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Banking on Trust: Supervisory Transparency and Depositors' Actions

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Banking on Trust: Supervisory Transparency and Depositors' Actions*

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Abstract

We explore the role of institutional trust in influencing depositors' reactions to bank supervisory actions in India. Utilizing a unique event that led to unexpected penalties on banks and the quasi-random nature of branch locations, we find news of penalties on some banks leading to deposit withdrawals from offending and neighboring nonoffending branches. Such withdrawals are more pronounced in regions with lower trust in public institutions, including trust in courts and banks. Trust is associated with information access and the quality of local services. We find limited evidence that credit and economic activity also decline in regions with deposit withdrawals.

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1. Introduction

Trust in public institutions is crucial for a well-functioning banking system because it critically influences depositors' decisions to entrust their funds to banks. Extant literature has explored the factors that determine consumers' trust in banks and public institutions (Fungáčová et al., 2019; Jansen et al., 2015; van der Cruijsen et al., 2023), and how such trust is affected by certain adverse events such as the global financial crisis (Knell & Stix, 2015; Sapienza & Zingales, 2012; Stevenson & Wolfers, 2011). However, few studies carry forward this line of work to explore how trust influences consumers' financial decisions. Exceptions include Osili & Paulson (2014), who find that immigrants who experienced a banking crisis in their home countries are less likely to use banks in the United States, and Van Der Cruijsen et al. (2012), who find that consumers manage their savings accounts more actively following the financial crisis. Building on this foundation, we explore how trust affects depositors' decisions to withdraw funds in response to supervisory penalties, thus extending our understanding of consumers' financial decisions in times of institutional distress. We also examine the effect of such withdrawals on credit and local economic activity.

We use the setting of a developing country (India) where trust in public institutions is generally low, yet there is significant state-level variation in such trust (Mallick et al., 2023). We utilize a unique event that resulted in significant and unexpected supervisory penalties on several large banks. Depositors' reactions to these penalties would depend crucially on their trust in the regulator and the institutions that appoint and empower the regulator to fulfill its duties. If depositors perceive such institutions to be weak and ineffective, they may view penalties on some banks as indicative of systemic deficiencies in the management and supervision of all banks, causing them to withdraw funds from the banking system. Conversely, if depositors believed that the regulator correctly identified problem banks, they may reallocate funds to other banks thereby effectively imposing market discipline.

To understand how trust influences depositors' actions, we focus on the branches of nonoffending banks located in the vicinity of the offending banks' branches. We focus on these neighboring branches for several reasons. If depositors reallocate capital within the banking system, they will likely move funds to these neighboring branches. On the other hand, if depositors remove their funds from the banking system altogether, neighboring branches should also witness a decline in

deposits. Furthermore, depositors located near offending banks' branches are more likely to know about the penalties—through word-of-mouth, neighborhood social networks, or observation of other depositors' actions.

The Reserve Bank of India (RBI) regulates India's commercial banks, which make up 91% of the assets of the banking sector (RBI, 2022). The RBI can issue enforcement actions and monetary penalties against errant commercial banks. However, enforcement actions against commercial banks are infrequent, and the regulator generally uses penalties as its primary enforcement tool. In fact, at the time of our study, no commercial banks were subject to enforcement actions; thus, the imposition of penalties was of significant consequence. These penalties have been publicly disclosed in RBI press releases and footnote disclosures in banks' annual reports starting in November 2004. With the disclosure regime change in 2004, RBI also released information on penalties imposed prior to the date of disclosure. While most penalties were issued against nonbanking financial institutions and small cooperative banks, a few penalties were also issued against commercial banks. However, these penalties were generally minor, ranging from ₹0.5 million to ₹1.5 million ($6,048 to $18,144).[1]

It was only in 2013 that the RBI imposed large and significant penalties of ₹10 million ($120,963) and above on commercial banks following investigative reporting by the news media. Specifically, in 2013, the news website *Cobrapost* investigated three major private sector banks and unveiled videos where top executives and staff from these banks advised an undercover journalist on money laundering techniques. The public's uproar over this revelation led the RBI to thoroughly examine *all* commercial banks' financial records, internal controls, and compliance mechanisms at their main offices and several branches.[2] These penalties were large and unprecedented, and had significant media coverage. Therefore, this incident provides a unique setting to study depositors' reactions to supervisory actions. If depositors were ever predisposed to respond to supervisory interventions, this particular context would elicit a reaction.[3]

[1] USD amounts are calculated at an exchange rate of 82.67 INR/USD throughout.

[2] See, for example, "*Cobrapost* exposé: Reserve Bank slaps fine on three banks," *The Hindu*, June 10, 2013.

[3] Although the penalties were issued mainly for violations of regulations related to money laundering, the RBI explicitly stated that "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." (See, for example, "RBI penalises Axis Bank, HDFC Bank and ICICI Bank," *RBI Press Release*, June 10, 2013.) Therefore, depositors might have interpreted these penalties as indicative of broadly lax supervision, rather than merely specific lapses in oversight related to money laundering.

We utilize proprietary branch-level deposit data for commercial banks in India to study depositors' responses to the regulatory penalties. Our baseline results suggest that depositors respond to these penalties—total deposits of banks that received penalties declined by 10%–11% in the year after the event, relative to banks that did not receive penalties. These results are robust to including time-varying bank-specific controls, branch and year-specific fixed effects, and district × year fixed effects to control for any time-varying changes in the local demand for deposits.[4]

Having confirmed that deposits at penalized banks decline following sanctions, we next turn to our main tests to delineate the role of institutional trust by studying the reactions of depositors at nearby, unpenalized banks. An empirical challenge in identifying neighboring banks' depositors' reactions is that supervisory penalties are not randomly assigned. Regions where depositors are already inclined to withdraw funds might systematically receive penalties. Therefore, to identify the effect of penalties on neighboring banks' depositors' reactions, we rely on the quasi-exogenous nature of bank-branch locations in India. Branch location is quasi-random because the RBI has maintained a licensing policy that mandates banks to open a certain percentage of their branches in rural and unbanked areas to promote financial inclusion. For instance, guidelines put in place in 1977 stipulated that out of every four new branches a bank opens, at least one should be in a rural area. In 2005, branching rules were selectively expanded based on per-capita bank branch density. The RBI has issued several such guidelines over the years.[5] Prior research has used the exogeneity of branch location to study the impact of bank expansion on rural poverty reduction (Burgess & Pande, 2005), economic growth (Young, 2017), and households' health outcomes (Cramer, 2021). We utilize proximity to the offending bank branches as our variable of interest. Although banks might strategically locate within unbanked areas (e.g., select more profitable unbanked regions), the validity of our research design only requires us to assume that the distance of unoffending bank branches from offending bank branches is not systematically related to the probability of receiving penalties.

We find that deposits decline predictably at nonoffending branches with their distance from the offending branch. Specifically, for every halving of the distance to the offending branch, the

[4]Districts are local administrative units similar to counties in the United States.

[5]See, for example, "RBI issues new branch expansion norms," *Economic Times*, May 18, 2017.

deposits at neighboring nonoffending branches decline by 0.35%–1.58%. This analysis only utilizes the sample of nonoffending banks and therefore mitigates concerns that unobserved factors or underlying differences between offending and nonoffending banks could drive our results. In a robustness test, we remove banks targeted by the *Cobrapost* exposé, to confirm that depositors react to the supervisory actions and not only to news of the exposé. These results indicate that depositors do not reallocate capital from offending to nonoffending banks but rather remove funds from offending and neighboring nonoffending bank branches, consistent with a lack of trust in the banking system.

While we cannot distinguish between insured and uninsured deposits, it is worth noting that deposit insurance is not very effective. Although deposit insurance exists in India, the limit was low at ₹100,000 ($1,210) for our sample years, and was increased to ₹500,000 ($6,048) only in 2020. Importantly, there are significant frictions and delays in accessing deposit insurance. If a bank is in crisis, the regulator generally restricts withdrawals. Depositors may be allowed nominal withdrawals, which could be capped as low as ₹1000 ($12).[6] Given the frictions to accessing insured deposits, deposit insurance is less meaningful, especially for smaller depositors with low savings and limited means to buffer themselves against liquidity shocks. Thus, it is likely that insured depositors behave similarly to uninsured depositors.

We posit that trust in public institutions, which pertains to confidence in the ability and ethical conduct of these institutions, drives depositors' actions. Trust is difficult to measure; however, understanding it is crucial to financial system stability because it influences depositors' decisions to place their funds with banks. The literature typically utilizes survey data to measure trust (e.g., Knell & Stix, 2015; Sapienza & Zingales, 2012). Consistent with the literature, we also draw on survey data to measure trust in various public institutions. In particular, we rely on the 2011-12 India Human Development Survey (IHDS-II), a nationally representative survey of 42,152 households. Because trust is a concept that builds gradually over time, trust measured in 2011-12 would be applicable in the year that banks received penalties (i.e., in 2013). We utilize responses related to trust in several crucial public institutions—politicians, state governments, local

[6] See, for example, "RBI puts PMC Bank under watch, customers can't withdraw more than ₹1,000 for 6 months," *India TV News*, September 24, 2019; and "Another PMC Bank: RBI steps in to curb withdrawal limit, assures depositors at the same time," *Financial Express*, January 14, 2020.

governments, courts, and banks.

Our measures of trust are at the state-level and several social and economic factors might drive such trust. However, we view these factors not as different from trust but as the basis of the construct of trust. For example, the quality of the local news media could comprise an element of trust because reliable and accurate reporting is crucial in shaping perceptions and confidence in public institutions. Therefore, we first explore the determinants of trust in institutions using high-dimensional data on the predictors of trust that include the effectiveness of enforcement; ethnic, religious, and political conflict; social cohesion (shared values and community bonds); access to reliable information (access to news and confidence in the news media to report truthfully); the quality of local services such as hospitals, schools, and local government; corruption; crime; demographics (e.g., education levels); and economic indicators. Using principal component analysis to reduce the dimensionality of the data, we find that information access and the quality of local services are the most important determinants of trust in institutions, particularly trust in courts and banks.

We next assess whether depositors at neighboring nonoffending banks behave differently in states with high versus low trust. We find that neighboring nonoffending branches in states with higher trust in courts and banks witness a lower decline in deposits. In terms of economic magnitude, for every halving of the distance to the offending branch, relative to a one standard deviation increase in trust in courts, deposits decline by an additional 1.63% when trust in courts is lower by one standard deviation. Similarly, for every halving of the distance to the offending branch, relative to a one standard deviation increase in trust in banks, deposits decline by an additional 1.51%–2.46% when trust in banks is lower by one standard deviation. We also examine whether depositors respond to the two significant determinants of trust—access to information and the quality of local services—and find that they do, thereby revealing the main channels through which trust in public institutions influences depositors' actions.

Given the decline in deposits, we next investigate the local market effects of regulators disclosing penalties and depositors withdrawing funds. Consistent with the decline in deposits at neighboring nonoffending banks, we also find a decline in credit disbursed by these banks. Specifically, for every halving of the distance to the offending branch, the credit extended at neighboring nonoffending branches declines by 0.76%–0.83%. We also explore whether local economic activity is affected

by the decline in deposits and loans. Following prior research, we use nighttime light intensity as a measure of economic activity (Asher et al., 2021; Chodorow-Reich et al., 2020; Henderson et al., 2011). As opposed to GDP data, which are only available at the district level, human-generated nighttime light intensity allows us to measure economic activity at the more granular town/village level. We find that, following the issuance of penalties, nighttime light intensity declines significantly in towns and villages that are more exposed to offending banks relative to areas that are less exposed. In particular, for a one percent increase in exposure to offending bank branches, town/village-level nighttime light intensity declines by 0.02 to 0.04 percentage points in the years following the issuance of penalties. These results suggest that deposit withdrawals had a net negative impact on credit disbursal and local economic activity, consistent with banks playing a unique intermediation role in the economy (Diamond & Rajan, 2001).

Finally, we study where the withdrawn deposits go. Acharya et al. (2022) find that in times of crises, depositors move their funds from private to public sector (state-owned) banks, which have an implicit state guarantee. However, we do not find a flight of deposits to large public sector banks, potentially because 52% of the penalties were issued to public sector banks. Instead, our evidence suggests that at least some deposits flee to small regional banks (i.e., regional rural banks). Similar to large public sector banks, regional rural banks are government-owned and have an implicit state guarantee; however, they operate locally and tend to be smaller. Unlike officers at large public sector banks, who are drawn from a national talent pool and rotated regularly between branches, officers at regional rural banks tend to belong to the local community, speak the local language, and are not rotated, making them more trusted. We find that doubling the exposure to offending banks is associated with an increase of 6.5 to 8.4 percentage points in deposits at regional rural banks. However, a back-of-the-envelope calculation suggests that less than 10% of the withdrawn deposits end up at rural regional banks. That is, the vast majority of withdrawn deposits appear to have exited the banking system. The fact that deposits are shifting toward smaller, more trusted banks further underscores the important role of institutional trust on depositor behavior.

Our full set of results are inconsistent with alternative explanations. A potential alternative explanation is that the penalties successfully reduced money laundering. Offending banks might

have scaled down their activities and removed suspicious clients.[7] If penalties were successful in reducing errant behavior, it must be that regulators were correctly targeting offending banks, which makes it puzzling that neighboring banks' depositors respond and more so systematically with distance to the offending bank branches. Our findings instead suggest a strong influence of trust and local information networks in influencing neighboring nonoffending banks' depositors (e.g., Iyer & Puri, 2012).

A second alternative is that money launderers may have withdrawn their funds from offending and neighboring banks due to an increased fear of detection. However, our finding that deposits increase at regional rural banks is inconsistent with this alternative and suggests that at least some depositors moved their funds to these more trusted smaller banks. Furthermore, the regulator's disclosures explicitly state that they did not find any prima facie evidence of money laundering, further suggesting that depositors might have viewed these penalties as indicative of lax supervision and, therefore, withdrawn their funds from offending and neighboring nonoffending banks.

Our work is subject to certain limitations. Depositors may withdraw funds due to liquidity needs, deteriorating bank fundamentals (including signals of poor supervision), or beliefs about the behavior of other depositors (Brunnermeier & Oehmke, 2013; Goldstein, 2012). We account for changes in liquidity needs by including district $\times$ year fixed effects. Our findings that neighboring nonoffending banks' depositors respond to penalties and that such response varies with trust in institutions suggest that depositors view penalties as a signal of larger issues with bank management and supervision, indicating that depositors react to fundamentals. However, our measures of trust are regional-level and could be associated with several factors. Our approach has been to embrace this endogeneity in trust and understand the underlying factors that determine trust and drive depositors' actions. Our finding that information access is associated with depositors actions strongly suggests the role of fundamentals. However, we cannot rule out the alternative that neighboring depositors' reactions might be driven by panic.

Our work makes several contributions to the literature. First, we contribute to the literature on trust in institutions (Alesina & La Ferrara, 2002; Guiso et al., 2009; La Porta et al., 1997; Sapienza

[7] While this argument may hold theoretically, in practice, banks cannot independently close suspicious depositors' accounts without legal justification.

et al., 2013). Previous research has predominantly concentrated on exploring the erosion of trust in banks and other institutions in the aftermath of the 2008 financial crisis, as well as investigating the factors that influence trust (Fungáčová et al., 2019; Jansen et al., 2015; Knell & Stix, 2015; Sapienza & Zingales, 2012; van der Cruijsen et al., 2023). Despite the extensive research on the decline of trust in financial institutions, there remains a significant gap in understanding how institutional trust specifically impacts consumer financial decisions (Osili & Paulson, 2014; van der Cruijsen et al., 2023). Our study addresses this gap by investigating the role of institutional trust in shaping depositors' reactions to regulatory penalties.

Second, our results are related to the extensive literature on bank runs (Allen & Gale, 1998; Bryant, 1980; Chari & Jagannathan, 1988; Diamond & Dybvig, 1983; Jacklin & Bhattacharya, 1988). Our work contributes to the empirical literature on bank runs (Artavanis et al., 2022; Iyer & Puri, 2012; Iyer et al., 2016), which has not explored the role of institutional trust. We show that depositors of offending and neighboring banks withdraw their funds in response to regulatory penalties, and their response is magnified in regions with low trust in institutions.

Third, our work contributes to the literature on the disclosure of bank supervisory actions. Prior work in this area focuses on developed markets and generally finds a reallocation of capital away from offending banks (e.g., Delis et al., 2019; Gopalan, 2022; Jordan et al., 2000; Kleymenova & Tomy, 2022). For example, Delis et al. (2019) find that deposits decline at banks that receive enforcement actions, but that such declines are driven by banks shrinking the asset side of their balance sheet. Jordan et al. (2000) find banks' stock price reaction to the disclosure of bank enforcement actions is significantly related to the quality of bank disclosures. Jordan et al. (2000) also study spillover effects, and find no spillover in market reaction for most enforcement actions including the ones with large stock price reductions for the nodal bank. They find spillovers in specific cases when clusters of banks fail. In contrast to these studies, we find that depositors of neighboring nonoffending banks withdraw their funds, and these withdrawals affect credit access and local economic activity. Moreover, we show that institutional trust is associated with depositors' response to supervisory penalties.

Our work also contributes by exploring a developing market, which provides clear policy implications. Bank regulators in developing countries often cite international best practices as motivation

for their supervisory actions.[8] While this approach might be beneficial in areas such as capital adequacy frameworks or accounting and reporting systems, our findings suggest that it may be less desirable regarding policies around supervisory transparency, particularly regulators' decisions to disclose the outcome of supervisory actions. Bank regulators disclose the outcomes of supervisory actions mainly to impose market discipline and share the burden of supervision with capital providers who may reallocate their capital based on this information (Calomiris & Kahn, 1991; Diamond & Rajan, 2001). However, market discipline presumes a certain degree of trust that the underlying public institutions are competent, not captured by vested interests, and enforce laws effectively. Our work suggests that low trust in public institutions reduces the efficacy of market discipline as a policy instrument and underscores the importance of trust as critical to the imposition of market discipline.

Finally, our work contributes more generally to the literature on bank transparency and financial system stability (Acharya & Ryan, 2016; Anbil, 2018; Bischof et al., 2023; Bushman & Williams, 2012; Chen et al., 2022; Flannery, 1998; Flannery et al., 2013; Granja, 2018; Ryan, 2018). While regulators may disclose negative information to impose market discipline, such disclosure could also increase the risk of bank runs and financial system instability. Our results suggest that the risk of financial instability in response to greater transparency of supervisory actions is high in the developing market context where trust in public institutions is weak, and speculative runs are not uncommon (Acharya et al., 2022; Rojas-Suarez & Weisbrod, 1996).

2. Background and institutional setting

The banking sector in India consists of scheduled banks which are included in the Second Schedule of the RBI Act of 1934, and nonscheduled banks that are not included in the Act. Scheduled banks are classified as commercial or cooperative banks. Commercial banks are further classified into public sector banks (state-owned), private sector banks, and foreign banks. Cooperative banks are classified into urban and rural cooperative banks and are similar to community banks in the

[8] For example, in 2021, the banking regulator in India (the Reserve Bank of India or RBI) asked banks to align their internal audit function with international best practices ("RBI ask banks to align internal audit function with global best practices," *Economic Times*, January 8, 2021). In 2004, citing international best practices, the RBI decided to disclose the penalties imposed on banks ("Enhancement of transparency on bank's affairs through disclosures," *RBI Press Release No.:RBI/2004-05/226*, July 15, 2013).

United States. To be included in the Second Schedule of the RBI Act, a bank must satisfy specified criteria, such as maintaining certain thresholds of paid-up capital and reserves and having a track record of sound banking operations. Scheduled banks have access to credit facilities from the RBI, are eligible to participate in government-sponsored development programs, and have access to inter-bank funds. Unlike scheduled banks, nonscheduled banks are not eligible for certain facilities, such as access to the RBI's borrowing facilities or participation in government-sponsored development programs. Nonscheduled banks can offer various financial services but are not subject to the same regulatory oversight as scheduled banks. Scheduled commercial banks account for over 91% of the assets of the banking sector (RBI, 2022). Our sample comprises scheduled commercial banks.

The Reserve Bank of India, the country's central bank, is the primary regulator of scheduled commercial banks. The RBI's mandate is to ensure financial stability and consumer and depositor protection. The Deposit Insurance and Credit Guarantee Corporation (DICGC), a subsidiary of the RBI, provides deposit insurance. The deposit insurance scheme in India was introduced in 1961 and has been revised several times since. In 1993, the deposit insurance limit was ₹100,000 ($1,210). It 2020, it was increased to ₹500,000 ($6,048).[9] However, significant delays to accessing deposit insurance exist (Iyer & Puri, 2012). Notably, the RBI suspends deposit withdrawals in case of bank failure, resulting in a loss of liquidity for depositors. For example, insured depositors of PMC Bank, which failed in 2019, could not access their deposits even two years later.[10] Small depositors generally have lower wealth, limited savings, and few buffers against income shocks. They are also likely to have fewer assets to use as collateral, limiting their access to credit. Therefore, small depositors worried about liquidity might not consider the existence of deposit insurance when deciding to withdraw their funds from troubled banks.

The RBI supervises banks and can impose enforcement actions and penalties on violating banks. No banks in our sample period were under an enforcement order, and imposing penalties was the primary tool that the regulator used against errant banks. The disclosure of penalties occurs in two ways: A press release issued by the regulator giving details of the circumstances under which it

[9]For further details, please see the "Deposit Insurance and Credit Guarantee Act 1961"(https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/dicgc_act.pdf).

[10]See, "PMC Bank depositors in limbo. Depositors of PMC Bank still await clarity on withdrawals," *Hindu BusinessLine*, August 20, 2021.

imposed the fines and a footnote disclosure in the banks' following annual report. The RBI decided to adopt a policy of greater transparency concerning the banks it supervised following the stock market scams of the early 2000s, based on the recommendations of a parliamentary committee to investigate these scams.[11] After weighing the pros and cons of disclosure, and international best practices, the RBI decided to disclose details of penalties levied on banks.[12] Disclosure of penalties became effective as of November 1, 2004. However, most fines were against individuals, nonbanking financial corporations, or small cooperative banks rather than commercial banks. The few fines that were issued against commercial banks were small and relatively insignificant, ranging from ₹0.5 million to ₹1.5 million ($6,048 to $18,144).[13]

It was only in 2013 that there was a steep increase in enforcement when the regulator imposed penalties of over ₹10 million ($120,963) on errant banks.[14] The average penalty amount in 2013 was significantly higher than in the previous years and stood at ₹21 million ($254,022). The mean penalty amount in 2013 as a share of total revenue (profit after tax) was 0.04% (0.12%). The maximum penalty as a share of total revenue (profit after tax) was 0.15% (2.33%).

This steep change in enforcement followed an investigative piece by the news website *Cobrapost* in early 2013, spotlighting three large private sector banks. *Cobrapost* released video footage showing high-ranking officials and employees of the three banks suggesting methods for laundering money to an undercover reporter. Following the public outcry related to this exposé, the RBI inspected the books of accounts, internal control, and compliance systems of the three banks at their corporate offices and some branches. The inspection revealed several violations of know your customer (KYC) and anti–money laundering guidelines, leading to unprecedentedly large penalties of ₹10–₹50 million ($120,963–$604,814) against these banks. Importantly, the RBI stated that their investigation did not reveal any prima facie evidence of money laundering, which they could only determine after inspections by tax and enforcement agencies. This statement by the RBI suggests that depositors could have perceived these penalties as suggestive of overall lenient supervision, rather than isolated instances of oversight failures linked to money laundering. Also, the RBI's

[11] See, for example, "Scams that rocked the markets," *Hindu BusinessLine*, August 15, 2022.
[12] Please see RBI Press Release No.:2004-05/226 issued on October 19, 2004.
[13] In untabulated analysis, we find no change in deposits following these smaller penalties.
[14] Dr. Raghuram Rajan took over as the governor of RBI in September 2013. These penalties were publicly disclosed in June–August 2013, and were imposed towards the end of the previous RBI governor's tenure.

press release related to these violations did not provide details of the specific violations at each bank but rather a summary of the violations at all three banks.[15]

RBI inspected several other banks in the following months and issued penalties against an additional 28 banks. Similar to before, the RBI disclosures only contained a summary of the violations by these banks and little detail related to the specific violations of each bank. These violations included noncompliance with KYC norms and anti–money laundering guidelines, including customer identification procedures and risk categorization, failure to file cash transaction reports, nonadherence to instructions on monitoring transactions in customer accounts, and classification of accounts as inoperative or dormant. The banks also violated instructions on the upper limit for remittances and repatriation of funds, import of gold on a consignment basis, acceptance of cash above ₹50,000 ($605) from customers for the sale of gold coins, and the issue of demand drafts.[16]

3. Data and sample

3.1. Branch and bank-level data

We source branch-level deposit and credit data from the RBI's "Basic Statistical Returns" (BSR) dataset. Other studies have used this dataset, including Cole (2009) and Acharya et al. (2022). The data are proprietary and not publicly available. We have access to this data from the RBI from 2000 to 2014.[17] The data are annual as of March 31, the fiscal year-end date for all banks. The data contain aggregate deposits at the branch level. We require the branches to have existed for all 15 years to mitigate concerns that variation in sample size over time might be driving the results. We further exclude branches with zero deposit balances and high volatility which removes close to 3% of branches. Our final sample consists of 41,377 branches for 45 banks. Figure 1 presents the spatial distribution of bank branches that did and did not receive penalties and shows that branches are geographically spread and not concentrated.[18] Bank-level data comes from the Centre for Monitoring Indian Economy (CMIE) Prowess database, which contains the audited financial statements for all Indian companies.

[15] We provide RBI's press release related to these penalties in Appendix C.2.
[16] We provide RBI's press release related to these penalties in Appendix C.3 and Appendix C.4.
[17] Our repeated attempts to obtain post-2014 data from the RBI were unsuccessful. However, we expect depositors to respond to penalties in the short term. Moreover, our main tests (Table 3) utilize spatial variation in distance to the penalty banks and not temporal variation.
[18] Our results hold on including district fixed effects, which should account for any geographic clustering branches.

Table 1, Panel A, presents descriptive statistics related to the branch-year, bank and geographic-level variables. Table 1, Panel B, shows the difference in mean characteristics between banks that received penalties (*Penalty banks*) and those that did not (*Non-penalty banks*) in 2012, the year before the penalties were issued. The table shows that relative to non-penalty banks, penalty banks have lower capital ratios, higher non-performing assets, and lower return on assets, although these differences are not statistically significant at conventional levels. Also, penalty banks are larger than non-penalty banks and the difference is highly significant.[19] That banks receiving penalties are worse-performing further suggests that depositors may perceive factors other than the violation of money-laundering rules driving the imposition of penalties. We winsorize all continuous variables at the 1% and 99% tails of their respective distributions in each sample year and provide detailed definitions of all variables used in our analyses in Appendix A.

3.2. Data on regulatory penalties

We source data on monetary penalties issued by the RBI against individuals and banks from the database Watchoutinvestors.com. This database compiles cases of fraud and noncompliance with regulations against individuals and companies and contains information on regulatory actions by 43 regulators across industries. Watchoutinvestors.com states the following as its mission: "To prevent unscrupulous entities/persons from harming investors and thereby help build public confidence in the financial system, enabling greater flow of public investment to the right avenues." As discussed in Section 2, the RBI decided to disclose information on fines starting in November 2004. However, most fines were against individuals, nonbanking financial corporations, or small cooperative banks rather than against commercial banks.

3.3. Other data

We source demographic and spatial characteristics data from the 2011 Census of India and IHDS-II. Data on trust also comes from IHDS-II. We further source district-level GDP data from Indicus Analytics. Following recent research, we use human-generated nighttime luminosity as a proxy for local economic activity (Asher et al., 2021; Chodorow-Reich et al., 2020; Henderson

[19] We control for bank characteristics in all our specifications. Furthermore, our main results hold on matching penalty and non-penalty banks on these characteristics using entropy balancing (Hainmueller, 2012).

et al., 2011). The nighttime light intensity data have several advantages—they can be measured at a more granular level and do not face the measurement issues of GDP (Martinez, 2022). Data on nighttime light intensity are a consistently processed time series of annual global nighttime lights produced from monthly cloud-free average radiance grids. The data are collected by satellite and filtered to measure the quantity of artificial light in an area. We source this data from the Socioeconomic High-Resolution Rural-Urban Geographic Platform for India (SHRUG). These data are available from 2012 to 2021 and include the minimum, maximum, and mean light intensity at the town/village level which is more granular than the district level.

4. Baseline results

As our baseline specification, we estimate variations of the following model to assess whether depositors respond to supervisory penalties:

$$Y_{ijt} = \beta_0 + \beta_1 Treatment_j + \beta_2 Post_t + \beta_3 Treatment_j \times Post_t + \gamma X_{jt-1} + \alpha_i + \delta_t + \epsilon_{ijt}, \tag{1}$$

where i indexes the bank branch, j the bank, and t the year. The variable Y_{ijt} represents the natural logarithm of total savings deposits at the branch-year level; *Treatment* is an indicator for banks that received penalties in 2013; *Post* is an indicator for the year following the issuance of penalties, that is, 2014; X is vector of bank-specific controls measured in the year prior to the treatment year and includes size (the natural log of total assets), capital ratio, nonperforming assets ratio, and return on assets; α_i represents bank-branch fixed effects; δ_t represents year fixed effects; ϵ is the error term. With the inclusion of branch and year fixed effects, the main effects of *Treatment* and *Post* are subsumed. In additional specifications, we include district and year fixed effects, as well as district $\times$ year fixed effects to account for any time-varying changes in the demand for deposits. We cluster standard errors at the district level in all our estimations.[20]

We present results from the estimation of Equation 1 in Table 2. Column (1) includes district and year fixed effects, whereas column (2) includes branch and year fixed effects. The results indicate that banks that receive large penalties witness an 11% decline in deposits relative to the

[20]Our results are robust to clustering standard errors at the bank or branch level (untabulated).

control sample.[21] The coefficients are stable across both columns, whereas the R^2 increases from 48.1% to 90.6%. The stability of the coefficient estimates suggest that omitted variables are unlikely to bias our results. In column (3), we include district × year fixed effects to account for any localized time-varying changes in the demand for deposits. The results are similar: treated bank branches see a 10% decline in total deposits.

In additional robustness, we match penalty and non-penalty banks on the bank characteristics of size, capital ratio, nonperforming assets ratio, and return on assets using entropy balancing (Hainmueller, 2012). Entropy balancing creates covariate balance for treatment and control groups by assigning different weights to the observations. We find similar results in the entropy-balanced sample.[22] Overall, our baseline results indicate a relative decline in deposits at banks that received penalties.

5. Trust in institutions and depositors' actions

5.1. Deposits at neighboring nonoffending branches

We next turn to our main analyses to assess the role of institutional trust. We conjecture that trust in institutions plays a key role in determining depositors' actions. On the one hand, if depositors believe that penalties at some banks are indicative of systemic deficiencies in the management and supervision of all banks, they may withdraw their funds from nonoffending banks as well. However, on the other hand, if they believe that the regulator correctly identified and disciplined bad banks, they may transfer their funds to the nonoffending banks. The behavior of depositors will depend crucially on the confidence they place in the regulatory authority and the entities responsible for appointing and empowering the regulator to fulfill its obligations effectively.

To delineate the role of trust in institutions, we focus on the deposits at branches of nonoffending banks in the vicinity of the offending banks. We focus on these neighboring nonoffending branches for two reasons. First, if depositors reallocate capital away from offending banks, they are likely to move them to neighboring nonoffending branches. Second, depositors located near treated branches are more likely to know about the penalties—they could directly observe the actions of depositors at

[21] These magnitudes are calculated as follows: $(e^{-0.115} - 1) \times 100 = -11$. This is illustrative of the approach we use in all subsequent analogous cases.

[22] These results are presented in Table C1 of the Appendix C.

the offending bank.[23] Depositors could also learn about penalties through word-of-mouth channels or social network effects, which likely operate in the local neighborhood of the treated banks. The literature has shown that social networks can influence individuals' decisions to withdraw their deposits from troubled banks (Bikhchandani et al., 1992; Iyer & Puri, 2012; Iyer et al., 2016; Kelly & Ó Gráda, 2000; Kiss et al., 2014). For example, Kelly & Ó Gráda (2000) find evidence of depositors' networks playing a crucial role in their decision to withdraw deposits from a bank in New York during two waves of panic in the 1850s. They use the county of origin of recent Irish immigrants to construct their network measures. Iyer & Puri (2012), in their study of a bank run in India, also find that depositors' social networks are relevant in predicting their decision to run. They measure social networks spatially as depositors' neighborhoods and based on information about who referred the depositor to the bank.

Identifying how depositors from nearby banks react to supervisory penalties is challenging because penalties are not distributed randomly, and regions prone to deposit withdrawals might receive more penalties. To determine the impact of these penalties on depositors of neighboring banks, we utilize the quasi-random nature of branch location. This randomness stems from the RBI's policy requiring a proportion of branches to be established in rural and unbanked areas to foster financial inclusion. For example, a rule from 1977 requires that at least one of every four new branches must be in a rural location. Additionally, in 2005, branching regulations were adjusted based on local per-capita bank branch density. Previous studies have leveraged the quasi-exogenous nature of branch locations to explore the effects of bank expansion on various socioeconomic outcomes. These include rural poverty alleviation (Burgess & Pande, 2005), economic growth (Young, 2017), and health outcomes in households (Cramer, 2021).

We utilize proximity to the offending bank branches as our variable of interest. Identifying the effect of penalties on neighboring banks' depositors requires that the distance of nonoffending branches to offending bank branches is not systematically related to the probability of offending banks receiving penalties. Our inferences are subject to the validity of this reasonable assumption.

To test neighboring banks' depositors' reactions to penalties, we estimate variations of the

[23]For example, Figure C1 in the Online Appendix shows the crowd build-up during a bank run at Sri Guru Raghavendra Sahakara Bank in 2020.

following model:

$$Y_{ijt} = \beta_0 + \beta_1 Proximity\ to\ Treatment_i + \beta_2 Post_t + \beta_3 Proximity\ to\ Treatment_i \times Post_t + \gamma X_{jt-1} + \alpha_i + \delta_t + \epsilon_{ijt}, \quad (2)$$

where *Proximity to Treatment* is the negative of the log distance from each nonoffending branch to the nearest treated branch. The remaining variables are as defined before. With the inclusion of branch and year fixed effects, the main effects of *Proximity to Treatment* and *Post* are subsumed. We include district and year fixed effects, and branch and district × year fixed effects in additional specifications.

Results from the estimation of Equation 2 are presented in Table 3. The sample for this estimation excludes offending banks' branches. Column (1) of the table includes district and year fixed effects, column (2) includes branch and year fixed effects, and column (3) includes district × year fixed effects. The coefficients of *Proximity to Treatment* × *Post* across all columns show a decline in deposits. Specifically, for every halving of the distance to the treated branch, the deposits at neighboring nonoffending branches decline by 0.35%–1.58%.[24] Because branch location is quasi-random, this analysis allays concerns that other unobservable factors might be driving our results and allows us to make a causal link between the issuance of penalties and the subsequent decline in deposits at neighboring nonoffending branches.

We also conduct additional analysis to confirm that depositors react to supervisory actions and not only the *Cobrapost* exposé. In this analysis, we remove the three banks that were the target of the sting operation and reestimate Equation 1. Our main inferences continue to hold.[25]

Overall, the results in this section show that depositors do not reallocate capital from offending to neighboring nonoffending bank branches but rather remove their funds from offending and nonoffending banks. These results are consistent with a lack of trust in the bank regulator and the institutions that appoint and empower the regulator to fulfill its duties.

[24] These magnitudes are calculated as follows: $(2^{-0.023} - 1) \times 100 = -1.58$. This is illustrative of the approach we use in all subsequent analogous cases.

[25] These results are presented in Table C2 of the Online Appendix.

5.2. Trust in public institutions: Survey evidence and determinants

Our results in Section 5.1 suggest that the mechanism behind depositors of neighboring branches withdrawing their deposits is a lack of trust in public institutions. Depositors may believe that penalties imposed on certain banks indicate broader management and oversight issues in the banking sector, leading them to also pull their funds from nearby branches. Following prior literature, we utilize survey data on institutional trust to further explore depositors' actions (Knell & Stix, 2015; Sapienza & Zingales, 2012).

Our survey data come from the India Human Development Survey for 2011–12, which is a nationally representative survey of 42,152 households.[26] The survey covers questions related to several social and economic topics. We rely on the questions related to confidence in institutions. 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.* We utilize responses related to the following institutions: *politicians (to fulfil promises), state government (to look after the people), village panchayats (to implement public projects), courts (to deliver justice)*, and *banks (to keep money safe)*.[27] We create an indicator variable that takes a value of one if respondents have "A great deal of confidence," and zero otherwise. Given the fewer number of observations at the district level, we aggregate the indicators to the state level. We then standardize these state-level aggregates to compare the various measures across states. The resulting measures of *Trust (Politicians)*, *Trust (State Government)*, *Trust (Village Panchayats)*, *Trust (Courts)*, and *Trust (Banks)*, are continuous with larger values representing greater levels of trust. Table 1, Panel A, presents descriptive statistics for these measures. We find significant variation in these trust measures across states.[28]

Numerous social and economic factors may influence trust, and we consider these factors not as separate from trust, but as foundational elements that constitute the very construct of trust itself.

[26]This survey is designed and administered by the University of Maryland and the National Council of Applied Economic Research (NCAER). For further details please see Desai et al. (2010).

[27]Panchayats are a form of local government or village council primarily found in rural areas and play a crucial role in grassroots-level governance. Also, the phrases in parentheses (e.g., "to fulfill promises") are part of the survey questionnaire.

[28]Figure C2 in Appendix C shows the variation in state-level trust measures.

Building on this perspective, we estimate variations of the following equation to understand the factors that are associated with regional variation in trust:

$$\begin{aligned} Trust_s = \beta_0 &+ \beta_1 Enforcement_s + \beta_2 Conflict_s + \beta_3 Social\ Cohesion_s + \beta_4 Information\ Access_s \\ &+ \beta_5 Quality\ of\ Local\ Services_s + \beta_6 Corruption_s + \beta_7 Crime_s \\ &+ \beta_8 Demographics_s + \beta_9 Macro_s + \epsilon_s. \end{aligned} \tag{3}$$

The dependent variable *Trust* represents the various measures institutional trust described above. The nine predictor variables in Equation 3 are also measured at the state level and capture various dimensions of trust in institutions. We include several measures of these predictor variables for 43 measures in total. We briefly describe these measures below and include detailed definitions and sources in Appendix B. Finally, given the high-dimensional data (i.e., 43 predictor variables), we use Principal Component Analysis (PCA) to reduce the dimensionality of the data.[29]

The variable *Enforcement* represents the strength of enforcement. We expect trust in institutions to be higher in states that better enforce laws. Indian courts are notoriously slow, driven by judicial vacancies, inefficiency, and resource constraints (Datta & Rai, 2021). Therefore, following the literature, we utilize data on the average age of pending civil cases in Indian high courts to measure the strength of enforcement (Boehm & Oberfield, 2020).

The variable *Conflict* represents the extent of ongoing ethnic or religious conflict. We expect trust in institutions to be low in regions with high conflict, particularly if opposing groups perceive those institutions as partisan (Rohner et al., 2013). We measure *Conflict* using various proxies. First, we use the number of conflicts from the Armed Conflict Location and Event Dataset (ACLED), which captures political conflict events in the country (Raleigh et al., 2010). Second, we use the incidence of Hindu-Muslim riots from the Inter-University Consortium for Political and Social Research (ICPSR). While cases of political violence can vary over time and geography, the distribution of Hindu-Muslim conflict over states is generally persistent over time (Iyer & Shrivastava, 2018; Varshney, 2003). Such persistence suggests that Hindu-Muslim conflict may be a function of entrenched institutions and, therefore, more closely associated with trust in institutions.

[29] In most cases, we use data before the treatment. In cases where this is not possible, we use the best available alternative, which could be more recent data. However, the constructs we measure (e.g., enforcement or conflict) persist over time in states, making this less of a concern.

Third, we utilize survey data on perceptions of conflict in the neighborhood and local community from the IHDS-II. Finally, we include data on riots reported by the National Crime Records Bureau (NCRB). Using PCA, we generate the first component representing the maximum variation from these conflict variables. Our final measure of *Conflict* is the first PCA component.

Social Cohesion represents strong community bonds and shared values—factors that should be associated with higher trust in public institutions. Strong community bonds and shared values are associated with high social capital, defined as the features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit (Putnam, 1993). Studies have associated trust and social capital with higher civic engagement and cooperation, higher voter turnout, and efficient institutions promoting growth and development (Banfield, 1967; La Porta et al., 1997; Putnam, 2000; Sapienza et al., 2013). We utilize survey data on membership in local social and political associations and responses related to the strength of community bonds as measures of social cohesion. As described in Appendix B, the IHDS-II reports 18 such variables.

In addition, social capital and trust are likely to be higher in regions with greater population homogeneity as people are more likely to interact with others who are similar to them, and increased interaction builds trust (Alesina & La Ferrara, 2000; Guiso et al., 2004). Therefore, we also proxy for the construct of *Social Cohesion* using two measures of religious diversity in the population (Shanon-Weiner Diversity Index and Gini-Simpson Diversity Index). Our final measure of *Social Cohesion* is the first principal component of these 20 variables related to social cohesion.

Access to timely and accurate information on important local issues such as education, elections, the environment, or the functioning of the local government can influence trust in institutions. Accurate and timely information allows the electorate to hold officials and politicians responsible for their actions. We measure access to information using local news circulation and survey data on the perceived confidence in the news media to disseminate the truth. *Information Access* is the first principal component of these variables. Relatedly, the quality of local services such as health, education, and the police can influence trust in public institutions. We measure this construct using survey data on the confidence in police (to enforce the law), hospitals (to provide good treatment), and schools (to provide good education). As before, *Quality of Local Services* is the first principal component of these variables.

Corruption and crime can lead to a loss of credibility and confidence in public institutions,

leading to lower trust. We use data on corruption and crime cases reported by the NCRB. We also use the incidence of electricity theft as an additional measure of corruption (Gaur & Gupta, 2016). We use the first principal components of these variables related to corruption and crime as our final measures of *Corruption* and *Crime*. Finally, we control for demographic and economic characteristics using the proportion of individuals with a college degree, unemployment rate, and state-level per capita GDP.

Results from the estimation of Equation 3 presented in Table 4. The table shows that access to information is significantly associated with trust in the local government (village panchayat) and courts, and the quality of local services is significantly associated with trust in banks. With an adjusted R^2 of 25.6%–48.5%, our model appears to capture key attributes associated with trust in local government, courts, and banks.

5.3. Institutional trust and depositors' actions

We next evaluate whether trust in institutions plays a role in depositors' decisions to withdraw their funds. In particular, we estimate variations of the following equation:

$$\begin{aligned} Y_{ijts} = \beta_0 &+ \beta_1 Proximity\ to\ Treatment_i + \beta_3 Post_t + \beta_4 Trust_s \\ &+ \beta_5(Proximity\ to\ Treatment_i \times Post_t) + \beta_5(Trust_s \times Post_t) \\ &+ \beta_7(Proximity\ to\ Treatment_i \times Post_t \times Trust_s) \\ &+ \gamma X_{jt-1} + \alpha_i + \delta_t + \epsilon_{ijts}, \end{aligned} \tag{4}$$

where *Trust* represents the state(s)-level measures *Trust (Politicians)*, *Trust (State Government)*, *Trust (Village Panchayat)*, *Trust (Courts)*, and *Trust (Banks)* described above. The main effects of *Proximity to Treatment, Post*, and *Trust* are subsumed with the inclusion of branch and year fixed effects. The remaining variables are as described before.[30] In an additional specification, we include branch and bank × year fixed effects. This specification allows us to estimate the effects within a bank—that is, how deposits at various branches of the same bank change with exposure

[30] In addition, for the tests related to *Trust (Banks)* we control for variation in financial inclusion at the district level using the Crisil Inclusix index of financial inclusion. The index combines various parameters of financial inclusion, including deposits, credit, bank branch, and insurance penetration. We also interact the Inclusix index with *Trust (Banks)* because financial inclusion is likely to be higher in districts with higher trust in banks.

to high and low-trust regions.

Results from the estimation of Equation 4 are presented in Table 5. The odd-numbered columns include branch and year fixed effects, whereas the even-numbered columns include branch and bank × year fixed effects. The coefficient estimates for *Proximity to Treatment* × *Post* are relatively stable and not influenced much by the inclusion of year or bank × year fixed effects, suggesting that omitted variable bias is not a big concern in our setting. Columns (1)–(6) of the table show that trust in politicians, the state government, and the local government (village panchayat) are not significantly associated with depositors' decisions to withdraw their funds. Column (7) shows that trust in courts is significantly associated with depositors of neighboring nonoffending branches withdrawing their funds. In terms of economic magnitude, for a one standard deviation increase in *Trust (Courts)*, for every halving of the distance to the offending branch, the deposits at neighboring nonoffending branches decline by 0.90%, whereas, for a one standard deviation decrease in *Trust (Courts)*, deposits decline by 2.53%. That is, for every halving of the distance to the offending branch, relative to a one standard deviation increase in trust in courts, deposits decline by an additional 1.63% when trust in courts is lower by one standard deviation. Our results are not statistically significant at conventional levels on including bank × year fixed effects (Column (8)).

Columns (9)–(10) of Table 5 show that trust in banks plays a significant role in the withdrawal decisions of depositors of neighboring nonoffending branches. In terms of economic magnitude, for a one standard deviation increase in *Trust (Banks)*, for every halving of the distance to the offending branch, the deposits at neighboring nonoffending branches decline by 0.48%–0.21%, whereas, for a one standard deviation decrease in *Trust (Banks)*, deposits decline much more by 1.99%–2.67%. That is, for every halving of the distance to the offending branch, relative to a one standard deviation increase in trust in banks, deposits decline by an additional 1.51%–2.46% when trust in banks is lower by one standard deviation.

Finally, we assess whether depositors respond to the significant dimensions of trust (i.e., information access and the quality of local services as we find in Table 4). We reestimate Equation 4 after replacing *Trust* with the variables *Information Access* and *Quality of Local Services*. Results from this estimation are presented in Table 6. The odd-numbered columns include branch and year fixed effects, whereas the even-numbered columns include branch and bank × year fixed effects. The table shows that *Information Access* and *Quality of Local Services* is significantly associated

with the decline in deposits at neighboring nonoffending branches. In terms of economic magnitude, column (1) shows that for every halving of the distance to the offending branch, relative to a one standard deviation increase in information access, deposits decline by an additional 2.30% when information access is lower by one standard deviation. Similarly, column (3) shows that for every halving of the distance to the offending branch, relative to a one standard deviation increase in the quality of local services, deposits decline by an additional 1.64% when the quality of local services is lower by one standard deviation. Our results are qualitatively similar on including branch and bank × year fixed effects, but not statistically significant at conventional levels (p-values = 0.176 and 0.108).

Overall, the results in this section show that trust in public institutions, including trust in courts and banks, significantly predict depositors' reactions to regulatory penalties. Furthermore, the underlying determinants of such trust are access to information and the quality of local services.

6. Changes in credit and economic activity

6.1. Changes in credit

We next examine whether the decline in deposits is associated with changes in credit provision in the local market. Bank branches in India can source deposits from one region and lend them out to other regions. Some branches are designated explicitly as deposit-taking branches and do not give out much credit. Furthermore, although deposit rates are set at the headquarters level, branches have considerable flexibility in setting loan rates, particularly for retail loans. Banks could also switch to wholesale sources of funding. These factors suggest that a decline in deposits need not translate to decreased credit access at the local level.

In Table 7, we present results from estimating changes in credit at the branch-year level. Specifically, we re-estimate Equation 2, where the dependent variable now represents the natural logarithm of total credit at the branch-year level. Column (1) of the table includes district and year fixed effects, column (2) includes branch and year fixed effects, and column (3) includes district × year fixed effects. Columns (1) and (2) show that for every halving of the distance to the offending branch, the credit extended at neighboring nonoffending branches declines by 0.76%–0.83%. However, our results are not significant on including district × year fixed effects (column (3)).

6.2. Changes in economic activity

We also explore the impact of the decline in deposits and credit on local economic activity. Following prior work, we use nighttime light intensity as a measure of economic activity (Asher et al., 2021; Henderson et al., 2011), which allows us to measure changes in economic activity at the more granular town/village level. Furthermore, human-generated night light activity captures both the formal and informal sectors of economic activity. We estimate variations of the following model at the town/village-year level:

$$\begin{aligned} Night\ Luminosity_{vt} = \beta_0 + \beta_1 Exposure\ (Town/Village)_v + \beta_2 Post_t \\ + \beta_3 Post_t \times Exposure\ (Town/Village)_v + \delta_t + \omega_v + \epsilon_{vt}, \end{aligned} \tag{5}$$

where *Night Luminosity* is the natural logarithm of the mean and maximum nighttime light intensity aggregated at the town/village(v)-year level.[31] The variable *Exposure (Town/Village)* represents a town/village's exposure to offending banks and is measured as the number of branches of offending banks scaled by the total number of branches in that town/village, expressed as a percentage and measured in the year prior to the imposition of large penalties. ω_v represents town/village fixed effects. The remaining variables are as defined before. With the inclusion of town/village and year-fixed effects, the main effects of *Exposure (Town/Village)* and *Post* are subsumed.

Results from the estimation of Equation 5 are presented in Table 8. Columns (1) and (3) include only year fixed effects whereas the remaining columns include year and town/village fixed effects. Across all specifications, we find that a one percent increase in *Exposure* is associated with a 0.02 to 0.04 percentage point decline in nightlights luminosity. Given data limitations, the sample for this analysis begins in 2012. Also, the decline in economic activity may only manifest in the long run; therefore, we extend the sample for this estimation to 2021. These results suggest that the decline in deposits and loans through greater exposure to offending banks' branches is associated with a long-term decline in productive activity.

[31] We do not include the minimum light intensity as these mostly consist of zeros.

7. Where do the withdrawn deposits go?

We next explore where the deposits that leave the commercial banks following the imposition of regulatory penalties go. Research finds that during crisis times, deposits move to public sector banks which are state-owned and whose obligations are expected to be fulfilled by the government in case of bank failure (Acharya et al., 2022). In our sample, 52% of all large penalties were issued against public sector banks, making it unlikely that deposits would flee to these banks. Consistent with this, in untabulated analysis, we do not find any evidence that deposits flee to public sector banks following the disclosure of large penalties.

We also study changes in the deposits of regional rural banks. These banks are also state-owned but are smaller than the public sector banks that receive penalties. Regional rural banks operate more locally relative to public sector banks—they have greater local expertise and bank officers who belong to the local community. Unlike the officers at large public banks, drawn from a national pool and rotated out regularly, the officers at regional rural banks are not rotated and are more likely to speak the local language and to be aware of local customs, making them more trusted.

To assess whether deposits move to regional rural banks, we estimate variations of the following model at the district level:

$$Y_{dt} = \beta_0 + \beta_1 Exposure_d + \beta_2 Post_t + \beta_3 Post_t \times Exposure_d + \delta_t + \omega_d + \epsilon_{it}, \tag{6}$$

where Y_{dt} is the share of total deposits of regional rural banks at the district and year level. Examining changes in the district-level share of total deposits of regional rural banks controls for the overall supply and demand of deposits in the district and only examines the distribution between these regional rural banks and commercial banks. The variable *Exposure* represents a district's exposure to offending banks and is measured as the number of branches of offending banks scaled by the total number of branches in that district, expressed as a percentage and measured in the year prior to the imposition of large penalties. ω_d represents district fixed effects. The remaining variables are as defined before. With the inclusion of district and year fixed effects, the main effects of *Exposure* and *Post* are subsumed.

Results from the estimation of Equation 6 are presented in Table 9. Column (1) includes year

fixed effects whereas column (2) includes year and district fixed effects. The results show that the district-level share of total deposits at regional rural banks in districts that are more exposed to offending banks increase, relative to districts that are less exposed. In particular, doubling the exposure to offending branches increases the district-level share of deposits of regional rural banks by 6.5 to 8.4 percentage points. These results suggest that deposits that leave offending banks move to smaller, more trusted regional banks, further highlighting the role of trust in determining depositors' actions.

8. Conclusion

In this paper, we examine the role of trust in public institutions in influencing depositors' actions, using a sample of commercial banks in India and a unique and unexpected event that led to large supervisory penalties on several banks. To identify the role of trust on depositors' actions, we rely on the quasi-exogenous nature of branch location, which is driven by policy initiatives related to financial inclusion, and study deposits at neighboring nonoffending branches. Low levels of trust could lead to the perception of systemic failures, potentially triggering fund withdrawals from both offending and nearby nonoffending banks. Conversely, higher trust levels may prompt depositors to redistribute funds within the banking system, thereby enforcing market discipline. We focus on depositors at nonoffending neighboring branches because they are more likely to learn about the penalties through word-of-mouth channels or direct observation. Furthermore, if depositors reallocated capital within the banking system, they would likely move these funds to banks in their neighborhood.

We observe a predictable reduction in deposits at nonoffending branches closer to the offending branches. Specifically, for every halving of the distance to an offending branch, the deposits at nearby nonoffending branches decrease by 0.35% to 1.58%. This analysis focuses solely on nonoffending banks, addressing potential biases from unobserved variables or inherent differences between offending and nonoffending banks. The findings demonstrate that depositors do not transfer funds from offending to nonoffending banks; instead, they withdraw their money from both offending and the proximate nonoffending branches, indicating a general mistrust in the banking system.

To further explore the trust mechanism, we utilize survey data on trust in public institutions. We find that trust in courts and banks plays a significant role in depositors' decisions to withdraw

funds. Digging deeper, we find that such trust in institutions is explained by information access (i.e., news circulation and confidence in the news media to report news truthfully) and the quality of local services (i.e., confidence in hospitals, schools, and the police). This emphasis on local trust highlights the importance of the local context in understanding depositors' responses.

We also study whether the decline in deposits influences local economic activity. We find a decline in credit disbursed at neighboring nonoffending branches. Furthermore, the decline in deposits and loans affects local economic activity, as indicated by a more significant reduction in nighttime light intensity in towns and villages that are more exposed to offending banks.

Finally, we also investigate where the withdrawn deposits go and find evidence that some deposits move to regional rural banks that are government-owned but smaller than the public sector commercial banks. Unlike commercial banks, officers at regional rural banks are drawn from the local community and are not periodically rotated out. Therefore, regional rural banks are likely to be more trusted, further reinforcing our results that depositors' actions are influenced by trust.

Our study demonstrates that trust in public institutions is a key determinant of depositors' responses to the disclosure of supervisory action. Our work has significant implications for regulators, particularly in developing markets, and highlights the need to build and maintain trust in public institutions as an important precursor to policies that encourage market discipline.

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Appendix A. Variable definitions

Variable	Definition	Source
Dependent Variables		
Deposits (Total)	Natural logarithm of the total amount of deposits in savings accounts at branch-year level, winsorized at 1^{st} and 99^{th} percentile	BSR data from RBI
Loans (Total)	Natural logarithm of the total amount of loans disbursed at branch-year level, winsorized at 1^{st} and 99^{th} percentile	BSR data from RBI
Night Luminosity	Natural logarithm of the mean and maximum nighttime light intensity aggregated at the town/village-year level	SHRUG, VIIRS
Share of Deposits at Regional Rural Banks	Share of total amount of deposits in regional rural banks at district-year level	BSR data from RBI
Independent Variables		
Capital Ratio	Capital adequacy ratio (in percent) of a given bank, measured in 2012, the year before the treatment year; in percentages	Prowess database
College Degree	The proportion of men or women at or above the age of 20 in a district who hold a college degree or higher	2011 Census of India
Conflict	First Principal Component score derived from all the variables in the "Conflict" category defined in Appendix B	Authors' calculations
Enforcement	Average age of pending cases (measured in days) in High Courts in 2016	Boehm & Oberfield (2020)
Corruption	First Principal Component score derived from all the variables in the "Corruption" category defined in Appendix B	Authors' calculations
Crime	First Principal Component score derived from all the variables in the "Crime" category defined in Appendix B	Authors' calculations
Exposure	Number of branches of offending banks scaled by the total number of branches in that district, expressed as a percent and measured in the year prior to treatment	BSR data, Authors' calculations
Exposure (Town/Village)	Number of branches of offending banks scaled by the total number of branches in that town/village, expressed as a percent and measured in the year prior to treatment	BSR data, Authors' calculations

Per Capita GDP	Per Capita GDP at state level	Indicus Analytics
Information Access	First Principal Component score derived from all the variables in the "Information Access" category defined in Appendix B	Authors' calculations
Nonperforming Assets Ratio	Net non-performing assets to net advances ratio of a given bank, measured in 2012, the year before the treatment year; in percentages	Prowess database
Post	Indicator variable which takes the value of 1 the year 2014, and 0 otherwise	Authors' calculations
Proximity to Treatment	Negative of the log distance from each nonoffending branch to the nearest treated branch, where distances of 0 meters are substituted by 100 meters	Authors' calculations
Quality of Local Services	First Principal Component score derived from all the variables in the "Quality of Local Services" category defined in Appendix B	Authors' calculations
Return on Assets	Return on total assets of a given bank, measured in 2012, the year before the treatment year; in percentages	Prowess database
Size	Natural logarithm of the total assets of a given bank, measured in 2012, the year before the treatment year	Prowess database
Social Cohesion	First Principal Component score derived from all the variables in the "Social Cohesion" category defined in Appendix B	Authors' calculations
Treatment	Indicator variable which takes the value of 1 for banks that received monetary penalties in 2013 due to the *Cobrapost* exposé and 0 otherwise	RBI press releases, Authors' calculations
Trust (Banks)	The state-wise average of an indicator variable that takes the value of 1 if the survey respondent has "a great deal of confidence" in banks and 0 otherwise, demeaned and scaled by its standard deviation	IHDS-2, Authors' calculations
Trust (Courts)	The state-wise average of an indicator variable that takes the value of 1 if the survey respondent has "a great deal of confidence" in courts and 0 otherwise, demeaned and scaled by its standard deviation	IHDS-2, Authors' calculations
Trust (Politicians)	The state-wise average of an indicator variable that takes the value of 1 if the survey respondent has "a great deal of confidence" in politicians and 0 otherwise, demeaned and scaled by its standard deviation	IHDS-2, Authors' calculations

Trust (State Government)	The state-wise average of an indicator variable that takes the value of 1 if the survey respondent has "a great deal of confidence" in state governments and 0 otherwise, demeaned and scaled by its standard deviation	IHDS-2, Authors' calculations
Trust (Village Panchayat)	The state-wise average of an indicator variable that takes the value of 1 if the survey respondent has "a great deal of confidence" in village panchayats and 0 otherwise, demeaned and scaled by its standard deviation	IHDS-2, Authors' calculations
Unemployment Rate	Unemployment rate at state level	2011 Census of India

Appendix B. Determinants of trust in institutions

Variable category	Variable description	Source
Conflict	Average number of conflicts scaled by population (per 1000); 2016-2022	ACLED
Conflict	Total number of Hindu-Muslim conflicts, scaled by population (per 1000); 1950-1995	Varshney-Wilkinson Dataset on Hindu-Muslim Violence in India, ICPSR
Conflict	Incidence of a lot of conflict in the village/urban neighborhood; 2011-2012	IHDS-2
Conflict	Incidence of a lot of conflict among the communities/jatis in the village/urban neighborhood; 2011-2012	IHDS-2
Conflict	Number of riots scaled by population (per 1000 people); 2012	NCRB
Corruption	Number of corruption cases scaled by population (per million); 2021	NCRB
Corruption	Percentage of electricity loss; 2009	Gaur & Gupta (2016)
Crime	Incidence of someone in the household having their belongings stolen in the last 12 months; 2011-2012	IHDS-2
Crime	Incidence of break-ins or illegal entry into homes in the last 12 months; 2011-2012	IHDS-2
Crime	Incidence of attacks or threats against someone in the household in the last 12 months; 2011-2012	IHDS-2
Crime	Number of murder cases scaled by population (per 1000); 2012	NCRB
Crime	Total number of crimes scaled by population (per 1000); 2012	NCRB
Demographics	Proportion of individuals who hold a college degree or higher; 2011	Census of India
Enforcement	Average age of pending cases (measured in days) in High Courts; 2016	Boehm & Oberfield (2020)
Information Access	The number of reported circulations of daily publications in a given state scaled by the total population of that state; 2013-2014	Office of Registrar of Newspapers for India
Information Access	Incidence of a great deal of confidence in the news media to print/broadcast the truth; 2011-2012	IHDS-2
Quality of Local Services	Incidence of a great deal of confidence in the police to enforce the law; 2011-2012	IHDS-2
Quality of Local Services	Incidence of a great deal of confidence in government schools to provide good education; 2011-2012	IHDS-2
Quality of Local Services	Incidence of a great deal of confidence in private schools to provide good education; 2011-2012	IHDS-2
Quality of Local Services	Incidence of a great deal of confidence in government hospitals to provide good treatment; 2011-2012	IHDS-2
Quality of Local Services	Incidence of a great deal of confidence in private hospitals to provide good treatment; 2011-2012	IHDS-2

Macro	Unemployment rate; 2011	Census of India
Macro	Per Capita GDP; 2012	Indicus Analytics
Social Cohesion	Shanon Weiner measure of population diversity (using religion); 2011	Census of India
Social Cohesion	Gini Simpson measure of population diversity (using religion); 2011	Census of India
Social Cohesion	Incidence of someone in the household belonging to a mahila mandal (women's social service club); 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a youth club/sports group/reading room; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to an employee union/professional group; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a self-help group; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a credit/savings group; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a religious group; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a social group/festival society; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a caste association; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a development group/NGO; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to an agricultural/milk/other cooperative; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a political party; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to a lions/rotary club; 2011-2012	IHDS-2
Social Cohesion	Total number of aforementioned groups to which someone in the household belongs; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household belonging to at least one of the aforementioned groups; 2011-2012	IHDS-2
Social Cohesion	Incidence of someone in the household participating in a public meeting called by the village panchayat/nagarpalika/ward committee (local government) in the last year; 2011-2012	IHDS-2
Social Cohesion	Incidence that someone in the household is a member/official of the village panchayat/nagarpalika/ward committee (local government); 2011-2012	IHDS-2
Social Cohesion	Incidence that someone close to the household is a member/official of the village panchayat/nagarpalika/ward committee (local government); 2011-2012	IHDS-2
Social Cohesion	Incidence that people in the community bond together to solve problems; 2011-2012	IHDS-2

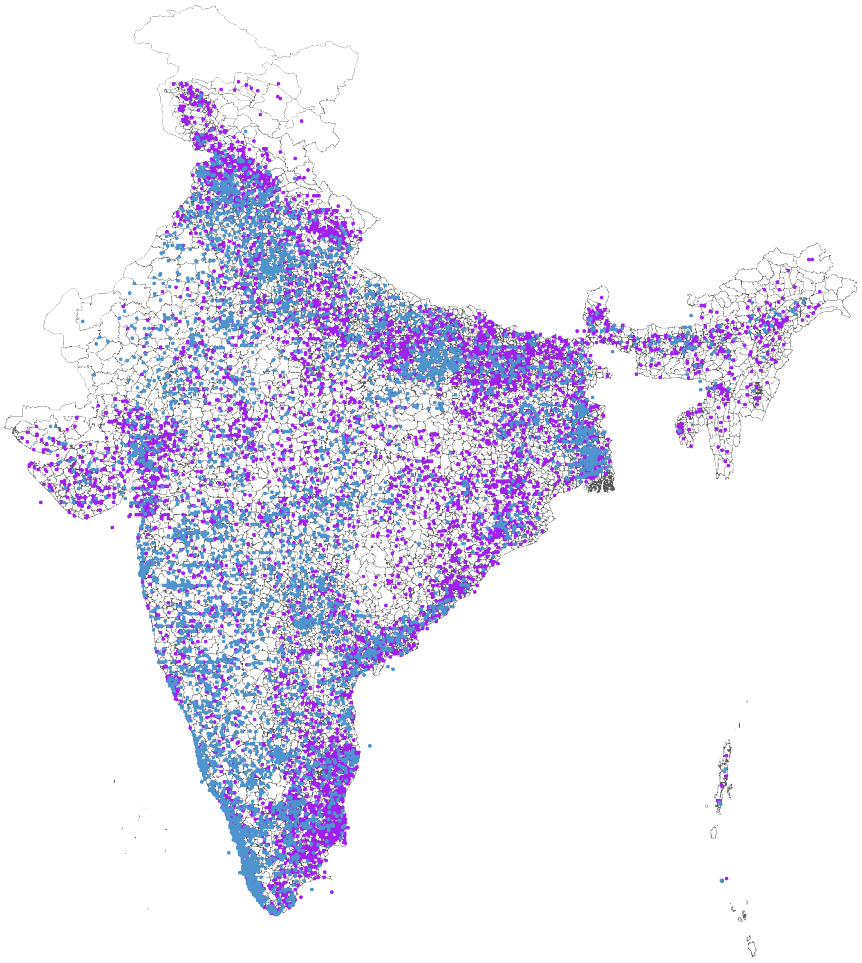

Figure 1: Spatial distribution of bank branches

This figure shows the spatial distribution of bank branches. The purple dots represent the bank branches that received penalties. The blue dots represent bank branches that did not receive penalties.

Table 1: Summary Statistics

This table presents the summary statistics for the variables used in this paper. The sample period is from 2000 to 2014. Panel A presents summary statistics for all variables, Panel B presents difference in means in bank-level characteristics between penalty and non-penalty banks for the year prior to the imposition of penalties. All variables are defined in Appendix A. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

Panel A: Summary statistics

	N	Mean	Median	Std
Dependent variables (branch-year level)				
Deposits (Total)	620655	10.947	11.006	1.221
Loans (Total)	620608	11.280	11.246	1.323
Dependent variables (district-year or town/village-year level)				
Nightlights (Max)	111040	1.090	0.921	0.767
Nightlights (Mean)	111040	0.528	0.403	0.519
Share of Deposits at Regional Rural Banks	7908	14.383	12.281	11.969
Control variables (bank-level)				
Capital Ratio	45	16.749	13.320	12.886
Nonperforming Assets Ratio	45	1.052	0.980	0.753
Return on Assets	45	1.097	0.962	0.699
Size	45	13.371	13.724	1.719
Exposure to treatment variables (district or town/village level)				
Exposure	639	63.861	64.375	17.407
Exposure (Town/Village)	11108	61.047	63.636	29.725
Proximity to Treatment	118845	-5.186	-4.605	1.449
Trust in institutions variables (state level)				
Trust (Banks)	33	0.000	0.359	1.000
Trust (Courts)	33	0.000	0.079	1.000
Trust (Politicians)	33	0.000	-0.171	1.000
Trust (State Government)	33	0.000	-0.033	1.000
Trust (Village Panchayat)	33	0.000	-0.007	1.000
Determinants of trust variables (state level)				
College Degree	35	0.104	0.093	0.050
Conflict	33	0.000	-0.190	1.332
Corruption	28	0.000	-0.045	1.101
Crime	33	0.000	-0.224	1.476
Enforcement	35	789.743	858.000	329.173
Information Access	33	0.000	0.063	1.039
Per Capita GDP	32	88.906	74.000	56.448
Quality of Local Services	33	0.000	0.064	1.690
Social Cohesion	33	0.000	-0.813	2.897
Unemployment Rate	35	0.218	0.195	0.112

Table 1: Summary Statistics, continued

Panel B: Differences in characteristics of Penalty and Non-penalty banks

	Penalty banks			Non-penalty banks			Difference in means	
	N	Mean	Std	N	Mean	Std	Difference	t-Statistic
Capital Ratio	24	13.098	1.366	21	20.922	18.136	7.824	1.972
Nonperforming Assets Ratio	24	1.171	0.699	21	0.917	0.806	-0.255	-1.124
Return on Assets	24	0.924	0.608	21	1.296	0.756	0.372	1.801
Size	24	14.165	1.094	21	12.463	1.872	-1.701***	-3.654

Table 2: Change in deposits following regulatory penalties

This table presents OLS estimates of changes in deposits in response to regulatory penalties. The table presents results from a difference-in-differences estimation. *Treatment* takes the value of one for banks that received penalties and zero otherwise, whereas *Post* takes the value of one for the period following the penalties (i.e., 2014) and zero otherwise. The sample period is from 2000 to 2014. Bank controls are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)
Treatment × Post	-0.115***	-0.115***	-0.104***
	(-10.346)	(-10.346)	(-10.531)
Observations	620,640	620,640	620,355
Adjusted R^2	0.481	0.906	0.916
Bank controls	Yes	Yes	Yes
Year FE	Yes	Yes	No
Branch FE	No	Yes	Yes
District FE	Yes	No	No
District × Year FE	No	No	Yes

Table 3: Changes in deposits at neighboring branches

This table presents OLS estimates of changes in deposits at neighboring nonoffending branches in response to regulatory penalties. The variable *Proximity to Treatment* is the negative of the log distance from each nonoffending branch to the nearest treated branch, whereas *Post* takes the value of one for the year following the penalties and zero otherwise. The sample period is from 2000 to 2014 and excludes banks that received penalties. Bank controls are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors in are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)
Proximity to Treatment × Post	-0.023***	-0.023***	-0.005**
	(-6.053)	(-6.053)	(-2.493)
Observations	118,845	118,845	117,855
Adjusted R^2	0.532	0.913	0.929
Bank controls	Yes	Yes	Yes
Year FE	Yes	Yes	No
Branch FE	No	Yes	Yes
District FE	Yes	No	No
District × Year FE	No	No	Yes

Table 4: Determinants of trust in public institutions

This table presents OLS estimates of the determinants of trust in public institutions. All variables are defined in Appendix A. The t-statistics are presented in parentheses. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Trust (Politicians)	Trust (State Government)	Trust (Village Panchayat)	Trust (Courts)	Trust (Banks)
	(1)	(2)	(3)	(4)	(5)
Enforcement	-0.000	0.000	0.000	0.000	0.000
	(-1.403)	(0.759)	(0.064)	(0.639)	(0.733)
Conflict	0.038*	-0.016	-0.032	-0.028	0.023
	(1.913)	(-0.470)	(-1.044)	(-0.645)	(0.675)
Social Cohesion	-0.003	-0.004	-0.005	-0.005	-0.018
	(-0.533)	(-0.446)	(-0.562)	(-0.389)	(-1.724)
Information Access	-0.001	0.046	0.087**	0.109**	0.028
	(-0.052)	(1.307)	(2.680)	(2.363)	(0.775)
Quality of Local Services	0.010	0.022	0.003	0.035	0.050**
	(0.878)	(1.179)	(0.207)	(1.450)	(2.665)
Corruption	0.001	0.010	0.018	-0.010	0.031
	(0.055)	(0.364)	(0.705)	(-0.278)	(1.093)
Crime	-0.009	0.015	0.005	0.004	-0.008
	(-0.688)	(0.664)	(0.244)	(0.122)	(-0.345)
College Degree	-0.062	-1.480*	-0.509	0.653	1.474*
	(-0.137)	(-1.969)	(-0.738)	(0.663)	(1.900)
Unemployment Rate	-0.037	-0.018	-0.081	0.170	0.307
	(-0.214)	(-0.062)	(-0.310)	(0.457)	(1.045)
Per Capita GDP	-0.001	0.001	0.000	0.001	-0.001
	(-1.402)	(0.600)	(0.480)	(0.630)	(-0.942)
Constant	0.241**	0.335**	0.306**	0.417**	0.684***
	(2.831)	(2.369)	(2.353)	(2.248)	(4.685)
Observations	28	28	28	28	28
Adjusted R^2	0.060	0.267	0.256	0.388	0.485

Table 5: Trust in institutions and changes in deposits at neighboring branches

This table presents OLS estimates of changes in deposits in response to regulatory penalties. The variable *Proximity to Treatment* is the negative of the log distance from each nonoffending branch to the nearest treated branch, whereas *Post* takes the value of one for the year following the penalties and zero otherwise. *Trust(x)* measures trust in x institution at the state level. The sample period is from 2000 to 2014. The controls include bank-level control variables that are measured in the year prior to the treatment year. In addition, we control for the level of financial inclusion in columns (9)–(10). All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	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)
Proximity to Treatment × Post	-0.021***	-0.022***	-0.020***	-0.022***	-0.020***	-0.021***	-0.025***	-0.024***	-0.021***	-0.018***
	(-5.831)	(-6.988)	(-6.351)	(-7.018)	(-6.084)	(-6.583)	(-6.031)	(-6.253)	(-7.579)	(-7.506)
Proximity to Treatment × Post × Trust (Politicians)	0.008	0.003								
	(0.909)	(0.441)								
Proximity to Treatment × Post × Trust (State Government)			0.010	0.003						
			(1.322)	(0.449)						
Proximity to Treatment × Post × Trust (Village Panchayat)					0.008	0.004				
					(1.555)	(0.930)				
Proximity to Treatment × Post × Trust (Courts)							0.012**	0.008		
							(2.445)	(1.595)		
Proximity to Treatment × Post × Trust (Banks)									0.018***	0.011**
									(2.925)	(1.988)
Observations	118,770	118,755	118,770	118,755	118,770	118,755	118,770	118,755	118,770	118,755
Adjusted R^2	0.914	0.930	0.914	0.930	0.914	0.930	0.914	0.930	0.914	0.930
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Branch FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE × Year FE	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes

Table 6: Determinants of trust and changes in deposits

This table presents OLS estimates of changes in deposits in response to regulatory penalties. The variable *Proximity to Treatment* is the negative of the log distance from each nonoffending branch to the nearest treated branch, whereas *Post* takes the value of one for the year following the penalties and zero otherwise. The sample period is from 2000 to 2014. Bank controls are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Deposits (Total)	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)	(4)
Proximity to Treatment × Post	-0.025***	-0.023***	-0.025***	-0.024***
	(-6.065)	(-6.546)	(-6.129)	(-6.562)
Proximity to Treatment × Post × Information Access	0.016**	0.009		
	(1.984)	(1.355)		
Proximity to Treatment × Post × Quality of Local Services			0.007*	0.006
			(1.909)	(1.609)
Observations	118,770	118,755	118,770	118,755
Adjusted R^2	0.913	0.930	0.913	0.930
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	No
Branch FE	Yes	Yes	Yes	Yes
Bank FE × Year FE	No	Yes	No	Yes

Table 7: Change in credit disbursed following regulatory penalties

This table presents OLS estimates of changes in credit disbursed in response to regulatory penalties. The variable *Proximity to Treatment* is the negative of the log distance from each nonoffending branch to the nearest treated branch, whereas *Post* takes the value of one for the year following the penalties and zero otherwise. The sample period is from 2000 to 2014. Bank controls are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Loans (Total)	Loans (Total)	Loans (Total)
	(1)	(2)	(3)
Proximity to Treatment × Post	-0.012***	-0.011***	-0.000
	(-2.744)	(-2.839)	(-0.086)
Observations	118,788	118,788	117,812
Adjusted R^2	0.522	0.898	0.907
Bank controls	Yes	Yes	Yes
Year FE	Yes	Yes	No
Branch FE	No	Yes	Yes
District FE	Yes	No	No
District × Year FE	No	No	Yes

Table 8: Change in nighttime light intensity following regulatory penalties

This table presents OLS estimates of nighttime light intensity changes at the town/village level following the imposition of penalties. *Exposure (Town/Village)* is the number of offending branches in a town/village scaled by the total branches in that town/village. The sample period is from 2012 to 2021. The indicator variable *Post* takes the value of one for the period following the penalties and zero otherwise. Bank-level control variables are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Nightlights (Mean)	Nightlights (Mean)	Nightlights (Max)	Nightlights (Max)
	(1)	(2)	(3)	(4)
Exposure (Town/Village) × Post	-0.00024**	-0.00024**	-0.00036**	-0.00036**
	(-2.152)	(-2.152)	(-2.469)	(-2.469)
Observations	110,990	110,990	110,990	110,990
Adjusted R^2	0.038	0.949	0.022	0.937
Year FE	Yes	Yes	Yes	Yes
Town/Village FE	No	Yes	No	Yes

Table 9: Change in deposits at regional rural banks

This table presents OLS estimates of changes in the share of deposits at regional rural banks at the district level. The sample period is from 2000 to 2014. The indicator variable *Post* takes the value of one for the period following the penalties and zero otherwise. The variable *Exposure* is the number of branches of offending banks scaled by the total number of branches in a district, expressed as a percentage and measured prior to the imposition of penalties. Bank-level control variables are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Share of Deposits at Regional Rural Banks	Share of Deposits at Regional Rural Banks
	(1)	(2)
Exposure × Post	0.084***	0.065***
	(3.999)	(3.715)
Observations	7,908	7,900
Adjusted R^2	0.445	0.858
Year FE	Yes	Yes
District FE	No	Yes

Appendix C. Supplementary materials

Appendix C.1. Additional figures and tables

Figure C1: A bank run at Sri Guru Raghavendra Sahakara Bank in Bangalore. Source: "Another PMC Bank-Like Crisis? RBI Restricts Withdrawals From Sri Guru Raghavendra Sahakara Bank," *Indiatimes.com*, January 14, 2020.

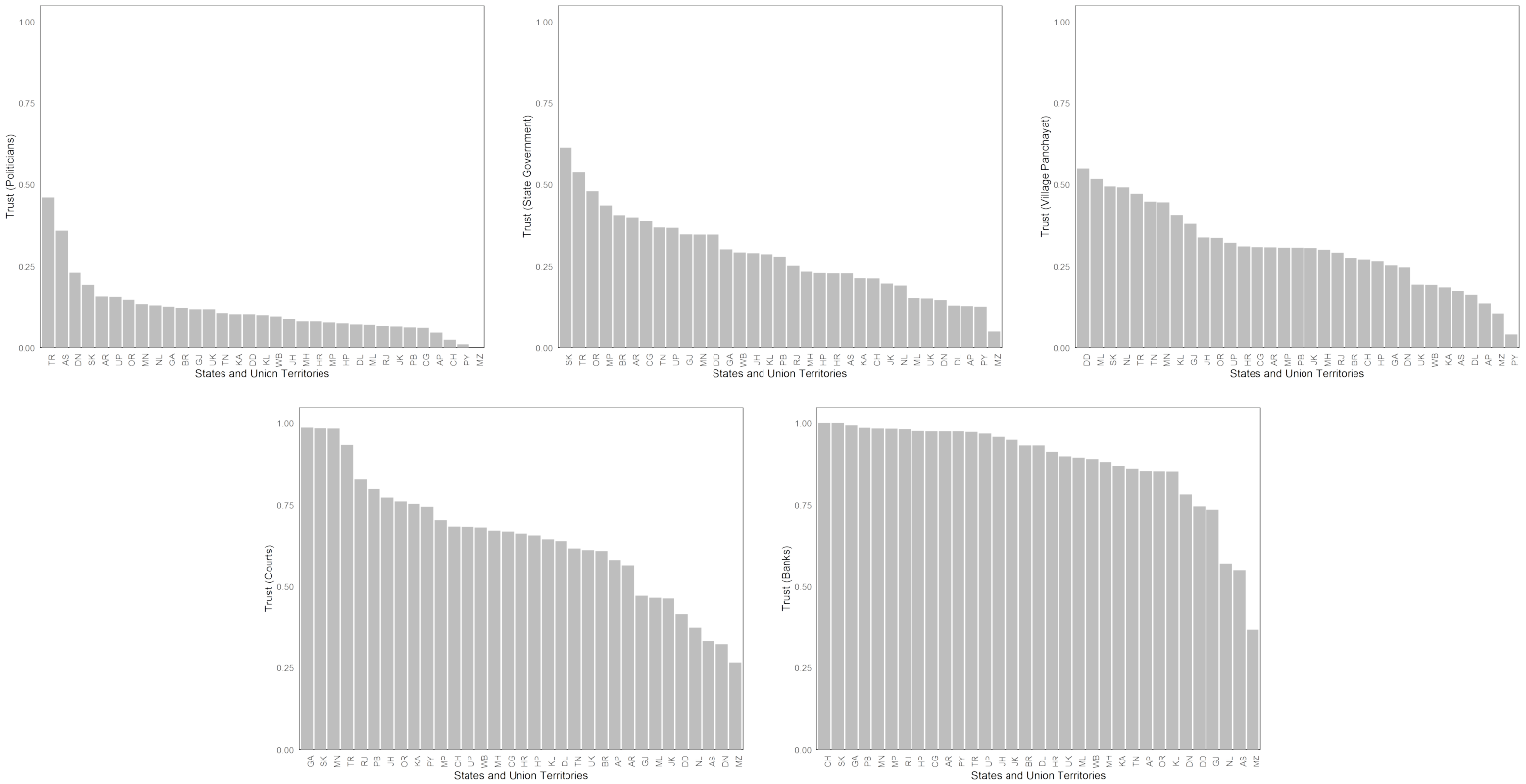

Figure C2: Figure showing state-level trust measures

Table C1: Change in deposits following regulatory penalties (entropy-matched on bank characteristics)

This table presents OLS estimates of changes in deposits in response to regulatory penalties, where treated and control banks are entropy-matched on bank characteristics. *Treatment* takes the value of one for banks that received penalties and zero otherwise, whereas *Post* takes the value of one for the period following the penalties (i.e., 2014) and zero otherwise. The sample period is from 2000 to 2014. Bank controls are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)
Treatment × Post	-0.075***	-0.075***	-0.063***
	(-6.038)	(-6.038)	(-6.044)
Observations	620,640	620,640	620,355
Adjusted R^2	0.507	0.911	0.921
Bank controls	Yes	Yes	Yes
Year FE	Yes	Yes	No
Branch FE	No	Yes	Yes
District FE	Yes	No	No
District × Year FE	No	No	Yes

Table C2: Change in deposits following regulatory penalties (removing banks targeted by *Cobrapost*)

This table presents OLS estimates of changes in deposits in response to regulatory penalties, after excluding banks that were targeted by *Cobrapost*. The variable *Proximity to Treatment* is the negative of the log distance from each nonoffending branch to the nearest treated branch, whereas *Post* takes the value of one for the year following the penalties and zero otherwise. The sample period is from 2000 to 2014. Bank controls are measured in the year prior to the treatment year. All variables are defined in Appendix A. The t-statistics are presented in parentheses. Standard errors are clustered by district; $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$ (two-tailed).

	Deposits (Total)	Deposits (Total)	Deposits (Total)
	(1)	(2)	(3)
Proximity to Treatment × Post	-0.023***	-0.023***	-0.005**
	(-6.053)	(-6.053)	(-2.493)
Observations	118,845	118,845	117,855
Adjusted R^2	0.532	0.913	0.929
Bank controls	Yes	Yes	Yes
Year FE	Yes	Yes	No
Branch FE	No	Yes	Yes
District FE	Yes	No	No
District × Year FE	No	No	Yes

Appendix C.2. RBI penalises Axis Bank, HDFC Bank and ICICI Bank (RBI Press Release dated June 10, 2013)

प्रेस प्रकाशनी PRESS RELEASE

भारतीय रिज़र्व बैंक
RESERVE BANK OF INDIA

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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

Appendix C.3. RBI penalises 22 Banks (RBI Press Release dated July 15, 2013)

प्रेस प्रकाशनी PRESS RELEASE

भारतीय रिज़र्व बैंक
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July 15, 2013

RBI penalises 22 Banks

The Reserve Bank of India has imposed monetary penalty on the following 22 banks for violation of its instructions, among other things, on Know Your Customer/Anti Money Laundering. The details are:

Monetary Penalty

Sl. No.	Name of the bank	Penalty Amount (in ₹ crore)
1	Andhra Bank	2.50
2	Bank of Baroda	3.00
3	Bank of India	3.00
4	Canara Bank	3.001
5	Central Bank of India	3.00
6	Deutsche Bank A.G.	1.00
7	Development Credit Bank Ltd.	1.00
8	Dhanlaxmi Bank Ltd.	2.00
9	Indian Overseas Bank	3.002
10	ING Vysya Bank Ltd.	1.50
11	Jammu & Kashmir Bank Ltd.	2.501
12	Kotak Mahindra Bank Ltd.	1.501
13	Oriental Bank of Commerce	2.00
14	Punjab and Sind Bank	2.50
15	Punjab National Bank	2.50
16	State Bank of India	3.00
17	The Federal Bank Ltd.	3.00
18	The Lakshmi Vilas Bank Ltd.	2.50
19	The Ratnakar Bank Ltd.	0.50
20	United Bank of India	2.50
21	Vijaya Bank	2.00
22	Yes Bank Ltd.	2.00

In respect of seven other banks, as indicated below, where such scrutinies have been conducted and banks' explanation called for, the banks' written or oral submissions were found to be satisfactory or no violation of serious nature has been established. It has, therefore, been decided not to impose any monetary penalty but to issue only suitable cautionary letters.

Cautionary Letter

Sl. No.	Name of the bank
1	Barclays Bank PLC
2	BNP Paribas
3	Citibank N.A.
4	Royal Bank of Scotland
5	Standard Chartered Bank
6	State Bank of Patiala
7	The Bank of Tokyo Mitsubishi UFJ Ltd.

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

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.

Background

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 banks at their offices during April 2013. The scrutiny of these banks revealed violation of certain regulations and instructions issued by the Reserve Bank of India, namely,

- non-adherence to certain aspects of know your customer (KYC) norms and anti money laundering (AML) guidelines like customer identification procedure, risk categorisation, periodical review of risk profiling of account holders, periodical KYC updation;
- 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 ₹ 50,000;
- non-adherence to instructions on monitoring of transactions in customer accounts;
- non-adherence to instructions on classification of accounts as 'in-operative'/dormant and lapses in monitoring of transactions in dormant accounts;
- non-adherence to instructions which prohibits acceptance of cash above ₹50,000 from customers for sale of gold coins and issue of Demand Drafts, etc.;
- non-adherence to instructions on the upper limit for remittances under Liberalised Remittance Scheme, upper limit for repatriation of funds from non resident ordinary (NRO) accounts;
- non-adherence to instructions on import of gold on consignment basis.

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. The Reserve Bank penalised the first lot of three banks, on June 10, 2013.

Alpana Killawala
Chief General Manager

Press Release : 2013-2014/95

Appendix C.4. RBI penalises six banks (RBI Press Release dated August 23, 2013)

प्रेस प्रकाशनी PRESS RELEASE

भारतीय रिज़र्व बैंक
RESERVE BANK OF INDIA

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August 23, 2013

RBI penalises six banks

The Reserve Bank has imposed monetary penalty on the following six banks for violation of Reserve Bank of India instructions, inter alia, on Know Your Customer/Anti Money Laundering. The details of the penalty are:

Sl. No.	Name of the bank	Penalty Amount (in ₹ Crore)
1	Allahabad Bank	0.50
2	Bank of Maharashtra	0.501
3	Corporation Bank	1.50
4	Dena Bank	2.00
5	IDBI Bank Ltd.	1.00
6	Indian Bank	1.00

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.

In respect of IndusInd Bank Ltd. where such scrutiny has been conducted and the bank's explanation called for, based on written or oral submissions, as the bank's reply was found to be satisfactory or no violation of serious nature has been established; it has been decided not to impose any monetary penalty but only to issue suitable cautionary letter.

Background

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 banks at their offices during April and May 2013. The scrutiny of these banks revealed violation of certain regulations and instructions issued by Reserve Bank of India, namely,

- non-adherence to certain aspects of know your customer (KYC) norms and anti money laundering (AML) guidelines like customer identification procedure, risk categorisation, periodical review of risk profiling of account holders, periodical KYC updation

- non-adherence of KYC norms 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

- non-adherence to instructions on monitoring of transactions in customer accounts including walk-in-customers

- non-adherence to instructions which prohibit acceptance of cash above ₹ 50, 000 from customers for sale of gold coins and issue of Demand Drafts etc.

- non-adherence to instructions on import of gold on consignment basis

- non-adherence to instructions on permitted credits to Non-resident accounts

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. The Reserve Bank penalised the first of three banks on June 10, 2013 and second lot of 22 banks on July.

Press Release : 2013-2014/383

Ajit Prasad
Assistant General Manager