THE UNHOLY TRINITY: REGULATORY FORBEARANCE, GOVERNMENT-OWNED BANKS AND ZOMBIE FIRMS*

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Abstract

Asset quality forbearance to alleviate loans under temporary crisis-induced liquidity stress adversely impacts the allocative efficiency of credit. Bank-firm matched data from India reveal that government-owned banks increased lending to firms facing solvency pressures relative to their private counterparts. The predominance of government-owned banks and an external crisis facilitate identification. Zombie lending by government banks crowded out productive lending, especially in industries and bank portfolios with high proportions of failing firms, controlling for demand-side factors. The reduced loan loss provisioning requirements facilitated regulatory arbitrage by banks through asset-risk reclassification, hiding true asset quality. Forbearance manifested fiscal dominance allowing the sovereign to postpone the costly recapitalization of government banks—an implicit subsidy that facilitated the build-up of stressed assets in the banking system.

Keywords: Regulatory Forbearance, Non-performing Assets, Government Banks, Zombie Lending.

JEL classifications: E58, E65, G21, G28.

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1 Introduction

Many countries enacted regulatory forbearance measures to provide borrowers relief during the COVID-19 crisis. Forbearance refers to loan concessions or temporary repayment relief granted by lenders to alleviate short-term liquidity stresses that borrowers face during financial crises or special economic or legal circumstances. It may be premature to assess the longer-term impact of policies enacted during the pandemic. However, past policy experiments can provide useful insights into the potential impact of forbearance on the allocative efficiency of credit. The literature suggests that regulatory forbearance can create dueling incentives. As a risk management tool, forbearance allows otherwise solvent firms facing temporary liquidity stress to remain in operation. However, banks can also use forbearance to keep zombie firms afloat (Caballero, Hoshi, and Kashyap, 2008, Peek and Rosengren, 2005, Acharya et al., 2019, Blattner, Farinha, and Rebelo, 2019). If used to shield non-performing assets on their balance sheets, forbearance measures can distort bank incentives to provision for and manage credit risk in loan portfolios properly.

This paper examines the credit allocative efficiency impact of the asset quality forbearance measures enacted by the Reserve Bank of India (RBI) during the global financial crisis using bank-firm matched data. The predominance of government-owned banks in India's banking system facilitates identification. Further, the timing of the forbearance policy was exogenously dictated by external financial conditions during the global financial crisis (GFC). The paper investigates whether temporarily lowered capital provisioning requirements that allowed banks to restructure assets by altering risk-weights attached to loans under liquidity stress also allowed banks to hide true asset quality. In other words, whether the reduced loan loss provisioning requirements facilitated regulatory arbitrage by banks through asset-risk reclassification. Acharya (2020) suggests that forbearance is a manifestation of fiscal dominance. Accordingly, forbearance could allow the sovereign, a majority owner, to postpone the costly recapitalization of government banks.

The paper's main contributions are as follows. First, a predominantly government-owned banking system provides a unique setting to examine how regulatory forbearance can ex-

acerbate the misallocation of credit. We demonstrate that forbearance functioned as an implicit subsidy that facilitated the build-up of stressed assets in the banking system. Second, an ambiguously-worded regulatory policy gave banks discretion to lower provisioning requirements for loans under "temporary liquidity stress" in the midst of the GFC. Given the well-documented difficulties in distinguishing between liquidity and solvency stress, we find that the asset quality-based forbearance policy allowed banks to shield non-performing assets. Government banks acted as conduits of zombie lending by evergreening existing bad loans to hide losses.

Third, zombie firms on life support continue to survive at the expense of healthy firms. Controlling for demand-side factors, zombie lending by government banks crowded out more productive lending, especially in industries and in bank portfolios with high proportions of failing firms. Credit was reallocated from healthy firms to the weakest firms.

Fourth, the links between government banks and inefficient firms persist following forbearance withdrawal, signaling the possibly irreversible lending distortions resulting from long periods of forbearance. A separating equilibrium of bank-firm quality-based matches emerges. Higher-quality firms migrate away from government-owned banks and form new banking relationships with private banks, while government banks remained in sticky matches with weak firms. Our evidence presents a cautionary tale about the potentially long-lasting misallocation effects of temporary forbearance measures.

We study the RBI's 2008 "Special Regulatory Treatment" for loans under temporary, crisis-induced liquidity stress. The policy relaxed the asset-risk classification rules governing capital provisioning requirements for financial institutions. With the new regulation, banks were no longer required to automatically downgrade the asset quality of loans to the substandard category due to missed principal or interest payments.

Notably, the RBI regulation did not provide explicit criteria for identifying liquidity-constrained firms, leaving it up to the banks as to which loans were assigned to the new "restructured" category. Banks could simply claim that delinquent firms faced temporary liquidity stress, place their loans in the restructured grouping and allow the loans to remain

in good standing.[1] Table A illustrates that under normal circumstances, in the absence of forbearance, the now "restructured" loans would have been subject to immediate downgrades to the sub-standard category, and capital provisioning requirements would increase proportionately and substantially (RBI, 2009).[2]

Table A: Capital Provisioning Requirements Prior to the Forbearance Regulation

Asset Category	NPA Duration	Provisioning Rate
Standard		0.25%-1%
Sub-Standard	<12 months	10%
Doubtful	12 to 24 months	20%
	24 to 48 months	30%
	> 48 months	100%
Loss		100%

Source: *Reserve Bank of India.* This table shows the loan-loss provisioning requirements by loan category in 2008, prior to the Special Regulatory Treatment regulation. Provisioning requirements for standard assets depend on the industry sector of the loan—the table shows the range of provisioning rates across all industries. NPA denotes non-performing assets.

Non-performing and restructured assets in India's banking system rose significantly between 2008 and 2018.[3] Following forbearance withdrawal, the build-up of stressed assets in government-owned banks came to light. Before the global financial crisis, India had the lowest non-performing asset (NPA) ratio amongst G-20 countries. By 2018, it had the highest NPA ratio of 11 percent. India's NPA ratio was also higher than its emerging market counterparts.[4] The data show a collapse in credit accompanied by falling profitability and capital

[1]Specifically, subject to some conditions, the forbearance measures permitted loan accounts of firms to retain their 'standard' or good standing classification post-restructuring due to missed payments. See Part B in https://rbi.org.in/scripts/NotificationUser.aspx?Id=5090&Mode=0

[2]That is, banks would be required to increase their capital reserves to protect themselves against the potentially increased default risk of these loans. Before 2008, the RBI broadly classified commercial bank loans as "standard" (assets in good standing) or non-performing assets (NPAs). Sub-classifications of NPAs, depending on the over-due principal, interest, or both, further categorized bank assets as sub-standard, doubtful, and loss assets.

[3]https://www.epw.in/journal/2018/34/perspectives/non-performing-assets-commercial-banks.html

[4]https://timesofindia.indiatimes.com/business/india-business/only-4-major-nations-have-higher-bad-loans-than-india/articleshow/62275553.cms

provisioning ratios, especially for government-owned banks (Figure 1 and Figure IA.1).

Zombie firms emerged on a large scale, indicating a twin balance sheet problem of a banking and corporate sector under financial stress. In 2016, approximately 40 percent of non-financial firms in India had an interest coverage, the ratio of revenues to interest payments, and 21 percent of firms had an interest coverage ratio of less than one, meaning that they could not cover their debt payments with current revenues. The average interest coverage ratio of Indian firms fell from 6.92 in 2007 to nearly half at 3.38 by 2015. At the same time, leverage remained unchanged, suggesting that the debt service capacity of the corporate sector had sharply declined.

To examine the credit allocation efficiency impact of forbearance, we begin by constructing a timeline of the RBI's forbearance stance by carefully parsing policy statements in official circulars posted on the RBI website.[5] Banking secrecy laws in India forbid banks from revealing information about their borrowers.[6] Firms can, however, voluntarily disclose information about their lenders. We exploit this asymmetry in information revelation to compile a matched firm-bank dataset with the corresponding firm and bank fundamentals. Using information about banks listed on firm financial statements in the CMIE's Prowess database, we build a bridge connecting banks and firms that allows us to construct bank-lending portfolios.

Prowess provides detailed financial statements from a broad universe of firms that we use to construct firm-level measures such as liquidity, solvency, firm size, etc. We construct bank-level measures of distress from the Basic Statistical Returns of Scheduled Commercial Banks published annually by the RBI.[7] In the matched dataset of firms and their lead banks, our sample has approximately 8,000 firms over the 2006-2016 period. The supplemental analysis uses hand-collected information on restructured loans from the Ministry of Corporate Affairs. We use these data to examine the relationship between the RBI's regulatory timeline, bank

[5]The circulars are available at https://rbi.org.in/Scripts/BS_CircularIndexDisplay.aspx dated August 2008 to February 2018, the relevant time frame for the forbearance related measures in India.

[6]The Public Financial Institutions Obligation as to Fidelity and Secrecy ACT, 1983. http://legislative.gov.in/sites/default/files/A1983-48.pdf

[7]Data are available on the RBI's online portal, Database on Indian Economy (DBIE)

ownership, and the zombie, liquidity, and solvency status of borrower firms.

Our findings suggest that banks took full advantage of the ambiguity in the policy communication and extensively used the restructured category to avoid adding to their capital reserves to provision for sub-standard loans. Using a triple interaction specification in pooled regressions, we show that government-owned banks significantly increased lending to zombie borrowers.[8] The triple difference estimates are plausibly causal given that the implicit parallel trends assumption is not violated. Zombie and healthy firms may have been on different time trends before the RBI introduced the forbearance schemes. However, the time trend differences between the two sets of firms do not appear to vary across government and privately-owned banks—the variation we exploit in the triple difference specification. The forbearance policy appears to provide banks with an incentive to obscure the true asset quality of their loans, offering a route to postpone or altogether avoid the recognition of troubled assets.

We find that the lending patterns did not change following forbearance withdrawal, suggesting that prolonged periods of asset-quality forbearance may have persistent effects. Forbearance appears to facilitate the evergreening of zombie loans by government banks exacerbating the 'extend and pretend' phenomenon. While insufficient recapitalization can perversely increase zombie lending (Acharya et al., 2019; Blattner, Farinha, and Rebelo, 2019), our results highlight that the sticky matches between bank- and firm types may also render future recapitalization ineffective.

Consistent with a misallocation of credit by banks close to their minimum capital requirement, evidence suggests that marginal banks may avoid loan loss recognition either due to sunk costs or soft budget constraints (Peek and Rosengren, 2005, Dewatripont and Maskin, 1995). In our case, government banks faced perverse incentives to provide additional credit

[8] A firm is classified as a zombie if the firm received subsidized credit, i.e., the firm can borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has a debt-to-assets ratio greater than 0.15.

to severely impaired borrowers.[9] Using supplemental loan-level data on restructured loans and exploiting within-firm variation, our evidence demonstrates that government banks had higher loan restructuring rates than private banks.

Our paper contributes to several strands of the literature. First, the literature on weakly capitalized banks, zombie firms, and the misallocation of credit focused on Japanese banks and, more recently, on European banks (Acharya et al., 2019, Blattner, Farinha, and Rebelo, 2019, and Gopinath et al., 2017). Our evidence is consistent with the congestion hypothesis in bank lending (Caballero, Hoshi, and Kashyap, 2008), that zombie-lending can distort competition by subsidizing credit to inefficient firms (Storz et al., 2017, Andrews and Petroulakis, 2019), and that there may be a policy dimension to the problem of zombie lending (McGowan, Andrews, and Millot, 2018). Second, we highlight the regulatory heterogeneity and political economy aspects of forbearance policies (Gropp et al., 2020, and Mian, Sufi, and Trebbi, 2010) arising from the state ownership of banks in India. With persistent lending relationships (Bhue, Prabhala, and Tantri, 2015), the long-lasting effects of forbearance in our paper suggest that zombie lending hinders the creative destruction process.

Third, given the effects of "stealth recapitalization" on capital allocation (Acharya et al. (2019)), we focus on the stealth bailout of government-owned banks. Anecdotal evidence suggests that the forbearance schemes targeted the looming threat of bad loans made during the lending boom in the early 2000s, such as in the infrastructure sector. Finally, our findings relate to recent papers focusing on the ongoing banking crisis in India, the role that distance plays in hiding bad loans, and the clean-up phase following forbearance withdrawal (Flanagan and Purnanandam, 2020 and Chopra, Subrahmanian, and Tantri, 2020).

The paper proceeds as follows. Section 2 provides details about the RBI's forbearance policy in the aftermath of the global financial crisis. Section 3 describes our data sources

[9]Peek and Rosengren (2005) suggest soft budget constraints to explain lending inefficiencies in Japan. Marginal banks tend to evergreen loans, essentially gambling for resurrection (Freixas, Rochet, and Parigi, 2010, Acharya et al., 2011, Baldursson and Portes, 2013, Koudstaal and Van Wijnbergen, 2012, Ben-David, Palvia, and Stulz, 2019). The loan portfolios of the government banks in our sample had higher proportions of low-solvency and zombie firms when compared to their private counterparts, consistent with government banks functioning as conduits of zombie lending.

and presents summary statistics. Section 4 presents findings on (i) lending patterns to low-solvency and low-liquidity borrowers following the implementation and withdrawal of forbearance; (ii) lending to zombie firms; (iii) the adverse spillovers to high-quality firms, and (iv) the real effects of forbearance. Section 5 presents robustness checks and alternative tests. Section 6 provides a discussion of our results and concludes.

2 Regulatory Forbearance and the GFC

This section describes the asset quality forbearance policy implemented by the Reserve Bank of India (RBI) and the special role of government-owned banks. We begin by describing the forbearance policies put in place amid the GFC. We divide the forbearance policies into two sub-periods: increasing forbearance between August 2008 and May 2013 and a period of forbearance withdrawal between May 2013 and February 2018. The online appendix also briefly describes the evolution of the legal framework that banks can access to resolve non-performing or stressed loans.

2.1 The GFC, Regulatory Forbearance and Regulatory Arbitrage

Before 2008, loans in good standing were classified as standard assets and subjected to a capital requirement of 0.25%-1% (Table A). The provisioning requirements for standard assets depend on the industry sector of the loan, and hence there is a range of provisioning rates across industries. Loans that missed principal or interest payments were immediately classified as a sub-standard asset and subjected to a higher capital provisioning rate of 10% up to a one-year period. If an asset continued in the sub-standard category beyond one year, it was downgraded further into the doubtful and then loss categories with progressive increases in provisioning rates to account for the steady deterioration in asset quality. Table A shows the different provisioning rates based on the alternative categories of loans in 2008.[10]

[10]These provisioning rates have been gradually increased since 2008. The most current rates (as of July 1, 2015) are 15% for the sub-standard category, 25% for doubtful assets for up to one-year & 40% for assets in the doubtful category from one to three years. The latest notice about provisioning norms is here: Reserve Bank of India (2015). https://rbidocs.rbi.org.in/rdocs/notification/PDFs/101MC16B68A0EDCA9434CBC239741F5267329.PDF

As a precautionary measure and potentially to address the emerging crisis in the infrastructure sector, the Reserve Bank of India announced a "Special Regulatory Treatment" for the restructuring of debt in 2008. The asset quality forbearance provided temporary liquidity relief to otherwise solvent firms due to GFC-related adverse shocks to firm cash flows. Under the terms of this new regulation, lending institutions were no longer required to automatically downgrade the asset quality to the sub-standard category due to missed payments of principal or interest or both. If banks could claim that a firm had missed payments because it faced temporary liquidity difficulties during the crisis, they could classify the loan assets into the new 'restructured' category not subject to the higher provisioning rates. Under normal circumstances, the loan would be downgraded to the sub-standard category, and capital provisioning requirements would increase proportionately.

Not surprisingly, banks took full advantage of the 'restructured' classification to avoid the higher provisioning requirements. Forbearance steadily provided banks with a route to postpone or altogether avoid the recognition of troubled assets (Vishwanathan, 2018). Banks used the restructured classification to engage in regulatory arbitrage deviating sharply from the original intent of the forbearance policy, namely, to provide temporary relief for otherwise viable firms encountering liquidity issues during a crisis.

State ownership of a majority of Indian banks, 70% of banking sector assets, is an additional important aspect in allocating credit in the aftermath of the forbearance policy. Sovereign control over government-owned banks leads to what Patel (2020) terms banking sector-fiscalization in India. The government uses the state-owned banks for day-to-day macroeconomic management rather than their primary financial intermediation function. Acharya (2020) hypothesizes a fiscal dominance channel where the sovereign's fiscal health determines bank regulation. As a result, there is considerable sovereign influence on default disclosure norms and loan provisioning requirements. The RBI exerts significant control over distressed asset resolution procedures because it dictates provisioning requirements for banks and disclosure norms for non-performing assets. These practices directly impact bank balance sheets imposing additional capital requirements for government-owned banks. As a

result, as the regulator, the RBI is often under pressure from the government to postpone bad loan recognition that would ultimately require recapitalization by the sovereign. Given the predominant role of government-owned banks in the Indian financial system, we analyze the quality of credit allocation distinguishing between banks based on ownership.

By 2013, restructured assets constituted nearly 70% of stressed assets for government-owned commercial banks (Figure 1a). The non-performing to gross asset ratio in Figure 1b mirrors the pattern. With the announcement of forbearance, restructured or hidden assets rose and the non-performing asset ratio declined. Similarly, the ratio of distressed assets (defined as the sum of non-performing and restructured assets) was relatively flat during the forbearance period increasing sharply after the withdrawal was announced—distressed assets had, however, started increasing for government-owned banks by 2011 (Figure 1c). Taken together, the patterns in the three panels of Figure 1 suggest that the evolution of the hidden asset ratio masked the true extent of bank loan portfolio deterioration. We see that following the announcement of forbearance withdrawal in 2013, the restructured to distressed assets ratio began to decline while the ratio of non-performing and distressed assets increased sharply. We discuss the construction of these measures in greater detail in Section 3.1.2.

A Financial Stability Report from the RBI notes that while major crisis periods justify regulatory forbearance, extended periods of forbearance potentially lead to moral hazard problems [Financial Stability Report (Including Trend and Progress of Banking in India 2013-14), 2014]. It also noted that as India moved towards implementing Basel II norms, accounting discretion such as restructuring would subsequently have no impact on capital requirements. In May 2013, the RBI announced the withdrawal of forbearance on asset classification effective April 1, 2015.

2.2 Regulatory Forbearance: The Withdrawal Phase

Between 2013 and 2017, the RBI and the government began tightening the prudential norms for asset classification and income recognition. However, some windows of restructuring remained open. Raghuram Rajan, Governor of the RBI, initiated an 'Asset Quality Review'

(AQR) that led banks to recognize the non-performing nature of several loans, previously considered restructured assets under the forbearance regime. During this time, we see a significant increase in the proportion of non-performing assets in the gross loans of banks. Noticeably, it is only after 2015, the AQR implementation year, that the proportion of restructured assets in gross loans finally starts declining. Figure 1 provides visual confirmation of using the forbearance regulation to hide the stressed loans under the guise of 'restructured' assets.[11].

In summary, we can broadly classify forbearance measures into two phases, a phase starting August 2008 and ending May 2013, when forbearance increased, and a second phase beginning May 2013 and ending February 2018, when forbearance was removed entirely. Table A1 summarizes the major policy events and the direction of increases and decreases in forbearance over our sample period. Our analysis ends in the first quarter of 2016 to avoid the confounding effects of the Insolvency and Bankruptcy Code introduced in May 2016, which significantly altered the bad loan resolution process, and importantly to avoid contaminating our results with the demonetization episode that began in November 2016.

3 The Data

We use firm-level data from the Prowess database and bank-level data from the DBIE database of the Reserve Bank of India. Prowess covers firms in the organized sector, which refers to registered companies that submit financial statements. According to the government, "the organized sector comprises enterprises for which the statistics are available from the budget documents or reports, etc. On the other hand, the unorganized sector refers to those enterprises whose activities or collection of data is not regulated under any legal provision or do not maintain any regular accounts".[12] The 1956 Companies Act requires Indian

[11]Other measures implemented included the creation of a data warehouse of large loans called the Central Repository of Information on Large Credits (CRILC) to cover all loans in India over Rs. 5 crores (approximately US$ 0.7 million). Accessible by all banks, the database provides a transparent way for banks to gain information about whether a borrower has defaulted with another bank.

[12]For more details, refer to Ministry of Labour and Employment (2000)

firms to disclose information on capacities, production, and sales in their annual reports.

Prowess covers both publicly-listed and unlisted firms from a wide cross-section of manufacturing, services, utilities, and financial industries from 1989 to 2019. About one-third of the firms in Prowess are publicly-listed firms. The companies covered account for more than 70% of industrial output, 75% of corporate taxes, and more than 95% of excise taxes collected by the Government of India (CMIE).

Firm-level balance sheet and income statement data provide detailed information about numerous variables, such as sales, profitability, and assets. The Prowess data also provide information on the identity of banks from whom firms borrow. We hand-match these bank identities to detailed bank balance sheet information from the RBI's DBIE database.[13]

Our forensic approach to matching firms to banks has a unique advantage. Financial secrecy laws prohibit banks in India from revealing the identity of their borrowers.[14] However, there is no such restriction on firms voluntarily revealing their bankers. Our empirical analysis takes advantage of this asymmetry in information sharing to build a bridge from firms to banks in our data.

The Prowess data combined with the DBIE data are well-suited for understanding how banks and firms respond to policy changes such as forbearance. Prowess provides the names of banks for about 19,600 firms. After applying the filter mentioned above, the firm-bank bridge, our sample has 8,331 unique firms. Approximately two-thirds (36%) of the firm-year observations have a single banking relationship, and the remainder have multiple banks. The average number of bankers among multiple banking firms is 4.86 over the sample period.

The Indian NIC system (2008)[15] system classifies firms in the Prowess dataset by industry. The data include firms from a wide range of industries, including mining, basic manufacturing, financial and real estate services, and energy distribution.

An additional advantage of the bank and firm-level data is that with detailed balance

[13]When a firm borrows from more than one bank in a year, the bank names in Prowess are in the order in which they appear in the firm's financial statements. In the case of multiple banking relationships, we retain the first bank as it likely corresponds to the firm's lead bank.

[14]The Public Financial Institutions (Obligation as to Fidelity and Secrecy) Act, 1983. http://legislative.gov.in/sites/default/files/A1983-48.pdf

[15]See http://mospi.nic.in/classification/national-industrial-classification for further details.

sheet information, we can analyze the forbearance policy's impact on banks based on their loan portfolio characteristics—firms distinguished by zombie, solvency, and liquidity status. We can compile a sample of non-financial firms matched with their bankers to explore the nature of the matches using both borrower and bank characteristics. Prowess also provides data on stock market returns and financial performance variables like current assets, current liabilities, debt, cash flows, and interest expenses. We use the financial variables to construct firm-level measures of quality. We also use information on real variables like the change in gross fixed assets and a firm's wage bill to examine the real effects of the forbearance policy changes.

We supplement the principal analysis with loan-level data on loan charges from the Ministry of Corporate Affairs (MCA). Firms self-declare the data, which may or may not be validated by a formal audit. The data contain information about loan amounts and financial institution names. We use the "date of modification" to enumerate loan restructurings and the amounts restructured. We match the loan-level data to the main Prowess data using the Company Identification Number (CIN). We hand-match the data on scheduled commercial banks. The final dataset comprises matched firm-bank information on collateralized loans.

Since firms and banks manually file the data, there are numerous instances where, due to human error, there are duplicate observations in the data. We address these inaccuracies as follows. Each charge has a unique charge identification number. We drop observations with duplicate charge identification numbers or if the charge identification number is different, but the loan amounts, bank names, and dates are the same. We take a conservative approach and drop observations where the date of loan initiation, loan amount, and the CIN appear more than once. We then aggregate up to the bank-firm-year level and form a balanced panel to get 1,298,440 observations.

We use a sample period from 2006 to 2016. We ended the sample period in March 2016 to avoid confounding the results with the Insolvency and Bankruptcy Code introduced in May 2016 and the demonetization episode of November 2016. We distinguish between the phase after the introduction of forbearance in 2008 and the phase after withdrawal was announced

in 2013.

We match the firm-level data with bank-level information obtained from annual Bank Statistical Returns (BSR) available on the Reserve Bank of India's website. [16] The publicly available version has bank-level balance sheet data and standard variables such as industry classification, credit, deposits, NPAs, and restructured advances.

Our baseline analysis includes government-owned and private scheduled commercial banks. In the robustness section, we extend the analysis to foreign banks for a placebo test. In 2016, there were 27 government-owned banks, 21 private sector banks, and 49 foreign banks in the Indian banking system.[17] Government-owned banks account for almost 70% of the total market share, private sector banks for approximately 23%, and foreign banks for the remaining 7%. Figure 2 shows that asset quality declined significantly post-2013 and more so for government-owned banks. We restrict our sample of lenders to government-owned and private sector banks for the main analysis, introducing foreign banks as a robustness check. We construct bank-level measures of performance using the DBIE's BSR dataset.

The fiscal year for a vast majority of Indian firms ends in March. A subset of firms release data quarterly as well. The bank-level data is released at the end of March every year. To ensure that we use the latest available information about each firm, we use the latest date in a financial year for firms' financial variables. We exclude observations with missing values for total assets, a central variable required for computing several variables used in our main analysis. Table A2 provides a detailed summary of variable definitions. Table A3 reports the steps we follow to construct our sample for the period 2006-2016. The final sample is at the firm-lead-bank-year level comprising 38,016 observations, 8331 unique firms, and 39 unique lead banks.

[16] Following is the link to the DBIE portal of RBI https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications#!4

[17] In addition there were 56 regional rural banks, 1,562 urban cooperative banks and 94,384 rural cooperative banks, and cooperative credit institutions–these banks are excluded from our analysis as they do not lend to the firms in our sample.

3.1 Constructing Borrower and Bank-Level Measures

In the next section, we examine both bank and borrower-level responses to the forbearance policy to assess whether government-owned banks' lending to low-quality firms changed and whether banks used the asset classification benefits to their advantage. Or, did the forbearance provide an opportunity for regulatory arbitrage? Following the announcement of forbearance, a consistent pattern of increased lending to low-solvency and zombie firms could indicate that the firms were distressed due to fundamental economic problems and not temporary liquidity constraints. First, we describe the construction of our borrower-level measures from the firm-level data and the bank-level measures.

3.1.1 Borrower-Level Measures

We begin with measures of borrower-level quality. Liquidity ratios are based on the portions of the company's current assets and current liabilities taken from the firm balance sheet and indicate the ability to repay short-term obligations. We consider the Quick Ratio (Current Assets-Inventory/Current Liabilities) and the Cash Ratio (Cash to Current Liabilities) as liquidity measures with higher values signaling available cash and short-term survival viability.

The solvency measures indicate the long-term survival potential of firms. To measure solvency, we use the Debt-to-Equity Ratio, the Debt-to-Assets Ratio, and Altman scores using emerging market weights. The Debt-to-Equity ratio signals the extent of leverage and measures the ability to repay long-term obligations. The measures are winsorized at 0.5% level on both ends of the tail every year to avoid significant outliers from biasing the averages.

Identification of zombies: There are several ways to classify zombie firms. A measure from Caballero, Hoshi, and Kashyap (2008) defines zombies as firms potentially receiving subsidized bank credit. More specifically, comparing actual interest payments made by firms with an estimated benchmark interest rate based on the firm's debt structure and market interest rates allows for zombie firm classification.

A second measure uses interest coverage ratio to classify zombies (McGowan, Andrews,

and Millot (2018)). A third measure from Acharya et al. (2019) uses the three criteria to classify zombies: (i) subsidized credit access in year t, (ii) credit ratings derived from the three-year median are BB or lower, and (iii) the syndicate composition either remained unchanged or, new participants did not replace the banks that left the syndicate.

In the baseline specification, we classify a firm as a *Zombie* if the firm received subsidized credit in a time period T, i.e., the firm can borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has a debt-to-assets ratio > 0.15.

Table IA.1 displays zombie-firm characteristics. Zombie firms are more likely to be in the manufacturing or infrastructure, consistent with the argument that the forbearance measures targeted failed infrastructure projects from the preceding lending boom period of 2002–2006 (column 6).[18] Zombie firms are also older, publicly-listed, and large. It is reassuring that our zombie definition is not capturing small firms with high growth potential that may not currently be able to service debt.

In addition, to confirm that our results are robust to the zombie-firm definition, we use a set of alternative measures. These include (i) in addition to subsidized credit, the borrower has an interest coverage ratio below two ($ICR < 2$), (ii) the borrower's ICR is less than one for at least three years consecutively and its Tobin's q is below median in the industry to which it belongs in any given year (Banerjee and Hofmann (2018)). Tobin's q is a market-based measure, and hence this sample is restricted to listed borrowers, and (iii) the IMF's speculative credit definition, i.e., firms with an interest coverage ratio, $ICR < 4.1$ and a net debt-to-assets ratio greater than 0.25.

[18]We can trace the origins of the trouble in the banking sector to the credit boom between 2004 to 2009. Commercial credit nearly doubled and was accompanied by significant foreign capital inflows, especially in infrastructure and related sectors such as Telecom, Power, Roads, Aviation, and Steel (Chakrabarty, 2013a). By 2008, poor credit quality (Chakrabarty, 2013b) coupled with problems gaining access to land and environmental clearances led to an increase in distressed assets, especially in the infrastructure sector (Chavan and Gambacorta, 2019; Chakrabarty, 2013a). Against this backdrop, the global financial crisis (GFC) occurred.

3.1.2 Bank-Level Measures

The Government of India's Ministry of Finance or various State Ministries of Finance hold majority stakes in Public Sector Banks (PSBs). We refer to public-sector banks as 'government-owned banks.' To investigate the role of ownership on the allocation of credit at the bank level, we require a measure that can capture the effect of regulatory forbearance on the bank's portfolio of assets. We begin by constructing bank-level portfolios by first collapsing the matched bank-firm dataset at the bank level to compute the number of borrowers attached to each bank. Next, we map the bank-level information from the RBI, namely, Gross Advances (GA), Restructured Advances (RA), and Non-Performing Advances (NPA), to our collapsed dataset by bank and year to compute bank-level metrics as follows.

We construct the 'Hidden Assets Ratio,' or the proportion of restructured assets in the total pool of distressed assets. We compute the ratio as restructured assets as a fraction of restructured and non-performing assets on a bank's balance sheet ($\frac{RA}{DA}$). Given that more granular data is not available for tracking the evolution of loans across the different loan classification categories like standard and non-standard over time,[19] we compute the Distressed Asset ratio as the sum of non-performing loans (NPAs) and restructured loans (RA) in any given year as a proportion of gross advances by the bank ($\frac{DA}{GA}$). Similarly, we compute the NPA ratio as the ratio of non-performing assets to gross advances ($\frac{NPA}{GA}$).

Figure 1 plots the evolution of the bank-level distressed and restructured asset ratios between 2006 and 2016 by ownership. Restructured and non-performing loans are significantly higher for government-owned banks than for private sector banks. Panel A shows the restructured assets ratio ($\frac{RA}{DA}$) steeply rising between 2008 and 2013 for government banks, reflected in the rising levels of restructured loans. Panel B plots the distressed assets ratio ($\frac{DA}{GA}$) that increases significantly after 2008 and continues to do so in the post-2013 period. Panel C displays the non-performing assets ratio ($\frac{NPA}{DA}$), the proportion of loans recognized as bad loans. The ratio hovered at relatively low levels till 2013, when forbearance withdrawal

[19]The RBI publishes the aggregate volume of loans in the standard and NPA categories for each bank on an annual basis but does not disclose how an individual loan transitions over the years from one category to another. We also do not know whether a firm loan has been classified as an NPA using firm-level data.

was announced, following which it spiked quickly, indicating a transfer of restructured assets to the non-performing category (i.e., from Panel A to Panel C). By 2016, NPAs were almost 10% of total loans in the Indian banking sector-significantly higher than in other emerging markets and driven by government-owned banks.

3.2 Summary Statistics

Table 1 shows the summary statistics for the selected firm-level and bank-level ratios used in our analysis. We present the statistics for high and low-quality borrowers by solvency, liquidity, and zombie status. We also test for the significance of the difference in means between the high and low-quality groups. Panel A shows the summary statistics by solvency and liquidity status. We observe that firms classified as low-solvency have significantly lower liquidity measures and significantly higher debt than solvent firms. Similarly, low-liquidity firms also have significantly lower-solvency measures and lower aggregate debt levels than liquid firms.

Panel B splits the sample via zombie status. We use the three alternative definitions of zombie firms as recipients of subsidized credit (Zombie Status #1), imposing an additional condition of an $ICR < 2$ (Zombie Status #2) and the subset of firms satisfying the IMF's 'speculative credit' definition (Zombie Status #3). Zombie firms have significantly higher aggregate debt levels and leverage ratios and lower interest coverage ratios and liquidity ratios than the creditworthy firms in the sample. An interesting observation is that the Zombie Status #3 definition of low-quality firms does not depend on the average interest rate paid by a firm. Perversely, this definition indicates a significantly lower borrowing cost for low-quality firms than for healthy firms. We infer that low-quality firms had cheaper access to credit during our sample period despite their low solvency and liquidity status.

In the formal empirical specifications, zombie firms receive subsidized credit; i.e., pay an average interest rate below that paid by creditworthy borrowers. Low-solvency firms have above-median debt-to-equity ratios, and low-liquidity firms have below-median cash ratios. Table 1, Panel C shows descriptive statistics for the bank-level data by bank health

status. On average, government-owned banks are smaller and have higher proportions of restructured and non-performing loans than healthy banks.

Using simple univariate regressions, Table 2 displays the correlation between the proportion of low-liquidity and low-solvency firms in a bank's portfolio and the distressed asset ratio of the bank between 2006-2016. We present regression coefficients for $\frac{DA}{GA}$, $\frac{RA}{DA}$ and $\frac{NPA}{GA}$ against different measures of low-solvency and low-liquidity. Solvency measures are based on debt-to-equity ratios and liquidity measures on the cash ratio.

The first two rows measure the proportion of firms in a bank's portfolio with above-median leverage ratios and in the top quartile. The third row focuses on a leverage ratio above 2, an accepted definition of leverage that is 'too high'. The last three rows focus on low-liquidity firms and measure the proportion of firms in a bank's portfolio with a cash ratio in the bottom quartile, below the median, and below unity, respectively.

The data suggest a consistent pattern of statistically significant and positive correlations between the bank-health measured by the ratio of stressed assets and low-quality borrowers measured by low liquidity and low solvency. The evidence in Table 2 provides preliminary evidence for the hypothesis that there is a time-invariant sticky match between government-owned banks and low-quality borrowers.

Further, Table 3 displays cross-tabulations based on the three firm characteristics of liquidity, solvency, zombie status, and bank-ownership status. The matrices uncover some interesting lending pattern differences across government-owned and private banks. Government-owned banks tend to lend more heavily to low-solvency, low-liquidity, and zombie credit firms than their private counterparts. The proportion of high solvency/low-liquidity firms and low-solvency/low-liquidity firms is significant. While low-liquidity firms constitute the 'intended' beneficiaries stated by the policy, low-solvency firms constitute the 'unintended' beneficiaries. We also see that the loan portfolios of government-owned banks comprise a higher proportion of low-quality firms signaling a misallocation of credit.

Figure 2 presents a graphical description of the time-series patterns in lending by government-owned and private banks. Panel A shows a rapid expansion in the aggregate credit extended

by government-owned banks compared to private banks. A visual inspection of the data reveals how aggregate credit was apportioned between borrowers by quality status based on alternative criteria such as zombie status (Panel B), solvency status (Panel C), and liquidity status (Panel D).

The credit extended to zombie firms shows a steep and sustained increase after 2008. While lending to creditworthy firms declines sharply following the forbearance withdrawal announcements by the RBI, no such reversal appears in lending to zombie firms following forbearance retraction. Similarly, lending to low-solvency firms consistently increases relative to 2008-levels, along with a very apparent decline in credit extended to solvent firms. Credit increases to low-solvency firms appear to moderate around the forbearance withdrawal announcement alongside increases in credit allocations to solvent firms.

Finally, we fail to observe a striking difference in the credit allocated to firms by liquidity status, although credit extended to liquid firms following forbearance withdrawal declines somewhat. Overall, the patterns of credit allocation by firm-health status are puzzling, especially given that the intent of the original forbearance policy allowances specifically addressed the needs of firms experiencing temporary liquidity stress. In the next section, we formally investigate the empirical validity of the patterns observed in Figure 2 and Table 3.

4 Benchmark Specification and Results

A visual inspection of the data in Figure 2 suggests that following the implementation of forbearance measures, lending increased to the beneficiaries stated in the forbearance policy, i.e., low-liquidity but solvent firms. However, lending also increased to zombie and low-solvency firms. In this section, we formally investigate the relationship between bank lending and zombie status to investigate whether asset quality forbearance impacted the efficiency of lending.

Much of the literature attributes the rise of zombie lending to weakening bank capital

ratios (Acharya et al., 2019).[20] A popular measure of bank capital is the Tier-I Capital to the Risk-Weighted Assets Ratio (CRAR-T1). CRAR-T1 consists of the first line of defense for a bank in the wake of any losses. We begin by graphically representing the relationship between bank capital ratios and the proportion of zombie firms. Figure IA.2 shows an inverse relationship between bank capital adequacy and the proportion of zombie borrowers. A possible interpretation is that if bank balance sheets were under stress during and after the global financial crisis, banks might have faced a perverse incentive to lend to zombie borrowers by evergreening loans, as mentioned previously, a phenomenon referred to as 'extend and pretend.'

In India, the regulator enabled such lending by instating forbearance against a backdrop of stable capital requirements (the minimum regulatory CRAR remained at 9% from 2006–2012). Bearing in mind the worsening interest coverage ratio of low-quality borrowers in our sample that coincided with declining bank health and forbearance provision, we test for the prevalence of zombie lending in our data focusing on whether a match exists between zombie firms and government-owned banks. We also explore whether zombie lending adversely affected lending to healthy firms, especially if government-owned banks also dominated lending in particular industries. Zombie lending may crowd out healthy firms with attendant spillover effects that could reduce private-firm access to bank lending.

4.1 Empirical Specification

We use a triple-interaction difference-in-differences specification to examine the impact of the forbearance policies on lending growth based on bank ownership and zombie status. First, we focus on the entire period after forbearance implementation, encompassing the

[20]Indirect means of forbearance can include beneficial restructuring, maturity extension, or conversion of the payment structure from regular installments to a lump-sum payment at maturity and may be more prevalent in emerging countries like India. Previous literature explores the connection between 'zombie' firms, or firms that would typically exit in a competitive market, and bank health (Andrews and Petroulakis, 2019). Perverse evidence suggests that it can become easier for weak firms that do not adopt the latest technologies to remain in the market, while more productive firms are less likely to expand (McGowan, Andrews, and Millot, 2018).[21] The literature also documents growing concerns that zombie firms may be holding back potential growth in several countries, including Japan (Caballero, Hoshi, and Kashyap, 2008), the United Kingdom (Acharya et al., 2019), and Southern Europe (Gopinath et al., 2017).

introduction and withdrawal phases. The benchmark specification is:

$$\begin{aligned} Log(Debt_{j,t+1}) = {} & \psi * Govt\,Bank_{b,j} + \phi * Zombie_{j,t} \\ & + \chi * Forbearance_t^1 + \beta * Govt\,Bank_{b,j} * Zombie_{j,t} \\ & + \delta * Govt\,Bank_{b,j} * Forbearance_t^1 + \eta * Zombie_{j,t} * Forbearance_t^1 \\ & + \zeta \times Govt\,Bank_{b,j} * Zombie_{j,t} * Forbearance_t^1 + \theta * \mathcal{X}_{j,t+1} + \gamma_j + \epsilon_{j,t+1} \end{aligned} \quad (1)$$

The outcome variable is the total lending to firm j assigned to lead bank b in period $t+1$. $Govt\,Bank_{b,j}$ captures bank ownership, an indicator variable which takes the value one if a firm (j) borrows from a government-owned lead banker and zero otherwise[22].$Zombie_{j,t}$ takes a value of one if a firm classifies as a zombie and zero otherwise. $Forbearance_t^1$ is an indicator variable that captures the post-forbearance announcement period taking a value of one in the years following 2008. The specification also includes a time-varying firm characteristic ($\mathcal{X}_{j,t+1}$) to control for firm size using log sales for time-invariant borrower characteristics (γ_j) and includes a complete set of double interaction effects.

The primary coefficient of interest is the triple interaction term, ζ that captures the growth in lending ($\Delta Log(Debt_{j,t+1})$) by government-owned lead banks (relative to private banks) to zombie firms over the entire post-forbearance period, 2009–2016, controlling for firm and bank characteristics.

To unpack the triple difference specification, note that the marginal effect of lending with respect to zombie status, $\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}$, is given by $\phi + \beta * Govt\,Bank + \eta_1 * RF + \zeta * Govt\,Bank \times RF$.[24]

[22]The Prowess data do not provide information on lending by each bank-firm pair, and hence we link firms to a lead bank.[23]

[24]Please note that margins cannot be calculated when the fixed effects absorb the main effects.

Table B: Unpacking the Triple Interaction Effect

	Marginal Effect	Coefficients
(i)	$\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}\Big\vert_{Govt\,Bank=1,RF=1}$	$\phi+\beta+\eta+\zeta$
(ii)	$\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}\Big\vert_{Govt\,Bank=1,RF=0}$	$\phi+\beta$
(iii) = (i) - (ii)	$\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}\Big\vert_{Govt\,Bank=1,RF=1-RF=0}$	$\eta+\zeta$
(iv)	$\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}\Big\vert_{Govt\,Bank=0,RF=1}$	$\phi+\eta$
(v)	$\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}\Big\vert_{Govt\,Bank=0,RF=0}$	ϕ
(vi)= (iv) - (v)	$\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}\Big\vert_{Govt\,Bank=0,RF=1-RF=0}$	η
(vii) = (iii)-(vi)	$\frac{\partial Log(Debt_{j,t+1})}{\partial Zombie_{j,t}}\Big\vert_{Govt\,Bank=0-Govt\,Bank=1,RF=1-RF=0}$	ζ

Table B, row (i) shows that the marginal growth in lending by government banks to zombie firms post-forbearance is captured by summing the coefficients $\phi+\beta+\eta+\zeta$. Further, the growth in lending by government banks to zombie firms before forbearance is the sum of the coefficients $\phi+\beta$ in row (ii). Therefore the difference between the two sets of coefficients ((i)-(ii)) in row (iii) is $\eta+\zeta$, the growth in government bank lending to zombie firms in the aftermath of the forbearance policy relative to the pre-forbearance window.

Similarly, row (iv) shows the marginal growth in lending by private banks to zombie firms post-forbearance as the sum of the coefficients $\phi+\eta$, while the coefficient ϕ in row (v) captures the lending growth by private banks to zombie firms before forbearance. Therefore, the growth in the lending by private banks to zombie firms following forbearance relative to the pre-forbearance period is equal to η in row (vi). Accordingly, the coefficient ζ, the triple interaction term in row (vii), captures the difference in lending growth to zombie versus healthy firms by government banks relative to the same difference for private banks, before and after forbearance implementation.

While we initially estimate the baseline without bank and year fixed effects to account for time-invariant bank characteristics and time effects, we introduce them in subsequent

specifications. Note that the bank (μ_b) and year (λ_t) fixed effects will absorb the ownership and forbearance terms, $Govt\,Bank_b$ and $Forbearance_t^1$.[25]

We also analyze the differences in lending growth for different phases of the forbearance regime. In 2013, the RBI announced the withdrawal of forbearance, as mentioned previously. We introduce an indicator variable $Forbearance^2$ that takes the value of one in the years following 2013, into the specifications in equations (1) and (2). Controlling for bank and year fixed effects, we estimate the following pooled specification:

$$\begin{aligned} Log(Debt_{j,t+1}) = \gamma_j + \mu_b + \lambda_t + \phi * Zombie_{j,t} + \beta * Govt\,Bank_{b,j} * Zombie_{j,t} \\ + \sum_{k=1}^{2} \delta_k * Govt\,Bank_{b,j} * Forbearance_t^k + \sum_{k=1}^{2} \eta_k * Zombie_{j,t} * Forbearance_t^k \\ + \sum_{k=1}^{2} \zeta_k * Govt\,Bank_{b,j} * Zombie_{j,t} * Forbearance_t^k + \theta * \mathcal{X}_{j,t+1} + \epsilon_{j,t+1} \quad (3) \end{aligned}$$

where $k = 1$ post the introduction of forbearance and $k = 2$ for withdrawal of forbearance.

The two triple interaction terms (ζ_1 & ζ_2) are the primary coefficients of interest. As before, ζ_1 represents the marginal growth in lending to zombies relative to healthy firms by government banks relative to private banks, before and after forbearance implementation. Correspondingly, ζ_2 captures the effect during the withdrawal period (2014-16) or the growth in the lending by government banks to zombie firms relative to private banks, restricting the post forbearance period to the withdrawal phase.

[25] The preferred specification becomes:

$$\begin{aligned} Log(Debt_{j,t+1}) = \gamma_j + \mu_b + \lambda_t + \phi * Zombie_{j,t} + \beta * Govt\,Bank_{b,j} * Zombie_{j,t} \\ + \delta * Govt\,Bank_{b,j} * Forbearance_t^1 + \eta * Zombie_{j,t} * Forbearance_t^1 \\ + \zeta * Govt\,Bank_{b,j} * Zombie_{j,t} * Forbearance_t^1 + \theta * \mathcal{X}_{j,t+1} + \epsilon_{j,t+1} \quad (2) \end{aligned}$$

Again, ζ captures the growth in lending to zombie versus healthy firms by government banks relative to their private counterparts before and after forbearance.

4.2 Zombie Lending

Columns 1 and 2 of Table 4, Panel A summarize the results, and Panel B presents the corresponding marginal effects computations. A positive and significant coefficient (0.264) on the triple interaction term, ζ_1, captures zombie lending by government-owned banks in the forbearance period (Column 1). The sum of the coefficients $\eta + \zeta$ is equal to -0.056, indicating a marginal 5.6% increase in lending growth by government banks to zombie firms before and after forbearance. In comparison, η is -0.208 indicating a 21% decline in lending by private banks to zombie firms over the same period. The marginal effects computation in Panel B of Table 4 show that, in the forbearance period, zombie lending by government-owned banks to zombie firms increases by 5.6 percentage points, whereas zombie lending by private-banks declines by 20.8 percentage points. In the forbearance period, zombie lending by government banks is therefore 26 percentage points higher relative to private banks.

Column 2 of Table 4 introduces controls for bank and year fixed effects consistent with the specification in equation (2). The pattern of coefficients remains similar, with the positive and significant ζ_1 rising slightly to 0.278 (s.e.=0.128). The results in columns 1 and 2 suggest that the pre-post forbearance differential in marginal lending growth to zombie firms by government relative to private banks ranges from 26%-28%.

Turning to the withdrawal phase of the forbearance policy (2014-2016) in Columns 3 and 4, we ask whether there is a reversal in the observed lending patterns of government and private banks, or does forbearance have persistent effects? The triple interaction coefficient ζ_2 coefficient for the forbearance withdrawal period ($RF_t^{Post2013} * Govt\,Bank_b * Zombie_{j,t}$) is statistically insignificant signals a sticky match between government banks and zombie borrowers, indicating the potentially persistent effects of forbearance provision. ζ_1 on $RF_t^{Post2008} * Govt\,Bank_b * Zombie_{j,t}$, however, remains positive and statistically significant. Further, while the statistically significant triple interaction term ζ_1 increases with bank and year effects, post-withdrawal coefficient ζ_2 remains insignificant.

Overall, the findings in Table 4 suggest that increased government-owned bank lending to their existing low-quality borrowers accompanied the lending norms relaxed during the

forbearance period. In all likelihood, the new loans enabled zombie firms to service their older loans, i.e., forbearance facilitated loan ever-greening. That the pattern does not appear to reverse following forbearance withdrawal indicates the potentially persistent effects of policies that relax lending norms.

Using an event study, we also estimate equation 3 which pools the introduction and withdrawal phases of forbearance to examine the dynamic effects of the forbearance policies on zombie lending. We replace the indicators for $Forbearance_t^k$ in Equation 2 with an indicator for each time period. Figure 3 plots the coefficients for the triple interaction term, ζ_1. Consistent with the findings in Table 4, we see an increase in zombie lending in the forbearance phase but no evidence of a reversal during the withdrawal phase. Figure 2 shows that the zombie and healthy borrowers may have been on different trends prior to the reform. However, our main specification compares the relative impact of government-owned banks lending to zombie and healthy borrowers against the same zombie-healthy firm lending difference for private banks. Indeed, Figure 3 suggests that the parallel trends assumption is not violated in the triple difference specification. Arguably, our estimates represent the causal impact of the forbearance policies on zombie lending.

To examine the validity of our inferences, we consider alternative refinements of the zombie-firm classification criteria. Appendix Table IA.2 presents the results. First, we add an $ICR < 2$ condition to the subsidized lending definition to ensure that the firms classified as zombies are indeed close to the point where they cannot service the interest costs on their borrowing (Columns (1) & (2)). Second, we employ the IMF's speculative lending definition in Table IA.2 (Columns (3) & (4)), which includes the debt of all firms in the data set with an ICR of less than 4.1 and a net debt-to-assets ratio greater than 0.25, where net debt is gross debt less cash.[26] The thresholds are empirically established based on constituents of the global investment-grade and speculative-grade bond indices.

Consistent with our baseline measure, we see an economically significant increase in zombie lending relative to non-zombie firms of 8% and 26.8%, respectively, using the alter-

[26]See the Global Financial Stability Report, October 2019: Lower for Longer, IMF

native zombie-firm definitions. We find qualitatively similar results following Banerjee and Hofmann (2018)'s zombie-firm measure. However, while the coefficient estimates are qualitatively similar in sign, they are not statistically significant. Recall that this alternative definition requires information about Tobin's q that can only be calculated for listed firms, while our sample's subsidized lending definition maximizes coverage.

4.3 Spillovers

Our findings thus far raise an important question. Does zombie lending crowd out healthy firm access to lending? Lending access spillovers can occur in two ways. A direct channel through the bank-credit reallocation where banks direct credit to zombie firms crowding out allocations to healthier firms, or the bank congestion channel. Or, an indirect channel that interferes with the creative destruction process, decreasing the demand for credit by healthy firms in the economy, the industry congestion channel (Caballero, Hoshi, and Kashyap (2008)).

To investigate the bank congestion channel, we examine the lending patterns of government-owned banks with higher proportions of zombies in their loan portfolios. By collapsing the data to the bank level we can calculate the proportion of zombies in a bank's portfolio in a given year ($Bank\,Frac\,Zombie_{b,t}$). We map this proportion back to the firm-level data and estimate the following specification to examine the spillover effects on government bank lending to healthy firms where $k = 1$ for introduction of forbearance and $k = 2$ for withdrawal of forbearance.

$$\begin{aligned} Log(Debt_{j,t+1}) = \gamma_j + \lambda_t + \mu_b + \beta_1 \times Bank\,Frac\,Zombie_{b,t} \times Healthy\,Firm_{j,t} \\ + \sum_{k=1}^{2} \delta_k \times Bank\,Frac\,Zombie_{b,t} \times Forbearance_t^k + \sum_{k=1}^{2} \eta_k \times Healthy\,Firm_{j,t} \times Forbearance_t^k \\ + \sum_{k=1}^{2} \zeta_k \times Bank\,Frac\,Zombie_{b,t} \times Healthy\,Firm_{j,t} * Forbearance_t^k + \epsilon_{j,t+1} \quad (4) \end{aligned}$$

Columns (1) and (2) of Table 5 summarize our findings. The coefficient on the triple interaction term, ζ_1, is negative and significant (-1.089 and -1.065) in the baseline specification with and without bank-year fixed effects. The findings suggest that as the proportion of zombie firms in the portfolios of government-owned banks increases by 10%, lending to healthy firms declines significantly and is 10.8% (10.6%) lower than lending to zombie firms.

Using the entire sample of banks, we observe that the proportion of firms classified as zombies in bank-loan portfolios is significant even at the 25th percentile of zombie lending, approximately 42%. This fraction is 47% for the sub-sample where the lead bank is government-owned and 32% for the sub-sample where the lead bank is private. The high proportions of zombie firms in private bank portfolios are also noteworthy.

Next, we evaluate lending to healthy firms at the two points of reference, i.e., 25th and 75th percentile values of bank congestion using the subsidized credit measure of zombie lending. We find that as the zombie proportion in bank portfolios rises from the 25th percentile value (42%) to the 75th percentile value (58%), the congestion effect intensifies from a 44% decline to a 61% decline in lending to healthy firms. The difference is a 17% (61%-44%) marginal contraction in lending to healthy firms. Similar calculations for the sub-samples of government-owned and private lead banks suggest marginal contractions that amount to 11% and 13% as the proportion of zombie firms in loan portfolios rises from the 25th to the 75th percentile.

Using the two alternative definitions of zombie firms, we find qualitatively similar coefficients for the bank congestion channel. An interesting observation is that the coefficients that capture spillovers from bank congestion are also statistically significant and negative during the withdrawal phase. Further, while crowding out to healthy firms continues during forbearance withdrawal, there is no significant decline in the leverage of low-quality borrowers in the withdrawal period.

To investigate the indirect industry congestion channel, we examine the lending spillovers to higher-quality borrowers in industries with higher proportions of zombie firms. We use the two-digit NIC codes in the Prowess data to identify the granular industry classification

and calculate the proportion of zombies in industry h in year t classifying the subset of firms that are not zombies as healthy firms j. With this classification, we replace the fraction of zombie firms in a banks portfolio with the fraction of zombie firms in an industry ($Industry\,Frac\,Zombie_{h,t}$) and re-estimate equation 4.

Columns (3) and (4) of Table 5 present the results. The coefficient on the triple interaction term, ζ_k which examines the debt levels of healthy firms, as the proportion of zombie firms in an industry increases during the forbearance period, is negative and statistically significant in the baseline specification with and without industry-year fixed effects (-0.694 and -0.896).

Similar to the bank-congestion measure, for industries at the 25th percentile of industry-zombie-concentration, the proportion of zombie firms is relatively high at about 33% for the total sample. This fraction is 38% for the sub-sample where the lead bank is government-owned and 31% for the sub-sample where the lead bank is private.

For the entire sample, we find that as the industry-zombie proportion rises from the 25th percentile value (33%) to the 75th percentile value(63%), the congestion effect intensifies from a 29% to a 56% decline in lending to healthy firms implying a 27% contraction in lending to healthy firms. Similar calculations for the sub-samples of government-owned and private lead banks suggest lending contractions of 22% and 26%, respectively.[27]

The documented patterns of lending are of particular concern as we might expect healthy firms to regain access following forbearance withdrawal. However, we do not observe significant reversals in lending to either low or high-quality borrowers when withdrawal is announced.[28] The findings from the zombie-lending and spillovers estimations highlight the crowding-out effects of artificially propping up low-quality firms at the expense of their more creditworthy counterparts. If market forces of creative destruction were allowed to operate, unfettered, inefficient, and loss-making firms would exit, allowing the fittest to survive. A perverse pattern appears to prevail instead—the evergreening of loans by government-owned

[27]Using the refined definition of zombie firms that adds the $ICR < 2$ criterion, we find that the triple interaction coefficient remains positive but is statistically significant in the post-withdrawal phase. Using the IMF's definition of speculative lending, the triple interaction coefficient is statistically significant at the 5% level.

[28]Results from alternative definitions of zombie firms for the bank-congestion effect are qualitatively similar, and the industry-congestion effects are robust across all three definitions.

banks to zombie firms and reduced access to credit for healthy firms.

A potential concern is that the matching of large banks and large firms may be driving our findings. To address this concern, we divide the firms and banks matched into four categories based on the asset size: big bank, small bank, big firm, and small firm. We re-estimate our specifications for these four sub-samples but do not find a statistically significant matching relationship based on firm and bank size.[29]

The reallocation of credit from private to zombie firms can impact real outcomes. The following subsection explores the real effects of forbearance on firm investment and employment patterns.

4.4 The Real Effects of Forbearance

To uncover evidence about the real effects of the forbearance policy, we examine firm investment and employment patterns. We estimate the following specification for zombie firms:

$$\begin{aligned} y_{j,t+1} = \gamma_j + \lambda_t + \mu_b + \beta_1 * Govt\,Bank_{b,j} * X_{j,t} \\ + \sum_{k=1}^{2} \delta_k * Govt\,Bank_{b,j} * Forbearance_t^k + \sum_{k=1}^{2} \eta_k * X_{j,t} * Forbearance_t^k \\ + \sum_{k=1}^{2} \zeta_k * Govt\,Bank_{b,j} * X_{j,t} * Forbearance_t^k + \epsilon_{j,t+1} \end{aligned} \quad (5)$$

where $y \in (Capex\,Ratio, Wage\,ratio)$ and $X \in (Zombie)$; $k = 1$ and $k = 2$ are the introduction and withdrawal of forbearance, respectively. Real investment is the $capex\,ratio = \frac{Capex_{j,t+1}}{Total\,Assets j,t+1}$ where $Capex_{j,t+1}$ is the change in gross fixed assets between year t and $t+1$. Employment expenses represent the proportion of wages in the total expenses of the firm i.e. $\frac{Wages_{j,t+1}}{Total\,Expenses j,t+1}$.

Table 6 summarizes the results for zombie borrowers. Differences in capital expenditures patterns of zombie firms during the forbearance period are not statistically significant (Columns 1 and 2). Expenditures on wages, however, rise significantly (Columns 3 and 4).

[29] Results are available on request.

Interestingly, zombie firms increased capital expenditures in the withdrawal phase, significant at the 10% level. Table IA.3 summarizes the results for low-solvency borrowers. Columns 1 and 2 show that low-quality borrowers do not appear to increase their capital expenditures following forbearance provision. Capital expenditures by low-solvency firms that borrow from government-owned banks decline significantly during the forbearance phase. The findings in Columns 3 and 4 suggest that low-quality borrowers may have used the new loans to make wage payments and to repaying existing loans. It is interesting to note that once forbearance withdrawal is announced, wage expenditures decline.[30]

To examine the performance of zombie and private companies during the forbearance period, we replace the dependent variable with firm productivity in our benchmark specification. We use the Olley-Pakes method to estimate firm-level productivity using balance sheet variables. We find that the productivity of zombie firms is, on average, 8% lower than healthy firms. This 8% difference in productivity represents 10% of the mean productivity in the sample. Turning to the spillovers channel, in industries with average fractions of zombie firms, the average productivity of a healthy firm is about 40% higher. We do not find significant differences in productivity between zombie versus healthy firms through the bank congestion channel.[31]

4.5 Firm heterogeneity

In this section, we examine which firms were ultimately targeted by the forbearance schemes. We hypothesize that the forbearance policies were driven by the fiscal dominance channel allowing the sovereign to postpone costly recapitalization of government banks. In short, forbearance provides an implicit subsidy to state-owned banks in particular. We examine the ultimate benefactors of these schemes.

At face value, the RBI announced the forbearance measures citing exposure to GFC

[30]Table IA.4 summarizes the results for low-liquidity firms. We cannot discern a statistically significant patterns in the capital expenditures or wage expenditures for low-liquidity firms in the forbearance or withdrawal periods for low-liquidity firms.

[31]Results are available on request.

(detailed in Section 1). In Table IA.5, we examine how forbearance affected firms with high exposure to the global markets, i.e., exporting firms. Columns (1)-(4) present estimates for the baseline specification conditional on firm export-dependence in 2005-07. We define a firm as 'exporting' if the export earnings as a percentage of total sales are strictly positive and classify firms as 'domestic' otherwise. The triple interaction estimates in column (1)-(2) from the domestic firm sub-sample suggest that government-owned bank lending does not show a statistically significant increase in firms not reliant on exports. In contrast, there is a statistically significant increase in lending growth to exporting firms by government-owned banks during the post-forbearance period. Though the point estimate for the triple interaction coefficient in column (3)-(4) is higher than the point estimate in column (1)-(2), the two are not statistically different from each other. While the forbearance measures were meant to address the firms temporarily hit by the GFC, they plausibly ended up supporting zombie firms with high export sector exposure. Despite inadvertently providing support to zombie firms, one could make the case that the forbearance policies did indeed serve the explicitly intended targets: the distressed firms with high export sector exposure.

However, another argument is that the the forbearance policies also addressed the slow build-up of stress in the infrastructure sector. Even in 2006, well before the peak of the GFC, the stress in the infrastructure projects was evident as many projects faced regulatory hurdles, failed to obtain environmental clearances, and there was a significant rise in the number of abandoned infrastructure project between 2006–2008, before the crisis (**Kaul**). While both private and government-owned banks had increased lending to the infrastructure sector, the build-up of infrastructure assets was higher for government-owned banks (Acharya and Rajan, 2020, Patel, 2020).

We next examine the effects of the forbearance policies on the firms in the infrastructure sector in Table IA.6. Columns (1)-(4) present results for the baseline specification, which is estimated conditional on the firm industry classification. We use the CapExDx database on planned investment projects to analyze infrastructure firms. CMIE provides this dataset that includes data on planned capital expenditure at the project level. The database includes

any investment project that involves positive capital expenditures and capacity expansion tracking their announcement, implementation, and completion dates. Importantly, CMIE links the projects and the Prowess database based on a company identifier. Based on these filters, we classify 'infrastructure' firms as those with at least one project in CapExDx and classify all other firms as 'others.'

The triple interaction coefficient estimates in columns (3)-(4) suggest that for the subsample of infrastructure firms borrowing from government-owned banks, there is a statistically significant increase in debt growth during the post-forbearance period. The non-infrastructure firms in column (1)-(2) experience no such increase, and the triple interaction in column (3)-(4) is statistically different from the coefficient in column (1)-(2). In addition to binary indicators for whether a firm has invested in any infrastructure projects or not, columns (5)-(8) consider the time-varying exposure to infrastructure projects. We classify 'infrastructure' firms as those with an above-median number of infrastructure project announcements in a year. The results from this alternative sample classification are consistent with the patterns in columns (1)-(4).

In Table IA.7, we present margin estimates for regression results on zombie lending to exporters and the infrastructure sector displayed in Table IA.5 and Table IA.6. Consistent with the baseline margin results, a disaggregation of triple difference estimate suggest that during the forbearance period, government-owned banks either increased lending growth to zombie firms to zombie firms in the exporting and the infrastructure sectors or contracted their lending by much less relative to the privately-owned banks. On the other hand, marginal credit growth by privately-owned banks declined to these sectors.

The results above support the our contention that though the forbearance schemes were meant to address vulnerability to the external sector, they also ended up addressing the emerging stress in the infrastructure sector. These heterogeneity results are in line with our central hypothesis,

5 Robustness Checks and Alternative Tests

This section explores alternative measures and motivations for forbearance and their impact on credit allocation.

5.1 Alternative Measures of Firm Quality

We begin by examining two additional measures of $Firm\,Quality$—solvency, and liquidity status. $Low\,Solvency_{j,t}$ refers to firms whose debt-to-equity measure in time t is above median and as $Low\,Liquidity_{j,t}$ if their cash ratio measure is below median. Columns 1 and 2 of Table (IA.8) show a statistically significant triple interaction term ζ equals 0.322 and 0.342, respectively, indicating that the lending differential between government and private banks to low-solvency firms in the aftermath of the forbearance policy ranges from 32%-34% (See Table (IA.8, Panel B) for the calculations). Also, note that total lending by government banks to low-solvency firms increases by 59.2% post forbearance ($\phi + \beta + \eta + \zeta$).

Turning to liquidity status, Columns (5) & (6) of Table (IA.8) present the results for specifications (1) & (2). While the coefficients are smaller in magnitude, they qualitatively similar in sign and significance. There is no significant decline in lending by government banks to low-liquidity firms from before and after forbearance ($\eta + \zeta = -0.002$). There is, however, a 20% decline in lending by private banks to low-liquidity firms. The differential in lending to low liquidity firms between government and private banks ranges from 21% to 24% after the introduction of forbearance.

Similar to the patterns for zombie firm lending, columns (3), (4), (7), and (8) of Table (IA.8) confirm that the triple interaction coefficient in the forbearance period, ζ_1, remains positive and statistically significant. However, the statistical insignificance of the ζ_2 coefficient after forbearance withdrawal signals a sticky match between government banks and low-quality borrowers, indicating once again the potentially persistent effects of forbearance provision. To summarize, across columns 1-8 in Table IA.8, the stability and statistical significance of the main coefficient of interest, ζ_1, the triple interaction term, validates the

differential impact of the forbearance policies on lending to low-quality firms by government relative to private banks.

5.2 An Alternative Measure of Forbearance: Provisioning Rates

By replacing the forbearance and withdrawal phase binary dummies with a continuous measure of provisioning rates on restructured loans and directly capturing the regulatory arbitrage incentives, we confirm the baseline impact on zombie lending using an alternate measure of forbearance. The exercise also addresses the concern that given that forbearance and post-forbearance periods in the baseline specification coincide with the crisis and post-crisis years, we may simply be capturing effects on credit through firm business cycles.

We establish that the provisioning requirements directly influenced bank incentives to engage in zombie lending. Table IA.9 examines the impact of provisioning requirements of restructured loans on zombie lending. Since restructured loans require lower provisioning than non-performing loans, banks have an incentive to classify loans as restructured to ameliorate bank capital requirements.

Lowered provisioning rates on restructured loans may increase the attractiveness of zombie lending, while high provisioning rates imply lower gains from restructuring bad loans. The evidence in Table IA.9 suggests a negative correlation between lower provisioning rates and an increase in credit to zombie firms. A 1% lower provisioning rate on restructured loans corresponds to a 2.1% increase in zombie credit (Column 2), a 9% decrease in credit to healthy firms via the industry congestion channel (Columns 3 and 4), and an 8.7% decline in credit via the bank congestion channel (Column 6).

5.2.1 An Alternative Definition of Bank Health: The Capital-To-Risk Weighted Asset Ratio

Provisioning requirements ought to bind more for weakly-capitalized banks since restructuring instead of recognizing bad loans, allows banks to avoid recognizing capital erosion.

The baseline analysis uses the variation in bank ownership. We repeat the baseline analysis using the capital-to-risk weighted assets ratio (CRAR) ratio. Table IA.10 replaces the time-invariant government bank dummy with a continuous time-varying measure of bank health captured by the CRAR ratio. Higher levels of CRAR indicate bank health and vice-versa. If banks with lower levels of CRAR engage in zombie lending, we expect a negative coefficient on the CRAR measure. Consistent with our baseline results, banks with 1% lower CRAR increase lending to low solvency and low liquidity firms by 9% (Columns 1–4). Column 6 indicates that banks with 1% lower CRAR increase lending to zombie firms by 7% during the forbearance period. As previously shown, these effects do not reverse post-forbearance.

5.2.2 Stressed Banks

Next, we use an alternative way of identifying distressed banks focusing directly on their ex-ante (before GFC) non-performing loans ratio instead of ownership characteristics. We classify a bank as stressed ($Stressed\,Bank_b$) if the proportion of non-performing loans in the total gross advances lent by a bank is in the top two terciles in 2007, i.e., prior to forbearance provision by the RBI. Results are shown in Table IA.11. Columns 1 and 2 of Table IA.11 summarize the results. We see a positive and significant coefficient (0.31) on the triple interaction term, ζ_1, on zombie lending by stressed banks in the forbearance period (Column 1). The positive and significant ζ_1 rises slightly to 0.32 in the specification with bank and year fixed effects (Column 2). The marginal effects computation shows that lending by stressed banks to zombie firms is 2% higher than zombie lending by healthy banks. The findings suggest that the relaxed lending norms during the forbearance period stimulated lending by stressed banks to their existing low-quality borrowers. Zombie-firm borrowing from stressed banks does not fall significantly in the forbearance retraction period; ζ_2 is not statistically significant. That the pattern does not appear to reverse following forbearance withdrawal indicates yet again the potentially persistent effects of policies that relax lending norms.

To discern whether the observed increase in zombie lending comes from bank supply-side

or firm demand-side effects, we supplement the main analysis with data on restructured loans. We create a balanced panel at the firm-bank group-year level, where the bank group refers to stressed and healthy banks. Following Khwaja and Mian (2005), Table IA.12 disentangles the demand and supply-side channels by comparing the total amount of restructured loans made by stressed banks against those made by healthy for the same firm. Using the more stringent zombie definition that accounts for firm distress ($ICR < 2$) in addition to the baseline definition of subsidized lending, we see that the amount of restructured loans from government-owned banks increased by 56 percent compared to private banks in the same firm-year (Columns 3 and 4).

Similarly, there were more restructured loans to zombie firms from stressed banks than private banks. The coefficients in Columns 1-2 and 5-6 using the baseline subsidized lending and IMF's speculative lending zombie definitions also show an increase in restructured loans. However, the coefficients are imprecisely estimated.[32] Our results point to bank-supply side effects leading to an increase in zombie lending during the forbearance period.

Zombie lending can occur in two ways. Banks can restructure loans due to loan provisioning incentives as evident during the forbearance phase. Banks can also evergreen loans by making new loans at subsidized rates to borrowers to pay off the old loans. Our zombie measure accounts for these differing incentives during the forbearance and withdrawal phases. Therefore, we focus on total zombie lending for the main analysis. There is a reversal in loan restructuring in the withdrawal phase. While Table IA.12 documents that banks had lower loan restructurings in the withdrawal phase, however, Table IA.11 shows that zombie lending overall did not decline. Since the withdrawal phase removed loan provisioning incentives for restructured loans, it appears that banks shifted away from restructuring loans as a form of evergreening but did not reduce overall zombie lending.

[32] A report published by the RBI (Reserve Bank of India, 2008) notes that inaccuracies exist in the MCA data due to filing errors. The data may not be audited and are self-reported by firms. Firms can also delay the date of filing. These factors can lead to measurement errors, biasing our estimates towards zero.

5.2.3 A Placebo Test: Foreign Banks

The baseline specifications exclude foreign banks under the assumption that their capital requirements are not sensitive to local forbearance measures in India. Therefore, foreign banks may be less sensitive to changes in local provisioning requirements given that their external parent company or bank can fund them. After 2014, foreign banks had the option to become wholly-owned subsidiaries—they operated as branches prior to that. We conduct a placebo test using the subset of foreign banks. Consistent with our priors, Table IA.13 shows no impact on lending patterns in this sub-sample. Since foreign banks account for only 7% of the total market share of loans, the number of observations declines.

5.2.4 Alternative Lenders

We also examine whether the forbearance schemes necessitated firms to seek alternate lenders. Our previous results emphasize the possibility of a sticky match between low-quality borrowers and government-owned banks and the consequent ever-greening of non-performing loans. Table IA.14 shows the results from a regression specification where the dependent variable is a binary indicator that classifies firms when they form a new relationship with a bank in period T with whom they did not have a relationship in the previous year.

Across the specifications, we find that healthy firms are 4% (Column 3) more likely to start borrowing from private sector banks and 11% more likely to start borrowing from foreign banks. Plausibly, the forbearance schemes further worsen the perverse matching of government-owned banks with unhealthy firms. The omitted group is government-owned banks. In Column 1, healthy firms were 4.4% more likely to form a new banking relationship with private sector banks in the forbearance period. This effect declines during the withdrawal phase, although the net effect of the forbearance and withdrawal phases is negative. Overall there is an increase in the switching behavior of healthy firms that perhaps explains the persistent patterns in lending to unhealthy firms that we document earlier in the paper.

6 Conclusion

This paper provides evidence that the regulatory forbearance measures enacted by the Reserve Bank of India during the global financial crisis effectively handed over a license for banks to engage in regulatory arbitrage. The forbearance measures provided banks with an incentive to hide true asset quality, and therefore the build-up of stressed assets in the system is a by-product of accounting subterfuge. As a form of indirect recapitalization, the forbearance policy encouraged government-owned banks to channel debt to zombie firms leading to a significant misallocation of credit.

Our findings imply that regulatory forbearance can function as an implicit subsidy from the regulator that postpones costly bank recapitalization. Asset quality forbearance, in particular, can allow banks to effectively "extend and pretend" distressed loans masking the underlying bank capital erosion. Loan-loss recognition would undoubtedly weaken bank balance sheets warranting recapitalization.

The implicit subsidy has further significance in India's predominantly government-owned banking system, comprising a nearly 70% share. Recapitalization costs are unquestionably consequential compared to budget-neutral forbearance schemes. Acharya (2020) highlights forbearance as a form of fiscal dominance focused on postponing further stress on the sovereign's balance sheet entailed by costly bank recapitalization, especially when fiscal space is limited. We show in this paper that while bank balance sheets can look deceptively healthy, under-capitalized banks and zombie lending can impair the provision of credit to healthy firms in the economy, further compromising the financial system.

Subsequent efforts to correct zombie lending, such as the bankruptcy law in 2016, had limited success in exacting banks to recognize non-performing loans (Kulkarni et al., 2020), and regulatory intervention efforts were, at best, partially effective. This paper shows that the sticky match between stressed banks and impaired firms persists after forbearance withdrawal.

Considering the many regulatory forbearance policies enacted during the COVID-19 crisis, India's experiment with regulatory forbearance provides a cautionary tale. It may be

challenging to unwind improperly designed temporary forbearance measures. These policies can have persistent adverse effects on access to credit, industry structure, and financial stability. As economies recover, active and costly intervention may be needed to address some of these longer-term legacies, such as zombie lending and the undercapitalization of banks.

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A Data Appendix

Table A1: Significant Regulatory Announcements since 2008

Date	Content of Announcement	Direction of RF
27-Aug-08	Special Regulatory Treatment Announced allowing forbearance	Increase
30-May-13	Announcement of withdrawal of Forbearance beginning April 1, 2015	Decrease
26-Feb-14	Framework for Revitalising Distressed Assets in the Economy-Guidelines on Joint Lenders Forum (JLF) and Corrective Action Plan (CAP)	Increase
15-Jul-14	Flexible Structuring of Long Term Project Loans to Infrastructure and Core Industries	Increase
1-Apr-15	Asset Quality Review Started	Decrease
8-Jun-15	Strategic Debt Restructuring Scheme for conversion of debt to equity	Increase
13-Jun-16	Scheme for Sustainable Structuring of Stressed Assets	Increase
12-Feb-18	Resolution of stressed assets: Revised Framework	Decrease

Notes: This table lists in a chronological order the major policy announcements by RBI pertaining to the increase or decrease in Regulatory Forbearance (RF) allowed on classification norms of stressed assets held by banks. The dates were collected by a detailed survey of all master RBI circulars released between August 27, 2008 and February 12, 2018.

Table A2: Description of Variables and Sources

	Firm-level variables:	
$\text{Log Debt}_{j,t}$	Log of total borrowings of a firm in a year (million INR)	CMIE
$\text{Capex}_{j,t}$	Total investment of a firm in a year measured as year-on-year change in gross fixed capital formation as a fraction of lagged assets (million INR)	CMIE
$\text{Wages Ratio}_{j,t}$	Total salaries paid in year as a fraction of total expenses (million INR)	CMIE
$\text{New Relationship}_{j,t}$	Dummy variable that equals one if firm forms a new banking/non-banking relationship	CMIE
$\text{Low Solvency}_{j,t}$	Dummy variable that equals one if firm has a above median debt to equity ratio in the cross-section of a year	CMIE
$\text{Low Liquidity}_{j,t}$	Dummy variable that equals one if firm has a below median cash to current liabilities ratio in the cross-section of a year	CMIE
$\text{Zombie}_{j,t}$ (status 1)	Dummy variable that equals one if a firm's average interest expenses (interest expenses scaled by debt) are below the prime lending rate of State Bank of India & debt to asset ratio greater than 0.15	CMIE
$\text{Zombie}_{j,t}$ (status 2)	Dummy variable that equals one if a firm is classified zombie as measured by the subsidised credit definition and also has an interest coverage ratio below 2	CMIE
$\text{Zombie}_{j,t}$ (status 3)	Dummy variable that equals one if a firm satisfies the IMF's condition of speculative credit i.e. net debt to assets ratio greater than 0.25 & interest coverage ratio below 4.1	CMIE
NonZombie_{t}	Dummy variable that equals one if a firm is not classified a zombie in a year measured by the above zombie definitions	CMIE
$\text{Log Sales}_{j,t}$	Log of total sales of a firm in a year (million INR)	CMIE
$\text{Bond}_{j,t}$	Dummy variable that equals one if a firm accessed bond market in a year	CMIE
$\text{Industry Frac Zombie}_{h,t}$	The fraction of total firms classified as a zombie in an industry in a year	CMIE
	Bank-level variables	
Stressed Bank_{b}	Dummy variable that equals one if a bank belonged to top two terciles of non-performing loans ratio in the cross-section of year 2007 i.e. before announcement of forbearance policy	DBIE
Govt. Bank_{b}	Dummy variable that equals one if a bank has a majority ownership by government of India	DBIE
$\text{CRAR Bank}_{b,t}$	Bank's capital to risk weighted assets ratio (in %)	DBIE
$\text{Regulator Proximity}_{b}$	Dummy variable that equals one if the distance of the bank headquarters is below median value in the cross-section of banks	CMIE
$\text{Bank Frac Zombie}_{h,t}$	The fraction of total firms classified as a zombie in a bank's portfolio of total number of firms in a year	CMIE
	Year-level variables:	
$\text{RF}_{t}^{\text{Post 2008}}$	Dummy variable that equals one if year is after August 2008 i.e. when the special regulatory treatment/ forbearance was introduced in aftermath of the GFC	RBI
$\text{RF}_{t}^{\text{Post 2013}}$	Dummy variable that equals one if the year is after May 2013 i.e. after forbearance withdrawal was announced	RBI
Prov rate_{t}	The provisioning rate required by Reserve Bank of India on restructured loans in a year	RBI

Table A3: Sample Construction

A. CMIE-DBIE Matched Sample Construction and Coverage Summary: 2006-2016

Variables	# Observations	# Unique Firms
Number of non-financial firm-year observations in CMIE sample with assets data	206,999	35,275
Number of firm-lead bank-year observations in CMIE's banker data	60,955	13,020
Number of firm-year observations matched to a lead banker	44,198	9,358
Number of firm-bank-year observations matched to DBIE bank-level data	38,016	8,331
Number of firm-bank-year observations with data on debt	25,844	5,791
Number of firm-bank-year observations with solvency data	33,713	7,555
Number of firm-bank-year observations with liquidity data	37,187	8,157
Number of firm-bank-year observations with zombie status #1 data	38,016	8,331
Number of firm-bank-year observations with zombie status #2 data	28,599	6,534
Number of firm-bank-year observations with zombie status #3 data	27,342	6,382

B. DBIE Sample Coverage: 2006-2016

Variables	# Observations	# Unique Banks
Number of bank-year observations (only domestic Scheduled Commercial Banks)	509	52
Number of bank-year observations: government-owned banks	294	28
Number of bank-year observations: private banks	215	24
Number of stressed banks: government-owned banks	187	17
Number of stressed banks: private banks	148	17

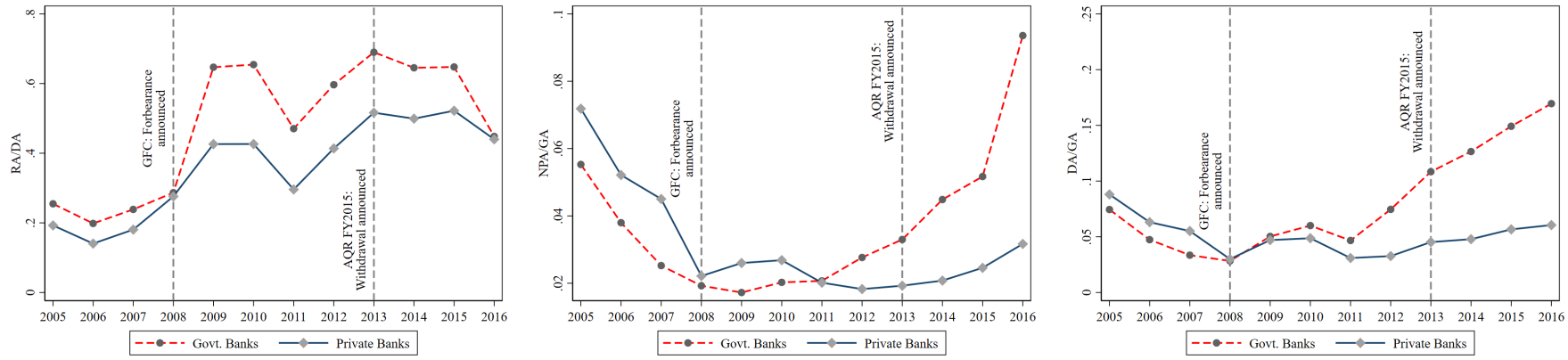
Notes: This table reports the sample summary for the data sets for the period 2006-2016. Panel A [33] reports the CMIE prowess data set's coverage summary at the firm-year and firm-lead bank-year level. The table also reports the reduction in number of observations as bank-level variables are merged. We also list the number of observations with non-missing values of various measures of firm quality as well as our main dependent variable, debt (in year $t+1$). Panel B [34] describes the Reserve Bank of India's DBIE dataset coverage at the bank-year level. A firm is classified as Zombie (status 1) if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A firm is classified as Zombie (staus 2) if in addition to satisfying zombie status 1, the firm has an ICR below 2. A firm is classified as Zombie (status 3) if the the firm satisfies the IMF's definition of speculative credit i.e. has an ICR less than 4.1 and a net debt-to-assets ratio greater than 0.25. Net debt is gross debt minus cash.

[33]For the baseline definition of zombie (zombie status 1), we take a conservative approach and classify firms with missing average interest rate as 'healthy'. We relax this assumption in the alternative zombie definition (zombie status 2), where we only consider non-missing values of average interest rate.

[34]The banks that were merged during our sample are dropped when matching bank-level data to firm-level data resulting in a match of 39 banks of which 29 are classified as stressed. The number of stressed government-owned banks is 16 & the number of stressed private banks is 13.

Figure 1: The Time-series Evolution of Troubled Asset Ratios

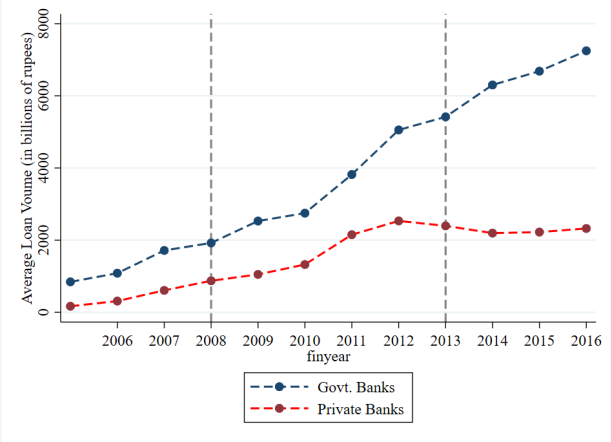
Notes: This figure plots the time-series evolution of annual troubled asset ratios for the period 2005–2016 for government-owned and private sector banks. Panel A of the figure plots the evolution of average bank level proportion of restructured loans in the total distressed loans during the sample period 2006-2016. Panel B of the figure shows the evolution of average bank level proportion of non-performing loans in the total loans during the sample period 2006-2016. Panel C of the figure shows the evolution of average bank level proportion of distressed loans in the total loans given out by a bank during the sample period 2006-2016. The 'Hidden Assets Ratio' is computed as the restructured assets as a proportion of restructured and non-performing assets on a bank's balance sheet ($\frac{RA}{DA}$). Distressed Assets are defined as the sum of non-performing loans (NPAs) and restructured loans (RA) in any given year. The NPA ratio as the ratio of non-performing assets to gross advances ($\frac{NPA}{GA}$). The distressed assets ratio is the fraction of restructured assets and non-performing assets as a proportion of gross advances by bank ($\frac{DA}{GA}$). A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. Government-owned and private sector bank classification is from DBIE.



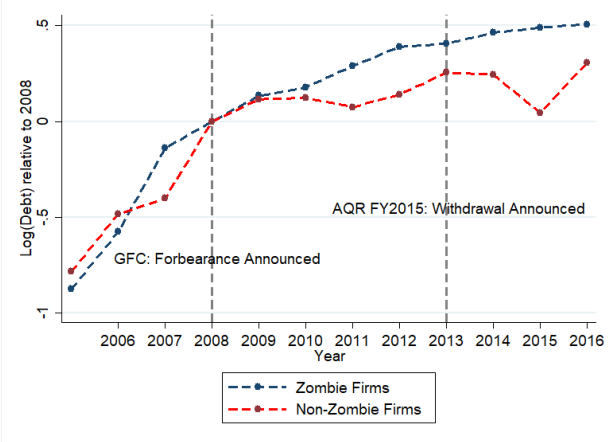
(a) **Hidden Assets Ratio ($\frac{RA}{DA}$)** (b) **Non-performing Assets Ratio ($\frac{NPA}{GA}$)** (c) **Distressed Assets Ratio ($\frac{DA}{GA}$)**

Figure 2: Lending to Firms by Solvency, Liquidity and Zombie Status

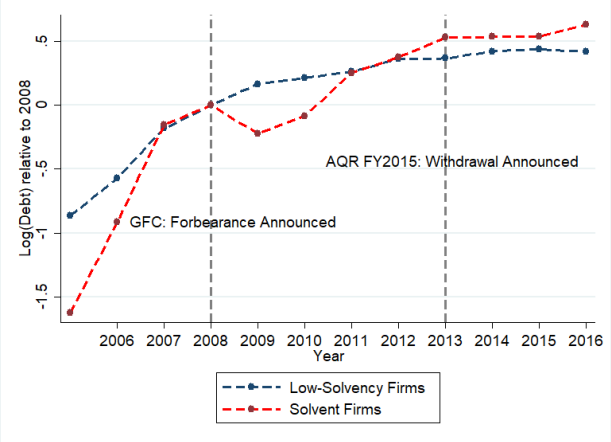
Notes: Panel A of the figure shows the evolution of sum of loans issued by government-owned banks and private-owned banks during the sample period 2006-2016. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India and Private Bank otherwise. Panel B of the figure shows the log-ratio of total debt borrowed by zombie and no-zombie firms in a given year relative to the year of the forbearance announcement, i.e., the y-axis is normalized to 0 at the announcement year in 2008. A firm is classified as *Zombie* if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. Remaining firms are classified as non-zombies. Panel C of the figure shows the log-ratio of total debt borrowed by the low-solvency and solvent firms in a given year relative to the year of the forbearance announcement, i.e., the y-axis is normalized to 0 at the year of the announcement in 2008. A firm is classified as *Low Solvency* if the Debt to equity measure of the firm in time period T is above median. Remaining firms are classified as solvent. Panel D of the figure shows the log-ratio of total debt borrowed by the low-liquidity and liquid firms in a given year relative to the year of the forbearance announcement, i.e., the y-axis is normalized to 0 at the year of the announcement in 2008. A firm is classified as *Low Liquidity* if the cash ratio measure of the firm in time period T is below median. Remaining firms are classified as liquid.



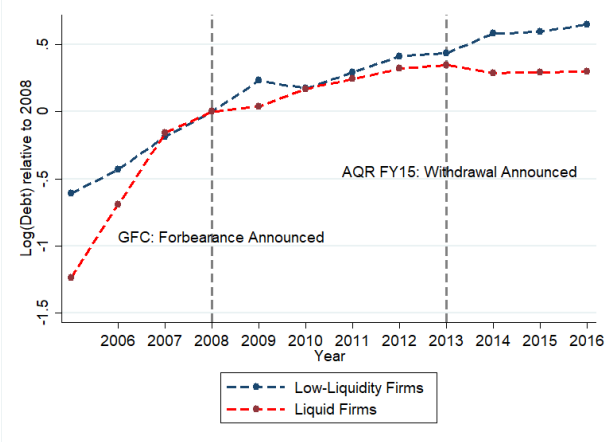
(a) **Aggregate Lending By Banks**



(b) **Debt of Zombie & Non-zombie Firms**



(c) **Debt of Low-solvency & Solvent firms**



(d) **Debt of Low-liquidity & Liquid firms**

Figure 3: An Event Study: The Impact of Regulatory Forbearance on Zombie Firm Lending

Notes: This figure shows the event study plots for the impact of forbearance policy on zombie lending using the Equation 2 with an indicator for each year. The coefficient for the triple interaction term with $Govt.Bank_b$, $Zombie_{j,t}$, and an indicator for each year is plotted below. The gray bars represent the 5 percent confidence interval. The dependent variable is the firm-level log of debt in period T+1. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. A firm is classified as Zombie if the firm received subsidized credit in time period T i.e. the firm can borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has a debt to assets ratio $> .15$. The specification controls for the year fixed effects, time-invariant bank fixed effects, time-invariant borrower characteristics and time-varying firm size via log of sales. Standard errors are clustered at firm level. 95% confidence intervals are shown.

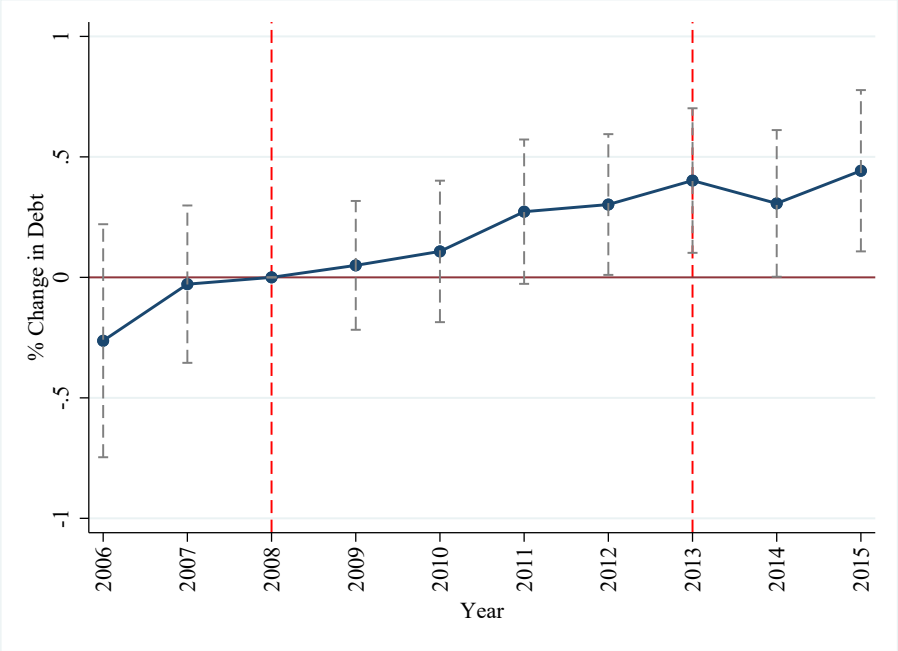


Figure 4: Government and Private Banks: The Distressed Assets Share to Market Share

Notes: Figure 4 plots the time-series evolution of the bank-level average of ratio of distressed assets share and the market share for the period 2005–2016. The distressed assets share of a bank is defined as the sum of non-performing assets (NPAs) and restructured assets (RAs) out of gross advances (loans) in a given year. The market share is defined as the proportion of a bank's loans in the total loans of the aggregate banking sector in a year. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. Government-owned and private sector bank classification is from DBIE.

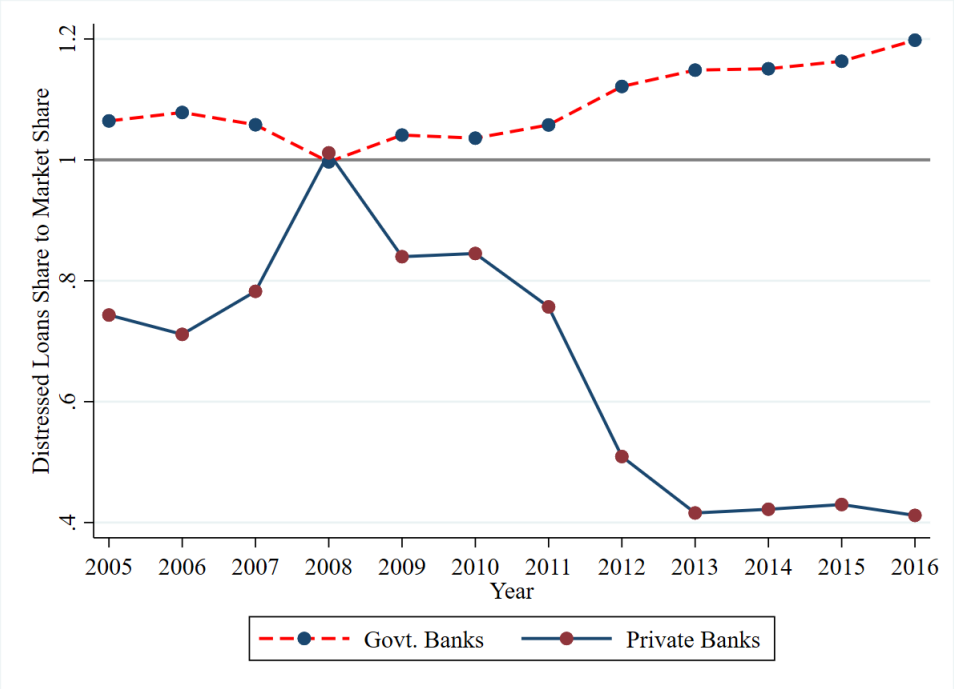


Table 1: Panel A: Firm-Year Univariate Tests by Solvency & Liquidity Status

	Solvency Status			Liquidity Status		
Variables	Solvent	Low-Solvency	Diff	Liquid	Low-Liquidity	Diff
Cash Ratio	1.62	0.28	(***)	1.72	0.03	(***)
Quick Ratio	3.47	0.90	(***)	3.39	0.67	(***)
Debt Equity ratio	0.16	4.91	(***)	1.47	3.52	(***)
Debt Assets Ratio	0.12	0.45	(***)	0.38	0.67	(***)
Interest Coverage Ratio	50.41	10.07	(***)	40.65	18.41	(***)
Log Sales	4.10	6.47	(***)	5.15	5.83	(***)
Log Debt	5.75	6.95	(***)	6.10	6.38	(***)
Capex Ratio	0.04	0.06	(***)	0.05	0.04	(***)
Wages Ratio	0.15	0.08	(***)	0.13	0.09	(***)
Avg Interest Rate	37.98	10.76	(***)	28.06	13.89	(***)
Observations	16,260	17,453		17,715	19,472	

Panel B: Firm-Year Univariate Tests by Zombie Status

	Zombie Status 1			Zombie Status 2			Zombie Status 3		
Variables	Healthy	Zombie	Diff	Healthy	Zombie	Diff	Healthy	Zombie	Diff
Cash Ratio	1.474	0.215	(***)	0.402	0.215	(***)	0.655	0.154	(***)
Quick Ratio	3.121	0.845	(***)	1.180	0.866	(***)	1.716	0.691	(***)
Debt Equity ratio	1.953	3.305	(***)	1.352	5.344	(***)	1.365	4.014	(***)
Debt Assets Ratio	0.511	0.582	(***)	0.327	0.744	(***)	0.295	0.586	(***)
Interest Coverage Ratio	55.710	4.823	(***)	13.710	0.802	(***)	32.476	1.593	(***)
Log Sales	4.154	6.500	(***)	5.668	6.380	(***)	5.001	6.748	(***)
Log Debt	5.436	6.894	(***)	6.946	6.373	(***)	6.518	7.052	(***)
Capex Ratio	0.037	0.053	(***)	0.051	0.038	(***)	0.049	0.046	(*)
Wages Ratio	0.159	0.075	(***)	0.087	0.082	(***)	0.107	0.067	(***)
Avg Interest Rate	43.224	7.764	(***)	25.339	8.333	(***)	30.003	11.375	(***)
Observations	19,177	18,839		19,393	9,206		13,971	13,371	

Notes: Panels A and B show the summary statistics for the selected firm level ratios used in our analysis. We present the statistics for high and low quality borrowers by: Solvency, Liquidity and Zombie status. We also test for the significance of the difference in means between the high and low quality groups. A firm is classified as Low Solvency if the debt to equity measure of the firm in time period T is above median. A firm is classified as Low Liquidity if the cash ratio measure of the firm in time period T is below median. A firm is classified as Zombie (status 1) if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A firm is classified as Zombie (staus 2) if in addition to satisfying zombie status 1, the firm has an ICR below 2. A firm is classified as Zombie (status 3) if the the firm satisfies the IMF's definition of speculative credit i.e. has an ICR less than 4.1 and a net debt-to-assets ratio greater than 0.25. Net debt is gross debt minus cash. Capex and wages ratio are capital expenditure and wage bill respectively scaled by total expenses in a year.

Panel C: Bank-Year Univariate Tests by Bank Type

	Bank Ownership		t-test
Variables	Private Banks	Govt. Banks	Diff
Log Gross Advances	12.016	13.581	(***)
Log Assets	12.551	14.068	(***)
Restructured Assets Ratio	0.019	0.045	(***)
Non-Performing Loans Ratio	0.027	0.035	(***)
Distressed Assets Ratio	0.046	0.080	(***)
Observations	174	335	

Notes: Panel C summarizes the main variables used in the analysis from the bank-year data set obtained from the Reserve Bank of India (DBIE website) for 2006-2016. The variables, Gross Advances, assets, and stressed assets, are measured in million INR. Stressed assets are the sum of non-performing loans and restructured loans in a year. All the ratio variables are calculated as a proportion of the gross advances.

Table 2: The Relationship Between Bank and Firm Distress

Measure	$\frac{RA}{DA}$	$\frac{NPA}{GA}$	$\frac{DA}{GA}$
% Borrowers (Debt-Equity Ratio > Q4)	0.722***	0.0362***	0.144***
% Borrowers (Debt-Equity Ratio > Q2)	0.695***	-0.00164	0.0769***
% Borrowers (Debt-Equity Ratio > 2)	1.303***	0.0408***	0.212***
% Borrowers (Cash Ratio < Q1)	0.384**	0.0310*	0.0946***
% Borrowers (Cash Ratio <Q2)	0.387***	0.00935	0.0407*
% Borrowers (Cash Ratio <1)	0.973***	0.0776***	0.219***

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the correlation between bank level ratios and the proportion of low quality borrowers in the bank's portfolio i.e. proportion of firms with low solvency measures and low liquidity measures in a bank's portfolio. RA/DA is restructured assets as a proportion of restructured and non-performing assets on a bank's balance sheet. NPA/GA is the ratio of non-performing assets to gross advances. DA/GA is the fraction of restructured assets and non-performing assets as a proportion of gross advances by the bank. Debt-Equity Ratio is used as a measure of solvency and Cash Ratio (Cash to Current Liabilities) is used as a measure of liquidity. Cash ratio $< Q1$ refers to the proportion of borrowers with a cash ratio measure in the lowest quartile Q1. Cash ratio $< Q2$ refers to the proportion of borrowers with a cash ratio measure below the median Q2. Cash ratio < 1 refers to the proportion of borrowers with a cash ratio measure < 1 which is the industry accepted signal of declining liquidity. Debt-Equity Ratio $> Q4$ refers to the proportion of borrowers with a debt to equity measure in the top quartile Q4. Debt-Equity Ratio$> Q2$ refers to the proportion of borrowers with a debt to equity measure above the median Q2. Debt-Equity Ratio> 2 refers to the proportion of borrowers with a debt to equity measure > 2 which is the industry accepted signal of insolvency. All measures are computed separately for each year.

Table 3: Cross-tabulations for Sample Firm-Year-Bank Panel Observations

	Private Banks				Govt. Banks			
		$\text{Liquidity}_{j,t}$				$\text{Liquidity}_{j,t}$		
		High	Low	Overall		High	Low	Overall
$\text{Solvency}_{j,t}$	High	40%	18%	59%	High	30%	14%	44%
	Low	16%	25%	41%	Low	19%	37%	56%
	Overall	56%	44%	100%	Overall	49%	51%	100%
		$\text{Zombie}_{j,t}$				$\text{Zombie}_{j,t}$		
		No	Yes	Overall		No	Yes	Overall
$\text{Solvency}_{j,t}$	High	51%	9%	60%	High	35%	9%	45%
	Low	10%	30%	40%	Low	12%	43%	55%
	Overall	62%	38%	100%	Overall	48%	52%	100%
		$\text{Zombie}_{j,t}$				$\text{Zombie}_{j,t}$		
		No	Yes	Overall		No	Yes	Overall
$\text{Liquidity}_{j,t}$	High	37%	16%	53%	High	27%	19%	46%
	Low	22%	25%	47%	Low	19%	35%	54%
	Overall	60%	40%	100%	Overall	47%	53%	100%

Notes: This table shows the distribution of the sample across the measures of firm quality and bank ownership. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. A firm is classified as Low Solvency if the Debt to equity measure of the firm in time period T is above median. A firm is classified as Low Liquidity if the cash ratio measure of the firm in time period T is below median. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$.

Table 4: Panel A: The Impact of Regulatory Forbearance on Zombie Firm Lending

Dependent Variable: $\text{Log(Debt)}_{j,t+1}$	(1)	(2)	(3)	(4)
$\text{Govt. Bank}_{b,j}$	0.195		0.210	
	(0.131)		(0.131)	
$\text{Zombie}_{j,t}$	0.698***	0.703***	0.698***	0.702***
	(0.125)	(0.122)	(0.125)	(0.122)
$\text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	-0.282**	-0.293**	-0.286**	-0.297**
	(0.131)	(0.129)	(0.131)	(0.129)
$\text{RF}_t^{\text{Post 2008}}$	0.428***		0.407***	
	(0.116)		(0.115)	
$\times \text{Govt. Bank}_{b,j}$	-0.225*	-0.224*	-0.203*	-0.205*
	(0.123)	(0.121)	(0.122)	(0.120)
$\times \text{Zombie}_{j,t}$	-0.208*	-0.238**	-0.214*	-0.244**
	(0.122)	(0.120)	(0.121)	(0.120)
$\times \text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	0.264**	0.278**	0.235*	0.254**
	(0.129)	(0.128)	(0.129)	(0.128)
$\text{RF}_t^{\text{Post 2013}}$			0.112	
			(0.080)	
$\times \text{Govt. Bank}_{b,j}$			-0.094	-0.108
			(0.095)	(0.095)
$\times \text{Zombie}_{j,t}$			0.008	0.022
			(0.085)	(0.086)
$\times \text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$			0.138	0.132
			(0.100)	(0.101)
No. of Obs.	24126	24126	24126	24126
R^2	0.930	0.931	0.929	0.931
Borrower FE	Y	Y	Y	Y
Year FE	N	Y	N	Y
Bank FE	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the direct effects of regulatory forbearance on debt using a triple difference specification. The dependent variable in all columns is the firm-level log of debt in T+1. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of Forbearance. The indicator variable $\text{RF}^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of Forbearance by RBI. All specifications control for time-invariant borrower characteristics and time-varying firm size via log of sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at firm level.

Panel B: Marginal Effects of Government and Private Bank Lending in the Aftermath of Forbearance

	Zombie Firms (From Table 4, Panel A)	
	Model (1)	Model (3)
	Margins Estimates	
Govt. Bank, Post RF (A)	0.472	0.462
Govt. Bank, Pre RF (B)	0.416	0.441
Private Bank, Post RF (C)	0.490	0.486
Private Bank, Pre RF (D)	0.698	0.699
	Triple Difference in Differences Calculations	
(A-B)	0.056	0.021
(C-D)	-0.208	-0.214
(A-B)-(C-D) (%)	26%	23%

Notes: This table displays the margins estimates for government-owned banks and privately-owned banks, estimated from the baseline specification in Equation 1. Model (1) and Model (3) for zombie firms refer to the regressions estimates in Columns (1) and (3) from Table 4, Panel A. Row A (C) displays the margins for the relevant column for government-owned (privately-owned) banks in the post forbearance policy period. Row B (D) displays the margins for the relevant column for government-owned (privately-owned) banks in the pre forbearance policy period. Row A-B shows the change in lending for government-owned banks between the pre and post forbearance policy period. Row C-D shows the change in lending for privately-owned banks between the pre and post forbearance policy period. The row (A-B)-(C-D) shows the change in lending by government-owned banks compared to privately-owned banks between the pre and post forbearance period. All specifications control for time-invariant borrower characteristics and time-varying firm size via Log of Sales. Standard errors are clustered at firm level. Please note that margins cannot be calculated when the fixed effects absorb the main effects.

Table 5: The Spillover Effects of Zombie Firm Lending to Healthy Firms in the Aftermath of Regulatory Forbearance

Dependent Variable: $\text{Log(Debt)}_{j,t+1}$	(1)	(2)	(3)	(4)
$\text{Non-Zombie}_{j,t}$	-0.960***	-0.969***	-0.767***	-0.915***
	(0.190)	(0.191)	(0.132)	(0.146)
$\text{IndustryFracZombie}_{h,t}$			0.268*	
			(0.140)	
$\text{BankFracZombie}_{b,t}$	0.006			
	(0.155)			
$\text{Non-Zombie}_{j,t} \times \text{BankFracZombie}_{b,t}$	0.988***	1.011***		
	(0.354)	(0.358)		
$\text{Non-Zombie}_{j,t} \times \text{IndustryFracZombie}_{h,t}$			0.628***	0.909***
			(0.233)	(0.256)
$\text{RF}_t^{\text{Post 2008}}$	0.045		-0.069	
	(0.072)		(0.089)	
$\times \text{Non-Zombie}_{j,t}$	0.582***	0.577***	0.381***	0.495***
	(0.203)	(0.206)	(0.135)	(0.152)
$\times \text{BankFracZombie}_{b,t}$	0.580***			
	(0.167)			
$\times \text{Non-Zombie}_{j,t} \times \text{BankFracZombie}_{b,t}$	-1.089***	-1.065***		
	(0.386)	(0.394)		
$\times \text{IndustryFracZombie}_{h,t}$			0.342***	
			(0.118)	
$\times \text{Non-Zombie}_{j,t} \times \text{IndustryFracZombie}_{h,t}$			-0.694***	-0.896***
			(0.246)	(0.274)
$\text{RF}_t^{\text{Post 2013}}$	0.414***		0.235***	
	(0.064)		(0.090)	
$\times \text{Non-Zombie}_{j,t}$	0.060	0.063	-0.222*	-0.169
	(0.204)	(0.208)	(0.123)	(0.143)
$\times \text{BankFracZombie}_{b,t}$	-0.180			
	(0.163)			
$\times \text{Non-Zombie}_{j,t} \times \text{BankFracZombie}_{b,t}$	-0.347	-0.358		
	(0.388)	(0.396)		
$\times \text{IndustryFracZombie}_{h,t}$			-0.482***	
			(0.104)	
$\times \text{Non-Zombie}_{j,t} \times \text{IndustryFracZombie}_{h,t}$			0.137	0.037
			(0.221)	(0.254)
No. of Obs.	22984	22980	22984	22907
R-sq.	0.926	0.928	0.926	0.929
Borrower FE	Y	Y	Y	Y
Year FE	N	N	N	N
Bank FE	N	N	N	N
Industry X Year FE	N	N	N	Y
Bank X Year FE	N	Y	N	N

	Full Sample		Subsample: Govt. Banks=1		Subsample: Private Banks=1	
	BankFrac	IndustryFrac	BankFrac	IndustryFrac	BankFrac	IndustryFrac
coefficient	-1.065**	-0.896***	-1.065**	-0.896***	-1.065**	-0.896***
p25	.42	.33	.47	.38	.32	.31
p75	.58	.63	.58	.63	.45	.60
p25 effect (coeff×p25 value)	-.44	-.29	-.50	-.34	-.34	-.27
p75 effect (coeff×p75 value)	-.61	-.56	-.61	-.56	-.47	-.53

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the spillover effects of regulatory forbearance on firm-level total debt using a triple difference specification. The dependent variable in all columns is the firm-level log of debt in T+1. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of RF. The indicator variable $\text{RF}^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of RF by RBI. $\text{Industry Frac Zombie}_{h,t}$ is the fraction of total firms classified as a zombie in an industry in time period T. $\text{Bank Frac Zombie}_{b,t}$ is the fraction of total firms classified as a zombie in a bank's portfolio in time period T. All specifications control for time-invariant borrower characteristics and time-varying firm size via log of sales. Borrower, year, industry-year and bank fixed effects are as indicated. Standard errors are clustered at firm level.

Table 6: The Real Effects of Regulatory Forbearance on Capital Expenditures and Wages (Zombie Firms)

Dependent Variable:	$\text{Capex}_{j,t+1} = \frac{\Delta\text{GFA}_{j,t+1}}{\text{Total Assets}_{j,t+1}}$		$\text{Emp}_{j,t+1} = \frac{\text{Wages}_{j,t+1}}{\text{Total Expenses}_{j,t+1}}$	
	(1)	(2)	(3)	(4)
$\text{Govt. Bank}_{b,j}$	-0.003		0.006	
	(0.008)		(0.008)	
$\text{Zombie}_{j,t}$	0.009	0.008	0.007	0.007
	(0.010)	(0.010)	(0.007)	(0.007)
$\text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	0.009	0.010	-0.010	-0.011
	(0.010)	(0.010)	(0.007)	(0.007)
$\text{RF}_t^{\text{Post 2008}}$	-0.010		0.016**	
	(0.006)		(0.006)	
$\times$ $\text{Govt. Bank}_{b,j}$	0.006	0.007	-0.011	-0.010
	(0.007)	(0.007)	(0.007)	(0.007)
$\times$ $\text{Zombie}_{j,t}$	-0.010	-0.008	-0.015**	-0.015**
	(0.010)	(0.010)	(0.007)	(0.007)
$\times$ $\text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	-0.005	-0.007	0.016**	0.017**
	(0.010)	(0.010)	(0.008)	(0.008)
$\text{RF}_t^{\text{Post 2013}}$	-0.002		0.003	
	(0.004)		(0.006)	
$\times$ $\text{Govt. Bank}_{b,j}$	-0.006	-0.006	0.008	0.009
	(0.005)	(0.005)	(0.006)	(0.00625)
$\times$ $\text{Zombie}_{j,t}$	-0.018***	-0.018***	0.007	0.00748
	(0.006)	(0.006)	(0.006)	(0.006)
$\times$ $\text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	0.012*	0.012*	-0.010	-0.010
	(0.007)	(0.007)	(0.007)	(0.007)
No. of Obs.	24208	24208	27124	27124
R-sq.	0.436	0.439	0.848	0.849
Borrower FE	Y	Y	Y	Y
Year FE	N	Y	N	Y
Bank FE	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the real effects of regulatory forbearance on capital and employment of zombie firms borrowing from government-owned banks using a triple difference specification. In columns 1–2 the dependent variable is the capex ratio defined as the proportion of change in gross fixed assets out of total assets of a firm in period T+1. Columns 3–4 show the results for expenditure on employment as proxied by the proportion of wages in the total expenses of a firm in period T+1. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio > .15. The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of forbearance. The indicator variable $\text{RF}^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of forbearance by RBI. All specifications control for time invariant borrower characteristics and time varying firm size via Log of Sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at firm level.

The Unholy Trinity: Regulatory Forbearance, Stressed Banks and Zombie Firms

Online Appendix

Anusha Chari Lakshita Jain Nirupama Kulkarni

Appendix IA.1 Loan Recovery Processes Prior to the GFC

India did not implement an effective and comprehensive bankruptcy framework until 2016 (Reserve Bank of India, 2017). Prior to this, and in the absence of the requisite legal apparatus for resolving stressed assets, the central bank resorted to makeshift arrangements with out-of-court resolutions that mimicked formal bankruptcy laws. Not surprisingly, India has consistently ranked very low in global rankings of loan recovery prospects and the time taken for the resolution of stressed-assets.

Debt Recovery Tribunals (established under the "Recovery of Debts due to Banks and Financial Institutions Act of 1993") were established to help banks and financial institutions recover their dues speedily without being subject to the lengthy procedures of the civil courts (See The Indian Express, 2018 for a perspective on bad loan problem).[35] Subsequently, the SARFAESI Act of 2002 allowed banks and other financial institutions to auction off the residential or commercial properties of defaulters to recover loans. In addition, the RBI introduced the Corporate Debt Restructuring mechanism in 2001 to allow syndicates or consortium of lenders to restructure the debt of corporate firms.

The policy specifically targeted multiple banking accounts along with syndication/consortium accounts of corporate borrowers with outstanding exposures to banks and other financial institutions exceeding Rs.10 crores (roughly US$1.35 million). Recognizing the difficulties in reaching an agreement among different lending institutions, the policy specifically targeted exposures involving more than one lender under a consortium or multiple banking arrangements. The rationale for the restructuring mechanism was to allow loans to otherwise viable firms to be restructured through an orderly and coordinated program to help minimize losses to the both borrowers and creditors.

Criticism arose that the provisions of SARFAESI Act were not being used properly by banks and recovery rates were a mere 13% of the original amounts at stake in 2013-14. Influential promoters could still play off one bank against another by choosing to repay some loans while strategically defaulting on others. Many listed firms in India are backed by promoters who are a set of persons and/or families that effectively control the firm. The term 'promoter' is defined under Section 2(69) of the Companies Act, 2013 and Regulation

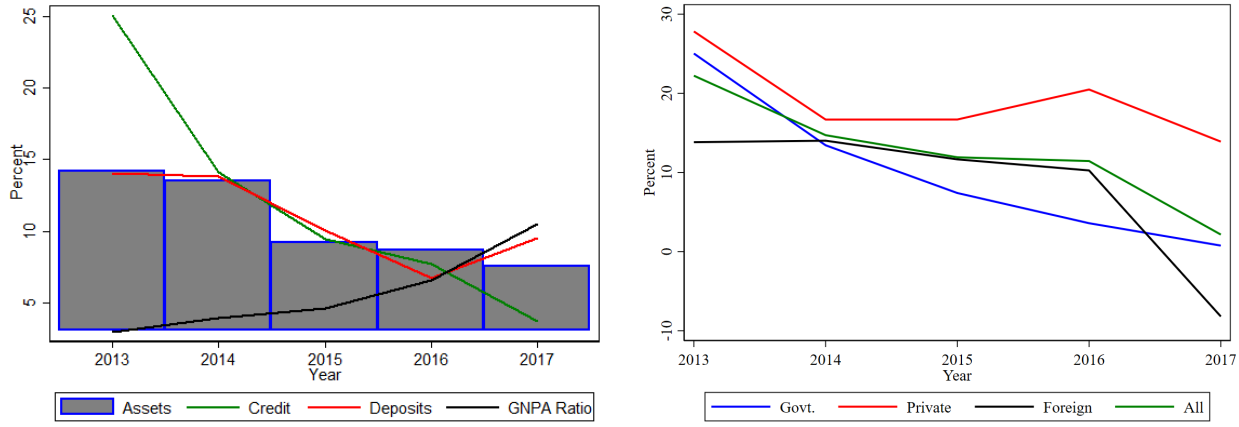
[35]See the article by Dr Raghuram Rajan for a perspective on bad loan problem at https://indianexpress.com/article/explained/raghuram-rajan-bad-loans-npa-indian-banking-system-economy-5351347/

2(1)(za) of the Securities and Exchange Board of India (Issue of Capital and Disclosure Requirements) Regulations, 2009 to broadly mean persons having 'control' over a company (Faculty of Law, University of Oxford, 2016).[36] Overall, banks were not backed by the regulators in their efforts to recover outstanding loans, particularly those given to politically-connected promoters.

[36]https://www.law.ox.ac.uk/business-law-blog/blog/2016/12/promoter-exits-india-real-leash-reined-market-watchdog

Figure IA.1: Recent Banking Trends in India

Notes: This figure shows the aggregate growth trends in assets, credit, deposits and non-performing assets of the banks in India for the period 2013–2017. Panel (a) shows the aggregate growth trends of assets, credit, deposits and gross non-performing asset (GNPA) ratio for the banks in India for the period 2013–2017. GNPA ratio is the proportion of non-performing assets to gross advances (loans). Panel (b) shows the growth in advances (loans) by bank-type. Bank types are government-owned, private, and foreign banks. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. Classification for bank-types is from DBIE.



(a) **Aggregate Growth**

(b) **Gross Advances by Bank Type**

Figure IA.2: The Relationship between Bank Capital and Zombie Proportions at the Bank Level

Notes: This figure plots the time-series trend in bank capital and the proportion of zombie firms in the bank's portfolio for the years 2006–2016. The y-axis on the left-hand-side measures the average proportion of zombies in a bank's portfolio and the y-axis on the right-hand-side measures the average bank capital ratio (CRAR Tier I). The horizontal line at 9% refers to the stipulated minimum capital ratio.

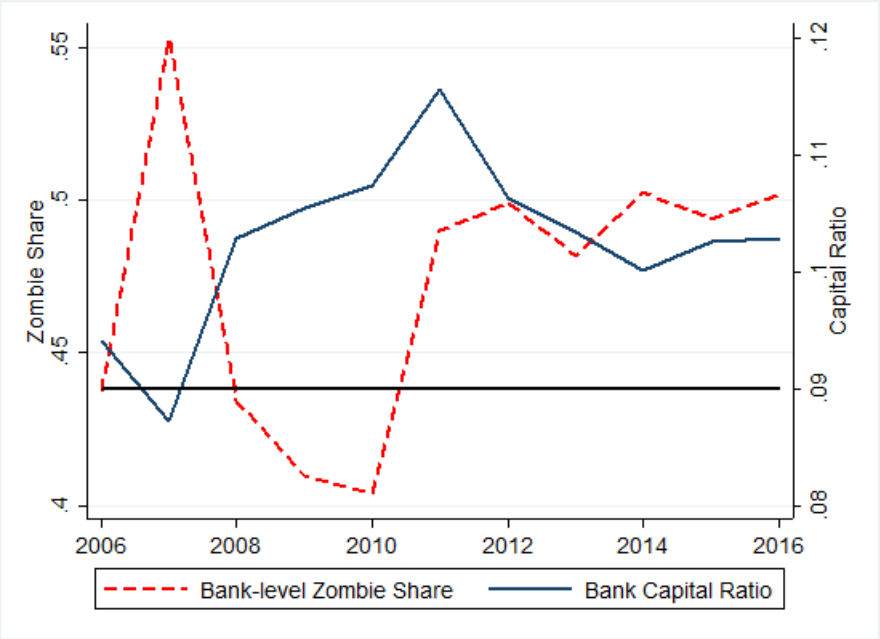


Table IA.1: Zombie Firm Characteristics

Dependent Variable: $Zombie_{j,t}$	(1)	(2)	(3)	(4)	(5)	(6)
Manufacturing firm	0.234***					0.231***
	(0.00985)					(0.0113)
Infrastructure firm		-0.119***				0.0407***
		(0.0127)				(0.0144)
Young			-0.164***			-0.0791***
			(0.0141)			(0.0143)
Listed firms				0.127***		0.0819***
				(0.00940)		(0.00963)
Size					0.206***	0.121***
					(0.0198)	(0.0198)
No. of Obs.	38324	38324	39227	39227	39227	38324
R-sq.	0.0547	0.00858	0.00549	0.0160	0.00860	0.0691

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table summarizes the characteristics of zombie firms. Columns 1–5 shows coefficients from uni-variate regressions. Column 6 shows coefficients for the horse-race regression including all the variables. The dependent variable in all columns is whether a firm is classified as a zombie in a given year. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. Manufacturing firm is a dummy variable that takes the value 1 if a firm is a manufacturing firm. Similarly, Infrastructure firm and Listed firms are dummy variables that take the value 1 if a firm is an infrastructure firm and listed firm respectively. Young is a dummy variable that takes the value 1 for firms with age less than 5 years. Size is proxied by the log of the assets of the firm. Standard errors are clustered at the firm-level.

Table IA.2: Alternative Measure of Zombie Status: Accounting for Firm Distress

$\text{Log Debt}_{j,t+1}$	(1)	(2)	(3)	(4)
$\text{Govt Bank}_{b,j} \times \text{RF}_t^{\text{Post 2008}} \times \text{Zombie}_{j,t}^{ICR}$	0.0878	0.0985		
	(0.123)	(0.122)		
$\text{Govt Bank}_{b,j} \times \text{RF}_t^{\text{Post 2013}} \times \text{Zombie}_{j,t}^{ICR}$	0.179**	0.183**		
	(0.0861)	(0.0856)		
$\text{Govt Bank}_{b,j} \times \text{RF}_t^{\text{Post 2008}} \times \text{Zombie}_{j,t}^{IMF}$			0.268**	0.269**
			(0.135)	(0.132)
$\text{Govt Bank}_{b,j} \times \text{RF}_t^{\text{Post 2013}} \times \text{Zombie}_{j,t}^{IMF}$			0.115	0.123
			(0.0981)	(0.0977)
No. of Obs.	21827	21827	21827	21827
R-sq.	0.931	0.932	0.931	0.933
Borrower FE	Y	Y	Y	Y
Year FE	N	Y	N	Y
Bank FE	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the effects of regulatory forbearance on debt of zombie firms using a triple difference specification and an alternate zombie measure. The dependent variable in all columns is the firm-level log of debt in T+1. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. The indicator variable $\text{Forbearance}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of Forbearance. The indicator variable $\text{Forbearance}^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of Forbearance by RBI. A firm is classified as $Zombie_{j,t}^{ICR}$ if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India, has Debt to Assets ratio $> .15$ and has an interest coverage ratio below 2.The IMF definition of speculative credit recipient ($Zombie_{j,t}^{IMF}$) includes a firm with an ICR less than 4.1 and a net debt-to-assets ratio greater than 0.25. Net debt is gross debt minus cash.

Table IA.3: The Real Effects of Regulatory Forbearance on Capital Expenditures and Wages (Low Solvency Firms)

Dependent Variable:	$\text{Capex}_{j,t+1} = \frac{\Delta\text{GFA}_{j,t+1}}{\text{Total Assets}_{j,t+1}}$		$\text{Emp}_{j,t+1} = \frac{\text{Wages}_{j,t+1}}{\text{Total Expenses}_{j,t+1}}$	
	(1)	(2)	(3)	(4)
$\text{Govt. Bank}_{b,j}$	-0.005		0.004	
	(0.009)		(0.008)	
$\text{Firm Quality}_{j,t}$	0.000	-0.001	0.001	0.001
	(0.011)	(0.011)	(0.008)	(0.007)
$\text{Govt. Bank}_{b,j} \times \text{Firm Quality}_{j,t}$	0.009	0.010	-0.007	-0.007
	(0.012)	(0.012)	(0.008)	(0.008)
$\text{RF}_t^{\text{Post 2008}}$	-0.015**		0.014*	
	(0.007)		(0.008)	
$\times$ $\text{Govt. Bank}_{b,j}$	0.009	0.010	-0.008	-0.008
	(0.008)	(0.008)	(0.008)	(0.008)
$\times$ $\text{Firm Quality}_{j,t}$	-0.004	-0.004	-0.010	-0.009
	(0.011)	(0.011)	(0.008)	(0.008)
$\times$ $\text{Govt. Bank}_{b,j} \times \text{Firm Quality}_{j,t}$	-0.011	-0.012	0.010	0.009
	(0.012)	(0.012)	(0.009)	(0.009)
$\text{RF}_t^{\text{Post 2013}}$	-0.007**		0.002	
	(0.003)		(0.006)	
$\times$ $\text{Govt. Bank}_{b,j}$	-0.002	-0.002	0.008	0.008
	(0.004)	(0.004)	(0.006)	(0.006)
$\times$ $\text{Firm Quality}_{j,t}$	-0.015**	-0.015**	0.007	0.007
	(0.007)	(0.007)	(0.007)	(0.007)
$\times$ $\text{Govt. Bank}_{b,j} \times \text{Firm Quality}_{j,t}$	0.013*	0.014*	-0.008	-0.008
	(0.007)	(0.007)	(0.008)	(0.008)
No. of Obs.	22144	22144	24678	24678
R-sq.	0.453	0.456	0.862	0.863
Borrower FE	Y	Y	Y	Y
Year FE	N	Y	N	Y
Bank FE	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the real effects of regulatory forbearance on capital and employment for low-solvency firms at government-owned banks using a triple difference specification. In columns 1–2 the dependent variable is the capex ratio defined as the proportion of change in gross fixed assets out of total assets of a firm in period T+1. Columns 3–4 show the results for expenditure on employment as proxied by the proportion of wages in the total expenses of a firm in period T+1. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. A firm is classified as Low Solvency if the Debt to equity measure of the firm in time period T is above median. A firm is classified as Low Liquidity if the cash ratio measure of the firm in time period T is below median. The indicator variable $\text{Forbearance}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of forbearance. The indicator variable $\text{Forbearance}^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of forbearance by RBI. All specifications control for time invariant borrower characteristics and time varying firm size via Log of Sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at firm level.

Table IA.4: The Real Effects on Wages and Capital Expenditures (Low Liquidity Firms)

Dependent Variable:	$\text{Capex}_{j,t+1} = \frac{\Delta\text{GFA}_{j,t+1}}{\text{Total Assets}_{j,t+1}}$		$\text{Emp}_{j,t+1} = \frac{\text{Wages}_{j,t+1}}{\text{Total Expenses}_{j,t+1}}$	
	(1)	(2)	(3)	(4)
$\text{Govt. Bank}_{b,j}$	0.001		0.001	
	(0.007)		(0.006)	
$\text{Firm Quality}_{j,t}$	-0.012	-0.012	0.001	0.001
	(0.008)	(0.008)	(0.007)	(0.007)
$\text{Govt. Bank}_{b,j} \times \text{Firm Quality}_{j,t}$	0.007	0.007	-0.001	-0.001
	(0.009)	(0.009)	(0.008)	(0.007)
$\text{RF}_t^{\text{Post 2008}}$	-0.0154**		0.013**	
	(0.007)		(0.005)	
$\times$ $\text{Govt. Bank}_{b,j}$	0.003	0.004	-0.006	-0.006
	(0.007)	(0.007)	(0.006)	(0.006)
$\times$ $\text{Firm Quality}_{j,t}$	0.002	0.003	-0.008	-0.008
	(0.009)	(0.009)	(0.007)	(0.007)
$\times$ $\text{Govt. Bank}_{b,j} \times \text{Firm Quality}_{j,t}$	-0.00484	-0.006	0.006	0.007
	(0.009)	(0.009)	(0.008)	(0.008)
$\text{RF}_t^{\text{Post 2013}}$	-0.011***		0.007	
	(0.004)		(0.006)	
$\times$ $\text{Govt. Bank}_{b,j}$	0.003	0.003	0.006	0.006
	(0.005)	(0.005)	(0.006)	(0.006)
$\times$ $\text{Firm Quality}_{j,t}$	0.004	0.003	-0.001	-0.001
	(0.006)	(0.006)	(0.007)	(0.007)
$\times$ $\text{Govt. Bank}_{b,j} \times \text{Firm Quality}_{j,t}$	-0.009	-0.008	-0.005	-0.005
	(0.007)	(0.007)	(0.007)	(0.007)
No. of Obs.	24136	24136	27002	27002
R-sq.	0.436	0.439	0.850	0.852
Borrower FE	Y	Y	Y	Y
Year FE	N	Y	N	Y
Bank FE	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the real effects of regulatory forbearance on capital and employment for low-liquidity firms at government-owned banks using a triple difference specification. In columns 1–2 the dependent variable is the capex ratio defined as the proportion of change in gross fixed assets out of total assets of a firm in period T+1. Columns 3–4 show the results for expenditure on employment as proxied by the proportion of wages in the total expenses of a firm in period T+1. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. A firm is classified as Low Solvency if the Debt to equity measure of the firm in time period T is above median. A firm is classified as Low Liquidity if the cash ratio measure of the firm in time period T is below median. The indicator variable $\text{Forbearance}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of forbearance. The indicator variable $\text{Forbearance}^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of forbearance by RBI. All specifications control for time invariant borrower characteristics and time varying firm size via Log of Sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at firm level.

Table IA.5: Impact on Export-oriented Firms

Dependent Variable: $\text{Log Debt}_{j,t+1}$	Non-Exporting		Exporting	
	(1)	(2)	(3)	(4)
$\text{Zombie}_{j,t}$	0.730***	0.702***	0.762***	0.774***
	(0.219)	(0.201)	(0.182)	(0.182)
$\text{RF}_t^{\text{Post 2008}} \times \text{Govt. Bank}_{b,j}$	-0.128	-0.131	-0.419**	-0.400**
	(0.211)	(0.208)	(0.191)	(0.189)
$\text{RF}_t^{\text{Post 2008}} \times \text{Zombie}_{j,t}$	-0.213	-0.237	-0.266	-0.293
	(0.200)	(0.192)	(0.196)	(0.195)
$\text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	-0.265	-0.243	-0.340*	-0.360*
	(0.228)	(0.214)	(0.190)	(0.189)
$\text{RF}_t^{\text{Post 2008}} \times \text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	0.186	0.183	0.413**	0.426**
	(0.217)	(0.210)	(0.203)	(0.203)
No. of Obs.	6321	6321	9124	9124
R-sq.	0.918	0.922	0.920	0.921
Borrower FE	Y	Y	Y	Y
Year FE	N	Y	N	Y
Bank FE	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table summarizes the impact of regulatory forbearance on lending to zombie firms through exporting mechanism. The dependent variable is the Log of Debt of a firm in period T+1. A firm is classified as Zombie if the firm received subsidized credit in period T i.e. the firm can borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A bank is classified as Govt. Bank if the government of India holds a majority stake (i.e., more than 50%). The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of Forbearance. We define a firm as 'exporting' if the export earnings as a percentage of total sales are strictly positive and classify firms as 'domestic' otherwise. All specifications control for time-invariant borrower characteristics and time-varying firm size via log of sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at the firm level.

Table IA.6: Impact on Infrastructure-oriented Firms

Dependent Variable: $\text{Log Debt}_{j,t+1}$	Binary Indicator				Median (M) # Projects			
	No		Yes		No ($< M$)		Yes ($>= M$)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\text{Zombie}_{j,t}$	0.637***	0.644***	1.131***	1.167***	0.654***	0.653***	1.153***	1.148***
	(0.140)	(0.137)	(0.360)	(0.355)	(0.235)	(0.230)	(0.327)	(0.324)
$\text{RF}_t^{\text{Post 2008}} \times \text{Govt. Bank}_{b,j}$	-0.156	-0.155	-0.921**	-0.984***	-0.160	-0.137	-0.867***	-0.850***
	(0.138)	(0.136)	(0.365)	(0.362)	(0.222)	(0.222)	(0.331)	(0.329)
$\text{RF}_t^{\text{Post 2008}} \times \text{Zombie}_{j,t}$	-0.181	-0.208	-0.699*	-0.782**	-0.179	-0.219	-0.748**	-0.768**
	(0.137)	(0.136)	(0.360)	(0.358)	(0.222)	(0.221)	(0.329)	(0.327)
$\text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	-0.189	-0.203	-0.822**	-0.867**	-0.208	-0.204	-0.801**	-0.808**
	(0.147)	(0.145)	(0.373)	(0.366)	(0.245)	(0.241)	(0.335)	(0.330)
$\text{RF}_t^{\text{Post 2008}} \times \text{Govt. Bank}_{b,j} \times \text{Zombie}_{j,t}$	0.152	0.170	0.918**	0.987***	0.258	0.277	0.916***	0.934***
	(0.147)	(0.146)	(0.370)	(0.365)	(0.237)	(0.235)	(0.334)	(0.331)
No. of Obs.	18578	18578	5548	5548	8823	8823	6135	6135
R-sq.	0.922	0.923	0.921	0.926	0.905	0.907	0.902	0.905
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	Y	N	Y
Bank FE	N	Y	N	Y	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table summarizes the impact of regulatory forbearance on lending to zombie firms through infrastructure mechanism. The dependent variable is the Log of Debt of a firm in period T+1. A firm is classified as Zombie if the firm received subsidized credit in period T i.e. the firm can borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A bank is classified as Govt. Bank if the government of India holds a majority stake (i.e., more than 50%). The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of Forbearance. Columns (1)-(4) present estimates for the baseline specification estimated conditional on whether firm industry classification is infrastructure sector or not. Columns (5)-(8) classify infrastructure firms as having an above-median number of infrastructure project announcements in the pre-forbearance period. All specifications control for time-invariant borrower characteristics and time-varying firm size via log of sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at the firm level.

Table IA.7: Export- and Infrastructure-oriented Firms: Marginal Effects

	Exports (Table IA.5)		Infrastructure (Table IA.6)			
	Column (1)	Column (3)	Column (1)	Column (3)	Column (5)	Column (7)
			Margins Estimates			
Govt. Bank, Post RF (A)	.437	0.568	0.419	0.528	0.523	0.520
Govt. Bank, Pre RF (B)	.464	0.421	0.448	0.309	0.445	0.352
Private Bank, Post RF (C)	.516	0.495	0.456	0.432	0.474	0.405
Private Bank, Pre RF (D)	.729	0.762	0.637	1.131	0.654	1.153
			Difference in Differences Calculations			
(A-B)	-0.027	0.147	-0.029	0.219	0.078	0.168
(C-D)	-0.213	-0.266	-0.181	-0.699	-0.179	-0.748
(A-B)-(C-D) (%)	19%	41%	15%	92%	26%	92%

Notes: This table displays the margins estimates for government-owned banks and privately-owned banks, estimated from the baseline specification in Equation 1. Column models are as explained in Table IA.5 and Table IA.6. Row A (C) displays the margins for the relevant column for government-owned (privately-owned) banks in the post forbearance policy period. Row B (D) displays the margins for the relevant column for government-owned (privately-owned) banks in the pre forbearance policy period. Row A-B shows the change in lending for government-owned banks between the pre and post forbearance policy period. Row C-D shows the change in lending for privately-owned banks between the pre and post forbearance policy period. The row (A-B)-(C-D) shows the change in lending by government-owned banks compared to privately-owned banks between the pre and post forbearance period. All specifications control for time-invariant borrower characteristics and time-varying firm size via Log of Sales. Standard errors are clustered at firm level. Please note that margins cannot be calculated when the fixed effects absorb the main effects.

Table IA.8: Panel A: The Impact of Regulatory Forbearance on Lending to Low-Solvency and Low-Liquidity Firms

	Firm Quality: Low-Solvency$_{j,t}$				Firm Quality: Low-Liquidity$_{j,t}$			
Dependent Variable: Log(Debt)$_{j,t+1}$	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Govt. Bank$_{b,j}$	0.157		0.179		0.097		0.113	
	(0.145)		(0.145)		(0.110)		(0.111)	
Firm Quality$_{j,t}$	0.787***	0.799***	0.796***	0.800***	0.326***	0.329***	0.324***	0.328***
	(0.143)	(0.139)	(0.142)	(0.139)	(0.106)	(0.102)	(0.105)	(0.102)
Govt. Bank$_{b,j}$ × Firm Quality$_{j,t}$	-0.220	-0.213	-0.224	-0.218	-0.144	-0.157	-0.148	-0.157
	(0.150)	(0.147)	(0.150)	(0.147)	(0.111)	(0.108)	(0.111)	(0.108)
RF$_t^{\text{Post 2008}}$	0.556***		0.519***		0.373***		0.357***	
	(0.133)		(0.133)		(0.100)		(0.099)	
× Govt. Bank$_{b,j}$	-0.275*	-0.276**	-0.256*	-0.259*	-0.160	-0.158	-0.157	-0.151
	(0.141)	(0.139)	(0.141)	(0.139)	(0.105)	(0.103)	(0.104)	(0.102)
× Firm Quality$_{j,t}$	-0.357**	-0.336**	-0.344**	-0.333**	-0.208*	-0.235**	-0.223*	-0.241**
	(0.142)	(0.139)	(0.142)	(0.140)	(0.113)	(0.111)	(0.115)	(0.113)
× Govt. Bank$_{b,j}$ × Firm Quality$_{j,t}$	0.322**	0.342**	0.301**	0.324**	0.206*	0.222*	0.207*	0.218*
	(0.151)	(0.149)	(0.151)	(0.150)	(0.120)	(0.117)	(0.121)	(0.119)
RF$_t^{\text{Post 2013}}$			0.161**				0.106	
			(0.077)				(0.075)	
× Govt. Bank$_{b,j}$			-0.058	-0.071			-0.014	-0.040
			(0.090)	(0.089)			(0.087)	(0.087)
× Firm Quality$_{j,t}$			0.002	-0.009			0.027	0.016
			(0.090)	(0.089)			(0.087)	(0.086)
× Govt. Bank$_{b,j}$ × Firm Quality$_{j,t}$			0.088	0.079			0.014	0.030
			(0.102)	(0.101)			(0.100)	(0.100)
No. of Obs.	21827	21827	21827	21827	24080	24080	24080	24080
R^2	0.930	0.933	0.930	0.933	0.926	0.928	0.926	0.928
Borrower FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	Y	N	Y
Bank FE	N	Y	N	Y	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table shows the results for the impact on lending to low-solvency (columns 1–4) and low-liquidity (columns 5–8) firms at govt. banks using a triple difference specification. The dependent variable is the log of debt of a firm in period T+1. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. A firm is classified as Low Solvency if the debt to equity measure of the firm in time period T is above median. A firm is classified as Low Liquidity if the cash ratio measure of the firm in time period T is below median. The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years post 2008 i.e. after the introduction of forbearance. The indicator variable $\text{RF}^{\text{Post 2013}}$ takes a value 1 in the years post 2013 i.e. after the announcement of withdrawal of forbearance by RBI. Borrower, year, and bank fixed effects are as indicated. All specifications control for time-invariant borrower characteristics and time-varying firm size via log of sales. Standard errors are clustered at the firm level.

Panel B: Marginal Effects-Government and Private Bank Lending in the Aftermath of Forbearance

	Low-Solvency (Table IA.8)		Low-Liquidity (Table IA.8)	
	Model (1)	Model (3)	Model (5)	Model (7)
	Margins Estimates			
Govt. Bank, Post RF (A)	0.532	0.547	0.179	0.169
Govt. Bank, Pre RF (B)	0.567	0.590	0.181	0.185
Private Bank, Post RF (C)	0.430	0.452	0.118	0.107
Private Bank, Pre RF (D)	0.787	0.796	0.326	0.330
	Difference in Differences Calculations			
(A-B)	-0.034	-0.043	-0.002	-0.016
(C-D)	-0.357	-0.344	-0.208	-0.223
(A-B)-(C-D) (%)	32%	30%	21%	21%

Notes: This table displays the margins estimates for government-owned banks and privately-owned banks, estimated from the baseline specification in Equation 1 replacing zombie measure with firm quality. Model (1) and Model (3) for low-solvency firms refer to the regressions estimates in Columns (1) and (3) from Table IA.8, Panel A. Model (5) and Model (7) for low-liquidity firms refer to the regressions estimates in Columns (5) and (7) from Table IA.8, Panel A. Row A (C) displays the margins for the relevant column for government-owned (privately-owned) banks in the post forbearance policy period. Row B (D) displays the margins for the relevant column for government-owned (privately-owned) banks in the pre forbearance policy period. Row A-B shows the change in lending for government-owned banks between the pre and post forbearance policy period. Row C-D shows the change in lending for privately-owned banks between the pre and post forbearance policy period. The row (A-B)-(C-D) shows the change in lending by government-owned banks compared to privately-owned banks between the pre and post forbearance period. All specifications control for time-invariant borrower characteristics and time-varying firm size via Log of Sales. Standard errors are clustered at firm level. Please note that margins cannot be calculated when the fixed effects absorb the main effects.

Table IA.9: Robustness Check: An Alternate Measure of Forbearance (Provisioning Rates)

Dependent Variable: Log Debt$_{j,t+1}$	(1)	(2)	(3)	(4)	(5)	(6)
Govt Bank$_{b,j}$ × Zombie$_{j,t}$ × Prov rate$_t$	-0.0177	-0.0212				
	(0.0145)	(0.0144)				
Non Zombie$_{j,t}$ × Industry Frac Zombie$_{h,t}$ × Prov rate$_t$			0.0685**	0.0917***		
			(0.0311)	(0.0345)		
Non Zombie$_{j,t}$ × Bank Frac Zombie$_{b,t}$ × Prov rate$_t$					0.0800*	0.0871*
					(0.0470)	(0.0498)
No. of Obs.	24866	24866	24866	24866	24866	24866
R-sq.	0.928	0.930	0.928	0.933	0.928	0.931
Borrower FE	Y	Y	Y	Y	Y	Y
Year FE	N	N	N	Y	N	Y
Industry X Year FE	N	N	N	Y	N	N
Bank FE	N	Y	N	Y	N	Y
Bank X Year FE	N	N	N	N	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the impact of provisioning requirements of restructured loans on zombie lending using a triple difference specification. The dependent variable is log of debt of a firm in period T+1. Columns 1–2 look at the Zombie firms borrowing from stressed banks with higher provisioning rates. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio > .15. A bank is classified as Govt. Bank if a majority stake (i.e. more than 50%) is held by the government of India. Prov rate$_t$ is the provisioning rate as given by RBI. Only the triple interaction terms are shown though remaining interaction terms, not absorbed by the fixed effects, are also included but not shown for brevity. All specifications control for time invariant borrower characteristics and time varying firm size via Log of Sales. Borrower, year, industry-year, bank, and bank-year fixed effects are as indicated. Standard errors are clustered at the firm-level.

Table IA.10: The Impact on Regulatory Forbearance on Lending to Low-solvency, Low-liquidity, and Zombie Firms by Bank Capitalization

Dependent Variable: $\text{Log Debt}_{j,t+1}$	(1)	(2)	(3)	(4)	(5)	(6)
$\text{CRAR}_{b,j} * \text{Low Solvency}_{j,t} * \text{RF}_t^{\text{Post 2008}}$	-0.0841**	-0.0901***				
	(0.0345)	(0.0335)				
$\text{CRAR}_{b,j} * \text{Low Solvency}_{j,t} * \text{RF}_t^{\text{Post 2013}}$	-0.0148	-0.0117				
	(0.0216)	(0.0209)				
$\text{CRAR}_{b,j} * \text{Low Liquidity}_{j,t} * \text{RF}_t^{\text{Post 2008}}$			-0.0892***	-0.0878***		
			(0.0277)	(0.0268)		
$\text{CRAR}_{b,j} * \text{Low Liquidity}_{j,t} * \text{RF}_t^{\text{Post 2013}}$			0.00620	0.00157		
$\text{CRAR}_{b,j} * \text{Zombie}_{j,t} * \text{RF}_t^{\text{Post 2008}}$					-0.0679**	-0.0716**
					(0.0295)	(0.0289)
$\text{CRAR}_{b,j} * \text{Zombie}_{j,t} * \text{RF}_t^{\text{Post 2013}}$					-0.00721	-0.00567
					(0.0208)	(0.0203)
No. of Obs.	21817	21817	24068	24068	24114	24114
R-sq.	0.931	0.933	0.927	0.928	0.930	0.933
Borrower FE	Y	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	Y
Bank FE	N	Y	N	Y	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table examines the impact of the regulatory forbearance on debt of low-liquidity, low-solvency, and zombie firms by bank capitalization using a triple difference specification. The dependent variable is log of debt of a firm in period T+1 $\text{CRAR}_{b,j}$ is capital-to-risk assets ratio, which is a continuous time-varying measure of bank health. A firm is classified as Low Solvency if the Debt to equity measure of the firm in time period T is above median. A firm is classified as Low Liquidity if the cash ratio measure of the firm in time period T is below median. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years post 2008 i.e. after the introduction of forbearance. The indicator variable $\text{RF}^{\text{Post 2013}}$ takes a value 1 in the years post 2013 i.e. after the announcement of withdrawal of forbearance by RBI. Only the triple interaction terms are shown though remaining interaction terms, not absorbed by the fixed effects, are also included but not shown for brevity. All specifications control for time invariant borrower characteristics and time varying firm size via Log of Sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at the firm-level.

Table IA.11: The Impact of Forbearance on Zombie and Healthy Firms

Dependent Variable: $\text{Log Debt}_{j,t+1}$	Direct Effects		Spillover Effects			
	Zombie Firms		Non-Zombie Firms			
			Within $\text{Bank}_{b,j}$		Within Industry_{i}	
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Stressed Bank}_{b,j} \times \text{Zombie}_{j,t} \times \text{RF}_t^{\text{Post 2008}}$	0.312***	0.323***				
	(0.105)	(0.103)				
$\text{Stressed Bank}_{b,j} \times \text{Zombie}_{j,t} \times \text{RF}_t^{\text{Post 2013}}$	0.0173	0.0211				
	(0.0907)	(0.0906)				
$\text{RF}_t^{\text{Post 2008}} \times \text{Healthy}_{jt} \times \text{Bank Frac Zombie}_{b,t}$			-1.086**	-1.062**		
			(0.438)	(0.448)		
$\text{RF}_t^{\text{Post 2013}} \times \text{Healthy}_{jt} \times \text{Bank Frac Zombie}_{b,t}$			-0.351	-0.362		
			(0.441)	(0.450)		
$\text{RF}_t^{\text{Post 2008}} \times \text{Healthy}_{jt} \times \text{Industry Frac Zombie}_{h,t}$					-0.693**	-0.896***
					(0.279)	(0.312)
$\text{RF}_t^{\text{Post 2013}} \times \text{Healthy}_{jt} \times \text{Industry Frac Zombie}_{h,t}$					0.136	0.0341
					(0.251)	(0.290)
No. of Obs.	24126	24126	24126	24126	24126	24126
R-sq.	0.930	0.931	0.930	0.934	0.930	0.933
Borrower FE	Y	Y	Y	Y	Y	Y
Year FE	N	Y	N	N	N	N
Bank FE	N	Y	N	N	N	N
Industry X Yr	N	N	N	N	N	Y
Bank X Yr	N	N	N	Y	N	N

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table summarizes the direct (columns 1–2) and spillover effects (columns 3–6) of regulatory forbearance on debt using a triple difference specification. The dependent variable in all columns is the firm-level log of debt in T+1. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A bank is classified as Stressed Bank if the proportion of non-performing loans in the total gross advances (loans) for the bank is in the top two terciles in 2007 i.e. before the introduction of RF policy by RBI. The indicator variable $\text{RF}^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of RF. The indicator variable $\text{RF}^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of RF by RBI. $\text{Industry Frac Zombie}_{h,t}$ is the fraction of total firms classified as a zombie in an industry in time period T. $\text{Bank Frac Zombie}_{b,t}$ is the fraction of total firms classified as a zombie in a bank's portfolio in time period T. Only the triple interaction terms are shown though remaining interaction terms, not absorbed by the fixed effects, are also included but not shown for brevity. All specifications control for time-invariant borrower characteristics and time-varying firm size via log of sales. Borrower, year, industry-year and bank fixed effects are as indicated. Standard errors are clustered at firm level.

Table IA.12: Exploiting Within-firm Variation Using Restructured Loans Data

Dependent variable: Restructured loans$_{j,t}$	(1) Log amt.	(2) Log #	(3) Log amt.	(4) Log #	(5) Log amt.	(6) Log #
Zombie definition:	Baseline		Refined measure		IMF definition	
Stressed Bank$_{b,j}$ * Zombie$_{j,t}$ * Forbearance$_t^{\text{Post 2008}}$	0.24	0.01	0.56**	0.03**	0.23	0.01
	(0.26)	(0.01)	(0.27)	(0.01)	(0.26)	(0.01)
Stressed Bank$_{b,j}$ * Zombie$_{j,t}$ * Forbearance$_t^{\text{Post 2013}}$	0.11	-0.00	-0.46**	-0.02**	-0.03	-0.01
	(0.24)	(0.01)	(0.23)	(0.01)	(0.21)	(0.01)
No. of Obs.	49940	49940	49940	48246	48246	48246
R-sq.	0.60	0.63	0.60	0.63	0.60	0.63
Firm X Yr	Y	Y	Y	Y	Y	Y
Bank Group X Yr	Y	Y	Y	Y	Y	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Notes: This table shows the effect of regulatory forbearance on restructured loans for the period T-1 to T using loan-level data on restructured loans using 3 different zombie measures. The dependent variable in columns 1, 3, and 6 is the logarithm of the total restructured loans by bank group (stressed/non-stressed) for each firm in a given year. In columns 2, 4, and 6 the dependent variable is the log of the corresponding total number of restructured loans. A bank is classified as Stressed Bank if the proportion of non-performing loans in the total gross advances (loans) for the bank is in the top two terciles in the year 2007 i.e. before the introduction of Forbearance policy by RBI. The indicator variable Forbearance$^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of Forbearance. The indicator variable Forbearance$^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of Forbearance by RBI. The baseline zombie measure in columns 1–2 is as defined in Table 4. The zombie measures in columns 3–6 is as defined in Table IA.2. Only the triple interaction terms are shown though remaining interaction terms, not absorbed by the fixed effects, are also included but not shown for brevity. All specifications include borrower-year fixed effects and the bank group-year fixed effects. Data on restructured loans is from the Ministry of Corporate Affairs. Standard errors are clustered at firm level.

Table IA.13: A Placebo Test: The Impact of Regulatory Forbearance on Firms Linked to Foreign Banks

Dep Var: Log Debt$_{j,t+1}$	(1)	(2)	(3)	(4)	(5)	(6)
Stressed Foreign Bank$_{b,j}$ × Zombie$_{j,t}$ × RF$_t^{\text{Post 2008}}$	-0.0401	-0.0912				
	(0.548)	(0.609)				
Stressed Foreign Bank$_{b,j}$ × Zombie$_{j,t}$ × RF$_t^{\text{Post 2013}}$	-1.042	-1.058				
	(0.665)	(0.659)				
Industry Frac Zombie$_{h,t}$ × Non Zombie$_t$ × RF$_t^{\text{Post 2008}}$			-0.0449	-0.310		
			(1.011)	(2.409)		
Industry Frac Zombie$_{h,t}$ × Non Zombie$_t$ × RF$_t^{\text{Post 2013}}$			2.041	3.174		
			(2.079)	(4.401)		
Bank Frac Zombie$_{h,t}$ × Non Zombie$_t$ × RF$_t^{\text{Post 2008}}$					0.448	2.617
					(1.850)	(3.400)
Bank Frac Zombie$_{h,t}$ × Non Zombie$_t$ × RF$_t^{\text{Post 2013}}$					0.0523	-0.706
					(2.182)	(2.987)
No. of Obs.	1038	1038	1038	1038	1038	1038
R-sq.	0.913	0.919	0.913	0.949	0.913	0.949
Borrower FE	Y	Y	Y	Y	Y	Y
Year FE	N	Y	N	Y	N	Y
Industry X Year FE	N	N	N	Y	N	N
Bank FE	N	Y	N	Y	N	Y
Bank X Year FE	N	N	N	N	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table summarizes the placebo results for the impact of regulatory forbearance on zombie lending using a triple difference specification for the subset of firms that borrow from foreign sector banks. The dependent variable is log of debt of a firm in period T+1. A firm is classified as Zombie if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$. A bank is classified as Stressed Foreign Bank if the proportion of non-performing loans in the total gross advances (loans) for the foreign bank is in the top two terciles in the year 2007 i.e. before the introduction of RF policy by RBI. The indicator variable RF$^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of RF. The indicator variable RF$^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of RF by RBI. Industry Frac Zombie$_{h,t}$ is the fraction of total firms classified as a zombie in an industry in time period T. Bank Frac Zombie$_{b,t}$ is the fraction of total firms classified as a zombie in a bank's portfolio in time period T. Only the triple interaction terms are shown though remaining interaction terms, not absorbed by the fixed effects, are also included but not shown for brevity. All specifications control for time invariant borrower characteristics and time varying firm size via Log of Sales. Borrower, year, industry-year, bank, and bank-year fixed effects are as indicated. Standard errors are clustered at the firm-level.

Table IA.14: The Impact on New Banking Relationships of Healthy Firms

Dependent Variable: New banking relationship$_{j,t+1}$	(1)	(2)	(3)
Private Bank$_{b,j}$ × Healthy$_{j,t}$ × RF$_t^{\text{Post 2008}}$	0.0438***	0.0441***	0.0414***
	(0.0132)	(0.0132)	(0.0132)
Foreign Bank$_{b,j}$ × Healthy$_{j,t}$ × RF$_t^{\text{Post 2008}}$	0.0978***	0.0987***	0.110***
	(0.0246)	(0.0247)	(0.0247)
Others$_{b,j}$ × Healthy$_{j,t}$ × RF$_t^{\text{Post 2008}}$	0.0288	0.0292	0.0404
	(0.0316)	(0.0318)	(0.0316)
Private Bank$_{b,j}$ × Healthy$_{j,t}$ × RF$_t^{\text{Post 2013}}$	-0.0169*	-0.0179*	-0.0154*
	(0.00909)	(0.00917)	(0.00911)
Foreign Bank$_{b,j}$ × Healthy$_{j,t}$ × RF$_t^{\text{Post 2013}}$	0.00628	0.00545	0.0100
	(0.0186)	(0.0188)	(0.0188)
Others$_{b,j}$ × Healthy$_{j,t}$ × RF$_t^{\text{Post 2013}}$	0.0590**	0.0580**	0.0455*
	(0.0290)	(0.0294)	(0.0244)
No. of Obs.	124170	124170	123999
R-sq.	0.131	0.133	0.161
Borrower FE	Y	Y	Y
Year FE	N	Y	Y
Bank FE	N	N	Y

Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table summarizes the probability of entry regression specification using a triple difference specification. The dependent variable is a dummy indicating a new firm relationship with bank b in period $T+1$. A firm is classified as *Zombie* if the the firm received subsidized credit in time period T i.e. the firm is able to borrow loans at an average interest rate that is lower than the Prime Lending Rate (PLR) of State Bank of India and has Debt to Assets ratio $> .15$ and Healthy otherwise. Private Bank is an indicator variable which takes the value 1 for privately-owned banks, Foreign Bank is an indicator variable which takes the value 1 for non-domestic banks, and Other is an indicator variable which takes the value 1 for all other non-bank lenders. Public banks are banks with majority government ownership. Classification for bank-type is from DBIE. The indicator variable RF$^{\text{Post 2008}}$ takes a value 1 in the years Post 2008 i.e. after the introduction of Forbearance. The indicator variable RF$^{\text{Post 2013}}$ takes a value 1 in the years Post 2013 i.e. after the announcement of withdrawal of Forbearance by RBI. Only the triple interaction terms are shown though remaining interaction terms, not absorbed by the fixed effects, are also included but not shown for brevity. All specifications control for time invariant borrower characteristics and time varying firm size via log of sales. Borrower, year, and bank fixed effects are as indicated. Standard errors are clustered at firm level.