Banking on Trust: Supervisory Transparency in Developing Economies

2nd CEMLA/Dallas Fed Financial Stability Workshop

Abhiman Das
Indian Institute of Management Ahmedabad

Tanmoy Majilla
Plaksha University

Rimmy E. Tomy
The University of Chicago

December 01, 2023

Motivation

- Ongoing debate in the banking sector on the pros and cons of disclosing the outcome of supervisory actions

  Pros:

  - Disclosure induces market discipline through higher price efficiency
  - Monitoring the regulator: holds regulators accountable, allays depositors' concerns that regulator may be privately forbearing

Motivation

- Ongoing debate in the banking sector on the pros and cons of disclosing the outcome of supervisory actions

  Cons:

  - Increased transparency could lead to financial instability and bank runs
  - May reduce ex-ante risk sharing incentives
  - Limits regulators' ability to forbear
  - May make banks less likely to collaborate with the regulator

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- **We study the implications of the disclosure of supervisory actions in a developing market setting**

Why study developing markets?

- Weak institutions and low trust in formal institutions
  - Delineate the **role of trust in institutions** on depositors' actions
- **Policy relevance**: Supervisory actions in developing countries tend to be motivated by international best practices
  - May not be desirable for disclosure policy

Research question

- How do depositors in a developing economy react to disclosures of bank supervisory actions?
  - Do depositors withdraw their funds in response to news of large regulatory penalties on banks?
  - Does trust in public institutions influence depositors' reactions?
  - Are credit and local economic activity affected?

Main findings

- Depositors of offending and neighboring banks react to large regulatory penalties
  - Deposits of offending banks decline by a relative 15%–17%
  - Deposits of neighboring nonoffending banks decline by 3%–10%
- Trust in public institutions influences depositors' reactions
- Credit and economic activity decline in regions with greater exposure to offending banks

Institutional background

- The Reserve Bank of India (RBI) regulates India's commercial banks, which account for 91% of banking sector assets
    - RBI issues enforcement actions and monetary penalties against errant banks
    - Penalties are the primary enforcement tool: Enforcement actions against commercial banks are infrequent
    - Penalties were publicly disclosed starting November 2004
        - Disclosed in RBI press releases
        - Footnote disclosure in banks' financial statements
        - Covered by the news media

Penalties issued against commercial banks

- Penalties against commercial banks were rare before 2004, and minor up until 2012
- Only in 2013 were large and significant penalties ($\geq$ ₹10 million) issued, following a sting operation by the investigative journalist website *Cobrapost*
- Public uproar led the RBI to thoroughly examine all commercial banks' financial records, internal controls, and compliance mechanisms
- The RBI issued penalties for non-compliance with various regulations, particularly anti-money laundering rules

RBI disclosures

प्रेस प्रकाशनी PRESS RELEASE

भारतीय रिज़र्व बैंक

RESERVE BANK OF INDIA

वेबसाइट : www.rbi.org.in/hindi
Website : www.rbi.org.in
इ-मेल email: helpdoc@rbi.org.in

संचार विभाग, केंद्रीय कार्यालय, एस.बी.एस.मार्ग, मुंबई-400001
DEPARTMENT OF COMMUNICATION, Central Office, S.B.S.Marg, Mumbai-400001
फोन/Phone: 91 22 2266 0502 फैक्स/Fax: 91 22 22660358

June 10, 2013

RBI penalises Axis Bank, HDFC Bank and ICICI Bank

The Reserve Bank has imposed a monetary penalty on Axis Bank, HDFC Bank and ICICI Bank for violating Reserve Bank of India instructions. The details of the penalty are:

Bank	Penalty amount (₹ in lakh)
Axis Bank Ltd.	500.10
HDFC Bank Ltd.	450.00
ICICI Bank Ltd.	100.10

The penalties have been imposed in exercise of powers vested in the Reserve Bank under the provisions of Section 47(A)(1)(c) read with Section 46(4)(i) of the Banking Regulation Act, 1949,

It may be recalled that the Reserve Bank of India had carried out a scrutiny of books of accounts, internal control, compliance systems and processes of these three banks at their corporate offices and some branches during March / April 2013 to investigate into the allegations of contravention of KYC/AML guidelines against them. The scrutiny of these three banks revealed violation of certain regulations and instructions issued by Reserve Bank of India, namely,

- non-observance of certain safeguards in respect of arrangement of "at par" payment of cheques drawn by cooperative banks,
- non-adherence to certain aspects of know your customer (KYC) norms and anti money laundering (AML) guidelines like risk categorisation and periodical review of risk profiling of account holders,
- Non-adherence of KYC for walk in customers including for sale of third party products, omission in filing of cash transaction reports (CTRs) in respect of some cash transactions, sale of gold coins for cash beyond Rs. 50000,
- not-obtaining of permanent account number (PAN) card details or form 60/61 as required,
- non-verification of source of funds credited to a few non-resident ordinary (NRO) accounts,
- failure to re-designate a few accounts as NRO accounts though required, non-submission of proper information called for by the reserve Bank, etc.

The investigation did not reveal any prima facie evidence of money laundering. However, any conclusive inference in this regard can be drawn only by an end to end investigation of the transactions by tax and enforcement agencies.

Based on the findings of the scrutiny, the Reserve Bank issued a show cause notice to each of these banks, in response to which the individual banks submitted written replies. After considering the facts of each case and individual bank's reply, as also, personal submissions, information submitted and documents furnished, the Reserve Bank came to the conclusion that some of the violations were substantiated and warranted imposition of monetary penalty as determined above.

A similar scrutiny was also conducted at the corporate offices of 36 other banks during April and May 2013. The process of follow up action in respect of these banks is at different stages of its completion.

Alpana Killawala
Chief General Manager

Press Release : 2012-2013/2071

Data and sample

- Branch-level deposit and credit data from the RBI's proprietary "Basic Statistical Returns" (BSR) dataset
  - Sample from 2000–2014
  - Aggregate deposits at the branch level
- Bank-level data from the Centre for Monitoring Indian Economy (CMIE) Prowess database
- Data on trust in public institutions from the India Human Development Survey
- Data on demographic and spatial characteristics from various sources
- District-level GDP from Indicus Analytics
- Data on human-generated nighttime light intensity from the Socioeconomic High-Resolution Rural-Urban Geographic Platform for India (SHRUG)

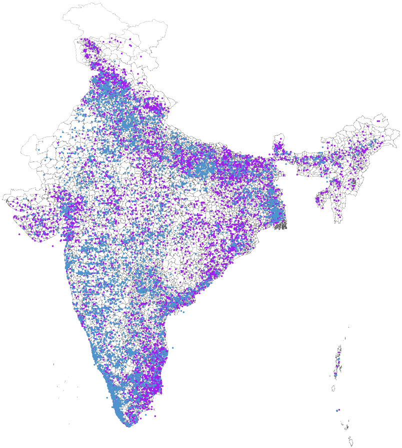
- **Sample: 41,377 branches for 45 banks; balanced sample for 15 years**

Descriptive statistics

- Treated banks are larger on average, but similar along other key dimensions

	Treatment			Control			Difference in means	
	N	Mean	Std	N	Mean	Std	Difference	t-Statistic
Capital Ratio	22	13.14	1.42	23	20.201	17.456	7.061	1.933
Nonperforming Assets Ratio	22	1.195	0.727	23	0.916	0.768	-0.279	(-1.251)
Return on Assets	22	0.933	0.628	23	1.254	0.739	0.321	1.571
Size	22	14.173	1.14	23	12.603	1.847	-1.570**	(-3.448)

Spatial distribution of branches



- Treated (purple) and control (blue) branches are geographically spread out
- Our model specifications include district fixed effects

Depositor response to regulatory penalties

- Difference-in-differences (DiD) specification:

$$\begin{aligned} Y_{it} = {} & \beta_0 + \beta_1 \textit{Treatment}_i + \beta_2 \textit{Post}_t \\ & + \beta_3 \textit{Treatment}_i \times \textit{Post}_t + \gamma X_{it-1} + \alpha_i + \delta_t + \epsilon_{it}, \end{aligned} \tag{1}$$

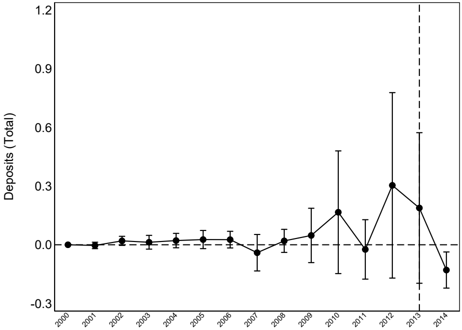
- Y_{it}: Log of total deposits at branch i in year t
- *Treatment*: Indicator for banks that received the large penalties in 2013
- *Post*: Indicator for the year 2014
- X: Vector of bank-specific controls in the year prior to the treatment year, includes size (the natural log of total assets), capital ratio, nonperforming assets ratio, and return on assets
- Include branch and year FE; district; district $\times$ year FE

Change in deposits following regulatory penalties

- Banks that receive large penalties witness a 15%–17% decline in deposits

	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)
Treatment × Post	-0.184***	-0.184***	-0.163***
	(-2.958)	(-2.956)	(-2.765)
Observations	620,655	620,640	620,355
Adjusted R^2	0.906	0.481	0.484
Bank controls	Yes	Yes	Yes
Year FE	Yes	Yes	No
Branch FE	Yes	No	No
District FE	No	Yes	No
District × Year FE	No	No	Yes

Coefficients plot



- Relative to control sample, treated banks witness a decline in deposits in 2014
- No discernible pre-trends
- Increased volatility in deposits following the financial crisis as GDP and income decline

Exposure to treatment

- Concern with DiD analysis: Penalties are not randomly assigned, unobserved factors could drive results
- **Branch location is quasi-random:** RBI policy to encourage banks to open branches in unbanked areas
  - Districts are differently treated based on location of branches
- Estimate at district (d)-level:

$$Y_{dt} = \beta_0 + \beta_1 Exposure_d + \beta_2 Post_t + \beta_3 Post_t \times Exposure_d + \alpha_d + \delta_t + \epsilon_{dt}$$

  - *Exposure*: Number of branches of offending banks scaled by the total number of branches in a district, in percent, measured prior to treatment

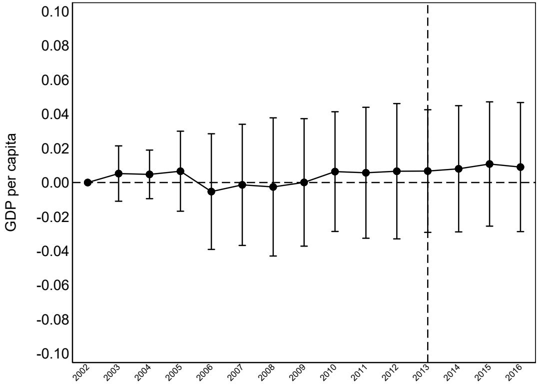
Exposure to treatment

	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)	(4)
Exposure × Post	-0.002***	-0.002***		
	(-3.347)	(-3.347)		
Exposure (indicator) × Post			-0.073***	-0.073***
			(-5.948)	(-5.948)
Observations	9,495	9,495	9,495	9,495
Adjusted R^2	0.192	0.988	0.195	0.988
Year FE	Yes	Yes	Yes	Yes
District FE	No	Yes	No	Yes

- A one percent increase in *Exposure* is associated with a 0.2% decline in district-level deposits

Robustness: Local economic conditions

- Treatment occurs in a single period for all units, we study impact in the next period
- Concern: Treated units could be located in economically worse regions



- No systemic differences in district-level GDP for treated and control units

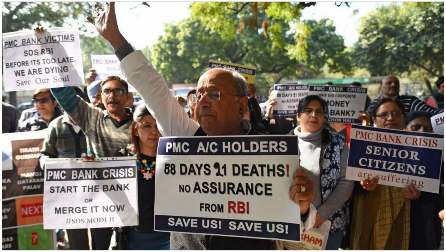
Deposit insurance is not very effective

BBC NEWS

PMC Bank collapse: 'We lost our money and then our son'

25 September 2020

When India's Punjab and Maharashtra Co-operative Bank (PMC) went under in 2019, nearly a million depositors were cut off from their life's savings. One year later, many are still waiting for their money, reports the BBC's Nidhi Rai.



Depositors have been protesting against the bank for months

- Insurance limit was low at ₹100,000 ($\sim$ \$1,200) for our sample years
- Restrictions on withdrawals in case of bank crisis: could be as low as ₹1,000 ($\sim$ \$12)
  - Could significantly affect small depositors with low savings and limited buffer against income shocks

Trust in institutions and depositors' actions

- Developing markets have weaker institutions and a lower trust in them
  - Trust in public institutions could determine depositors' beliefs about what the penalties indicate:
    - Systemic deficiencies in the management and supervision of all banks (withdraw funds from all banks)

      OR

    - The regulator correctly identifies and disciplines bad banks (reallocate capital to good banks)

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      OR

    - The regulator correctly identifies and disciplines bad banks (reallocate capital to good banks)
  - Study deposits at neighboring nonoffending branches
    - If depositors reallocate capital, they would move funds to neighboring banks
    - Depositors located near treated banks are more likely to learn about penalties

Deposits at neighboring nonoffending branches

- Word-of-mouth channels or social network effects operate in the local neighborhood of the treated banks
- Could directly observe the actions of offending banks' depositors

A bank run at Sri Guru Raghavendra Sahakara Bank in Bangalore, January 14, 2020.

Deposits at neighboring nonoffending branches

- Estimate variations of the following model:

$$Y_{it} = \beta_0 + \beta_1 Treatment_i + \beta_2 Neighbor + \beta_3 Post_t + \beta_4 Treatment_i \times Post_t \\ + \beta_5 Neighbor_i \times Post_t + \gamma X_{it-1} + \alpha_i + \delta_t + \epsilon_{it}$$

- *Neighbor*: Indicator for nonoffending banks' branches located in the offending bank's zip code

Deposits at neighboring nonoffending branches

- Neighboring banks witness a 3%–10% decline in deposits

	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)
Treatment × Post	-0.267***	-0.267***	-0.192***
	(-4.434)	(-4.432)	(-3.557)
Neighbor × Post	-0.100***	-0.100***	-0.033**
	(-7.515)	(-7.511)	(-2.097)
Observations	620,655	620,640	620,355
Adjusted R^2	0.906	0.481	0.484
Bank controls	Yes	Yes	Yes
Year FE	Yes	Yes	No
Branch FE	Yes	No	No
District FE	No	Yes	No
District × Year FE	No	No	Yes

- Results are consistent with a lack of trust in public institutions
  - I.e., a lack of trust in the regulator and the associated institutions responsible for appointing and empowering the regulator to fulfill its obligations effectively
- Depositors may believe that penalties on some banks are indicative of systemic deficiencies in the management and supervision of all banks

Measuring trust in public institutions

- Data from the India Human Development Survey, a nationally representative survey of 42,152 households
  - Survey respondents were asked: *I am going to name some institutions in the country. As far as the people running these institutions are concerned, would you say you have (1) A great deal of confidence, (2) Only some confidence, and (3) Hardly any confidence at all*
    - Politicians (to fulfill promises)
    - State government (to look after the people)
    - Village panchayats (to implement public projects)
    - Courts (to deliver justice)
    - Banks (to keep money safe)
- Trust in Village panchayats (local government), courts, and banks are associated with depositors withdrawing funds

Trust in institutions and change in deposits

	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Treatment × Post	-0.260***	-0.260***	-0.267***	-0.267***	-0.253***	-0.253***	-0.261***	-0.261***	-0.238***	-0.238***
	(-3.814)	(-3.814)	(-4.348)	(-4.348)	(-4.289)	(-4.289)	(-4.078)	(-4.078)	(-4.437)	(-4.437)
Neighbor × Post	-0.095***	-0.095***	-0.100***	-0.100***	-0.098***	-0.098***	-0.107***	-0.107***	-0.079***	-0.079***
	(-7.592)	(-7.592)	(-7.684)	(-7.684)	(-7.314)	(-7.314)	(-8.568)	(-8.568)	(-5.971)	(-5.971)
Treatment × Post × Trust (Politicians)	0.041	0.041								
	(0.543)	(0.543)								
Neighbor × Post × Trust (Politicians)	0.027	0.027								
	(1.391)	(1.391)								
Treatment × Post × Trust (State Government)			0.045	0.045						
			(0.760)	(0.760)						
Neighbor × Post × Trust (State Government)			0.014	0.014						
			(0.841)	(0.841)						
Treatment × Post × Trust (Village Panchayat)					0.083***	0.083***				
					(3.107)	(3.107)				
Neighbor × Post × Trust (Village Panchayat)					0.021	0.021				
					(1.235)	(1.235)				
Treatment × Post × Trust (Courts)							-0.073	-0.073		
							(-1.600)	(-1.600)		
Neighbor × Post × Trust (Courts)							0.043***	0.043***		
							(2.719)	(2.719)		
Treatment × Post × Trust (Banks)									-0.053	-0.053
									(-1.044)	(-1.044)
Neighbor × Post × Trust (Banks)									0.051*	0.051*
									(1.900)	(1.900)
Observations	620,265	620,265	620,265	620,265	620,265	620,265	620,265	620,265	620,265	620,265
Adjusted R^2	0.906	0.311	0.906	0.312	0.906	0.311	0.906	0.311	0.906	0.341
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Branch FE	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Bank FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

- Economic magnitudes:

	High trust($\mu + \sigma$)	Low trust($\mu - \sigma$)
Trust (Village Panchayat)	16% decline	29% decline
Trust (Courts)	6% decline	14% decline
Trust (Banks)	3% decline	12% decline

What determines trust in institutions?

- Estimate the following model at the state (s)-level:

$$
\begin{aligned}
Trust_s = \beta_0 &+ \beta_1 Enforcement_s + \beta_2 Conflict_s + \beta_3 Social\ Cohesion_s \\
&+ \beta_4 Information\ Access_s + \beta_5 Quality\ of\ Local\ Services_s \\
&+ \beta_6 Corruption_s + \beta_7 Crime_s \\
&+ \beta_8 Demographics_s + \beta_9 Macro_s + \epsilon_s
\end{aligned}
$$

  - Use 43 different measures for these nine predictor variables
  - PCA to reduce dimensionality

Determinants of trust in institutions

- *Information Access* and the *Quality of Local Services* are significantly associated with trust that drives depositors' actions

	Trust (Village Panchayat)	Trust (Courts)	Trust (Banks)
	(1)	(2)	(3)
Enforcement	0.000	0.000	0.000
	(0.064)	(0.639)	(0.733)
Conflict	-0.032	-0.028	0.023
	(-1.044)	(-0.645)	(0.675)
Social Cohesion	-0.005	-0.005	-0.018
	(-0.562)	(-0.389)	(-1.724)
Information Access	0.087**	0.109**	0.028
	(2.680)	(2.363)	(0.775)
Quality of Local Services	0.003	0.035	0.050**
	(0.207)	(1.450)	(2.665)
Corruption	0.018	-0.010	0.031
	(0.705)	(-0.278)	(1.093)
Crime	0.005	0.004	-0.008
	(0.244)	(0.122)	(-0.345)
College Degree	-0.509	0.653	1.474*
	(-0.738)	(0.663)	(1.900)
Unemployment Rate	-0.081	0.170	0.307
	(-0.310)	(0.457)	(1.045)
Per Capita GDP	0.000	0.001	-0.001
	(0.480)	(0.630)	(-0.942)
Constant	0.306**	0.417**	0.684***
	(2.353)	(2.248)	(4.685)
Observations	28	28	28
Adjusted R^2	0.256	0.388	0.485

Determinants of trust in institutions

- *Information Access* is the first principal component of:
  - Local news circulation
  - Survey responses on the perceived confidence in the news media to disseminate the truth
- *Quality of Local Services* is the first principal component of survey responses on the perceived confidence in:
  - Police (to enforce the law)
  - Private hospitals (to provide good treatment)
  - Government-run hospitals (to provide good treatment)
  - Private schools (to provide good education)
  - Government-run schools (to provide good education)

Determinants of trust and changes in deposits

	Deposits (Total)	Deposits (Total)
	(1)	(2)
Treatment × Post	-0.274***	-0.274***
	(-4.542)	(-4.434)
Neighbor × Post	-0.107***	-0.107***
	(-8.216)	(-8.806)
Treatment × Post × Information Access	0.068	
	(1.553)	
Neighbor × Post × Information Access	0.061***	
	(3.302)	
Treatment × Post × Quality of Local Services		0.039
		(1.256)
Neighbor × Post × Quality of Local Services		0.040***
		(4.166)
Observations	620,265	620,265
Adjusted R^2	0.906	0.906
Bank controls	Yes	Yes
Year FE	Yes	Yes
Branch FE	Yes	Yes

- Economic magnitudes:

	High trust($\mu + \sigma$)	Low trust($\mu - \sigma$)
Information Access	5% decline	14% decline
Quality of Local Services	7% decline	13% decline

Changes in credit

- Lending could be independent of deposits at the branch level
  - Deposits are movable across branches, some branches are primarily deposit-taking, branches have more flexibility in setting loan rates than deposit rates
  - Access to alternative wholesale sources of funding

	Total loans	Total loans	Total loans
	(1)	(2)	(3)
Treatment × Post	0.005	0.001	0.020
	(0.139)	(0.038)	(0.608)
Neighbor × Post	-0.064***	-0.068***	-0.032**
	(-3.094)	(-3.268)	(-2.216)
Observations	620,398	620,398	620,308
Adjusted R^2	0.901	0.493	0.493
Bank controls	Yes	Yes	Yes
District controls	Yes	Yes	No
Year FE	Yes	Yes	No
Branch FE	Yes	No	No
District FE	No	Yes	No
District × Year FE	No	No	Yes

- Neighboring banks witness a 3%–7% decline in total outstanding loans relative to nonoffending and nonneighboring branches

Changes in economic activity

- Nighttime light intensity as a measure of economic activity
- More granular than GDP: Captures changes in productive activity between various towns/villages within a district
- *Exposure (Town/Village):* number of branches of offending banks scaled by the total number of branches in a town/village, in percent, measured prior to treatment
- Data from 2012–2021

	Night Luminosity (Mean)	Night Luminosity (Mean)	Night Luminosity (Max)	Night Luminosity (Max)
	(1)	(2)	(3)	(4)
Exposure (Town/Village) × Post	-0.00029***	-0.00029***	-0.00042***	-0.00042***
	(-5.914)	(-5.914)	(-5.283)	(-5.283)
Observations	111,040	111,040	111,040	111,040
Adjusted R^2	0.038	0.950	0.022	0.937
Year FE	Yes	Yes	Yes	Yes
Town/Village FE	No	Yes	No	Yes

- Long-term decline in productive activity in regions more exposed to offending banks
- A one percent increase in exposure to offending banks is associated with a relative 0.03%–0.04% decline in nightlights luminosity

Where do the withdrawn deposits go?

- Some withdrawn deposits go to state-owned smaller regional rural banks
  - Greater local expertise
  - Officers belong to the local community and speak the local language, therefore are more trusted

	Deposits (Regional Rural)	Deposits (Regional Rural)	Deposits (Regional Rural)	Deposits (Regional Rural)
	(1)	(2)	(3)	(4)
Exposure $\times$ Post	-0.005**	0.003		
	(-2.199)	(1.537)		
Exposure (indicator) $\times$ Post			-0.086	0.145**
			(-1.092)	(2.279)
Observations	7,908	7,900	7,908	7,900
Adjusted R^2	0.280	0.884	0.254	0.884
Year FE	Yes	Yes	Yes	Yes
District FE	No	Yes	No	Yes

Summary and conclusion

- We examine the consequences of the disclosure of bank supervisory actions in a developing economy
- Depositors withdraw funds from both offending and neighboring nonoffending banks
- Trust in public institutions (local government, courts, and banks) plays a role in depositors' decisions to withdraw funds
  - Such trust is determined by local information access and the quality of local services
- Decline in deposits is associated with a decline in credit and local economic activity
- Some evidence that deposits move to smaller regional rural banks that are more trusted