Managing Stigma during a Financial Crisis

"...as in some past episodes of financial distress, banks were reluctant to rely on discount window credit, frustrating the Federal Reserve's efforts to enhance liquidity." – Ben Bernanke.

Sriya Anbil

Board of Governors of the Federal Reserve System

Motivation

- Why are banks reluctant to borrow from their LOLR?

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- A run on Northern Rock.

- Were banks reluctant to borrow because their identity would be revealed?

What is “stigma”?

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- Is this hypothesis correct?

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- Armentier, Sarkar, Shrader and Ghysels (2014): banks are willing to pay a premium to avoid borrowing from the discount window.

Research Questions

- Is there stigma if a bank is publicly revealed to have borrowed from its LOLR?
- If there is stigma, how can central banks create emergency lending facilities to alleviate this problem?

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  - Discount window borrowing is supposed to be anonymous.
- Does not exist during recent crisis.

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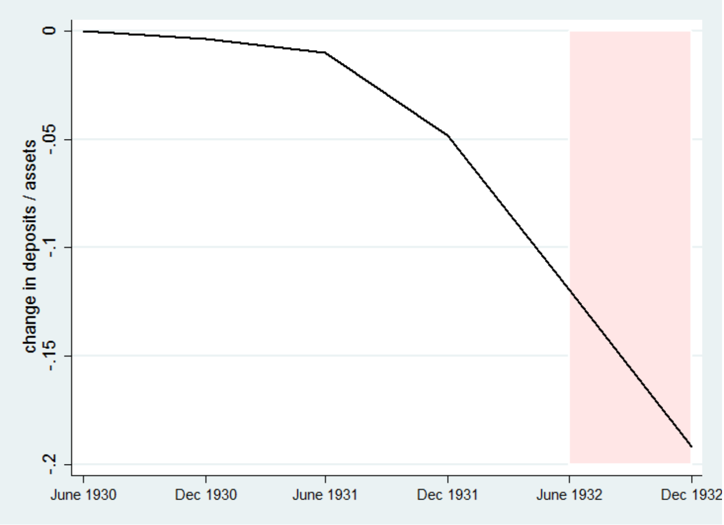
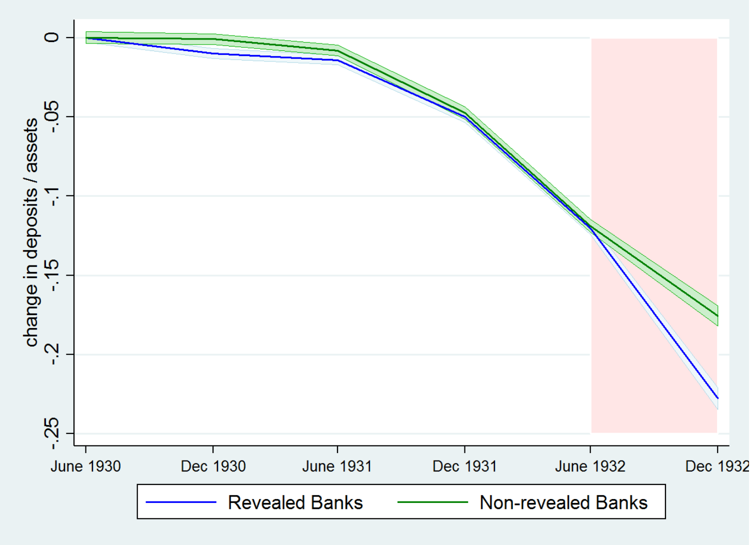
- Gave loans to banks in complete secrecy.
- On August 22, 1932, the Clerk of the House of Representatives published a *partial* list of banks that had *secretly* borrowed from the RFC.
- I use a difference-in-differences setting:
  - I compare "revealed banks" to "non-revealed banks".
  - the Clerk published the list of banks that he had access to.

Trend in Deposits

RFC borrowers during the Great Depression



Preview of Results



parallel trend ▸ total assets

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  - Revealed banks:
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- Revealing a partial list of banks yields stigma.
- Would stigma be reduced if many banks were revealed at the same time?
- Helps us think about the appropriate policy response.

Reconstruction Finance Corporation (RFC)

- Began giving loans on February 2, 1932.
  - interest rate of 5.5%.
  - maturities up to 3 years.
- 61% of banks could not borrow from the discount window.

discount window

The Publication of the List

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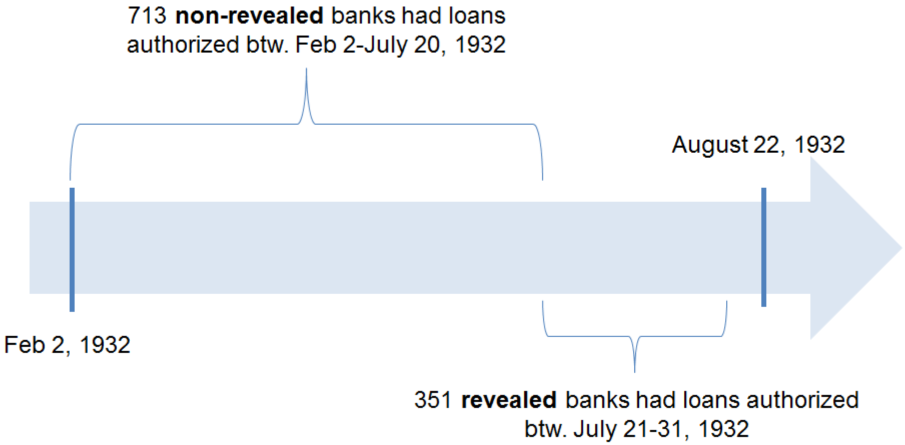
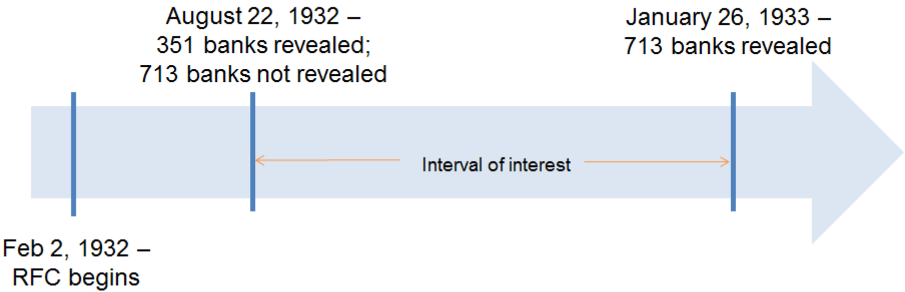
  - Section 201(b) added: the RFC had to submit a monthly report *to Congress* of borrower names.
- President Hoover was assured that the list would remain confidential.
- But the Clerk of the House of Representatives, South Trimble, felt it was his duty to make the reports public.
- Unexpectedly released the list on August 22, 1932.

Identification



Timeline


August 22, 1932 –
351 banks revealed;
713 banks not revealed
January 26, 1933 –
713 banks revealed
Interval of interest
Feb 2, 1932 –
RFC begins

Data

all hand-collected

- New York Times and Commercial & Financial Chronicle
- Rand McNally Bankers' Directory
  - semi-annual balance sheet information: December 31, 1929 to June 30, 1933 (8 obs. per bank, 8 books)
  - deposits, loans and discounts, bonds and securities
  - dates of bank failure, suspensions (in conservatorship)
- Moody's: confirmation of bank failure dates
- Final sample: 1,064 banks

Summary Statistics

Banks with loans authorized before August 22, 1932

As of June 30, 1932	Revealed Banks (351)		Non-revealed Banks (713)		
	Mean	Std. Dev	Mean	Std. Dev	Diff. in Means
total assets	2597.3	5539.0	4664.2	6348.3	***
$\frac{Deposits}{Assets}$	0.7042	0.1189	0.6933	0.1247	
$\frac{Loans\ and\ Discounts}{Assets}$	0.6929	0.1664	0.6548	0.1461	***
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parallel trend july stats

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- Failed: 32 revealed banks (9.2%), 43 non-revealed banks (6.0%)

parallel trend july stats

Empirical Specification

- Difference-in-differences analysis:

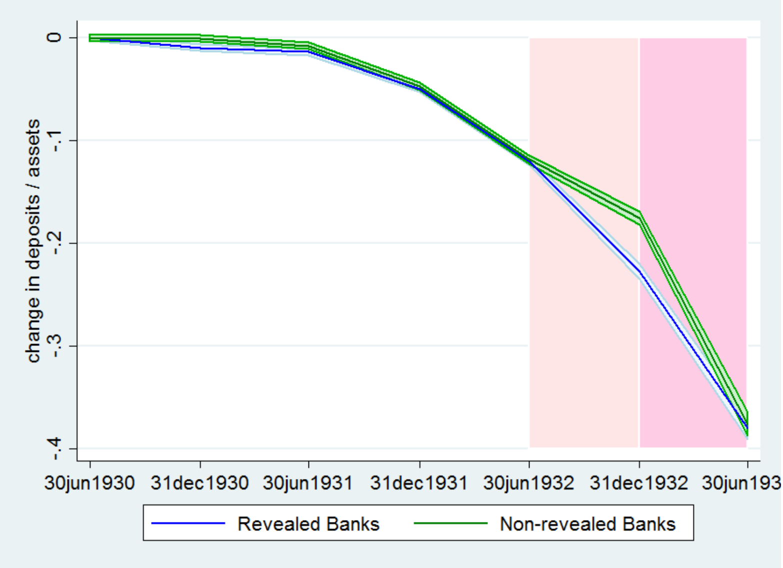
$$\frac{Deposits}{Assets}_{i,t} = \alpha + \beta_1 Revealed_i \times \mathbb{I}\{t = List\} + \beta_2 Revealed_i \times \mathbb{I}\{t = List + 1\} + \gamma X_{i,t-1} + \eta_t + \delta_i + \epsilon_{i,t}$$

- Concerns
  - Unexplained bank characteristics - $X_{i,t-1}$
    - ⋆ log of bank assets
    - ⋆ state-level: log of total deposits, log of total deposits at suspended banks, number of banks, number of suspended banks, per capita income
  - Time trends in banks' balance sheet - η_t Time FE
  - Unobservable bank characteristics - δ_i Bank FE

Stigma Exists

	deposits-to-assets	
$Revealed_i \times \mathbb{I}\{t = List - 1\}$	-0.0049	-0.0002
	(0.0072)	(0.0070)
$Revealed_i \times \mathbb{I}\{t = List\}$	-0.0482***	-0.03295**
	(0.0163)	(0.0157)
$Revealed_i \times \mathbb{I}\{t = List + 1\}$	0.0007	0.0166
	(0.0264)	(0.0236)
$X_{i,t-1}$	No	Yes
Bank Fixed Effects δ_i	Yes	Yes
Time Fixed Effects η_t	Yes	Yes
Obs.	6303	6303
R^2	0.6255	0.6626

Graphical Representation



Reducing Stigma

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- Look at number of banks revealed within a city.

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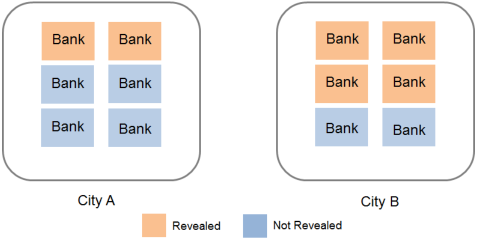
- How can we reduce stigma?
- Look at number of banks revealed within a city.
- Revealing many bank identities at the same time or just reveal the few?

Example

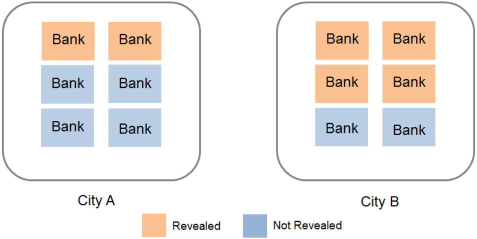


- Assumptions:
  - shocks hitting cities varied in intensity (Wicker 1996)
  - banks lent locally (Mitchener and Richardson 2014)

▸ city stats

Interpretation of the data

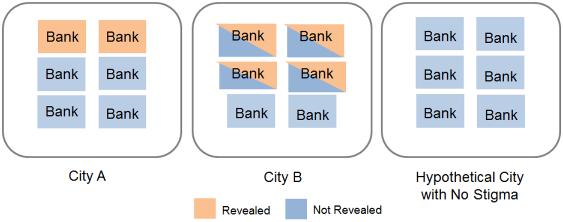
- A revealed bank in City A did worse than a revealed bank in City B.



- No stigma for the revealed banks in City B.

Interpretation of the data

- How can we think about the entire banking system?



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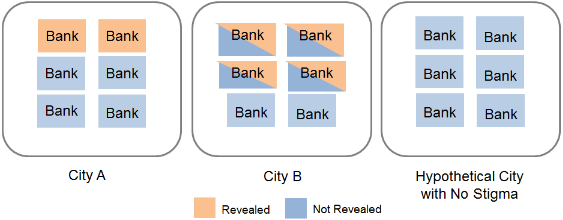

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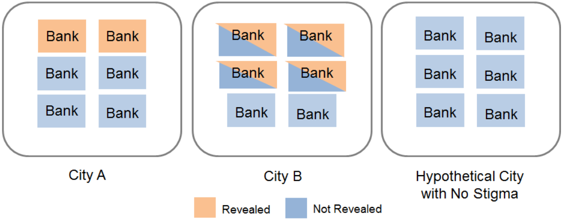

- City A does worse than City B if...
  - the non-revealed banks in City A did the same as the non-revealed banks in City B.

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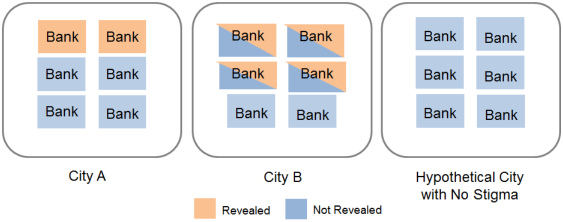

- City A does worse than City B if...
  - the non-revealed banks in City A did the same as the non-revealed banks in City B.
  - assuming the banks that didn't borrow in City A did the same as the banks that didn't borrow in City B.

Interpretation of the data

- In cities where nearly all banks were revealed...
  - no difference between the revealed and non-revealed banks.
  - information about nearly all the banks was revealed at the same time.

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- Revealing many banks at the same time is better than revealing few banks.

Appropriate Policy Response

- A lending facility that reveals the identities of many banks at the same time might have less stigma.
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- Benefit of coordination mechanism:
  - if identities are revealed, likely that $\geq$1 identity will be revealed
  - prevents only 1 identity being leaked individually
- Many banks need to borrow from the LOLR.

Conclusion

- Stigma exists.
- Stigma is large and warrants the attention of policy makers.

- Revealing many banks at the same time is better than revealing few.
- A lending facility that reveals many bank identities at the same time may have less stigma.

Robustness

- Compare banks that had loans authorized in July
  - Significant drop in the ratio of deposits-to-assets of 8% for revealed banks. ▸ july only
- Loan authorization date $\neq$ Loan application date
- Compare revealed banks that had loans authorized between Feb. 2-July 20 to non-revealed banks
  - Significant drop the ratio of deposits-to-assets of 11.5% for revealed banks ▸ earlier authorized loans
- Robust to alternative specifications ▸ loan controls ▸ deposit level

▸ adjusted assets

▸ revealed banks loans bonds

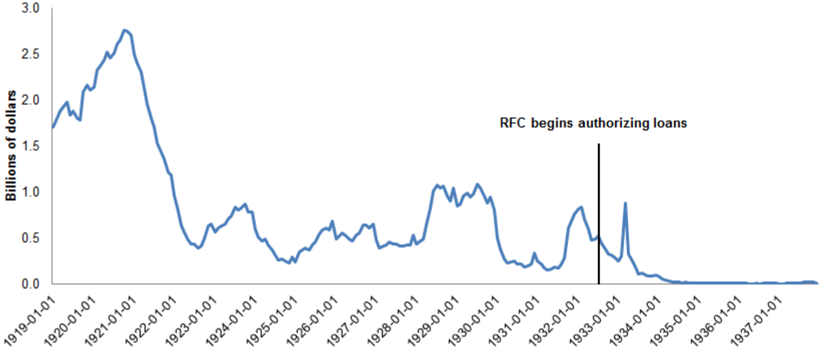
- Banks that never borrowed? ▸ deposit level all ▸ remaining liab ▸ sum stats never borrowed

Revealed banks hoarded cash

	$\frac{Loans}{Assets}_{i,t}$	$\frac{Bonds}{Assets}_{i,t}$
$Revealed_i \times \mathbb{I}\{t = List - 1\}$	-0.0108	0.0056
	(0.038)	(0.067)
$Revealed_i \times \mathbb{I}\{t = List\}$	-0.0244	0.0113
	(0.0181)	(0.0110)
$Revealed_i \times \mathbb{I}\{t = List + 1\}$	0.0195	0.0402***
	(0.0255)	(0.0154)
$X_{i,t-1}$	Yes	Yes
Bank Fixed Effects δ_i	Yes	Yes
Half-Year Fixed Effects η_t	Yes	Yes
Obs.	6256	6256
R^2	0.6036	0.6781

- limitations to the data

Total Borrowings of Depository Institutions from the Federal Reserve



Source: St. Louis Federal Reserve Economic Data

discount window

Effect on Deposits for Loans Authorized in July

	deposits over assets
$Revealed_i \times \mathbb{I}\{t = List - 1\}$	-0.0139
	(0.0124)
$Revealed_i \times \mathbb{I}\{t = List\}$	-0.0546**
	(0.0250)
$Revealed_i \times \mathbb{I}\{t = List + 1\}$	0.0231
	(0.0514)
$X_{i,t-1}$	Yes
Bank Fixed Effects δ_i	Yes
Half-Year Fixed Effects η_t	Yes
Obs.	2400
R^2	0.6213

july only

Effect on Deposits for Revealed Banks with Earlier Authorized Loans

	deposits over assets
$Revealed_i \times \mathbb{I}\{t = List - 1\}$	-0.0119
	(0.0118)
$Revealed_i \times \mathbb{I}\{t = List\}$	-0.0716**
	(0.0354)
$Revealed_i \times \mathbb{I}\{t = List + 1\}$	-0.0362
	(0.0547)
$X_{i,t-1}$	Yes
Bank Fixed Effects δ_i	Yes
Half-Year Fixed Effects η_t	Yes
Obs.	4771
R^2	0.6588

earlier authorized loans

Effect on Deposits
with Loan Controls

	deposits over assets
$Revealed_i \times \mathbb{I}\{t = List - 1\}$	-0.0034
	(0.0083)
$Revealed_i \times \mathbb{I}\{t = List\}$	-0.0473**
	(0.0224)
$Revealed_i \times \mathbb{I}\{t = List + 1\}$	-0.002
	(0.0284)
$X_{i,t-1}$	Yes
Bank Fixed Effects δ_i	Yes
Half-Year Fixed Effects η_t	Yes
Loan Controls	Yes
Obs.	6303
R^2	0.6690

loan controls

Effect on Deposit Levels

	log of deposit level
$Revealed_i \times \mathbb{I}\{t = List - 1\}$	-0.1134
	(0.1111)
$Revealed_i \times \mathbb{I}\{t = List\}$	-0.3699*
	(0.2302)
$Revealed_i \times \mathbb{I}\{t = List + 1\}$	0.2873
	(0.3133)
$X_{i,t-1}$	Yes
Bank Fixed Effects δ_i	Yes
Half-Year Fixed Effects η_t	Yes
Obs.	6207
R^2	0.6118

deposit level

Effect on Deposits

using adjusted assets

	deposits over adjusted assets
$Revealed_i \times \mathbb{I}\{t = List - 1\}$	-0.0137
	(0.0114)
$Revealed_i \times \mathbb{I}\{t = List\}$	-0.0518***
	(0.0201)
$Revealed_i \times \mathbb{I}\{t = List + 1\}$	0.0047
	(0.0283)
$X_{i,t-1}$	Yes
Bank Fixed Effects δ_i	Yes
Half-Year Fixed Effects η_t	Yes
Obs.	6303
R^2	0.5781

adjusted assets

Summary Statistics

Banks with loans authorized between July 10-31, 1932

As of June 30, 1932	Revealed Banks		Non-Revealed Banks		
	Mean	Std. Dev	Mean	Std. Dev	Diff. in Means
total assets	2597.3	5539.0	4537.54	6348.3	***
$\frac{\textit{Deposits}}{\textit{Assets}}$	0.7042	0.1189	0.7206	0.1005	
$\frac{\textit{Loans and Discounts}}{\textit{Assets}}$	0.6929	0.1664	0.6586	0.12355	*
$\frac{\textit{Bonds and Securities}}{\textit{Assets}}$	0.3067	0.1625	0.3414	0.1255	*

july stats

City Summary Statistics

As of June 30, 1932	No. of cities	% of revealed banks within a city	
		mean	max
All cities	817	22%	100%
Cities with 1 bank	252	53%	100%
Cities with at least 2 banks	565	12%	75%
Cities with at least 3 banks	318	11%	75%
Cities with at least 4 banks	204	10%	75%
Cities with at least 5 banks	140	11%	60%

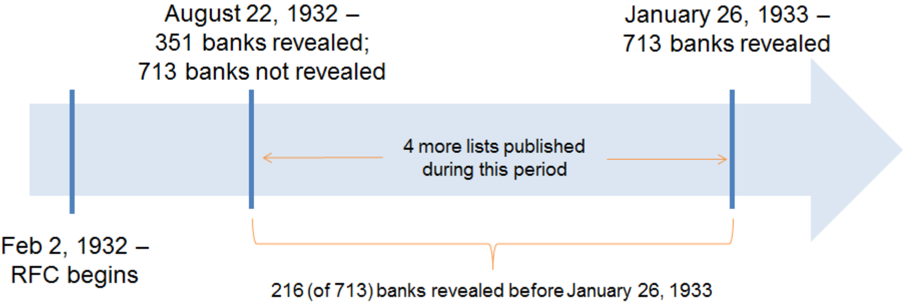
city stats

Summary Statistics on Failed Banks

	Total	Revealed	Not Revealed
Failed	315 (29.6%)	105 (29.9%)	210 (29.5%)
Failed btw. August 22, 1932 and January 26, 1933	75 (7.0%)	372 (9.2%)	43 (6.0%)
Failed after January 26, 1933	240 (22.6%)	73 (20.8%)	167 (23.4%)

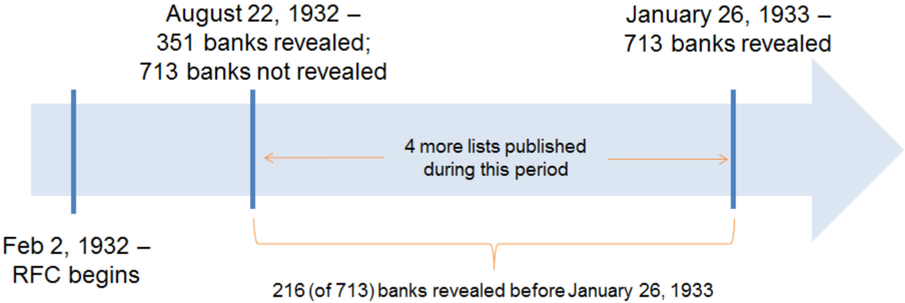
failure stats

Timeline



restricted control

Timeline



- 497 banks remain non-revealed on Jan. 26, 1933 = “Restricted Control Group”

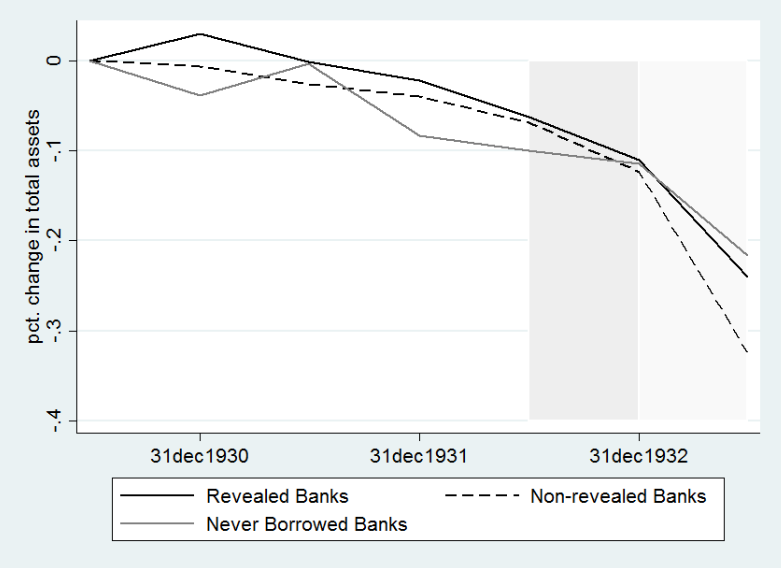
restricted control

Literature Review

- Literature on stigma
  - Armentier, Sarkar, Shrader, and Ghysels (2014); Furfine (2003); Kleymenova (2011); Ennis and Weinburg (2013)
- Literature on bank secrecy
  - Dang, Gorton, Holstrom, and Ordonez (2014); Hautcoeur, Riva, and White (2013)
- Literature on the Reconstruction Finance Corporation
  - Calomiris, Mason, Weidenmier, Bobroff (2013)

lit review

Trends in Bank Size



total assets

Trends in Deposit Levels

deposit level all

Trends in Remaining Liabilities

remaining liab

Summary Statistics

Banks that Never Borrowed

	Non-Revealed Banks (713)			Never Borrowed (130)			
	Obs.	Mean	Std. Dev	Obs	Mean	Std. Dev	Diff. in Mea
total assets	713	4664.2	6348.3	130	15812	27079	***
log(total assets)	713	7.95	0.92	130	8.44	1.63	***
$\frac{Deposits}{Assets}$	713	0.69	0.12	130	0.72	0.23	*
$\frac{Loans}{Assets}$	713	0.65	0.15	130	0.58	0.17	***
$\frac{Bond}{Assets}$	713	0.34	0.14	130	0.42	0.17	***
$\frac{Liabilities - Deposits}{Assets}$	713	0.31	0.12	130	0.28	0.22	***

sum stats never borrowed