

# Supervisory Transparency and Depositor Diversity: Bank Oversight in Developing Economies

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# Motivation

- Effective supervision should ensure that banks comply with **anti-money laundering and countering financing of terrorism (AML/CFT)** requirements
- Yet, it is controversial whether AML/CFT supervisory actions should be **disclosed**
- **This paper:** Disclosure of negative AML/CFT supervisory actions leads to deposits withdrawals when trust in institutions is low ex ante
  - Bad news on supervisory actions w/assymmetric information + low institutional trust → rationality for runs on **solvent banks**
  - Unintended effect on prudential supervisory goals with implications for real economy
- Findings relevant for design & implementation of an **effective safety net** and for customizing supervisory practices to **weaker institutional environments**

# This Paper

## - Approach:

- Diff-in-diff regression for savings deposits of branch  $i$  from bank  $b$ :

$$\log(\text{Deposits})_{i,t} = \beta_0 + \beta_1 \cdot (\text{Offender}_b \times \text{Post}_t) + \text{Bank characteristics}_{b,t-1} + \beta_i + \beta_t + \epsilon_{i,t},$$

- where *Offender*: Indicator for bank that received large penalties
- Alternative model: Regresses deposits on district's exposure to offending branches

## - Findings:

- $\beta_1$  *negative* → Deposits decline by 17% more in branches of offending than of nonoffending banks after penalties imposed
- Negative effect also on deposits from nonoffending neighboring branches
- Effects vary with trust in local governments, courts, and banks
- Negative effects on credit by nonoffending neighboring branches
- Evidence that withdrawn deposits go to regional rural banks

# My Main Comments

## 1. Identification

1.1 Diff-in-diff

1.2 District-level regression

## 2. Tracking deposits' trajectory

## 3. Mechanisms - Demand versus supply

## 4. Other comments & suggestions

## #1.1: Identification - Diff-in-diff

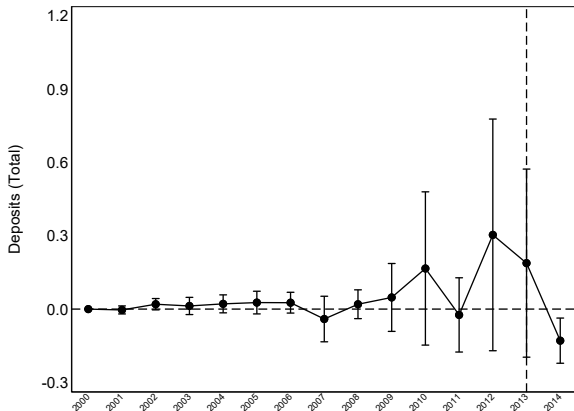
- **Assumptions:**

1. **Parallel trends** in deposits of penalized and non-penalized banks

# #1.1: Identification - Diff-in-diff

## - Assumptions:

### 1. Parallel trends in deposits of penalized and non-penalized banks



- Pre-trends cannot be ruled out
- Reverse causality: If offending banks were facing deposits' withdrawals before 2013 (Acharya et al., 2022), they may have cut back compliance spending and explicitly facilitated financial crimes to increase profits & deposits
- Formally test assumption (see, e.g., Rambachan & Roth, 2023; Freyaldenhoven et al., forthcoming)
- Try to get deposit data at higher frequency or for more post-treatment yrs
- Base year should be that prior to disclosure

## #1.1: Identification - Diff-in-diff

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1. **Parallel trends** in deposits of penalized and non-penalized banks
2. **No anticipation:** Being penalized in 2013 has no causal effects in deposits prior to 2013
  - Define when exactly “post” period starts
  - Provide narrative on its plausibility (not supported by dynamic estimates)

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- **Assumptions:**
  1. **Parallel trends** in deposits of penalized and non-penalized banks
  2. **No anticipation:** Being penalized in 2013 has no causal effects in deposits prior to 2013
    - Define when exactly “post” period starts
    - Provide narrative on its plausibility (not supported by dynamic estimates)
  3. **No spillovers** (stable unit treatment value, SUTVA): A penalized bank (branch) cannot impact a non-offending bank (branch) such that its potential outcomes change
    - The effects on neighboring branches imply spillover effects
    - See Butts (2023) and Huber & Steinmayr (2021) for extensions of diff-in-diff with spillover effects



## #1.2: Identification - District-level regression

- Regression model for deposits of district  $d$ :

$$\log(\text{Deposits})_{d,t} = \beta_0 + \beta_1 \cdot (\text{Exposure}_d \times \text{Post}_t) + \beta_d + \beta_t + \epsilon_{d,t},$$

- where  $\text{Exposure} = \frac{\sum_{b \in \text{Offend.}} \# \text{Bank-}b \text{ branches in } d}{\sum_b \# \text{Bank-}b \text{ branches in } d}$

- **Assumption:** Districts' exposure to offending branches is exogenous
  - No unobserved shocks should affect  $\epsilon_{d,t}$  via the same or correlated exposures

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- Is it plausible **ex ante**?
  - Paper argues quasi-random branch location  $\rightarrow$  For financial inclusion, regulator requires that at least a quarter of new branches a bank opens are rural
  - More broadly, what determines whether districts have more branches of (larger) offending vs. non-offending banks? Are there unobservables correlated with anything about that distribution?

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- **Assumption:** Districts' exposure to offending branches is exogenous
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- **Ex-post tests:**
  - Authors show dynamic estimates with no pre-trends on district's GDP (from eq. [2]?)
  - More important, show no pre-trends on deposits using dynamic estimates of eq. (2)
  - Use balance tests to show that observables are not systematically correlated with districts' exposures

## #2: Tracking deposits' trajectory

- Before analyzing mechanisms & effects on credit and economic activity, investigate which banks **lose** or **attract** deposits

### 1. Which banks were penalized? Do all penalized banks lose deposits?

- Estimate results by bank type:

$$\log(\text{Deposits})_{d,t} = \beta_0 + \sum_j \beta_j \cdot (\text{Exposure}_d^j \times \text{Post}_t) + \beta_d + \beta_t + \epsilon_{i,t},$$

- where  $\text{Exposure}^j = \frac{\sum_{b \in \{j; \text{Offend.}\}} \# \text{Bank-}b \text{ branches in } d}{\sum_b \# \text{Bank-}b \text{ branches in } d}$ ;  $j \in \{\text{public urban, public rural, private, ...}\}$

## #2: Tracking deposits' trajectory (cont.)

### 2. Where do the withdrawn deposits go?

- "in untabulated analysis, we do not find any evidence that deposits flee to **public sector banks** [...]"
- Evidence that deposits go to **regional rural banks**
- I suggest providing more comprehensive analysis by estimating:

$$\log(\text{Deposits at type-}j \text{ bank})_{d,t} = \beta_0 + \sum_j \beta_j \cdot (\text{Exposure}_d^j \times \text{Post}_t) + \beta_d + \beta_t + \epsilon_{d,t}$$

- All withdrawn deposits may not have been reallocated to nonoffending (& nonneighboring) branches of the same district
- Other possible destinations (matters to analyze impact on local economic activity):
  - **Outside the banking system:** bonds & other financial instruments, cash hoarding, family loans, mortgage down payment, consumption, investment in business
  - **Banks in other districts**

## #3: Mechanisms - Demand versus supply

1. **Demand-side mechanism: Penalties** → banks' deposit demand
2. **Supply-side mechanism: Disclosure** of penalties → customers' deposit supply

# #3: Mechanisms - Demand versus supply

## 1. Demand-side mechanism: Penalties → banks' deposit demand

- After being penalized, banks close or open fewer accounts to comply with KYC/AML regulations. Neighboring branches learn from those penalties and follow suit
  - Should not create cascade effects
  - Findings specific to AML/CFT penalties
- Main effects increasing in size of penalty burden → Conditional on bank  $b$  being penalized, estimate:

$$\log(\text{Deposits})_{i,t} = \beta_0 + \beta_1 \cdot \left[ \left( \frac{\text{Penalty value}}{\text{Revenue}} \right)_b \times \text{Post}_t \right] + \dots + \beta_b + \beta_t + \epsilon_{i,t},$$

- where  $\beta_1 < 0$  if driven by bank deposit demand
- Estimate benchmark model for **prices** (deposit rates): No change if demand driven;  $\uparrow$  if supply driven

### #3: Mechanisms - Demand versus supply (cont.)

#### 2. **Supply-side mechanism: Disclosure** of penalties → customers' deposit supply

- What are the expected effects of trust in state, banks, courts? Do they vary by type of lender?
  - Half of large penalties went to **public banks**, whose deposits have an **implicit state guarantee** and attract deposits from private banks in crises times (Acharya et al., 2022)
    - **Trust in state** should matter more and **trust in banks** less for withdrawals from **public banks**
- Estimate heterogeneous effects of trust by bank type:

$$\log(\text{Deposits})_{i,t} = \beta_0 + \sum_j \beta_j \cdot \left( \text{Offender}_b^j \times \text{Post}_t \times \text{Trust}_s \right) + \dots + \beta_b + \beta_t + \epsilon_{i,t},$$

- where  $j \in \{\text{public urban, public rural, private, ...}\}$  and  $s \in \{\text{state, courts, banks}\}$
- Try to get proxies of trust at a more granular (district) level
  - Do 36 entities provide enough detail? Is the IHDS representative at the state level?



## #4: Other comments & suggestions

- Can withdrawals be a form of market discipline by depositors towards offending banks?
- In estimates at the branch-level:
  - Use a bank-level subscript for treatment variable and bank-level controls
  - Regression adjustment: Interact the treatment variables with the demeaned controls in  $X_{i,t-1}$ .
  - Also estimate specifications with bank (instead of branch) FEs and bank- (branch-)specific time trends
  - Control for bank's liquidity ratio (liquidity risk may drive bank runs)
  - Figure 2: Fully interact equation with year FEs (i.e., also covariates and branch FEs)
- In estimates at the district-level:
  - How many districts in the sample? How many bank branches per district on average?
  - Also measure exposure: i) including neighboring nonoffending branches and ii) using pre-2013 branch size (e.g. deposits, revenue) rather than number
- Discuss economic significance of estimates
- Check why the following point estimates are almost identical always: i) with branch or district FE in equations (1) and (3), ii) with or without district FE in equation (2), iii) with branch or bank FE in equation (4), and iv) with or without town\ village FE in equation (6).

# Conclusion

- My main recommendations: Strengthening the tests of the identifying assumptions and separating demand- from supply-side mechanisms
- **Important and timely topic:** Deposit runs remain key concern for financial stability, as proven by the episodes of early March, and jeopardize sustainability of commercial bank business model
- Looking forward to read a future version!