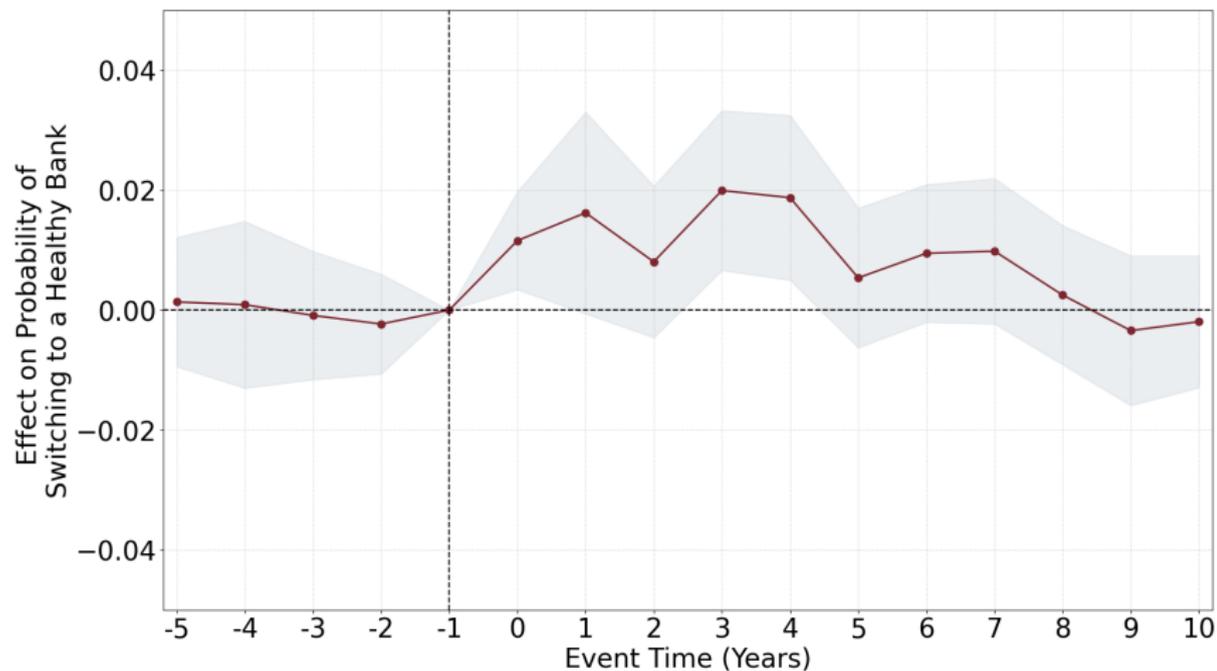
UCC-to-Firm Linkage

Statistic	Value
Number of unique firms	2,148,477
Number of unique filings	6,284,126
Cosine Similarity	
Average	0.9737
Median	0.9855
10th percentile	0.9295
90th percentile	1.0000
Geographic Distance (km)	
Average	0.0347
Median	0.0000
10th percentile	0.0000
90th percentile	0.0000
Match Probability	
Average	0.9329
Median	0.9407
10th percentile	0.8944
90th percentile	0.9682

UCC-to-Bank Linkage

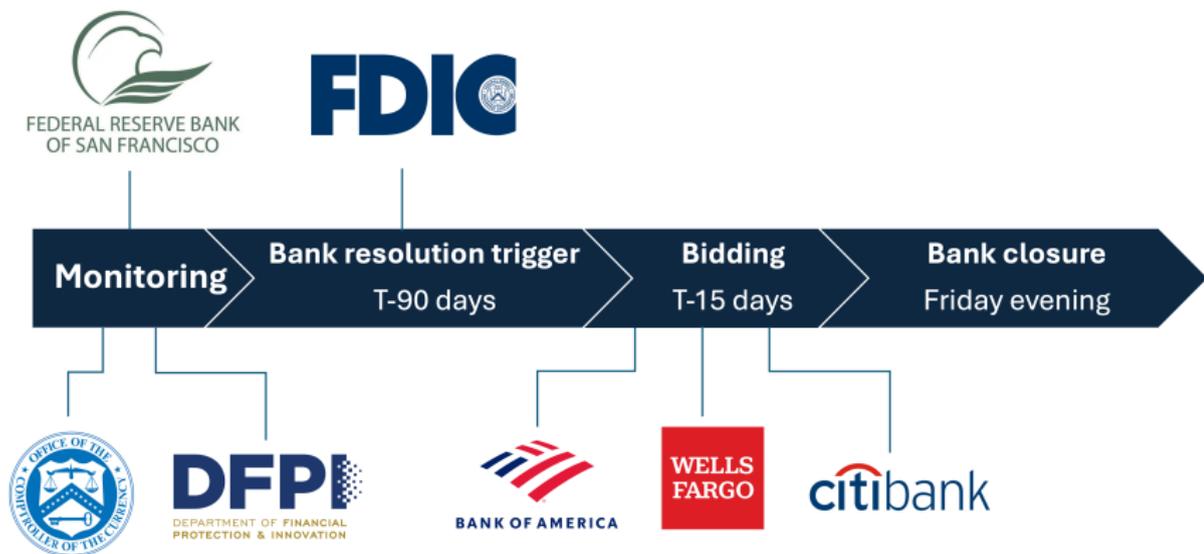
Statistic	Value
Number of unique filings	4,962,762
Number of unique banks	7,467
Cosine Similarity	
Average	0.98
Median	1.00
10th percentile	0.94
90th percentile	1.00
Match Probability	
Average	0.97
Median	0.99
10th percentile	0.94
90th percentile	0.99
Fraction with state match	1.00
Fraction with county match	0.89
Fraction with zip match	0.61

Bank switching behavior

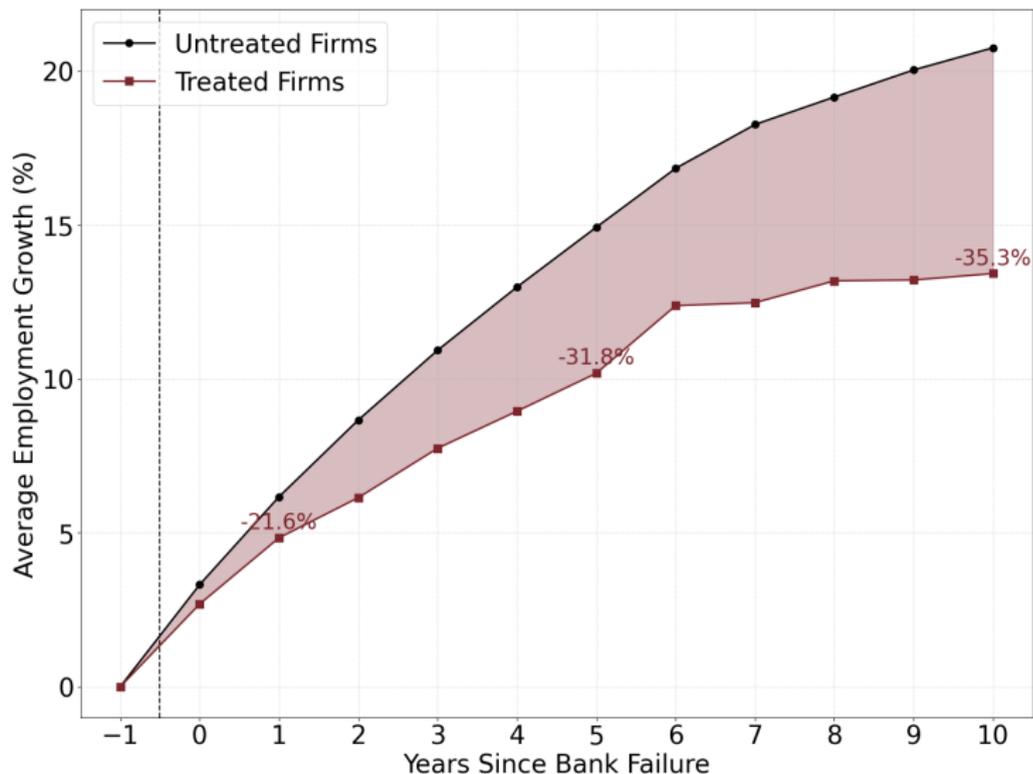


Back

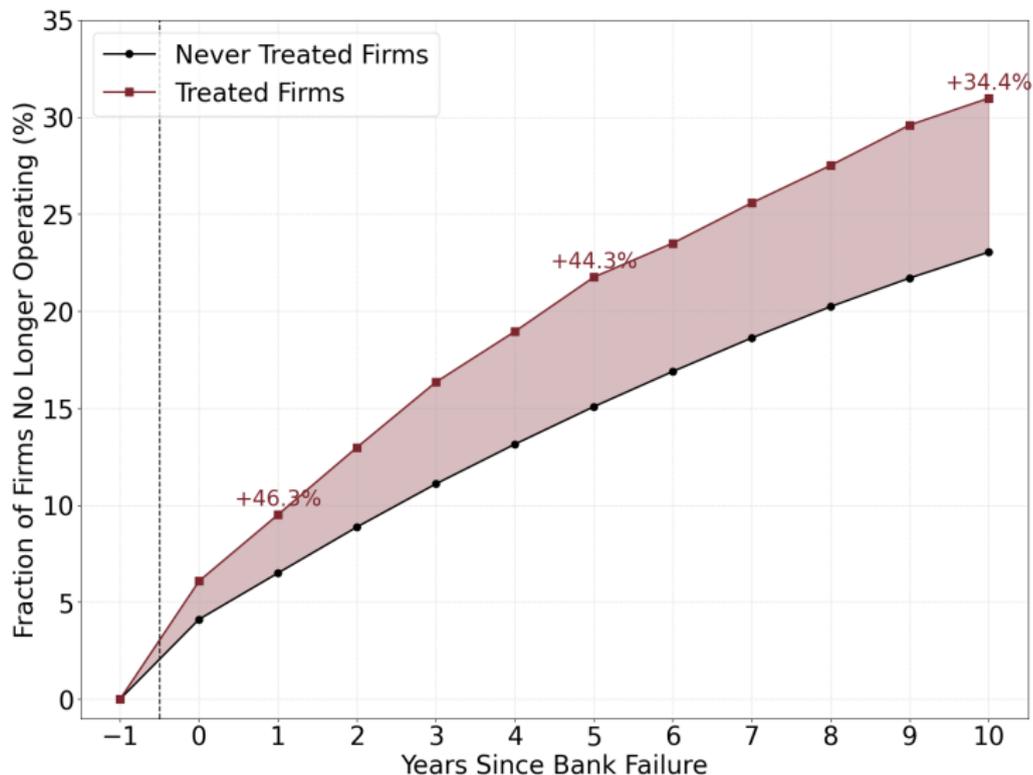
The bank resolution process in the US



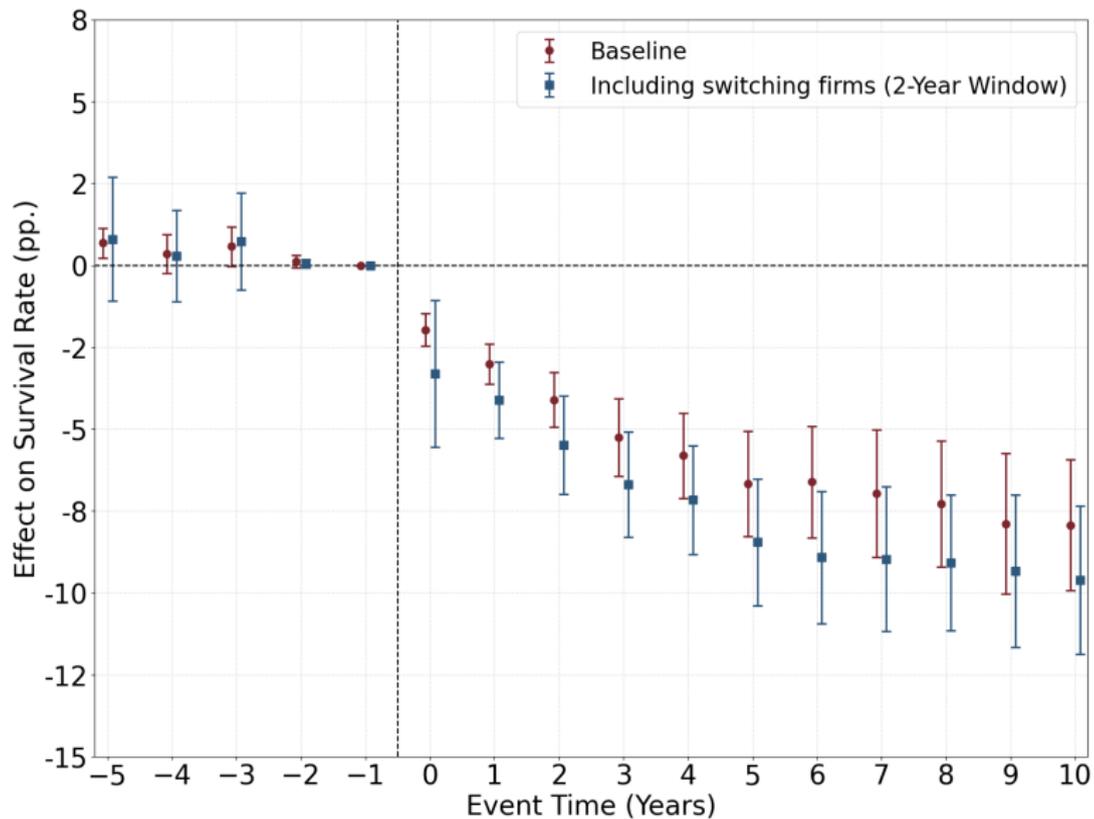
Effect on firm-level employment (scaled)



Effect on firm exit (scaled)



Two-year no-switch window



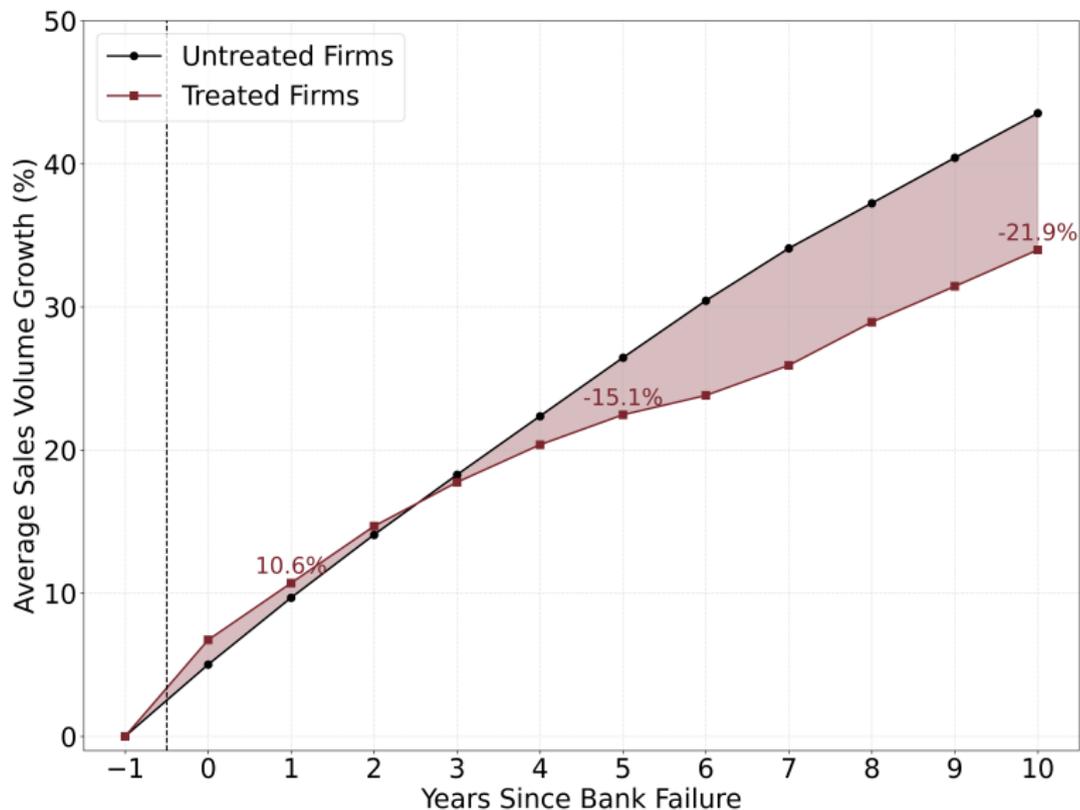
Descriptive statistics: firms

	All	Matched	Untreated	Treated
Employees				
Mean	6	12	12	17
P10	1	1	1	2
Median	2	3	3	5
P90	7	20	20	40
Number of UCC Filings				
Mean		3.3	3.2	7.3
P10		1.0	1.0	1.0
Median		1.0	1.0	3.0
P90		6.0	6.0	15.0
Length of Banking Relationship at Failure (years)				
Mean				6.1
P10				1.0
Median				4.0
P90				14.0
Number of firms	92,880,472	1,552,808	1,533,371	19,437

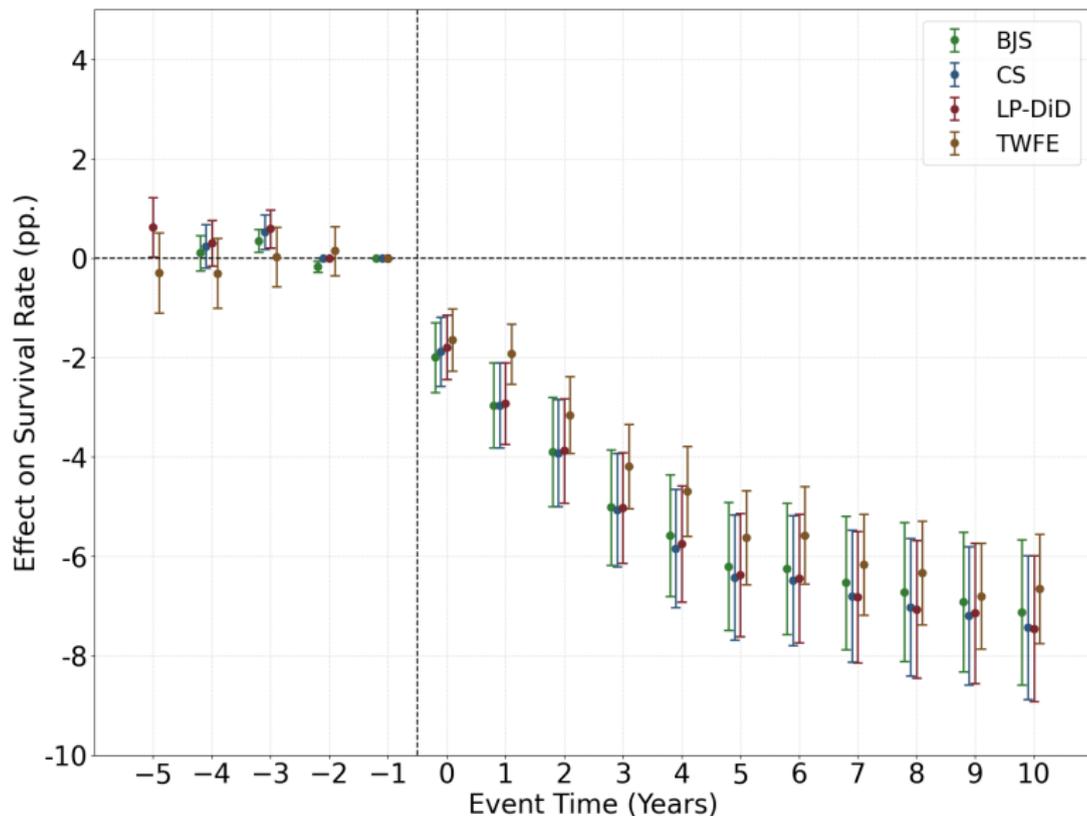
Descriptive statistics: banks

	All	Matched	Non-Failed	Failed
Assets (\$ millions)				
Mean	1,395.4	5,120.8	5,238.5	2,329.9
P10	5.2	77.6	77.1	87.4
Median	105.3	367.5	367.5	368.2
P90	897.6	3,401.0	3,479.3	2,289.3
Employees				
Mean	182	614	631	216
P10	3	18	18	19
Median	25	74	74	69
P90	180	536	547	365
Number of banks	17,496	3,929	3,770	179

Effect on firm-level revenue growth



Alternative estimators



Credit supply shocks → firms

Khwaja and Mian (2008) [debt]

Amiti and Weinstein (2011) [exports]

Chava and Purnanandam (2011) [capex]

Chodorow-Reich (2014) [employment]

Paravisini, et al. (2015) [exports]

Huber (2018) [employment]

Bank failure → firms

Slovin, et al. (1993) [share price]

Brewer, et al. (2003) [share price]

Minamihashi (2011) [capex]

Bank regulation / financial stability

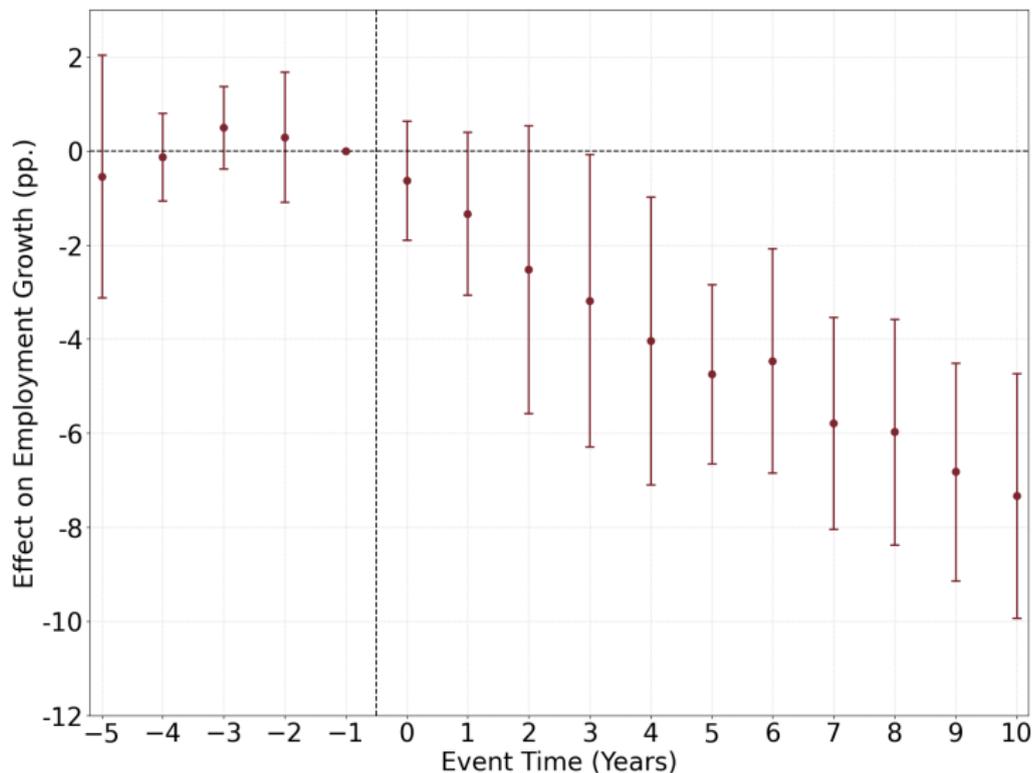
Merton (1977)

Diamond and Dybvig (1983)

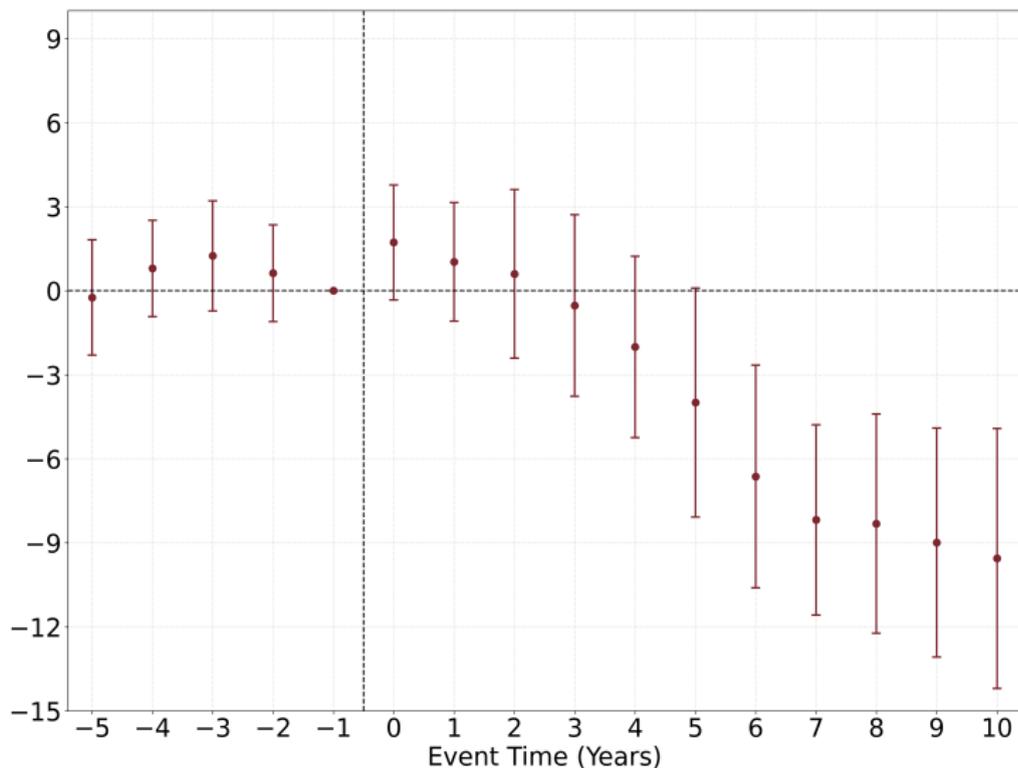
Allen and Gale (1998)

Granja, Matvos, and Seru (2017)

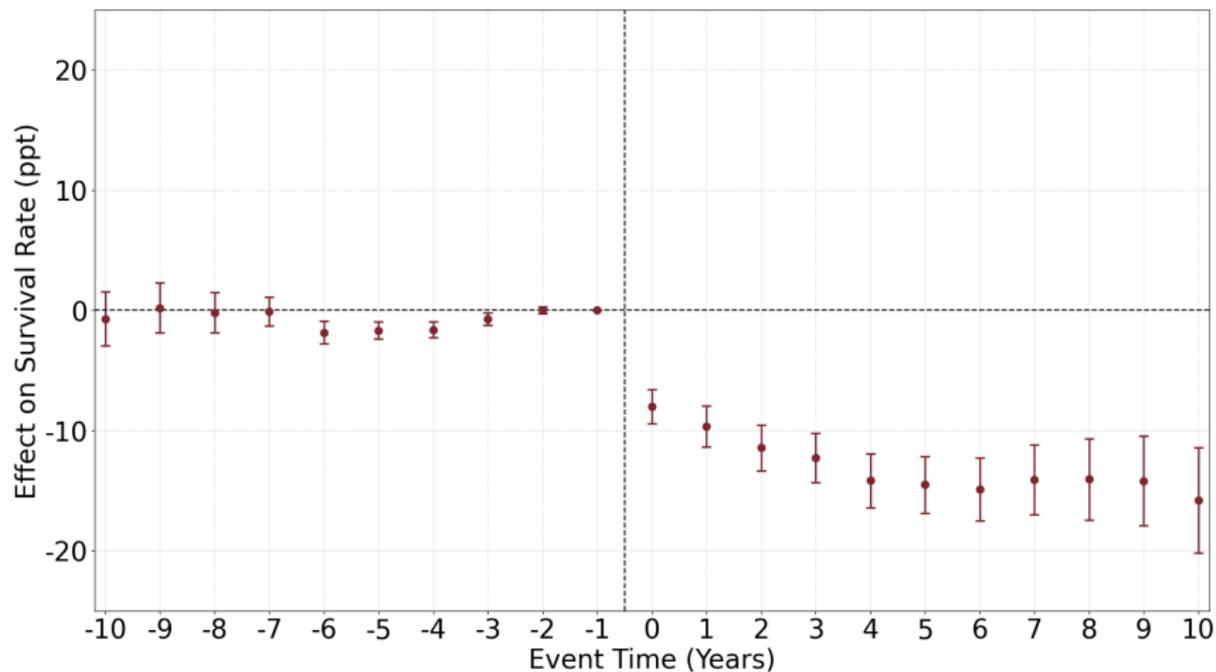
Surviving firms have slower employment growth...



...as well as slower revenue growth...



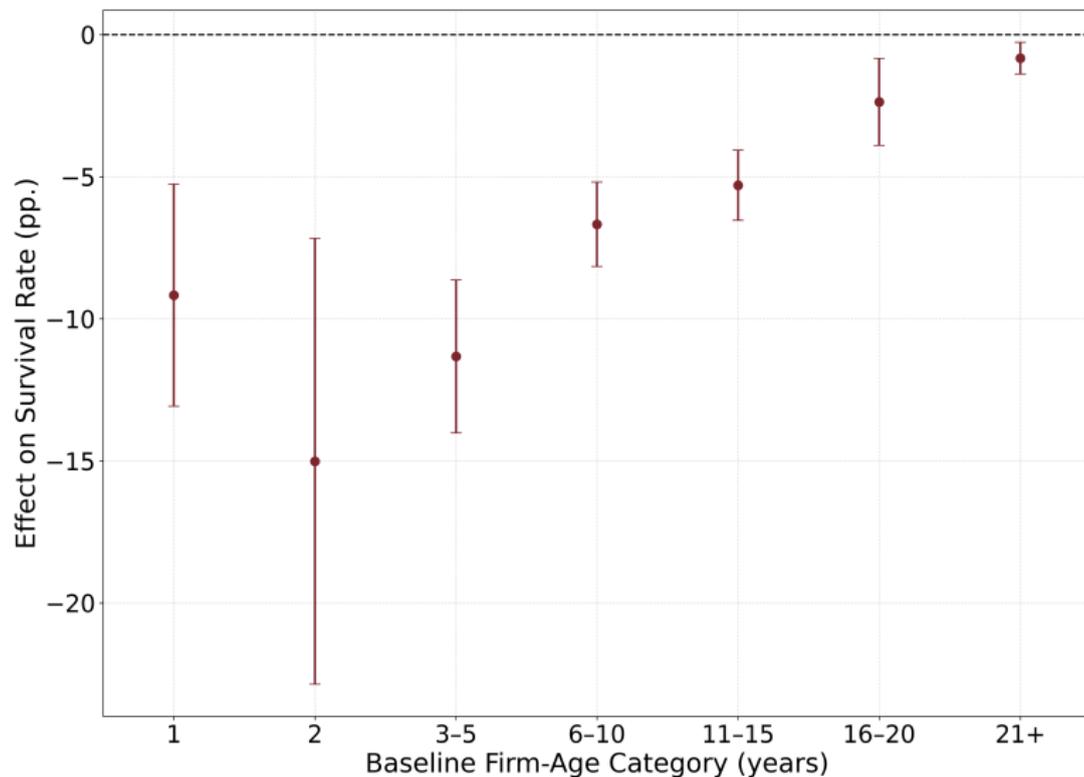
Effect on firm survival (Colonial Bank)



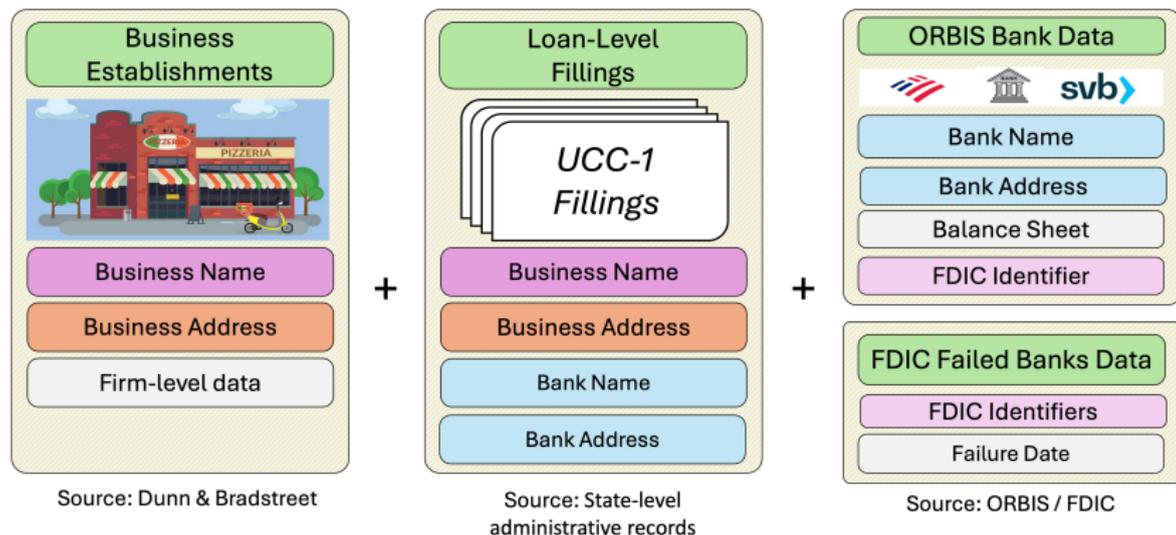
Firm-level employment

Back

Larger effects for younger firms



Establishment data <-> UCC filing <-> bank data



US Filings Map

Correlation with CRA

Match Probability Prediction

Descriptive stats: firms

Descriptive stats: banks

Good coverage of micro establishments

References

- ALLEN, FRANKLIN, AND DOUGLAS GALE (1998): "Optimal Financial Crises," The Journal of Finance, 53(4), 1245–1284, Publisher: [American Finance Association, Wiley].
- AMITI, M., AND D. E. WEINSTEIN (2011): "Exports and Financial Shocks," The Quarterly Journal of Economics, 126(4), 1841–1877.
- BREWER, ELIJAH, HESNA GENAY, WILLIAM CURT HUNTER, AND GEORGE G. KAUFMAN (2003): "The value of banking relationships during a financial crisis: Evidence from failures of Japanese banks," Journal of the Japanese and International Economies, 17(3), 233–262.
- CHAVA, SUDHEER, AND AMIYATOSH PURNANANDAM (2011): "The effect of banking crisis on bank-dependent borrowers," Journal of Financial Economics, 99(1), 116–135.
- CHODOROW-REICH, GABRIEL (2014): "The Employment Effects of Credit Market Disruptions: Firm-Level Evidence From the 2008–9 Financial Crisis," Quarterly Journal of Economics, 129(1).
- CORREIA, SERGIO, STEPHAN LUCK, AND EMIL VERNER (2024): "Failing Banks," NBER working paper.
- DIAMOND, DOUGLAS W., AND PHILIP H. DYBVIK (1983): "Bank Runs, Deposit Insurance, and Liquidity," Journal of Political Economy, 91(3), 401–419, Publisher: University of Chicago Press.
- DUBE, ARINDRAJIT, DANIELE GIRARDI, ÒSCAR JORDÀ, AND ALAN TAYLOR (2024): "A Local Projections Approach to Difference-in-Differences" NBER ^{21 / 21}