The Indian Banking Recapitalization Saga

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Abstract: In the aftermath of the global financial crisis, the Government of India (GoI) started infusing capital into the weak public sector banks to stabilise the banking sector and ensure healthy credit growth in the economy and, indirectly, healthy economic growth. This process of recapitalising public sector banks started in fiscal year 2008-09, and continued every year till fiscal year 2018-19. However, we find that it has neither stabilised the banking sector nor created credit growth or economic growth. We document that there has been credit misallocation instead of credit growth during the recapitalisation phase. Zombie lending has increased, and the firms receiving these loans did not undertake any real economic activity.

Keywords: Recapitalisation, Bank Lending Channel, Government Banks, Zombie Lending, Credit Misallocation.

JEL classifications: G21, G28, E65

"I would like to contend that the primary cause for the recent slowdown in our growth is the stress on the banking sector's balance sheet, especially of PSBs... When bank balance sheets are so weak, they cannot support healthy credit growth. Put simply, under-capitalized banks have capital only to survive not to grow; those banks barely meeting the capital requirements will want to generate capital quickly, focusing on high interest margins at the cost of high loan volumes... A decisive and adequate bank recapitalization... is a critical intervention necessary to address this balance sheet malaise."

-Quest for Restoring Financial Stability in India
Viral Acharya

1 Introduction

In the aftermath of the financial crisis of 2008, a large amount of capital has been infused by the Ministry of Finance, Government of India (GoI) into the Indian banking sector to: i) prevent the slowdown of economic growth and ii) restore the balance sheet of the government banks (GBs)[1]. The capital infusion has been so frequent that it has almost become second nature of the government to earmark a recapitalisation amount in the annual budgetary process. Till 2018-19, the GoI's aggregate recapitalisation has been worth INR 3.1 trillion. Of these INR 3.1 trillion, INR 1.2 trillion has been infused in GBs from 2008-09 to 2016-17 through the annual budgetary process. In 2017-18 and 2018-19, the GoI scrapped the yearly budgetary process and started issuing recapitalisation bonds. Around INR 1.9 trillion has been infused by the GoI to GBs in 2017-18 and 2018-19.

Despite these massive amounts of capital infusion by the GoI into GBs (Table 1[2] in data appendix), it did not translate into economic growth. Several signs suggest that India's scenario is similar to the Japanese experience in the 1990s and early 2000s, and the European experience after 2012. During the phase of 2008-09 to 2018-19, 21 percent (Chari, Jain, & Kulkarni, 2022) of the debt was owed by firms that could not cover their interest expenses

[1]We use GBs and public sector banks (PSBs) alternatively. GBs are those banks in which the GoI has a majority ownership. Only the GBs were recapitalized by the GoI.

[2]Table 1 shows the amount of capital infusion for each of the GBs. Note that all the GBs are not recapitalised every year, but if we look at the overall period from 2008-09 to 2018-19 then all the GBs have been recapitalised at least once throughout the period.

out of their pretax earnings. Non-performing Assets (NPA) in the banking sector have been the highest during this phase. The NPA number averaged 10 percent, which has induced a negative risk perception for the Indian banking sector (Figure 1 in data appendix). Moreover, the GBs have higher NPAs compared to other bank groups like private banks (PBs) or foreign banks (Figure 2 in data appendix). The gross non-performing assets (GNPAs) for GBs were more than thrice the amount for PBs. If we exclude the State Bank of India (SBI) from the list of GBs, the GNPA number is almost five times that of the PBs (Figure 3 in data appendix).

To the best of our knowledge, our paper is the first to provide empirical evidence that the NPAs in India's banking sector and the sluggish economic growth can, to some extent, be attributed to zombie lending by GBs. These banks regained some lending capacity through frequent capital infusions but remained weakly capitalised[3] in the post-recapitalisation period[4]. This phenomenon is similar to the banking crisis experienced in Japan. Much like the situation with weakly capitalised Japanese banks, which extended loans to support financially impaired borrowers in meeting obligations on their existing loans (as discussed in works like Giannetti & Simonov, 2013), the GoI pursued a strategy of forbearance coupled with frequent recapitalisation. This approach enabled GBs to avoid or, at the very least, postpone immediate losses arising from these loans, hoping that the additional time will allow the impaired borrowers to regain solvency.

Our findings indicate that around 7.4 percent of the loans provided by GBs during the post-recapitalisation period fall under zombie loans. This shift of credit supply, redirecting from creditworthy borrowers to insolvent borrowers, resulted in an inefficient credit allocation. This misallocation disrupted market equilibrium and adversely affected investment and employment in the economy.

[3]The Basel III norms stipulate a capital adequacy ratio (CAR) of 10.5 percent (8 percent + 2.5 percent capital conservation buffer). The GBs were very close to this mark and were marginally satisfying the requirement throughout the recapitalisation period from 2008-09 to 2018-19.

[4]Post-recapitalisation or recapitalisation period refers to the period from 2008-09 to 2018-19. In this period the GoI infused capital into the GBs on a year-to-year basis.

Thus, as the policy discourse revolves around concerns regarding the lack of positive real effect from infusing liquidity into the banking system due to the banks' unwillingness to lend, we present an additional rationale for the inefficacy of these actions: the allocation of credit does not prioritise the productive sectors of the economy. Although the recurrent recapitalisation may have successfully prevented a more severe economic downturn, augmenting it with a targeted recapitalisation strategy and/or mandatory bank mergers[5] might have facilitated a more stable recovery.

For our analysis, we obtained the loan data from the Ministry of Corporate Affairs (MCA) website, GoI. The MCA records all the data of secured loans borrowed by firms on which a charge has been registered under the Companies Act 2013. Our sample coverage period is from FY[6] 2006-2019. The data is organised at a firm-bank-year level to analyse the effects of recapitalisation on the banking sector and its subsequent influence on the real economy. Consequently, we structure our empirical study into three distinct sections. Initially, we analyse the growth of credit supply resulting from the recapitalisation of the GBs. Furthermore, we track the subsequent alteration in the lending patterns of the recapitalised GBs. Next, we assess the extent to which the alteration in credit supply has resulted in real economic consequences.

By modifying the approach of Khwaja and Mian (2008), we find that recapitalised GBs did not significantly increase their loan supply relative to banks that were not recapitalised. While the macro-level evidence of bank lending might imply that GBs did not significantly enhance their credit supply post-recapitalisation, the micro-level data regarding the specific firms that obtained credit presents a different story.

To analyse the specific borrowers that derived the greatest advantages from the recurring

[5]Although the bank mergers did happen, but it happened only after recapitalisation proved to be unsuccessful in itself to stabilise the PSBs. The Bank of Baroda merged with Vijaya Bank and Dena Bank in 2019. This merger created the third-largest bank in India in terms of assets. Punjab National Bank merged with Oriental Bank of Commerce and United Bank of India in 2020. This merger formed the second-largest PSB in India. Canara Bank merged with Syndicate Bank in 2020, creating a larger and stronger PSB.

[6]FY refers to fiscal year starting from April 1st of a particular year and finishing on March 31st of the next year.

capital infusion procedure, we partitioned our sample into two categories: low-quality borrowers and high-quality borrowers. This categorisation was based on their capacity to fulfil their current debt obligations, as measured by their interest coverage ratio (ICR). We find that the allocation of credit predominantly favoured borrowers with low creditworthiness, and this increase in credit supply is primarily through zombie lending.

Zombie lending refers to the practise of extending loans to economically failed borrowers with the intention of preventing or delaying loan defaults (Caballero, Hoshi, & Kashyap, 2008). To detect zombie lending, we define a zombie firm as a firm whose i) ICR has been less than one for the last three consecutive years; ii) age is greater than 15 years; iii) debt to asset ratio is greater than 0.25. Our results show that the recapitalised GBs primarily extended loans to low-quality borrowers through zombie lending.

To further analyse the impact of zombie lending by the GBs, we show that non-zombie/ healthy firms connected to banks that benefited from recapitalisation faced a significant reduction in capital expenditure and an increased average interest cost and employment expenses. This finding suggests that non-zombie firms were crowded out from the credit supply because of distortions created by zombie lending. In accordance with this finding, no discernible alterations in real economic activity, such as investment or employment, are observed for zombie firms. This evidence suggests fundamental problems with the lending process of the GBs during the recapitalisation period, which confirms that the GBs had misallocated credit and hampered economic growth.

Our paper contributes to two strands of literature: i) the literature dealing with the analysis of various kinds of recapitalisation programs in different settings (broadly the USA, Europe and Japan), and ii) the impact of zombie lending on the real side of the economy. The significance of our study lies in the uniqueness of the Indian setting wherein capital was infused to the GBs continuously for an elongated period of time. The results of our paper (as discussed above briefly) are in line with the literature and can be interpreted as dos and do nots while designing capital infusion policies.

The paper proceeds as follows. Section 2 describes the contribution of our paper to the related literature. Section 3 briefly summarises the recapitalisation process in the Indian scenario. Section 4 details the data used in our analysis. Section 5 documents and analyses the results of our paper, and section 6 concludes.

2 Related Literature

The banking system is one of the most important drivers of an economy. A healthy banking system ensures efficient credit allocation in the economy, thus pushing the economy's growth trajectory. In contrast, a poor banking system leads to credit misallocation and pulls the economy towards a recession. Because of the critical role played by the banking system in the real economy, governments tend to bail out banks during any banking or financial crisis. The flip side of the bank bailout is the associated fiscal implications and moral hazard costs.

Our paper contributes to the literature dealing with weakly capitalised banks, zombie lending and misallocation of credit (Cortés, Demyanyk, Li, Loutskina, & Strahan, 2020; V. V. Acharya, Berger, & Roman, 2018; Berger, Makaew, & Roman, 2019; Black & Hazelwood, 2013; Philippon & Schnabl, 2013; Diamond & Rajan, 2011; Steffen, 2014; Haselmann, Singla, & Vig, 2019). Most of these studies have focused on the capital purchase program in the US during 2008 or the capital infusion program in Japan during the nineties, the European stress tests during 2010 -2011, and the European comprehensive assessment programme 2014. The findings are mixed; Berger et al. (2019) and Black and Hazelwood (2013) found that banks that received enormous beneficiaries from the program increased overall lending while banks that received minor beneficiaries did not. Studies by V. V. Acharya et al. (2018) and Cortés et al. (2020) found that recapitalisation negatively impacted credit lending, and the reason was the poor implementation of the recapitalisation process. Steffen (2014) and Haselmann et al. (2019) studied the European comprehensive program in 2014. It was found that the program hurt the overall credit lending activity. The program was not

very effective due to the conflict of incentives. The national governments and central banks, supposed to provide the capital backstop, conducted the tests. The examiners had a clear incentive to under report the capital shortfall.

Our paper is one of the first to focus on the Indian scenario. The Indian scenario is an interesting testing ground as i) there was a dichotomous objective of pump priming the economic growth and protecting the balance sheet of the GBs, and ii) the recapitalisation was done on a recurrent basis. Despite frequent recapitalisation, the overall credit supply did not increase significantly. The tendency of the recapitalised banks had been towards decreasing credit supply, leading to credit misallocation. In particular, if the capital infusion fails to recapitalise marginal banks[7] adequately, it creates a significant moral hazard problem. It incentivises banks to reallocate their loan supply from borrowers with high credit quality to those with lower credit quality, resulting in adverse aggregate consequences for employment, investment, and overall economic growth.

Our study also provides support for the increasing apprehension of the potential hindrance of growth in several nations, such as Japan (Caballero et al., 2008) and Europe (V. V. Acharya, Eisert, Eufinger, & Hirsch, 2019; Gopinath, Kalemli-Özcan, Karabarbounis, & Villegas-Sanchez, 2017) by zombie firms. Blattner, Farinha, and Rebelo (2019) conducted a study that investigates the correlation between under-performing banks and diminished productivity growth subsequent to the European sovereign debt crisis. In a separate study, Gropp, Ongena, Rocholl, and Saadi (2022) concentrate on the influence of distressed bank recapitalisation through TARP[8] on productivity level during the global financial crisis. Banerjee and Hofmann (2018) as well as Caballero et al. (2008) demonstrate that the existence of zombie firms has a negative impact on investment and employment within firms that are more productive.

[7]The capital infusion has been directed to government banks close to their minimum capital requirements (CAG, 2017).

[8]TARP stands for "Troubled Asset Relief Program." It is a U.S. government program that was established in response to the global financial crisis of 2008. The program aimed to stabilise the financial system, restore confidence in the markets, and prevent further economic collapse.

Our paper is related to recent papers focusing on the ongoing banking crisis in India. Chari et al. (2022) show that the perverse effects of forbearance were concentrated in state-owned banks. Moreover, in industries and bank portfolios with high proportions of zombie firms, credit was reallocated from solvent to zombie firms, a pattern that persists even after forbearance is withdrawn. Kulkarni, Ritadhi, Vij, and Waldock (2021) document the effect of bankruptcy reforms on zombie lending. They show that a 2016 bankruptcy reform in India had a limited impact since lenders were reluctant to recognise zombie credit as non-performing.

3 The Indian Recapitalisation Experience

In this section we describe the recapitalisation process followed by the GoI to infuse capital into the banking system. We draw some analogies in the capital infusion process for the Indian banking situation with the 1990s Japanese banking crisis and the European debt crisis during the 2010s. In both these crises, the government intervened to recapitalise banks, as was done by the Indian government. An essential difference in the recapitalisation process by GoI vis-à-vis the Japanese or the European governments is that the objective of recapitalisation for GoI seemed to be a moving target. In the first half of the recapitalisation period (2009 - 2017), the capital infusion was done with the objective of credit growth and pump-priming the economy in the aftermath of the global financial crisis. A forbearance policy was implemented to improve liquidity in the system and the bank's balance sheet. In the second half of the recapitalisation period (2018 -2019), the objective changed to prevent a banking crisis. Moreover, unlike a one time recapitalisation, the capital was infused on a recurrent basis which may create a moral hazard problem.

The recapitalisation structure in India has been ad-hoc (CAG Report, 2017)[9]. There was

[9]CAG is the supreme audit institution of India and is empowered to audit all receipts and expenditures of the Government of India and the State Governments. The document's name is Report of the Comptroller and Auditor General of India on Recapitalisation of Public Sector Banks, Report No. 28 of 2017 (Performance Audit). The report is available at: https://cag.gov.in/en/audit-report/details/31779.

no specific process regarding the eligibility and magnitude of recapitalisation. Moreover, the eligibility requirements for recapitalisation were frequently changed. In general, the stated process for recapitalisation was based on the projections of capital requirements sent yearly by the GBs to the Department of Financial Services (DFS). The decision on the capital infusion in GBs entailed independent assessment by DFS. The GBs are supposed to consider the credit growth, risk profile of the assets, internal accruals of the bank and other sources of capital generation to project the capital requirements.

The process of capital infusion underwent a significant alteration in the fiscal year 2011-12. During this period, the GBs entered into Memorandums of Understanding (MoUs) with the DFS. These MoUs served as the foundation for capital infusion in the GBs until the fiscal year 2014-15. The MoUs establish specific performance benchmarks, the failure to meet them would result in the initiation of capital injections. The parameters encompassed several accounting metrics, such as the percentage of current account savings account (CASA), the percentage of return on assets (ROA), the net profit per employee, the percentage of market share in deposits, and the percentage of outstanding NPAs over a span of two years in relation to the total NPAs. The methodology for determining these performance metrics underwent modifications on an annual basis, and in some instances, within various tranches within the same year (namely, during the periods of 2010-11, 2015-16, and 2016-17), as evidenced in Table. 2. Furthermore, adherence to the regulations and MoUs regarding the capital infusion was not observed. According to the CAG Report (2017), the DFS made the decision to infuse capital in the fiscal year 2010-11 exclusively relying on information provided by the GBs themselves, without conducting any independent verification. Instead of utilising performance against MoU targets as the primary determinant for capital infusion, the real basis for such injection was determined by regulatory criteria pertaining to capital sufficiency and estimations of credit growth (CAG Report, 2017).

Patel (2020) coined "banking sector-fiscalization" to describe how sovereign control over government-owned banks in India operates. Instead of serving their primary role as finan-

cial intermediaries, the government employs these state-owned banks for routine macroeconomic management. V. Acharya (2020) proposes a fiscal dominance channel in which the sovereign's fiscal well-being influences the regulatory framework of banks. Consequently, significant sovereign authority affects default disclosure standards and loan provisioning criteria. Given the predominant role of government-owned banks in the Indian financial system, the frequent changing of criteria of capital infusion by the government shows a tacit understanding between the banks and the government. The underlying process is evidence of a strong moral hazard problem in the Indian banking system.

An important feature of the recapitalisation process is the magnitude of the recapitalisation, as mentioned by (Diamond, 2001) and (Diamond & Rajan, 2000). GoI recapitalised the GBs 135 times from the fiscal year ending 2009 to 2019. Moreover, over the years, the average size of recapitalisation in terms of equity is 12.36 percent, but that did not improve the asset size or the banks' leverage (Figure 4 in data appendix). On average, the recapitalisation amount was only 0.52 percent of the asset of the banks (Figure 5 in data appendix). Also, we witness that government banks' leverage remains very high during the entire recapitalisation period from 2009 - 2019. The leverage of GBs increased from 23:1 to 28:1. Moreover, Figure 6 shows, the CAR of the GBs did not improve by much despite capital infusion by the GoI. The implication is that the size of recapitalisation in the Indian context was very small. The inadequate size of recapitalisation can lead to credit misallocation in the economy. A preliminary analysis of zombie lending, as shown in Figure 7, shows that zombie lending by GBs has increased vis-à-vis other banks during the recapitalisation period. All these data points and graphs suggest that the recapitalisation process in India may have failed on a few grounds, specifically concerning the process of recapitalisation and the size of recapitalisation.

The size of recapitalisation is imperative in the context of the Indian economy as one of the main objectives of the recapitalisation process was to pump prime the economy by improving the credit growth in the economy. In the subsequent sections, we will discuss the

data and formally analyse the evidence our preliminary analysis and figures allude to.

4 Data

The data for the capital infusion made by the GoI has been sourced from the CAG Report (2017) report. The CAG report contains data from FY 2008-2009 to 2016-2017. The data from 2017 to 2019 has been sourced from the Department of Financial Services, Ministry of Finance. Capital infusion data beyond FY-2019 is not available at a disaggregated bank level. We have considered a pre-capitalisation period of three years from FY 2005-06 to FY 2007-08. In this period, the GoI had not undertaken any recapitalisation exercise for the GBs. Our sample period covers FY 2005-06 to FY 2018-19.

We obtained the loan-level data set from the Ministry of Corporate Affairs (MCA), GoI[10] . The Ministry of Corporate Affairs records all the secured loans borrowed by the firms on which a charge has been registered. The loan data covered in the MCA represents a significant proportion of the Indian economy. The reason is section 125 of the Companies Act 2013 mandates that lenders register the details of the borrower's loan for which a charge has been registered against the loan. A secured loan will be treated as unsecured if lenders do not register the loan details. Therefore, it is reasonable to believe that banks will usually register charges.

In India, the Public Financial Institutions (Obligation as to Fidelity and Secrecy) Act, 1983[11] prohibits the banks to disclose the identity of their borrowers. However, no such restrictions exist for the firms to disclose their bankers voluntarily. The Centre for Monitoring Indian Economy (CMIE) Prowess database contains information on the identity of banks from where the firms borrowed. We take the firms' revealed bank identity and filter out the non-financial firms. This process yields 14,246 non-financial firms covering 72 industries (2-digit National Industrial Classification (NIC)). We manually match this data with the

[10]The data are available at https://www.mca.gov.in/content/mca/global/en/home.html.
[11]https://www.indiacode.nic.in/bitstream/123456789/1821/3/A1983-48.pdf

loan-level data in MCA. As the ministry does not allow the mass download of the data, we manually downloaded each firm's loan-level information. We call this dataset the "MCA" dataset. The loan-level data set includes the information on SRN (serial number), charge Id, charge holder name (borrower name), date of creation of the loan, date of modification of the loan, date of satisfaction, amount, and lender's address. No information is available about interest rates, loan performance or the financial statements of either the borrower or the lender.

We supplement the "MCA data" with the firm-level borrower data from the Prowess database. The Prowess database contains the balance sheet and income statement data for listed and unlisted firms in the organised sector of the Indian economy. According to CMIE, the Prowess database covers more than 70 percent of industrial output, 75 percent of corporate taxes, and more than 95 percentof excise taxes collected by the GoI. We source the bank-related information from the database of the Indian economy (DBIE) maintained by the Reserve Bank of India (RBI). We augment the bank-firm information dataset with RBI DBIE for the information related to banks.

The data coverage for our sample is shown in the Table 3. Our sample period starts from FY 2006 (April 2005 to March 2006) and ends at FY2019 (April 2018 to March 2019). We find a total of 38,160 firm-bank relationships, among which we have 33,067 firm-bank relationships with non-zero loans. 12,270 firms issued new loans during our sample period (2006-2019). 10,987 of these loans are issued in the recapitalisation period (2009- 2019), and 4,504 loans are issued in the pre-recapitalization period (2006-2008). We have 39 banks in the dataset, among which 21 are GBs and 18 are PBs. We obtain 5,34,240 firm-bank-year observations in the entire sample period. When we classify the firms as high- or low-quality borrowers based on interest coverage ratio (ICR), we get a total of 3,16,443 firm-bank-year observations (after removing the missing values). We have 2,80,154 firm-bank-year observations for the zombie dataset, where firms are clearly identified as zombie or healthy firms after removing the missing values.

Table 4 presents a comprehensive summary of the key variables employed in our analysis.

5 Empirical Strategy

According to the CAG report, the goal of the GoI is to inject capital into the GBs to stimulate the economy and renew economic growth. The purpose of recapitalisation was to ensure that banks had enough capital to lend to healthy firms, which would enhance the investment activity of the firms and increase employment, leading to economic growth. This paper examines whether the recapitalisation procedure was successful in reviving economic growth through the bank lending channel. A significant challenge in studies examining bank lending channel is disentangling the firm-demand shock from the bank lending channel. To address the problem, we employ the modified Khwaja and Mian (2008) identification strategy of bank lending regression. Specifically, we trace the loan amount extended by GBs due to GoI recapitalisation to a firm. We take into account factors such as loan demand and various observed and unobserved firm characteristics that could potentially influence the outcomes of the loan.

We organise the data at the firm-bank-year level and do a within-firm-level analysis. In our baseline model, we use firm X-year and bank X-firm fixed effects. Firm X-year fixed effect controls for instances in which demand for loans of firms may change with time and also for time-invariant heterogeneous demand for loans by the firms. We have taken bank X-firm fixed effects, since the nature of our study entails a single firm taking loans from multiple banks which may lead to biased result because of the specific tendency of a bank to engage in low-quality lending. Moreover bank X-firm fixed effect also control for time-invariant firm-bank pair relationship. In some of the specifications, we also use bank X-year fixed effects to control for time-invariant and time-varying bank heterogeneity. For example, a change in the value of the sovereign bonds in the bank portfolio because of changing market interest rate (stealth recapitalisation) may also affect the bank lending channel.

We aggregate the total loan amount of a firm-bank pair taken in a particular year. If the bank has not made any loan to the paired firm in a year, then we consider the loan amount to be zero for the respective firm-bank-year observation. For example, let us assume that firm F1 receives a loan of INR 100 from bank B1 in the year 2015. We record INR100 as the loan amount for the F1-B1-2015 observation. Assume the same F1-B1 pair does not have any loan in 2016, then we record INR 0 loan amount for F1-B1-2016 observation.

The specific dates for capital infusion by the GoI are unavailable. Since the GoI decides on the total allocation for recapitalisation in its budget announcement at the end of a FY, we have considered the capital infusion dates to be the end of FY i.e. 31st March 20XX. For example, if an announcement is made for the infusion of capital before the end of the FY 2012, we consider the capital to be infused in the FY 2011-2012 and refer to it as t, whereas its impact period is any date beyond 31st March 2012, i.e., 1st April 2012 to 31st March 2013, and is considered as $t + 1$.

We use two different control sets to identify the causal impact of the recapitalisation on the bank lending channel. The control sets include banks that are not recapitalised during the recapitalisation period. In the first set, we include private and public banks that are not recapitalised in a given year as controls for that year. For example, let's assume that in a year, government bank GB1 got recapitalised but not GB2, then GB2 acts as a control bank for that year, and as the government does not recapitalise all private banks, they are also a part of the control set. In the second control set, all the private banks act as the control set, whereas the treated group consists of only the government banks that are recapitalised in the particular year.

5.1 Credit supply

The logarithm of the total quantity of loans issued by GBs and PBs during the recapitalisation period is depicted in Figure 8. During the recapitalisation phase, there was an increase

in the loan supply offered by PBs[12]. Whilst the loan supply by GBs, which had received capital infusion from the Government of India, experienced a reduction.

Next, we formally investigate whether GBs that were recapitalised increased their loan supply to firms vis-à-vis banks that did not receive any capital infusion from the GoI. To test the impact of recapitalisation on the bank lending channel, we use the regression framework as described in the equation:

$$Y_{ib,t+1} = \beta_1.size_{bt} + \eta.X_{bt} + Firm_i.Year_{t+1} + Firm_i.Bank_b + \epsilon_{ib,t+1} \tag{1}$$

where $Y_{ib,t+1}$ is the natural log of the amount of loan taken by a firm i from bank b during the year $t+1$; $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. X_{bt} are a vector of controls that capture the time varying bank characteristics.

The findings of this empirical analysis are presented in Table 5, which includes non-recapitalised GBs and private banks as the control group. Additionally, Table 6 presents the results with solely private banks serving as the control group. For the sake of conciseness, we just present the findings pertaining to our primary variable of focus, denoted as *size*. The findings indicate that the magnitude of the recapitalisation had a statistically non-significant effect on the credit supply of the banks. This finding remains consistent across all specifications (Columns 1-4), while accounting for various fixed effect sets.

In our least restrictive specification, we account for firm fixed effects, year fixed effects, bank fixed effects, and time-varying control variables particular to banks (see Column 1). Column 2 presents the regression outcomes when incorporating firm X-year fixed effects, enabling us to account for the firms' observed and unobserved time-varying attributes. In Column 3, we incorporate the firm X-year and firm X-bank effects, which exploit the fluctuations observed within the same firm-bank connection across different time periods. This controls for unobserved factors that are shared among firms, bank heterogeneity, and the

[12]Please note that private banks were never recapitalised by the GoI. It was only the government banks that were recapitalised by the Government of India.

associations between firms and their respective banks.

We use the approach of Peek and Rosengren (2005) and Giannetti and Simonov (2013) and utilise the likelihood of a loan being disbursed in a given year as the dependent variable instead of the loan amount to examine the robustness of these results. Column 4 of Table 5 and 6, confirms that our results are robust to using this alternative lending supply measure controlling for firm X-year, bank X-year and firm X-bank fixed effect. Our results indicate that banks have not been giving out loans despite the infusion of capital by GoI. This raises a question about what the banks are doing with the capital that the GoI is infusing and whether they are misallocating the credit.

5.2 Credit supply to low ICR firms

In the previous section, we see that the capital infusion by the GoI has not led to any significant changes in the credit disbursement by the GBs at the macro level. In this section, we dig deeper to check the microstructure of the loans disbursed by the recapitalised GBs. To check for this, we look at the type of borrowers to whom the banks are supplying the loans. We frame the following regression equation to check for the same:

$$\begin{aligned} Y_{ib,t+1} = \beta_1.size_{bt} + \beta_2.borrower_{it} + \beta_3.borrower_{it}.size_{bt} + \eta.X_{bt} \\ + Firm_i.Year_{t+1} + Firm_i.Bank_b + \epsilon_{ib,t+1} \end{aligned} \tag{2}$$

where $borrower_{it}$[13] denotes the type of firms. We have segregated the firms into two types: i) low-quality firms, ii) high-quality firms. Low-quality firms are those whose ICR is less than the median ICR of all the firms for that particular year, and vice versa for high-quality firms. The segregation of borrowers into these types helps us identify whether there has been a misallocation of credits by the banks. The main variable of interest is $borrower.size$ in the above equation.

[13] $borrower_{it}$ is a dummy variable which takes a value of 1 when the firms is a low quality firm and zero otherwise.

The overall picture that emerges in Table 7, which includes non-recapitalized GBs and private banks as the control group, and Table 8, which only includes private banks as the control group, indicates that credit allocation was predominantly directed towards borrowers with low-IC ratios. This conclusion is supported by the significant positive interaction term *borrower.size*. The finding is consistent even when accounting for firm-specific impacts across time and the specific relationship between the firm and the bank, as demonstrated in Column 3. According to the coefficient presented in Column 3 of Table 7, it can be inferred that a 1 percent increase in the size of recapitalisation results in an estimated 3.14 percent increase in the allocation of credit towards borrowers with low credit quality.

Our results show that banks have misallocated credit in the economy by lending to low-quality firms. While the loan supply at the overall level has not changed significantly, the micro-level evidence paints an entirely different picture. It shows that the capital infusion by the GoI has been diverted towards distressed firms by the GBs.

5.3 Credit supply to zombie firms

In the previous section, we discuss the microstructure of bank lending by categorising the borrowers into two types vis-à-vis low-quality and high-quality firms. Our definition of low-quality firms can consist of solvent firms facing a temporary liquidity crunch because of external factors, as well as insolvent firms. To segregate solvent firms from insolvent firms, we identify the insolvent firms as zombie firms.

We define a zombie firm as a firm whose i) debt to asset ratio is greater than 0.25, ii) ICR has been less than one for the last three years, iii) age is greater than 15 years, and iv) firm's average interest expenses (interest expenses scaled by debt) are below the prime lending rate (PLR)[14] of State Bank of India . The definition of a firm with a debt-to-asset ratio greater than 0.25 helps us identify the firm as probable insolvent. But this definition may raise concerns that the firm may be facing a temporary liquidity crisis or the firm may

[14]The Prime Lending Rate is the interest rate that commercial banks charge their most creditworthy customers. It serves as a benchmark for various loans, including corporate, housing, and personal loans.

be in its initial years of operation, because of which it may have a higher interest bill than its earnings. To mitigate the concern of a firm facing a temporary liquidity crisis, we have included only firms whose ICR has been less than one consecutively for the past three years, which alludes to the fact that it is a non-performing firm. We address the concern of a firm being in its initial years of operation by only considering firms operating for more than 15 years.

The extant literature on zombie lending (V. V. Acharya et al., 2019; Caballero et al., 2008; Giannetti & Simonov, 2013) have defined zombie firms as distressed firms that have obtained loans at below-market interest rates. Our definition of a zombie firm does not include interest rates explicitly, as we do not have the individual interest rates of the loans issued by a bank to a firm. To mitigate this concern, we estimate a firm's average interest cost for a particular year against the SBI PLR. The average interest expense of a firm is estimated by the ratio of the interest expense of a firm to the total debt of the firm for a year. Figure 9 shows that the zombie firms, by our definition, have received loans at a rate lower than the SBI PLR.

The properties of zombie and non-zombie firms are compared in Table 9. On average, zombie firms demonstrate higher levels of leverage, as well as reduced net worth and profitability, as indicated by the EBITDA/Assets ratios[15]. Most remarkably, compared to other low-quality firms, zombie firms have an extremely low IC ratio of 0.032, which is significantly lower than the average of 0.075 for low-quality firms. As a result, these firms encountered challenges in meeting their existing interest payments with the earnings they made. In order to prevent occurrences of default, banks were then obligated to provide borrowers with additional liquidity at a lower cost through newly subsidised loans and/or reduce the interest rates on their current loans to levels below the prevailing market rate.

The graph presented in Figure 10 illustrates the temporal evolution of the proportion of

[15]This finding provides support for our rationale to segregate the low quality firms, as the zombie firms exhibit notably inferior quality in terms of observable solvency and liquidity ratios compared to the low quality firms.

zombie firms within our sample. The data presented in the figure indicates a notable rise in the proportion of zombie firms, as measured by asset-weights, over the period of recapitalisation. It changed from a value of approximately 1 percent to a value of approximately 8 percent at the end of the recapitalisation period.

To formally test for the impact of the size of recapitalisation on zombie lending by the recapitalised banks, we estimate the following panel regression:

$$\begin{aligned} Y_{ib,t+1} = \beta_1.size_{bt} + \beta_2.zombie_{it} + \beta_3.zombie_{it}.size_{bt} + \eta.X_{bt} \\ + Firm_i.Year_{t+1} + Firm_i.Bank_b + \epsilon_{ib,t+1} \end{aligned} \tag{3}$$

where $zombie_{it}$ is a dummy variable which takes the value of 1 if the firm is a zombie, otherwise zero. It is important to mention that, in our regression analysis, we employ a lag of one period for the *zombie* indicator, following the approach used in other studies such as Giannetti and Simonov (2013) and V. V. Acharya et al. (2019). This lag is necessary as the non lagged zombie dummy variable might potentially be influenced by a bank's decision to extend credit.

The findings of this empirical analysis are presented in Table 10, which includes GBs and private banks as the control set, and Table 11, which only includes private banks as the control set. For brevity, we only present the findings pertaining to our primary variable of focus, namely, the *size.zombie*. The findings indicate that the size of recapitalisation had a statistically significant influence on the credit supply of banks to zombie firms. This finding remains consistent across all specifications (Columns 1-4), while accounting for various fixed effects sets.

In our least restrictive specification, we incorporate firm-X-year controls to account for both observed and unobserved time-varying features of the firms. Additionally, we include bank fixed effects and time-varying bank control variables in Column 1 of our analysis. Column 2 shows the regression results for the case in which we also include firm X-bank fixed effects, which exploits the variation within the same firm-bank relationship over time.

Column 3 includes firm X-year, firm X-bank effects, and bank X-year effects. This controls for unobserved time-invariant and time-varying characteristics related to firm heterogeneity, bank heterogeneity, and relationships between firms and the respective bank. Specifically, the incorporation of bank X-year fixed effects for a given year mitigates potential endogeneity concerns related to sovereign bond holdings, which may be influenced by inherent bank characteristics in a manner that could introduce bias into the estimated treatment effect. The coefficient in column 3 of Table 10 suggests that a 10 percent increase in the size of recapitalisation translates into an approximately 33.17 percent increase in zombie lending.

We again use the approach of Peek and Rosengren (2005) and Giannetti and Simonov (2013) and utilise the likelihood of a loan being disbursed in a given year as the dependent variable instead of the loan amount to examine the robustness of these results. Column 4 of Table 10, confirms that our results are robust to using this alternative lending supply measure controlling for firm X-year, bank X-year and firm X-bank fixed effect. The coefficient in column 4 of Table 11 suggests that a 1 percent increase in the size of recapitalisation leads to an increase in log of odds of zombie lending by 2.79 times.

In order to address potential confounding factors or external influences that may have influenced banks' lending behaviour, we conducted placebo tests. These tests involved randomly assigning placebo recapitalisation years to the treatment group banks and randomly redistributing the recapitalised amounts across the group banks. In the initial placebo test, the recapitalisation years were randomly reassigned throughout the sample period spanning from 2006 to 2019. The statistical analysis conducted in Table 12, which includes both GBs and private banks as the control set, and Table 13, which only includes private banks as the control set, indicates that there is no significant positive impact on the banks' zombie lending. The coefficient of the *size.zombie* interaction term confirms this. The capital infusion to banks is randomly reassigned for the second placebo test. Table 14 and Table 15 present empirical evidence indicating the absence of a statistically significant association between the exogenously allocated capital injection and the occurrence of zombie lending by

the banking institutions.

In the previous section, our results show evidence of misallocation of credit as the recapitalised GBs engage in low-quality lending. The point of concern is that the low-quality borrowers might seemingly be distressed because they faced a temporary liquidity crunch. To mitigate this concern, we define zombie firms in a way that points towards economically non-viable existing borrowers of a bank. Our results show that recapitalised banks have engaged in zombie lending. The results reinforce our finding of misallocation of credits by recapitalised GBs.

5.4 Zombie distortion and real effect

Our findings thus far show that there has been a misallocation of credit by the recapitalised GBs. In this section, we highlight the effect of this misallocation of credit by focusing on its impact on the real side of the economy. We analyse it in two parts. The first part focuses on the spillover effect of misallocating credit vis-à-vis zombie lending. We analyse the impact of the spillover effect of zombie lending by checking whether zombie lending is crowding out healthy lending. In the second part, we focus on whether the zombie firms that have benefitted from the credit misallocation process have contributed to the real side of the economy through increasing investment or employment.

There are two potential channels through which the prevalence of zombie lending may have harmed healthy firms. First, banks incentivised to engage in zombie lending typically redirect their credit to existing borrowers struggling to meet their debt obligations. This misallocation of credit reduces the availability of loans and leads to higher interest rates for creditworthy firms operating in the same industry.

Second, the prevalence of zombie firms may distort market competition, negatively influencing non-zombie firms competing in the same sectors. The typical competitive outcome would be for struggling firms to reduce investment and lose market share. However, zombie loans sustain distressed borrowers artificially, causing market congestion. This then has a

distorting effect on healthy firms within the same industries. These effects may include, for instance, decreased capital expenditures, increased average interest costs, and increased employment expenses for the healthy firms.

Considering these two pathways, a high prevalence of zombie firms within a particular industry is anticipated to lead to more pronounced distortions for healthy firms. Consequently, industries with a significant zombie presence are expected to experience a less robust recovery than industries with a lower prevalence of zombies. This viewpoint is also supported by V. V. Acharya et al. (2019) and Caballero et al. (2008). We provide a suggestive industry-level evidence of the distortions caused by the increased zombie prevalence. Figure 11 shows that capital expenditure decreased in industries that faced a larger zombie fraction during the recapitalisation period relative to industries with a lower zombie fraction.

To test whether a high zombie presence had adverse spillover effects on non-zombie firms operating in the same industry during the recapitalisation period, we estimate the following panel regression:

$$\begin{aligned} Y_{ik,t+1} = {} & \beta_1.healthy_{ik,t} + \beta_2.healthy_{ik,t}.IndustryFracZombie_{kt} \\ & + \beta_3.healthy_{ik,t}.recapperiod + \beta_4.healthy_{ik,t}.IndustryFracZombie_{kt}.recapperiod \\ & + \eta.X_{ik,t} + Firm_{ik} + Industry_k.Year_{t+1} \\ & + \epsilon_{ib,t+1} \end{aligned} \tag{4}$$

where $IndustryFracZombie_{kt}$ measures the zombie fraction in industry k (2 digit NIC code) at time t, $recapperiod$ is a dummy variable which takes a value of 1 for the recapitalisation period (2009-19) or 0 otherwise, and $healthy$[16] is a dummy variable which takes a value of 0 if the firm is zombie, or 1 otherwise. The dependent variables are investment (measured as capital expenditure), average interest rate and employment expense (measured as wage expenses). Our coefficient of interest is β_4, which shows whether healthy firms invest less,

[16]We have used healthy firms and non-zombie firms synonymously in our study.

pay higher interest rates, or have higher employment expense. We again include firm and industry X-year fixed effects. The latter fixed effect mitigates worries regarding the potential correlation between the prevalence of zombies within an industry during a specific year and the industry's overall performance. Additionally this specification would account for fluctuations, scenarios where the government changes/updates policies specific to industries over time. For example, all shocks at the national policies, such as demonetisation, implementation of goods and service tax, and other such regulations.

Table 16, panel A, presents the results of this regression analysis. The results show that healthy firms significantly invest less ($\beta_4 < 0$). The estimates in Table 16, panel A, column 1 imply that healthy firms with an average 1 percent increase in their industry's zombie fraction reduced their investment by around 0.64 percent of total assets in the recapitalisation period compared to a scenario in which the zombie fraction would have stayed at its pre-recapitalisation level. For employment expense and average interest cost, our results do not show any significant change. The result is important as economic growth is fuelled by investment activities, and one of the objective of the GoI was to fuel economic growth by increasing investment through the bank lending channel.

Lastly, we examine whether industries with specific baseline characteristics have disproportionately bigger distortionary effects. We specifically examine whether the rent-seeking, construction, manufacturing, trade, and service sectors experienced more negative externalities.

To determine the rent seeking nature of any industry, we choose industries with higher corruption/political connection (mining, power, telecommunications, steel, and metals)[17]. The results in Table 16, panel B show a significant decrease in capital expenditure of the healthy firm in this group of industries, emphasising the adverse spillover of zombie lending. The average interest cost has decreased significantly for healthy firms in this group of indus-

[17]These sectors were considered as rent-seeking based on the findings of Fisman, Schulz, and Vig (2014) and Asher and Novosad (2023) who show that the mining and minerals industries in India are particularly associated with corruption and rent-seeking.

tries, contrary to our expectation about the adverse spillover of zombie lending. This result can be attributed to the political connectedness of this group of industries.

The construction, manufacturing, trade and services industries have been chosen based on National Industrial Classification (2 digit NIC code). The results in Table 16, panels C and D, show a significant decrease in capital expenditure, specifically for the manufacturing and construction industry. The result highlights quite the negative impact as these industries heavily depend on capital expenditure for sustenance. Although the results in Table 16, panels E and F do not show any significant impact of either capital expenditure, average interest cost, or employment expenses in the trade and services industry. However, all the coefficients for average interest cost and employment expenses are positive, suggesting an increase in expenses of the healthy firms in these industries.

To analyse the difference in the real impact of the zombie firms that benefitted from the recapitalisation of the banks vis-a-vis non-zombie firms, we frame the following regression equation:

$$\begin{aligned} RealEffect_{i,t+1} = \beta_1.AverageExposure_{it} + \beta_2.zombie_{it} \\ + \beta_3.AverageExposure_{it}.zombie_{it} + \eta.X_{it} + FixedEffects + \epsilon_{i,t+1} \end{aligned} \tag{5}$$

We construct an *AverageExposure* variable to serve as a proxy for measuring the degree to which firms derived benefits from the capital influx by virtue of their association with the banks. The *AverageExposure* variable quantifies the extent to which the firm is exposed to recapitalised banks. We calculate it as a weighted average of the size of capital infusion for each bank, as outlined in Equation (1), where the weights are the loans taken from the particular recapitalised banks as a fraction of the total loans taken by the firm. The aforementioned calculation results in the following metric:

$$AverageExposure_{it} = \frac{\sum size_{bt}.loan_{ib,t}}{\sum loan_{ib,t}}$$

We consider two measures of real impact. We consider investment ($\Delta GFA/TotalAssets$) and employment expense (wages/total expense). The baseline regression model includes fixed effects that are particular to individual firms and years. Additionally, firm-level control variables such as firm size, leverage, net worth, the proportion of tangible assets, the interest coverage ratio, and the EBITDA/total assets ratio are incorporated. These controls are included to account for various factors influencing corporate policies within firms. Furthermore, we use industry, year, and bank fixed effects to account for unobserved disturbances that may impact the credit demand of borrowing firms and their real outcomes.

Table 17, presents the results with the firm-year serving as the unit of analysis. For brevity, we only report the results for our primary variable of interest, the interaction of $AverageExposure_{it}.zombie_{it}$. The coefficients (Columns 1–6) are negative but indistinguishable from zero for both investment and employment expenses.

Overall, our results show evidence of zombie distortion. It has led to the crowding out of healthy firms from the credit lending process. The result is similar across all the industries, and specifically so for rent-seeking industries. Noticeably, this increased zombie lending did not also have any real impact on the economy in terms of investment or employment.

6 Concluding Remarks

In this paper, we analyse the capital infusion process undertaken by the GoI. Although capital infusion/bank bailouts have been extensively studied in the literature in different contexts, we had two unique reasons to focus on the Indian context: i) the recapitalisation process was carried out year on year for 10 years, from 2009 until 2019[18], and ii) the recapitalisation process can be stated to be ad hoc at best, with no basis for deciding the bank that will get the capital infusion. This is in contrast to the European, Japanese or USA experiences wherein capital was infused only once throughout the bailout phase, and either all banks

[18]The recapitalisation process has not stopped at the end of 2019. Due to the onset of COVID-19, it is still an ongoing process. Since our study focuses on the period from 2006 - 2019, the recapitalisation period boils down to a period of 10 years from 2009 - 2019.

were recapitalised or recapitalisation was targeted towards specific banks based on a sound selection principle. Moreover, the underlying objective of the recapitalisation process seemed to implicitly change from protecting the Indian economy against the headwinds due to the global financial crisis, to restoring the banks' balance sheet.

Our results show that GoI has failed in its recapitalisation objectives. Overall credit growth has not significantly improved despite frequent recapitalisations. On the contrary, this repeated and ad hoc recapitalisation has encouraged banks to indulge in evergreening bad loans by increasing distressed lending (specifically zombie lending). Moreover, the increase in zombie lending has led to a significant spillover effect. It has crowded out lending to healthy firms by increasing their average interest cost and wage expenses, significantly reducing capital expenditures (investment) for these firms. To err on the side of caution, we have also analysed whether this increased zombie lending has affected the real side of the economy, i.e. whether it has increased employment or investment. Our analysis shows that there has been no significant increase in either investment or employment by zombie firms.

Although the rationale for the recapitalisation to protect the economy from the malaise of the global financial crisis was a benign objective, the amount of recapitalisation and the basis of recapitalisation could be much better. Recapitalisation costs are unquestionably consequential for a government that has to maintain its fiscal health. However, poorly implemented policy can have its own cost, as in the Indian scenario. Repeated and a meagre amount of recapitalisation has incentivised the GBs to lend to impaired borrowers. This has led to the objective of recapitalisation being changed to protecting the bank balance sheet and, subsequently, a bigger recapitalisation bill for the GoI to foot. In its stead, a one-time recapitalisation and transparent implementation of the same could have more likely induced a more robust economic recovery and ensured a healthy balance sheet for the banks.

To conclude, the recapitalisation process has failed in fulfilling its objective and has had a negative effect by incentivising zombie lending and creating distortions in the credit supply process. Given the multitude of capital infusion policies implemented amidst the

COVID-19 crisis, our findings offers a lesson of caution. Such policies can exert enduring negative impacts on credit access, the configuration of industries, and the stability of the financial sector as a whole. The process of undoing ill-planned, and inefficient capital infusion policies may prove to be arduous. As economies rebound, addressing certain persistent consequences—such as zombie lending and the inadequate capitalisation of banks—might necessitate active and resource-intensive interventions to mitigate these lasting concerns.

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A Data Appendix

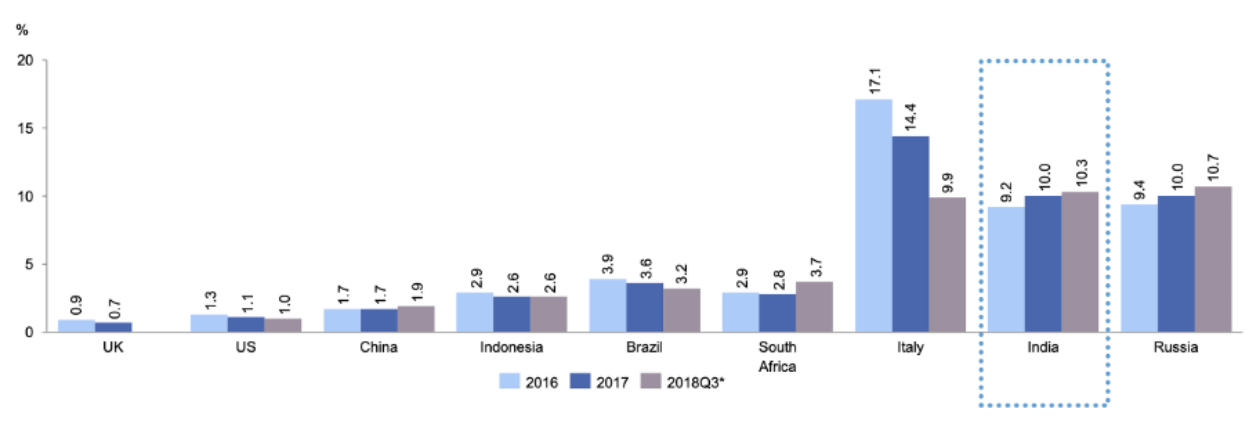

Figure 1: Gross NPA ratio

*: For Italy and China, data pertain to 2018 Q2. For UK, neither 2018 Q2 nor Q3 numbers were available. Note: Q2 and Q3 refer to calendar year quarters ending in June and September, respectively.

Source: Financial Soundness Indicators (FSI), IMF. (Taken from "The Cul-De-sac in Indian Banking: A Dominant Government Sector, Limited Fiscal Space and Independent Regulation (Is there an Impossible Trilemma?)", keynote address by Urjit Patel at the 19th Annual Conference on the Indian Economic Policy, Stanford University, 4th June, 2019.)

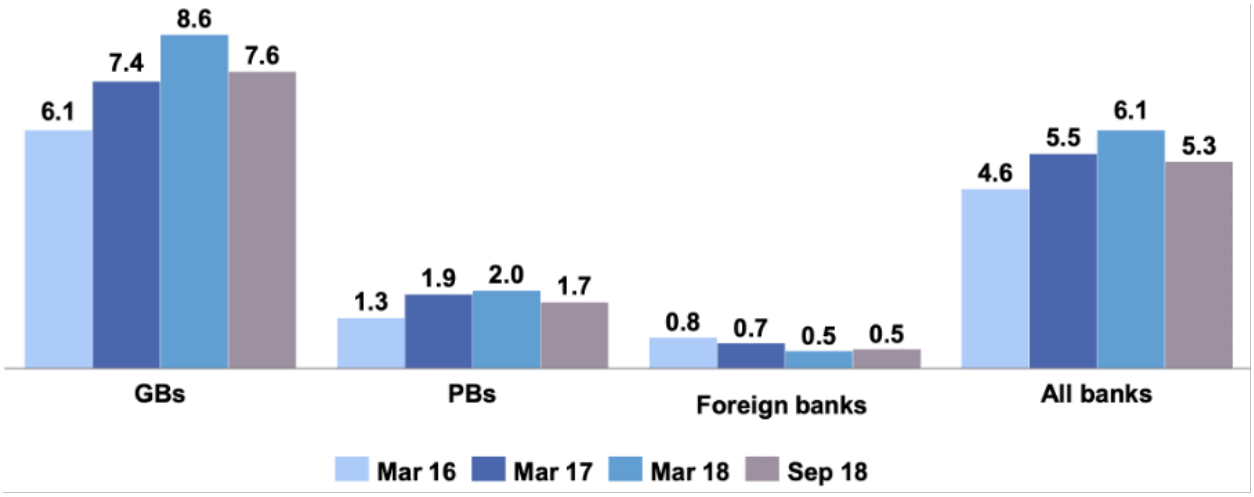

Figure 2: Net NPA ratio (%), there is a significant divergence in the performance of PBs and GBs in terms of operations financial indicators

Source: Statistical Tables Relating to Banks in India, RBI. (Taken from "The Cul-De-sac in Indian Banking: A Dominant Government Sector, Limited Fiscal Space and Independent Regulation (Is there an Impossible Trilemma?)", keynote address by Urjit Patel at the 19th Annual Conference on the Indian Economic Policy, Stanford University, 4th June, 2019.)

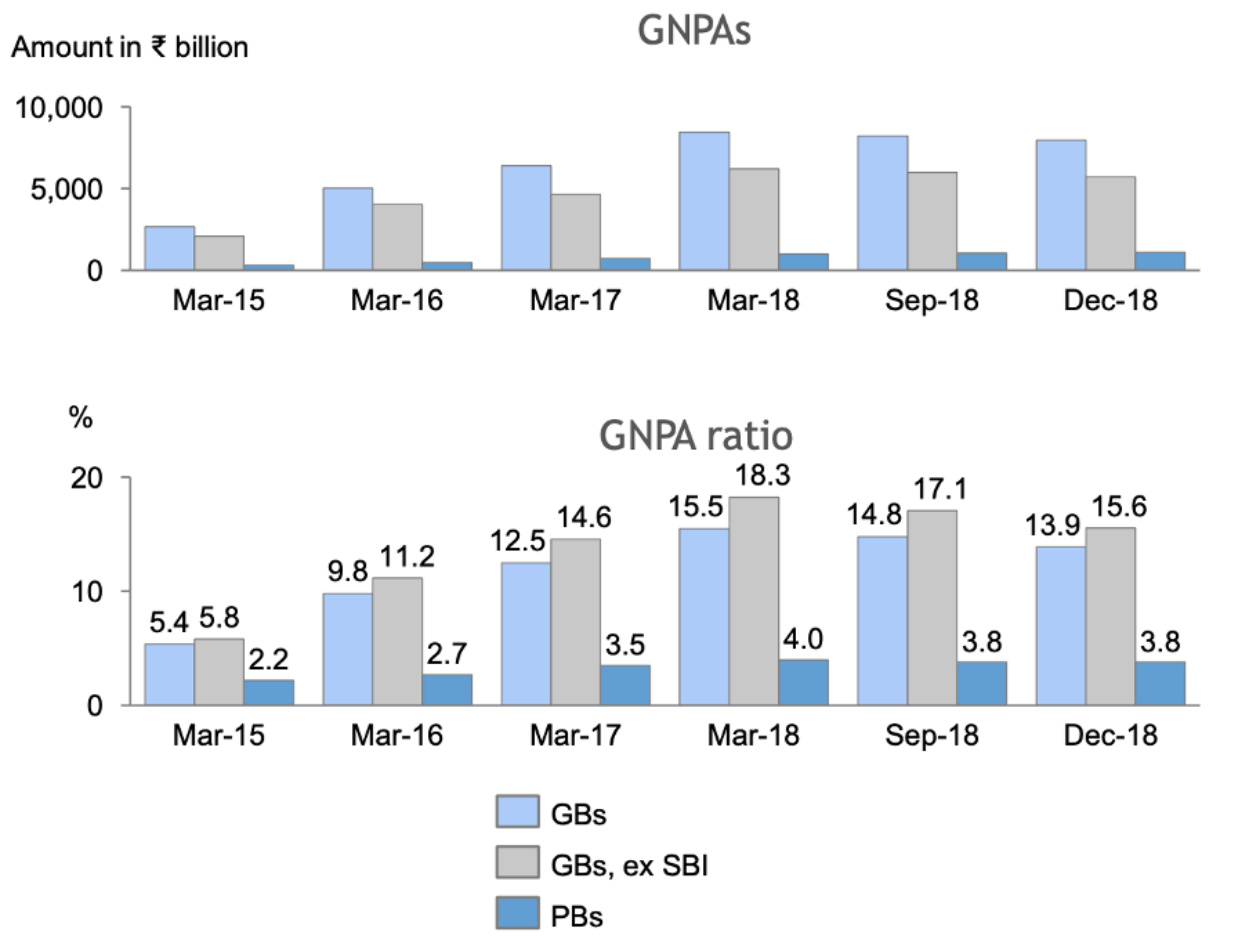

Figure 3: GNPAs GNPA ratio much higher for GBs (GNPA ratio for GBs > 3x of PBs) – even more stark for GBs-SBI

Source: Statistical Tables Relating to Banks in India, RBI. (Taken from "The Cul-De-sac in Indian Banking: A Dominant Government Sector, Limited Fiscal Space and Independent Regulation (Is there an Impossible Trilemma?)", keynote address by Urjit Patel at the 19th Annual Conference on the Indian Economic Policy, Stanford University, 4th June, 2019.)

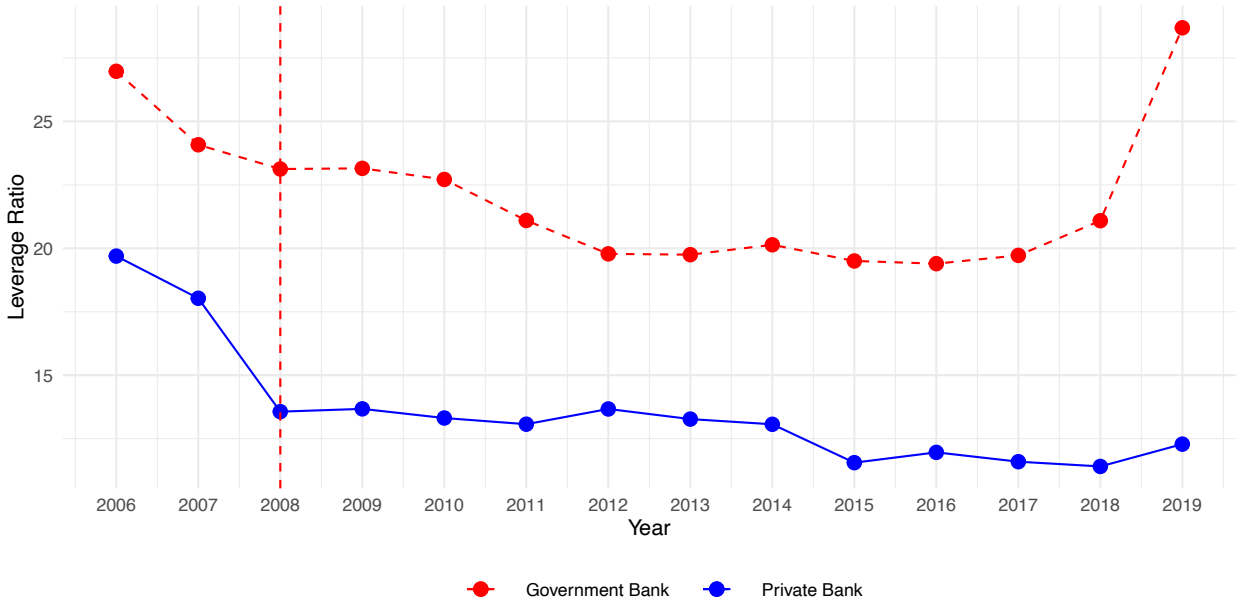

Figure 4: Leverage ratio of GBs and PBs

This figure shows the evolution of the leverage ratio of the banks from the pre-recapitalisation period to the post-recapitalisation period. Leverage ratio has been measured as the ratio of total asset to total equity. The red dotted vertical line in 2008 denotes the start of the capital infusion process.

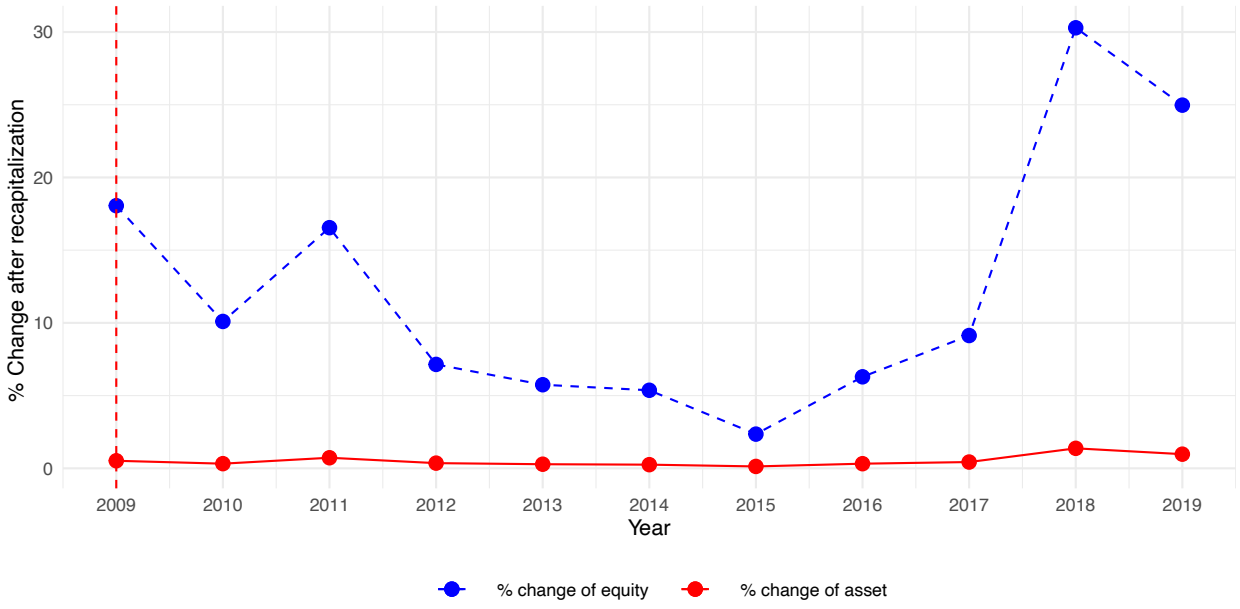

Figure 5: Change in equity and change in asset of GBs and PBs after recapitalisation

This figure shows the percentage change in equity and percentage change in asset of the recapitalised government banks relative to the capital infused by the Government of India to those banks. It shows the evolution in the post-recapitalisation period. The red dotted vertical line in 2009 denotes the start of the capital infusion process instead of 2008, since the percentage will be reflected a year later for the 2008-09 period.

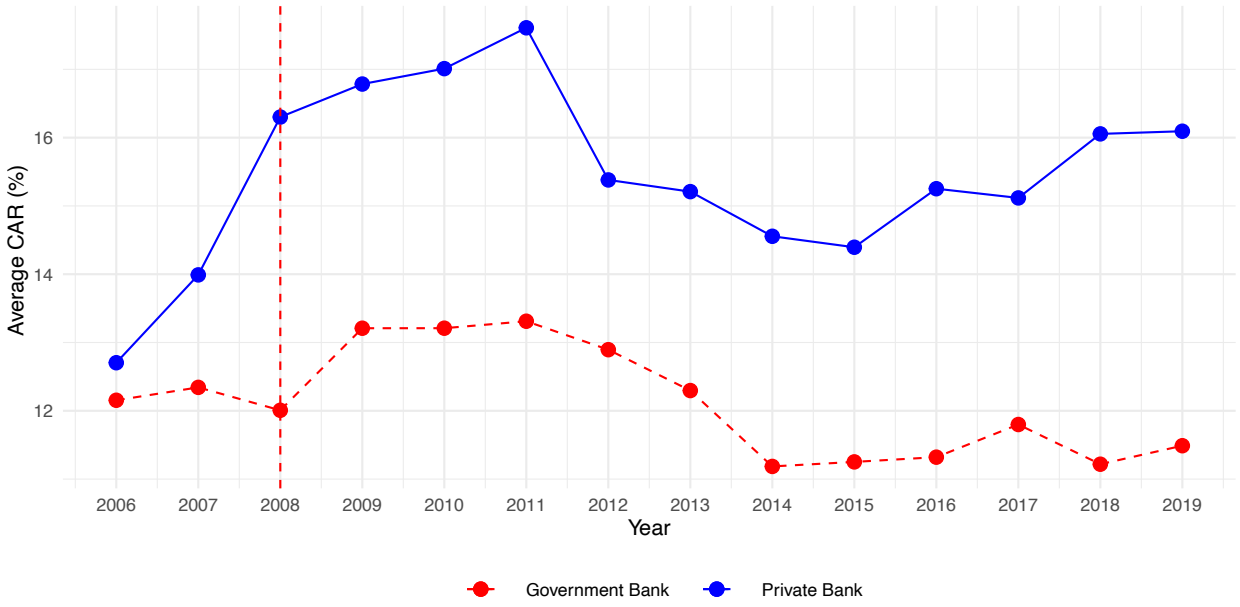

Figure 6: CAR across GBs and PBs

This figure shows the difference in the capital adequacy ratio for the government banks and the private banks during 2006 - 2019. The 'Average CAR' measures the cumulative average of the capital adequacy ratio across the government banks and private banks respectively. The red dotted vertical line in 2008 denotes the start of the capital infusion process. The line demarcates the graph into a pre-recapitalisation and post-recapitalisation phase.

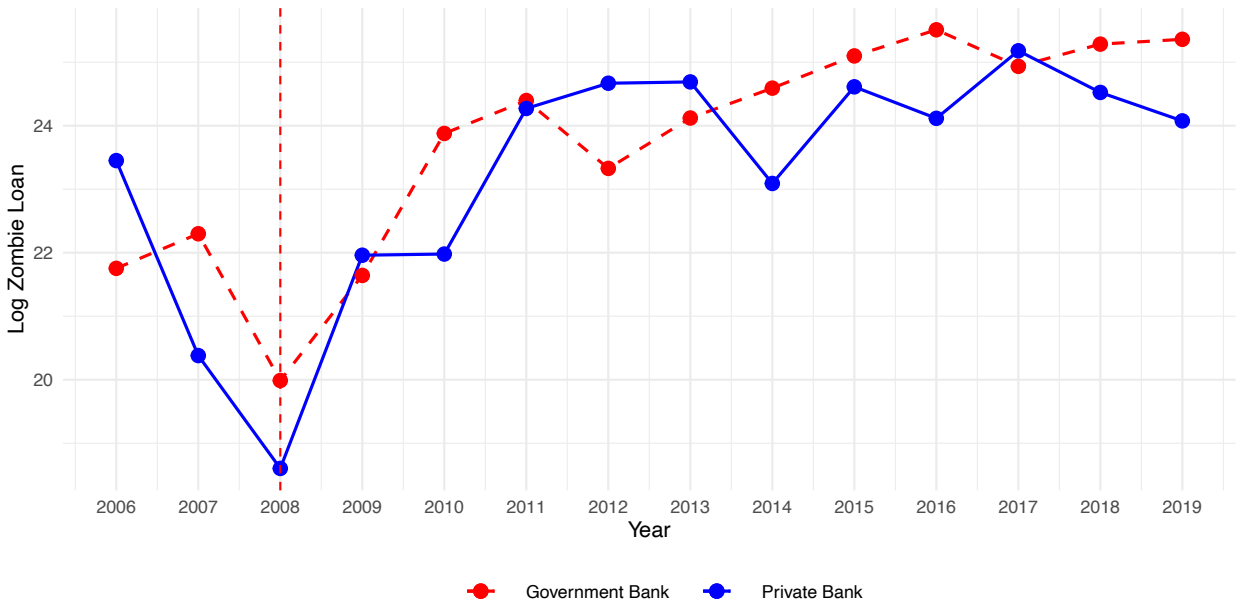

Figure 7: Zombie loan of GBs and PBs

This figure shows the evolution of zombie lending of both government banks and private banks from the pre-recapitalisation period to the post-recapitalisation period. 'Log Zombie loan' is the natural log of the cumulative amount of zombie loan supplied by the government banks and private banks respectively in a given year. A loan to firm is classified as zombie if ICR of the firm is less than 1 for consecutive three years, age of the firm is greater than 15 years, and debt to asset ratio is greater than 0.25. The red dotted vertical line in 2008 denotes the start of the capital infusion process.

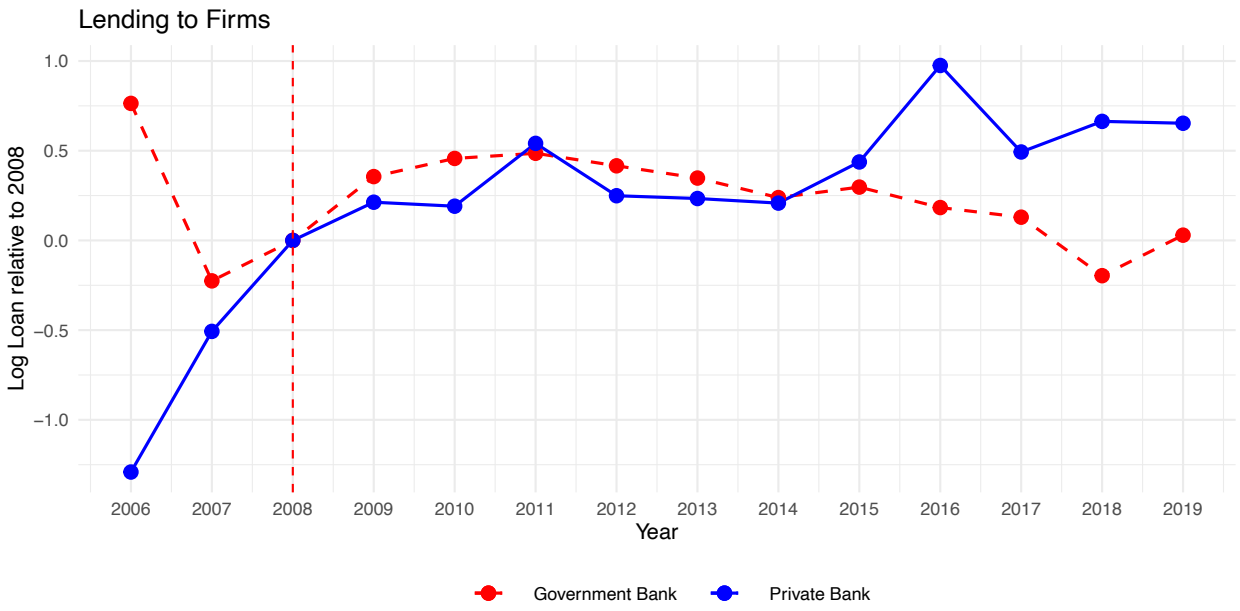

Figure 8: Credit growth

This figure shows the log ratio of the total loans in a given year relative to the year of the onset of capital infusion. The y-axis is normalised to 0 at the time of the onset of the capital infusion process. Log loan is the natural log of the cumulative amount of loan supplied by the government banks and private banks respectively in a given year. The figure shows the evolution of the credit supply of both government banks and private banks from the pre-recapitalisation period to the post-recapitalisation period. The red dotted vertical line in 2008 denotes the start of the capital infusion process.

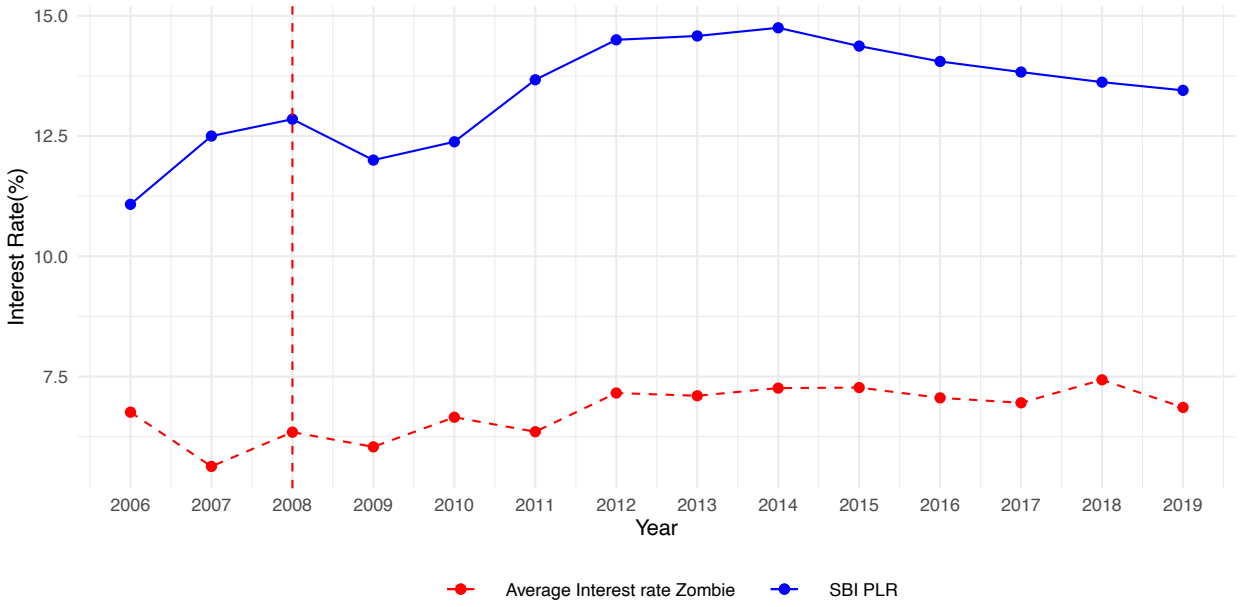

Figure 9: Zombie interest rate vs SBI PLR

This figure shows the difference in interest rate paid by a zombie firm vis-a-vis the SBI PLR rate. State Bank of India (SBI) is considered one of the healthier PSBs. The SBI PLR is the interest rate that SBI charge their most creditworthy customers. It serves as a benchmark for various loans, including corporate, housing, and personal loans. A loan to firm is classified as zombie if ICR of the firm is less than 1 for consecutive three years, age of the firm is greater than 15 years, and debt to asset ratio is greater than 0.25. 'Average interest rate zombie' is the average of the ratio of total interest expense to the total debt paid by the zombie firms in a given year. The red dotted vertical line in 2008 denotes the start of the capital infusion process.

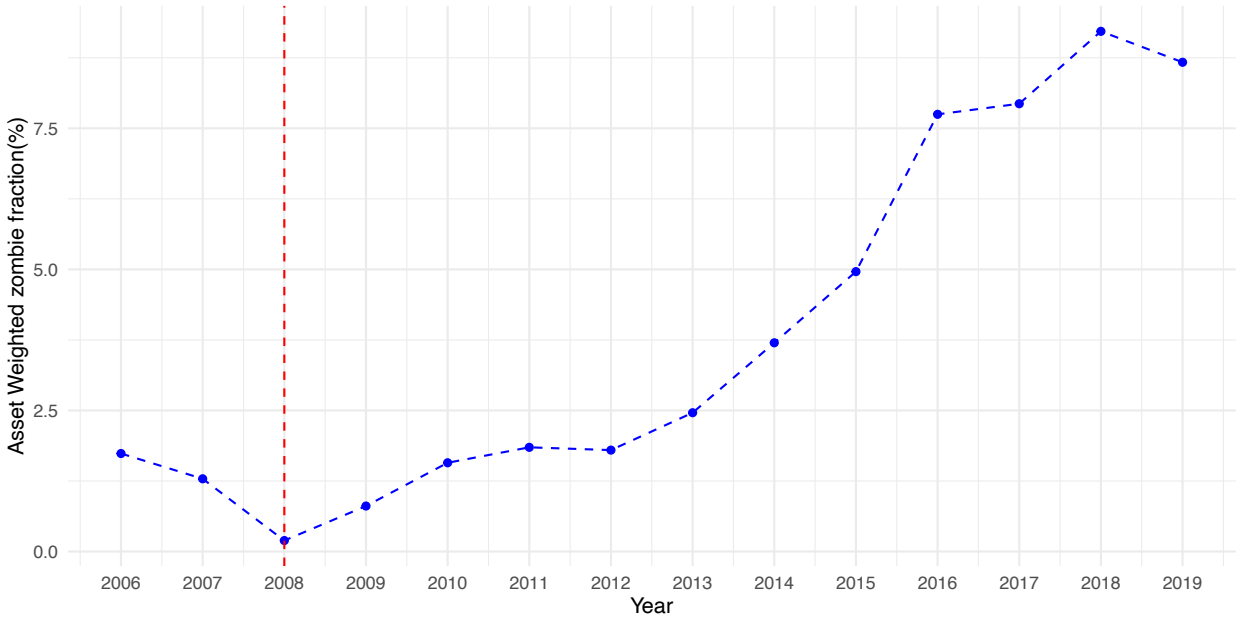

Figure 10: Evolution of asset weighted zombie

This figure shows the sharp increase in proportion of asset weighted zombie after 2008. The red dotted vertical line in 2008 denotes the start of the capital infusion process. A loan to firm is classified as zombie if ICR of the firm is less than 1 for consecutive three years, age of the firm is greater than 15 years, and debt to asset ratio is greater than 0.25.

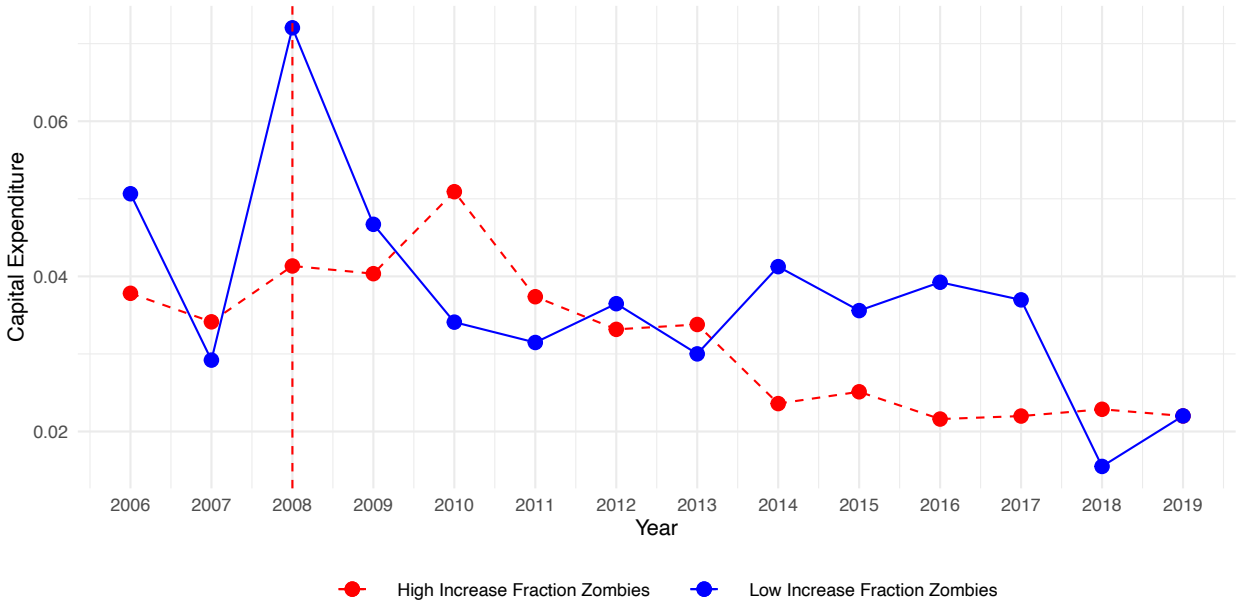

Figure 11: Capital Expenditure across zombie prevalent industries

This figure compares the capital expenditure across industries with high fraction of zombie firms vis-a-vis industries with low fraction of zombie firms. The industry has been classified into 'high increase fraction zombie' or 'low increase fraction zombie' on the basis of the asset weighted fraction of zombie firms in the given industry in the post-recapitalisation period. Industries with asset weighted zombie fraction in the top 25 percentile are classified as 'high increase fraction zombie' industries, whereas industries in the bottom 25 percentile of the asset weighted zombie fraction is classified as 'low increase fraction zombie'. A loan to firm is classified as zombie if ICR of the firm is less than 1 for consecutive three years, age of the firm is greater than 15 years, and debt to asset ratio is greater than 0.25. The red dotted vertical line in 2008 denotes the start of the capital infusion process.

Table 1: Year wise and bank wise capital infusion in INR crores

Name of PSBs	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Allahabad Bank	-	-	670	-	-	400	320	973	451	1500	4844
Andhra Bank	-	-	1173	-	-	200	120	378	1100	1890	2019
Bank of Baroda	-	-	2461	-	850	550	1260	1786	-	5375	-
Bank of India	-	-	1010	-	809	1000	-	3605	2838	9232	-
Bank of Maharashtra	-	-	940	470	406	800	-	394	300	3173	-
Canara Bank	-	-	-	-	-	500	570	947	748	4865	-
Central Bank of India	700	450	2253	676	2406	1800	-	535	1397	5158	2354
Corporation Bank	-	-	309	-	204	450	-	857	508	2187	2555
Dena Bank	-	-	539	-	-	700	140	407	1046	3045	-
Indian Overseas Bank	-	-	1054	1441	1000	1200	-	2009	2651	4694	2157
Indian Bank	-	-	-	-	-	-	280	-	-	-	-
Oriental Bank of Commerce	-	-	1740	-	-	150	-	300	-	3571	-
Punjab National Bank	-	-	184	655	1248	500	870	1732	2112	5473	8247
Punjab & Sind Bank	-	-	-	-	140	100	-	-	-	785	-
Syndicate Bank	-	-	633	-	-	200	460	740	776	2839	728
UCO Bank	450	450	1613	48	681	200	-	935	1925	6507	-
Union Bank of India	-	-	793	-	1114	500	-	1080	541	4524	-
United Bank of India	250	300	558	-	100	700	-	480	1026	2634	-
Vijaya Bank	500	-	1068	-	-	250	-	220	-	1277	-
State Bank of India	-	-	-	7900	3004	2000	2970	5393	5681	8800	-
IDBI Bank	-	-	3119	810	555	1800	-	2229	1900	12471	-

Source: Department of Financial Services, Ministry of Finance, GoI

Table 2: Basis of capital infusion

Financial Year	Capital Infused (INR in crores)	Mode of Recapitalisation	Basis	
			Reference Date	Actual/Estimated
2010 - 2011	7694[19]	Direct equity infusion from the budget	31/03/10	Actual Tier I CRAR
	6423	Direct equity infusion from the budget	31/03/11	Estimated Tier I CRAR
	6000	Direct equity infusion from the budget	31/03/11	Raising GoI holding to 58 percent
2011 - 2012	12000	Direct equity infusion from the budget	31/12/11	Actual Tier I CRAR
2012 - 2013	12517	Direct equity infusion from the budget	31/03/13	Estimated Tier I CRAR
2013 - 2014	14000	Direct equity infusion from the budget	31/03/14	Actual Tier I CRAR and Raising GoI holding to 58 percent
2014 - 2015	6990	Direct equity infusion from the budget	Not available	Actual RoA
2015 - 2016	9932	Direct equity infusion from the budget	31/03/16	Estimated CET-I
	10018	Direct equity infusion from the budget	31/03/16	Estimated RWA
	5050	Direct equity infusion from the budget	31/03/16	Estimated minimum regulatory capital
2016 - 2017	16414	Direct equity infusion from the budget	31/03/17	Estimated Tier I and estimated RWA
	7750	Direct equity infusion from the budget	31/03/17	Estimated CET-I
	836	Direct equity infusion from the budget	31/03/18	Estimated CET-I
2017 - 2019	190000	Recap Bonds		

Source: Department of Financial Service, Ministry of Finance, GoI

Note: [19]Includes INR250 crore, INR300 crore, INR700 crore and INR250 crore infused in United Bank, UCO Bank, Vijaya Bank and Central Bank of India, based on CCEA approval (February/March 2009) for infusion in 2009-10.).

Table 3: Data Coverage

MCA coverage		
Variable	Value	
MCA non financial firms	14246	
Period of observation	FY2006 - FY2019	
Firm-bank relationship	38160	
Firm-bank relationship with non zero loans	33059	
Firms issued new loans (FY2006 - FY2019)	12267	
New loan issued by banks (FY2006 - FY2019)	65529	
New loan issued by banks (FY2006 - FY2008)	9477	
New loan issued by banks (FY2009 - FY2019)	56052	
Number of firm-bank-year observations	531630	
Number of industries (NIC two digit)	72	
MCA coverage at firm and bank level		
Variable	Unique	Observations
Firms	14246	531630
Banks	39	531630
Public banks	21	321580
Private banks	18	210050
Distress firm distribution		
Variable	Unique	Observations
Firm-year-low ic = 1	10820	57620
Firm-year-low ic = 0	9766	50541
Firm-bank-year-low ic = 1		163620
Firm-bank-year-low ic = 0		151645
Total observations		315265
Zombie firm distribution		
Variable	Unique	Observations
Firm-year-zombie	1412	2948
Firm-year-non zombie	12394	89864
Firm-bank-year-zombie		9094
Firm-bank-year-non zombie		271060
Total observations		280154

Notes: This table reports the sample summary for the data set for the period 2006-2019. Our data set has been created by supplementing the "MCA data" with the firm-level borrower data from the Prowess database and the bank related information from database of the Indian economy, RBI. We also list the number of observations with non-missing values of various distress firm as well as zombie firms.

Table 4: Variable Description:

Variable	Definition	Source
Bank Level Variables		
Loan Amount	Loan borrowed by a firm from a bank in a year (INR)	MCA
Size	Capital infusion by GoI to the bank scaled by total equity	CAG report
Bank Level Control Variables		
Private size	Private paid up capital	CMIE
Log(bank asset)	Logarithm of total asset of a bank	DBIE, RBI
Equity/Asset	Ratio of equity to asset of a bank	DBIE, RBI
Impaired asset	Ratio of net NPA to net advance	DBIE, RBI
Return on asset	Bank's return on asset	DBIE, RBI
Return on investment	Bank's return on investment	DBIE, RBI
Firm Level Control Variables		
Interest Coverage ratio (ICR)	EBIT/ Interest expenses	CMIE
Zombie_1	ICR < 1 for three consecutive years, and age > 15 years, and debt to asset ratio > 0.25	CMIE
Zombie_2	ICR < 1 for two consecutive years, and age > 15 years, and debt to asset ratio > 0.25	CMIE
Log (Asset)	Natural log of total asset of a firm	CMIE
Leverage	Total debt/ Total Asset	CMIE
Net worth	Total Net worth/ Total Asset	CMIE
Tangibility	Fixed Asset/ Total Asset	CMIE
EBITDA/Asset	EBITDA/ Total Asset	CMIE
Firm Level Variables		
CAPEX	Change in the gross fixed asset/ lag total asset in a year	CMIE
Wage	Total salaries paid as a fraction of total expense in a year	CMIE
Low IC	It is a dummy variable equals to 1 if the ICR of the firm $<$ median of the ICR of all the firms in the year, otherwise 0	CMIE
Other Independent Variables		
Recap_period	It is a dummy variable which takes the value of 1 for the time period from 2009 - 2019, otherwise 0	
Industry Fraction Zombie	Asset weighted fraction of of zombie firms in a given industry in a given year	
Average exposure	$\sum \frac{Size_{bt} . Loan\_amount_{ibt}}{Total\_loan\_amount_{it}}$	
Note:	*The sample period covers from FY 2006 to FY 2019*	

Table 5: Credit Growth (all non treated bank act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
size	0.098	0.186	0.188	12.96
	(0.637)	(0.670)	(0.881)	(60.08)
Observations	531,630	531,630	531,630	531,630
R^2	0.077	0.398	0.466	0.725
Bank level controls	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No
Year fixed effect	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control includes all the banks excepting the recapitalised GBs. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 6: Credit Growth (all private bank act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
size	0.316	0.143	0.092	17.14
	(0.669)	(0.738)	(0.959)	(76.52)
Observations	432,194	432,194	432,194	432,194
R^2	0.079	0.423	0.501	0.726
Bank level controls	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No
Year fixed effect	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm -bank-year. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes only the private banks. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 7: Credit growth for low IC firms (all non treated banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
low_ic	-0.809^{***}	-2.130		
	(0.086)	(1.937)		
size	-0.491	-1.724^{***}	-1.532	
	(0.660)	(0.856)	(1.090)	
I(size $*$low_ic)	1.104^{***}	3.483^{***}	3.135^{***}	2.162^{***}
	(0.365)	(0.621)	(0.759)	(0.344)
Observations	315,265	315,265	315,265	315,265
R^2	0.088	0.368	0.455	0.731
Bank level controls	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No
Year fixed effect	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as low-IC (high-IC) if the ICR of the firm below/(above) the median of the ICR of all the firms in the year. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the banks excepting the recapitalised GBs. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 8: Credit growth for low IC firms (all private banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
low_ic	-0.856^{***}	-3.097		
	(0.087)	(2.263)		
size	-0.248	-1.924^{*}	-1.872	
	(0.710)	(1.026)	(1.311)	
I(size $*$low_ic)	1.281^{***}	4.004^{***}	3.785^{***}	3.232^{***}
	(0.449)	(0.674)	(0.861)	(0.435)
Observations	257,474	257,474	257,474	257,474
R^2	0.091	0.397	0.498	0.733
Bank level controls	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No
Year fixed effect	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as low-IC (high-IC) if the ICR of the firm below/(above) the median of the ICR of all the firms in the year. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes only the private banks. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 9: Zombie v/s non-zombie firms

	Good Quality			Low quality non zombie			Zombie				
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Difference in mean (t test) (low quality non zombie - zombie)	Difference in median (Wilcoxon test) (low quality non zombie - zombie)
log asset (in million)	9794	2408	18393	11940	1942	22376	16374	3765	25132	-4434^{***}	-1822^{***}
leverage	0.388	0.399	0.215	0.492	0.570	0.277	0.679	0.733	0.183	-0.187^{***}	-0.163^{***}
tangibility	0.462	0.422	0.305	0.523	0.493	0.357	0.594	0.603	0.372	-0.071^{***}	-0.110^{***}
ICR	8.165	4.212	8.505	0.692	1.086	1.139	−0.144	0.060	0.878	0.836^{***}	1.026^{***}
EBITDA/Asset	0.144	0.140	0.060	0.069	0.075	0.062	0.037	0.032	0.052	0.032^{***}	0.043^{***}
Net worth/Asset	0.415	0.402	0.193	0.203	0.228	0.271	0.220	0.182	0.164	-0.017^{***}	0.046^{***}

Notes: This table presents a test for the difference in means as well as difference in median between low-quality nonzombie firms and zombie firms. Low-quality and low-IC are used synonymously. A firm is classified as low-quality (high-quality) if the ICR of the firm below/(above) the median of the ICR of all the firms in the year. A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. *p<0.1; **p<0.05; ***p<0.01.

Table 10: Credit growth towards Zombie firms (all non treated banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
zombie_1	−7.869			
	(5.30)			
size	0.110	0.079		
	(0.857)	(1.056)		
I(size $*\text{zombie}_1$)	2.255***	2.409***	2.419***	2.425**
	(0.678)	(0.733)	(0.586)	(1.123)
Observations	280,154	280,154	280,154	280,154
R^2	0.358	0.453	0.459	0.731
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the banks excepting the recapitalised GBs. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 11: Credit growth towards Zombie firms (all private banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
zombie_1	−7.504			
	(5.281)			
size	0.197	0.124		
	(0.975)	(1.191)		
I(size $*\text{zombie}_1$)	2.615***	3.216***	3.317***	2.792**
	(0.788)	(0.831)	(0.629)	(1.283)
Observations	227,896	227,896	227,896	227,896
R^2	0.386	0.497	0.501	0.733
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the private banks. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 12: Placebo Test: Credit growth towards Zombie firms (all non treated banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
$zombie_1$	−7.581			
	(5.295)			
size	0.021	0.027		
	(0.143)	(0.181)		
I(size $*zombie_1$)	0.331	0.327	0.221	0.299
	(0.358)	(0.499)	(0.337)	(0.677)
Observations	280,154	280,154	280,154	280,154
R^2	0.358	0.453	0.458	0.731
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. The infused capital is randomly reassigned across the years of our sample period i.e. 2006 -2019, instead of the recapitalisation period (2009 - 2019). A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the banks other than the recapitalised GBs. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 13: Placebo Test: Credit growth towards Zombie firms (all private banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
$zombie_1$	−7.367			
	(5.284)			
size	0.233	0.224		
	(0.198)	(0.287)		
I(size $*zombie_1$)	0.058	0.407	0.158	−0.585
	(0.657)	(1.083)	(0.689)	(1.067)
Observations	280,154	280,154	280,154	280,154
R^2	0.387	0.497	0.501	0.733
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. The infused capital is randomly reassigned across the years of our sample period i.e. 2006 -2019, instead of the recapitalisation period (2009 - 2019). A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the private banks. Standard errors are clustered at the bank level. $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 14: Placebo Test: Credit growth towards Zombie firms (all non-treated banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
$zombie_1$	−7.546			
	(5.291)			
size	0.041	0.018		
	(0.132)	(0.175)		
I(size $*zombie_1$)	0.321	−0.291	−0.379	−0.875
	(0.425)	(0.581)	(0.467)	(0.763)
Observations	227,896	227,896	227,896	227,896
R^2	0.358	0.454	0.458	0.731
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. The amount of infused capital is randomly reassigned across the GBs for the recapitalisation period (2009 - 2019). A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the banks other than the recapitalised GBs. Standard errors are clustered at the bank level. $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 15: Placebo Tests: Credit growth towards Zombie firms (all private banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
$zombie_1$	−7.344			
	(5.276)			
size	−0.003	−0.029		
	(0.142)	(0.192)		
I(size $*zombie_1$)	0.399	0.207	0.039	0.259
	(0.482)	(0.792)	(0.605)	(1.138)
Observations	227,896	227,896	227,896	227,896
R^2	0.387	0.497	0.501	0.733
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. The amount of infused capital is randomly reassigned across the GBs for the recapitalisation period (2009 - 2019). A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the private banks. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 16: Zombie Distortion

	CAPX	Average Interest Rate	Wages
	(1)	(2)	(3)
A. Entire Sample:			
Industry frac zombie*Healthy*RecapPeriod	-0.636**	0.231	0.045
	(0.282)	(0.152)	(0.445)
Observations	212,015	230,212	259,326
R^2	0.319	0.229	0.238
B. Rent Seeking Industry:			
Industry frac zombie*Healthy*RecapPeriod	-60.180**	-0.417**	2.115
	(29.930)	(0.913)	(2.467)
Observations	61,394	61,394	61,394
R^2	0.292	0.282	0.239
C. Construction Industry:			
Industry frac zombie*Healthy*RecapPeriod	-3.153**	13.47	-3.419
	(1.429)	(12.47)	(2.314)
Observations	29,031	29,031	29,031
R^2	0.464	0.216	0.501
D. Manufacturing Industry:			
Industry frac zombie*Healthy*RecapPeriod	-0.845**	0.215	0.061
	(0.331)	(0.193)	(0.185)
Observations	151,810	151,810	151,810
R^2	0.271	0.228	0.324
E. Trade Industry:			
Industry frac zombie*Healthy*RecapPeriod	0.049	7.584	1.592
	(6.679)	(7.262)	(1.049)
Observations	31,095	31,095	31,095
R^2	0.365	0.171	0.749
F. Service Industry:			
Industry frac zombie*Healthy*RecapPeriod	-0.021	0.116	0.257
	(0.131)	(1.239)	(0.189)
Observations	16,133	16,133	16,133
R^2	0.521	0.117	0.848
Firm level controls	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes
Industry x Year fixed effect	Yes	Yes	Yes

Notes: This table presents firm-level regressions. The dependent variables are capital expenditures, interest cost, and wage expenses. $Industryfraczombie$ measures the asset-weighted fraction of zombie firms in a given industry in a given year. Healthy is an indicator variable equal to 1 for firms not classified as zombie firms. A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Firm control variables include the logarithm of total assets, leverage, tangibility, IC ratio, EBITDA as a fraction of total assets, and net worth. Standard errors are clustered at the firm level. *p<0.1; **p<0.05; ***p<0.01.

Table 17: Real Effect

	Dependent variable:					
	capx_asset			wage		
	(1)	(2)	(3)	(4)	(5)	(6)
avg_exposure	−0.013	−0.012	−0.012	0.006	0.006	0.006
	(0.028)	(0.028)	(0.028)	(0.008)	(0.008)	(0.008)
zombie_1	−0.006	−0.005	−0.005	−0.022	−0.022	−0.022
	(0.040)	(0.039)	(0.039)	(0.021)	(0.021)	(0.021)
I(avg_exposure $*\text{zombie}_1$)	−0.101	−0.104	−0.104	−0.023	−0.024	−0.024
	(0.103)	(0.103)	(0.103)	(0.056)	(0.056)	(0.056)
Observations	280,154	280,154	280,154	280,154	280,154	280,154
R^2	0.046	0.046	0.046	0.145	0.145	0.145
Firm level controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed effect	No	Yes	Yes	No	Yes	Yes
Industry fixed effect	No	No	Yes	No	No	Yes

Notes: This table presents firm-level regressions. The dependent variables are capital expenditures, and wage expenses. *AverageExposure* which measures a firm's indirect gains from its lending relationships by weighting the size of each of its loan from that particular bank which has been infused by the GoI by the fraction of its total outstanding loan amounts. A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Firm control variables include the logarithm of total assets, leverage, tangibility, IC ratio, EBITDA as a fraction of total assets, and net worth. Standard errors are clustered at the firm level. *p<0.1; **p<0.05; ***p<0.01.

B Online Appendix

Table 18: Credit growth towards alternate definition of Zombie firms (all non treated banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
I(size $*$zombie$_2$)	2.291***	2.123***	2.123***	1.724*
	(0.638)	(0.802)	(0.601)	(0.905)
Observations	280,154	280,154	280,154	280,154
R^2	0.358	0.453	0.459	0.731
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. The amount of infused capital is randomly reassigned across the GBs for the recapitalisation period (2009 - 2019). A firm is classified as zombie if ICR is less than 1 for two consecutive years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the banks other than the recapitalised GBs. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 19: Credit growth towards alternate definition of Zombie firms (all private banks act as control)

	Dependent variable:			
	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)
I(size $*$zombie$_2$)	2.614***	2.809***	2.878***	2.136**
	(0.744)	(0.940)	(0.665)	(1.066)
Observations	227,896	227,896	227,896	227,896
R^2	0.387	0.497	0.501	0.734
Bank level controls	Yes	Yes	No	No
Firm fixed effect	No	No	No	No
Year fixed effect	No	No	No	No
Bank fixed effect	Yes	No	No	No
Firm x bank fixed effect	No	Yes	Yes	Yes
Firm x year fixed effect	Yes	Yes	Yes	Yes
Bank x year fixed effect	No	No	Yes	Yes

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. The amount of infused capital is randomly reassigned across the GBs for the recapitalisation period (2009 - 2019). A firm is classified as zombie if ICR is less than 1 for two consecutive years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the private banks. Standard errors are clustered at the bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 20: Credit Growth with alternate clustering of error (all non treated bank act as control)

	Dependent variable:							
	log(1 + loan_amount)			loan indicator	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
size	0.098	0.186	0.188	12.96	0.098	0.186	0.188	12.96
	(0.133)	(0.213)	(0.222)	(60.08)	(0.638)	(0.674)	(0.886)	(60.08)
Observations	531,630	531,630	531,630	531,630	531,630	531,630	531,630	531,630
R^2	0.077	0.398	0.466	0.725	0.077	0.398	0.466	0.725
Bank level controls	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No	Yes	No	No	No
Year fixed effect	Yes	No	No	No	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes	No	No	No	Yes
Clustering	Firm				Firm and Bank			

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control includes all the banks excepting the recapitalised GBs. Standard errors are clustered at two levels i)firm level, ii) firm and bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 21: Credit Growth with alternate clustering of errors (all private banks act as control)

	Dependent variable:							
	log(1 + loan_amount)			loan indicator	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
size	0.316**	0.143	0.092	17.14	0.316	0.143	0.092	17.14
	(0.157)	(0.271)	(0.285)	(76.52)	(0.670)	(0.745)	(0.968)	(76.52)
Observations	432,194	432,194	432,194	432,194	432,194	432,194	432,194	432,194
R^2	0.079	0.423	0.501	0.726	0.079	0.423	0.501	0.726
Bank level controls	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No	Yes	No	No	No
Year fixed effect	Yes	No	No	No	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes	No	No	No	Yes
Clustering	Firm				Firm and Bank			

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control includes all the private banks. Standard errors are clustered at two levels i)firm level, ii) firm and bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 22: Credit Growth for Low IC firms with Alternate clustering of error (all non treated banks act as control)

	Dependent variable:							
	log(1 + loan_amount)			loan indicator	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I(size ∗low_ic)	1.104***	3.483***	3.135***	2.162***	1.104***	3.483***	3.135***	2.162***
	(0.263)	(0.434)	(0.508)	(0.344)	(0.383)	(0.642)	(0.793)	(0.344)
Observations	315,265	315,265	315,265	315,265	315,265	315,265	315,265	315,265
R^2	0.088	0.368	0.455	0.731	0.088	0.368	0.455	0.731
Bank level controls	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No	Yes	No	No	No
Year fixed effect	Yes	No	No	No	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes	No	No	No	Yes
Clustering	Firm				Firm and Bank			

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as low-IC (high-IC) if the ICR of the firm below/(above) the median of the ICR of all the firms in the year. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the banks excepting the recapitalised GBs. Standard errors are clustered at two levels i)firm level, ii) firm and bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 23: Credit Growth for Low IC firms with Alternate clustering of error (all private banks act as control)

	Dependent variable:							
	log(1 + loan_amount)			loan indicator	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I(size ∗low_ic)	1.281***	4.004***	3.785***	3.232***	1.281***	4.004***	3.785***	3.232***
	(0.281)	(0.479)	(0.603)	(0.435)	(0.461)	(0.698)	(0.905)	(0.435)
Observations	257,474	257,474	257,474	257,474	257,474	257,474	257,474	257,474
R^2	0.091	0.397	0.498	0.733	0.091	0.397	0.498	0.733
Bank level controls	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No	Yes	No	No	No
Year fixed effect	Yes	No	No	No	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes	No	No	No	Yes
Clustering	Firm				Firm and Bank			

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as low-IC (high-IC) if the ICR of the firm below/(above) the median of the ICR of all the firms in the year. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the private banks. Standard errors are clustered at two levels i)firm level, ii) firm and bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 24: Credit growth for Zombie firms with Alternate clustering of error (all non treated banks act as control)

	Dependent variable:							
	log(1 + loan_amount)			loan indicator	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I(size $*$zombie$_1$)	2.255***	2.409***	2.419***	2.425**	2.255***	2.409***	2.419***	2.425**
	(0.636)	(0.809)	(0.814)	(1.123)	(0.710)	(0.833)	(0.661)	(1.123)
Observations	280,154	280,154	280,154	280,154	280,154	280,154	280,154	280,154
R^2	0.358	0.453	0.459	0.731	0.358	0.453	0.459	0.731
Bank level controls	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No	Yes	No	No	No
Year fixed effect	Yes	No	No	No	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes	No	No	No	Yes
Clustering	Firm				Firm and Bank			

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the banks excepting the recapitalised GBs. Standard errors are clustered at two levels i)firm level, ii) firm and bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 25: Credit growth for Zombie firms with Alternate clustering of error (all private banks act as control)

	Dependent variable:							
	log(1 + loan_amount)			loan indicator	log(1 + loan_amount)			loan indicator
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I(size $*$zombie$_1$)	2.615***	3.216***	3.317***	2.792**	2.615***	3.216***	3.317***	2.792**
	(0.683)	(0.915)	(0.925)	(1.283)	(0.821)	(0.914)	(0.689)	(1.283)
Observations	227,896	227,896	227,896	227,896	227,896	227,896	227,896	227,896
R^2	0.386	0.497	0.501	0.733	0.386	0.497	0.501	0.733
Bank level controls	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Firm fixed effect	Yes	No	No	No	Yes	No	No	No
Year fixed effect	Yes	No	No	No	Yes	No	No	No
Bank fixed effect	Yes	Yes	No	No	Yes	Yes	No	No
Firm x bank fixed effect	No	No	Yes	Yes	No	No	Yes	Yes
Firm x year fixed effect	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Bank x year fixed effect	No	No	No	Yes	No	No	No	Yes
Clustering	Firm				Firm and Bank			

Notes: This table presents the results of a modified Khwaja and Mian (2008) bank lending channel regression. The unit of observation is a firm-bank-year. For the first three columns, the dependent variable is the natural log of the amount of loan taken by a firm in a given year. In the fourth column, the dependent variable is the probability of loan increase instead of log of the loan amount. $size_{bt}$ is the infused capital by the GoI during the year t scaled by the bank equity. A firm is classified as zombie if ICR is less than 1 for consecutive three years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Bank-level controls include the logarithm of total assets, equity/assets, impaired loans/equity, and return on assets. We also control for private recapitalisation of the banks and measure it as the ratio of private recapitalisation to the total equity of a bank in a given year. The control set includes all the private banks. Standard errors are clustered at two levels i)firm level, ii) firm and bank level. *p<0.1; **p<0.05; ***p<0.01.

Table 26: Real effect with alternate definition of zombie

	Dependent variable:					
	capx_asset			wage		
	(1)	(2)	(3)	(4)	(5)	(6)
I(avg_exposure $*$zombie$_2$)	−0.093	−0.094	−0.094	0.020	0.020	0.020
	(0.109)	(0.109)	(0.109)	(0.051)	(0.051)	(0.051)
Observations	280,154	280,154	280,154	280,154	280,154	280,154
R^2	0.046	0.046	0.046	0.145	0.145	0.145
Firm level controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Bank fixed effect	No	Yes	Yes	No	Yes	Yes
Industry fixed effect	No	No	Yes	No	No	Yes

Notes: This table presents firm-level regressions. The dependent variables are capital expenditures, and wage expenses. *AverageExposure* which measures a firm's indirect gains from its lending relationships by weighting the size of each of its loan from that particular bank which has been infused by the GoI by the fraction of its total outstanding loan amounts. A firm is classified as zombie if ICR is less than 1 for two consecutive years, and age is greater 15 years, and debt to asset ratio is greater than 0.25. Firm control variables include the logarithm of total assets, leverage, tangibility, IC ratio, EBITDA as a fraction of total assets, and net worth. Standard errors are clustered at firm level. *p<0.1; **p<0.05; ***p<0.01.