Moral Hazard Transmission Due to the Unexpected Rescue of a Private Bank: Evidence from India

Shashwat Agrawal*

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*Ph.D. Candidate in Finance, Department of Finance, Fulton Hall, Carroll School of Management, Boston College, Chestnut Hill, MA 02467, USA. Email: agrawasb@bc.edu.

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Abstract

A vast body of literature highlights how bank bailouts, capital infusions, and government safety nets can incentivize risk-taking behavior by amplifying moral hazard. While much of the research focuses on the bailed-out institutions, the broader implications of such interventions on other banks remain underexplored. This paper investigates the spillover effects of an unexpected bank bailout on the risk-taking and lending behavior of other banks in the Indian banking sector. Using granular corporate loan-level data and a dynamic difference-in-differences (DID) approach, I compare private banks (treated group) to government banks (control group) following the unexpected rescue of a private bank. I find that private banks significantly increase non-performing assets (NPA) and stock return volatility relative to government banks post-bailout. These findings suggest an increase in risk-taking driven by the "moral hazard" channel, as the bailout is expected to raise the perceived rescue likelihood for other private banks. The effect is particularly pronounced for smaller private banks and those with lower capital ratios. Loan-level analysis shows that affected private banks not only increase their overall lending at aggregate level but also expand lending to risky borrowers and engage in greater loan restructuring, relative to government banks. The results hold after controlling for demand factors through industry-time and/or borrower-time fixed effects. This study contributes to the literature by exploiting an unexpected bailout as an exogenous shock to causally link changes in risk-taking and lending to revised bailout expectations. It disentangles the "competition" and "moral hazard" channels, providing robust evidence of increased risk-taking by private banks driven by moral hazard. The findings underscore the broader negative externalities of bank bailouts, highlighting how such interventions can amplify sector-wide risk-taking behavior.

Keywords: Bank Risk, Bank Bailouts, Private Banks, Risky Lending, Moral Hazard
JEL Codes: E58, H81, G21, G28, G32, G33

1 Introduction

A vast body of literature highlights how bank bailouts, capital infusions, and government safety nets can incentivize risk-taking behavior by amplifying moral hazard (Hovakimian and Kane (2000); Cordella and Yeyati (2003); Dam and Koetter (2012); Black and Hazelwood (2013); Strahan (2013); Duchin and Sosyura (2014); Poczter (2016)). While much of the research focuses on the bailed-out institutions, the broader implications of such interventions on other banks remain underexplored. If the unexpected bailout of a bank leads other banks to perceive an increased likelihood of government intervention, they may also be encouraged to take on greater risks (Acharya and Yorulmazer (2007)). This spillover effect extends the moral hazard problem beyond the bailed-out bank, shaping risk-taking dynamics across the sector. In this paper, I investigate the consequences of an unexpected bank rescue on the risk-taking and lending behaviour of other banks in the Indian banking sector using bank level and granular loan level data, contributing to a greater understanding of these spillover effects.

Specifically, I focus on private banks and their risk-taking response to the unexpected rescue of a fellow private bank. I employ a dynamic difference-in-differences (DID) approach, comparing changes in non-performing assets (NPA) and stock return volatility of private (treated) banks relative to government (control) banks before and after the bailout.[1,2]

Empirical investigation of this topic presents several challenges. First, adverse economic conditions may simultaneously drive bank failures, subsequent bailouts, and increased risk for banks due to deteriorating borrower health, making causality difficult to establish. Second, attributing increased risk-taking to bailout expectations is inherently difficult, as these expectations are unobservable. Since bailout expectation is a function of factors such as size and interconnectedness, it is difficult to disentangle the effect of bailout expectation

[1]NPA are loans with no payments for 90 days or more, measured as a percentage of total advances. This metric is similar to non-performing loans (NPL).

[2]My sample comprises private and government scheduled commercial banks, collectively accounting for over 90% of banking assets (Chopra et al. (2021)). All banks in the sample are publicly listed, with government banks having more than 50% government ownership.

from bank characteristics such as size on risk-taking. Establishing a credible link requires an exogenous shock that isolates changes in bailout expectations independent of bank characteristics. Third, if a bailout is anticipated, changes in bank risk may stem from other factors, such as shifts in the competitive landscape, rather than changes in bailout expectations induced by the intervention. Fourth, even in scenarios where a bailout is unexpected, it remains challenging to identify which banks are most likely to respond to heightened moral hazard. Finally, the absence of granular, micro-level loan data limits the ability to precisely assess changes in risk-taking and lending behavior.

To overcome the challenges highlighted above, first, I leverage the unexpected rescue of an Indian private bank as a unique exogenous shock to the bailout expectations of other private banks. The bailout of "Yes bank" in 2020 serves as a novel exogenous event to the banking sector, offering an opportunity to examine its impact on risk-taking behavior among other private banks.[3] I shed light on moral hazard problems arising from the increased likelihood of a bailout using the unanticipated bailout of a private bank by estimating the changed risk-shifting propensities of private banks relative to government banks. The stock prices of "Yes bank" more than doubled over the two trading days after the bailout announcement. Credit rating agencies changed their rating of "Yes bank" debt from D (Default) one week before the bailout to A2/BB+ (High Safety/Inadequate Safety) within one week after the bailout. This suggests that the bailout of "Yes bank" was unexpected and a surprise to the market and credit rating agencies. Since shareholders of no private bank were rescued by government institute since 1991, the unanticipated rescue of "Yes bank" could positively affect the rescue likelihood of other private banks if the expected government decision positively correlates with past decisions. Due to the increased likelihood of a bailout, affected private banks will be incentivized to take more risks because they will not have to bear the full negative consequences of those risks.

Second, I employ a dynamic difference-in-differences (DID) framework, using government-

[3]See Gupta (2024)

owned banks as a control group. The Indian banking market provides a suitable setting for this analysis as it has a mix of government-owned and private-sector banks. Since government banks already have implicit rescue guarantees and get regular capital infusions (Marisetty and Shoeb (2024)), they will not update their bailout expectations as a result of the bailout of another bank. However, in the absence of government guarantees for private banks, it is reasonable to assume that the bailout likelihood of private banks will change due to the unexpected rescue of another private bank. Since the unexpected "Yes bank" rescue will only change incentives for private banks, government banks with prior bailout guarantees can be used as a control group. I use the DID design to estimate the change in risk-taking by private banks relative to control banks induced by the unexpected rescue of "Yes bank". By using this unanticipated intervention, I isolate changes in risk-taking behavior causally linked to altered bailout expectations, independent of underlying economic conditions or pre-existing bank characteristics. This design enables a robust comparison of changes in risk-taking behavior and lending between private banks (the treated group) and control banks.

Third, I use granular corporate loan data at bank-borrower-quarter level to evaluate lending behavior across private and government banks, achieving clean identification of changes in lending and risk behavior of the affected private banks relative to the control banks. Loan data allow me to control for demand factors and time variant firm characteristics using industry-year-quarter and firm-year-quarter fixed effects. Together, these methodological choices address key challenges and provide novel insights into the spillover effects of bank bailouts on sector-wide risk-taking and lending.

To estimate the causal effect of the unexpected rescue of "Yes bank" on increased risk-taking by other private banks relative to government banks using DID, my first identifying assumption is that the rescue is unexpected and unrelated to competitor banks. Since the rescue of the bank was unexpected, it can be considered exogenous to competitor banks' risk-taking behavior. The second identifying assumption is the parallel trend for DID which posits that, in the absence of treatment, the treatment and control groups would follow

similar trends over time. Since it is impossible to observe the treated bank's risk in a counterfactual scenario where the treatment did not occur, I cannot directly test the parallel trend assumption. However, I provide suggestive evidence by examining the pre-treatment trends. By plotting the pre-treatment risk trends of the treated and control banks, I observe the difference in bank risk between the two groups before and after the treatment. The lack of any changes in the dynamics of bank risks before the treatment supports the parallel trend assumption. After the unexpected bailout, the difference in risk between the treated and control banks increases significantly, indicating the impact of the treatment. This suggests that any divergence post-treatment can be attributed to the intervention itself. The assumptions of parallel trend and exogeneity of bank rescue allow me to estimate the effect of the unexpected bailout on the risk-shifting by private banks.

In this paper I provide empirical estimates on the induction of moral hazard in banks resulting from altered incentives due to the unexpected rescue of another bank. If the government is consistent in its actions, then the unexpected rescue of a private bank would increase the rescue likelihood of other private banks. This will motivate private banks to increase risk in response to changed risk-shifting incentives arising from moral hazard. I name this "moral hazard" channel.[4] In line with the "moral hazard" channel, after the unexpected rescue of the private sector bank, I find that the NPA of other private banks increase by 3.668 percentage points (40% of mean NPA) relative to government banks. Moreover, stock return volatility increase by 16% for private banks relative to government banks post the unexpected bailout. This is evidence of risk shifting by private banks in response to increased odds of rescue.

Deviating from the prevailing understanding that only the closest peers of "Yes bank" in terms of size would respond strongly, I find that non close private banks also increase risk

[4]Hakenes and Schnabel (2010) theoretically analyze spillover effects of bailouts, highlighting a "competition channel" where bailouts increase risk-taking among competitor banks due to intensified market competition. Unlike the "moral hazard" channel, which affects only private banks, the "competition channel" impacts both private and government banks. My DID estimate isolates the "moral hazard" channel by capturing the relative increase in risk-taking by private banks compared to government banks.

in response to the unexpected bailout. This suggests that the bailout alter the expectations of all private banks regarding future rescues, leading to increase in risk-taking behavior. I study interactions of private banks with post-bailout period and lagged bank characteristics to determine if the effect is concentrated among smaller or low-capitalized banks. I find some suggestive evidence that smaller and lower-capitalized private banks increase more risk compared to larger and well-capitalized private banks.

To achieve cleaner identification and to better understand how private banks adjust their behavior following altered rescue expectations after the unexpected bailout, I analyze corporate loan-level data for listed and unlisted borrowers. By examining the size and distribution of loans before and after the bailout, I uncover the specific changes in lending practices and risk-taking behaviors among private banks. From the granular loan-level data, I find that private banks respond to changed incentives by significantly increasing the size of their loan portfolios by 4.1 percentage points compared to government banks. I next restrict the sample to risky borrowers. I find that private banks increase loan exposure to risky borrowers by 9.2 percentage points compared to government banks. This suggests that, compared to government banks, private banks increase the size of their loan portfolios more for risky borrowers compared to less risky borrowers. I use industry-year-quarter fixed effects to control for demand channel. The results also hold with firm-year-quarter fixed effects, controlling for time variant firm characteristics. The findings imply that private banks not only increase loan outstanding, but they also increase their exposure to risky borrowers at a rate that exceeds the rate at which they increase loan exposure to other borrowers.

I now turn my attention to new loan issuance. At an aggregate level the share of new loans issued by private banks increases from 40.98% before the bailout from 2017 to 2019 to 52.06% after the bailout from 2020 to 2022. This implies that private banks increase new loan issuance more than government banks following the bailout. The results also hold when I do analysis at loan level. Additionally, I find that private banks issue significantly more new loans to risky borrowers compared to government banks after the bailout. This result

holds with industry-year-quarter and firm-year-quarter fixed effects, effectively controlling for unobservable demand factors by absorbing all time variant industry and firm characteristics, respectively. The results suggest that private banks not only increase new loan issuance at the aggregate level relative to government banks but also extend more new loans to high-risk borrowers post the unexpected bailout.

After providing evidence on risky new loan issuance by private banks post bailout, I examine bank risk for existing borrowers. At borrower-time level, I find that borrowers with greater exposure to private banks become riskier. I measure borrower risk using indicators based on interest coverage, Altman Z, and profit after tax (PAT). Another mechanism for higher risk-taking by banks is loan restructuring, which involves modifying loan terms (Caballero et al. (2008)). I find that private banks increase loan restructuring compared to government banks post the unexpected bailout. The increase in restructuring suggests higher risk-taking by private banks with existing borrowers.

After providing micro-level evidence on the drivers of risk taking, I examine aggregate bank risk with loan data. Using bank level data I find that private banks increase the proportion of new loans to borrowers with poor financial health after the unexpected bailout. Furthermore, private banks increase the proportion of active relationships with risky borrowers after the unexpected bailout. Collectively, these findings indicate a shift toward higher risk-taking behavior by private banks post-bailout.

I rule out alternative explanations as follows. The relative increase in risk-taking behavior by private banks post-bailout is not driven by their pre-existing exposure to COVID-19 industries, the series of government bank mergers, or the inclusion of too-big-to-fail (TBTF) banks. Furthermore, the increase in risk-taking behavior by private banks post-bailout may be attributed to heightened demand from risky borrowers rather than the decision by private banks to supply more loans to risky entities. Controlling for industry-year-quarter fixed effects reveals that within same industry-year-quarter private banks issue more new loans to risky firms and increase their exposure to risky borrowers through restructuring,

leading to higher default rates compared to government banks. Within a firm-year-quarter, private banks extend more loan amounts to financially distressed firms than government banks, indicating an increased preference of private banks for riskier borrowers after the event. These findings support the hypothesis that increase in risk for private banks is more likely due to private bank's changed incentives following the "Yes bank" bailout rather than the change in demand from borrowers.

My findings reveal that the unexpected rescue of a private banks induces increased risk-taking and lending by other private banks. This surge in risk-taking behavior suggests moral hazard induced due to a perceived increase in bailout likelihood. If the government maintains consistency in its actions, the unexpected rescue of the private sector bank would raise the likelihood of future rescues for other privately owned banks. The results underscore the broader negative externality associated with bailouts in the banking industry.

The literature closest to my paper examines the spillover effects of bank bailouts on competitor banks. Hakenes and Schnabel (2010) theorize that bailouts drive higher risk-taking among competitors due to intensified competition in the deposit market, a mechanism I term the "competition channel." Empirical studies, such as Gropp et al. (2011) and Cardillo et al. (2023), further support these spillover effects, attributing competitor banks' risk-taking to bailout-induced competitive pressures.

This paper extends the literature in three ways. First, I exploit an unexpected bailout as an exogenous shock to causally link changes in risk-taking to revised bailout expectations. Second, I disentangle the "competition" and "moral hazard" channels by leveraging India's mix of private and government banks, using a DID framework to isolate the moral hazard channel. Third, I utilize granular loan-level data with industry-year-quarter and firm-year-quarter fixed effects to control for demand-side and firm-level confounders, providing robust evidence on increased risk-taking by private banks post-bailout.

1.1 Related Literature and Contribution

Existing literature has predominantly focused on the moral hazard implications of government guarantees and bailouts, highlighting how these interventions can incentivize excessive risk-taking among the rescued banks by mitigating the full consequences of their actions. This is the classic risk shifting arising from moral hazard (Jensen and Meckling (1976)). However, systematic studies examining the spillover effects of such interventions on other financial institutions due to change in rescue likelihood are limited. This paper contributes to filling this gap by investigating how the unexpected rescue of a bank influences the risk-taking and lending behavior of other private banks.

My paper is related to several strands in the existing literature. The literature closest to my paper is one studying the spillover effects of bailouts on competitor banks. In a theoretical paper, Hakenes and Schnabel (2010) discuss the spillover effects of bail-outs on competitor banks.[5] They argue that bailouts drive higher risk-taking among the competitors of the rescued bank. This occurs because the anticipated bailout encourages the rescued bank to expand, intensifying competition in the deposit market, reducing margins for other banks, and thereby amplifying their risk-taking incentives. I call this the "competition" channel. Unlike the moral hazard channel, which impacts only private banks (as government banks do not adjust their perceived rescue likelihood in response to the unexpected bailout), the competition channel affects both private and government banks. Since my DID estimate captures the relative increase in risk-taking by private banks compared to government banks, my approach isolates and identifies the moral hazard channel.

Related empirical studies on the spillover effects of bank bailouts and capital infusions on competitor banks include Goldsmith-Pinkham and Yorulmazer (2010), Gropp et al. (2011), Calderon and Schaeck (2016), and Cardillo et al. (2023). Goldsmith-Pinkham and Yorulmazer (2010) does event study to study the effect of Northern Rock bailout on stock per-

[5] Acharya and Yorulmazer (2007) theoretically show that bailout incentivizes other banks, especially smaller banks, to herd and increase risk taking.

formance of other UK banks. Gropp et al. (2011) use bank-level data to demonstrate that competitor banks of those with higher bailout expectations increase risk-taking, attributing this behavior to the competition channel developed by Hakenes and Schnabel (2010). Calderon and Schaeck (2016) study the effect of capital infusions on banking competition. Similarly, Cardillo et al. (2023) apply a matching technique using bank-level data and show that competitor banks increase risk following unconditional government bailouts.

This paper extends the literature in three significant ways. First, I use the unexpected bailout of a private bank as an exogenous shock, a rare event likely to alter the rescue likelihood of other private banks. If the bailout is anticipated, competitor banks will not revise their perceived likelihood of rescue, and changes in risk-taking cannot be causally linked to the event. Second, I disentangle the competition and moral hazard channels by leveraging the unique mix of private and government banks in India. Competitor banks may increase risk after bailout due to heightened competitive pressure from the bailed-out bank's strengthened position in deposit and lending markets (competition channel). Alternatively, increased risk taking by competitor banks may result from higher bailout expectations triggered by the unexpected rescue of another bank (moral hazard channel). While both private and government banks are expected to respond to the competition channel, only private banks are likely to react to the moral hazard channel. By using a DID approach with private banks as the treatment group and government banks as the control group, I isolate the moral hazard channel.

Third, this paper expands the literature by utilizing granular corporate loan-level data at the bank-borrower-quarter level. By including industry-year-quarter and firm-year-quarter fixed effects, the analysis controls for confounding factors related to demand side influences and unobservable firm characteristics. The use of detailed data allows for a credible attribution of increased lending and risk-taking by private banks relative to government banks to changes in incentives of the banks after the bailout, effectively absorbing all time variant firm characteristics.

I also contribute to the strand of literature that studies the effects of capital infusions and bailouts on rescued banks' risk-taking and lending. A set of papers highlights the increase in risk taking by banks due to moral hazard problems from capital infusions (Flannery (1998); Sironi (2003)). Another set of papers suggests that capital infusions help rebuild the charter values of financially distressed banks, discouraging excessive risk-taking as failure would result in the loss of this higher charter value (Keeley (1990); Demsetz et al. (1996)). The empirical literature leans more strongly toward the moral hazard perspective. Studies on the implications of TARP show that TARP banks increased their risk-taking compared to non-TARP banks (Black and Hazelwood (2013); Duchin and Sosyura (2014); Behr and Wang (2020)). Evidence in other settings also show that government interventions, recapitalizations, and bailouts lead to increased bank risk-taking and introduce inefficiencies (Hryckiewicz (2014); Poczter (2016); Chari and Kehoe (2016)). My paper contributes to this strand of literature by demonstrating that the unexpected bailout of a single bank not only changes the behavior of the rescued institution but also induces risk-taking in other banks due to heightened bailout expectations.

Furthermore, I contribute to the literature that studies deposit insurance and too-big-to-fail (TBTF) banks. Merton (1977) shows that banks near financial distress are incentivized to take greater risks under deposit insurance, as the guarantee acts like a put option exercisable at default. Similarly, capital infusions serve as put options, encouraging riskier behavior since banks can rely on such support if they default. The market's perception of a bank's risk can also depend on its size. The Comptroller of the Currency's 1984 statement that some institutions are TBTF and that full deposit insurance would be provided to those banks acted as a positive wealth event for banks considered to be TBTF (O'hara and Shaw (1990)). Research shows that banks are incentivized to grow, both organically and inorganically, to become TBTF and enjoy the implicit safety net of government support (Strahan (2013)). Davies and Tracey (2014) finds that apparent economies of scale at very large banks vanish when adjusting for TBTF subsidies. Furfine (2006) studies the LTCM collapse and finds

that borrowing costs of large financial institutions fell after the LTCM rescue, suggesting the market perception of TBTF increased as a result of the Fed's intervention in 1998. This safety net encourages excessive risk-taking, which can destabilize the economy (Stern and Feldman (2004)). I contribute to this strand of literature by demonstrating that non-TBTF banks also respond to the bailout of another non-TBTF bank by increasing risk-taking, extending the scope of TBTF incentives to smaller institutions.

Finally, I contribute to the broader literature on the implications of bank risk, which is a significant concern due to its systemic consequences. Excessive bank risk can lead to bank failures, harming borrowers (Peek and Rosengren (2000); Ashcraft (2005)) and potentially triggering financial crises through spillover effects (Allen and Gale (2000)). Such crises disrupt financial markets and lead to real effects in terms of lower economic growth (Bernanke (1983)). I contribute to this broad strand of literature by demonstrating how the unexpected bailout of a single bank influences the risk-taking behavior of other banks by increasing bailout expectations for those banks. This underscores the broader economic risks associated with unexpected bank bailouts.

In the following paper, section 2 describes the institutional details. Section 3 presents the conceptual framework and hypothesis. Section 4 provides details on data. Section 5 discusses the main results. Section 6 provides evidence on mechanisms. Section 7 discussed alternate explanations and robustness. Section 8 concludes.

2 Institutional Details

2.1 "Yes bank" failure

The event that I study in this paper unfolded in March 2020. "Yes bank" was the eighth largest bank in India in March 2018. It suffered from increasing bad loans and decreasing capital ratios since the Reserve Bank of India's (RBI) asset quality reviews in 2017 and 2018. The bank had significant exposure to distressed borrowers. A critical moment came on 10

January 2020 when one independent director resigned from the bank's board, citing poor corporate governance. The stock price started declining steadily, and depositor withdrawal increased.

The pivotal moment happened on the evening of 5 March 2020, when RBI imposed a moratorium confining the bank's normal operations. RBI removed all board members and management of the bank. The bank's depositors were restricted from withdrawing more than ₹50,000 ($700) from their accounts for thirty days. The market, in anticipation of the bank's collapse, reacted negatively as the stock price of the bank declined by more than 55% from ₹37 to ₹16 on the next trading day. Three major credit agencies-Brickwork, CARE, and ICRA- downgraded the debentures of "Yes bank" to default, the lowest possible rating (Table 1). ICRA also downgraded the certificate of deposit of "Yes bank" to Default.[6]

2.2 Unexpected rescue of "Yes bank"

The market reaction combined with downgrading deposits to default by credit rating agencies suggests little or no expectation of rescue. On 6 March 2020, RBI initiated a reconstruction scheme for "Yes bank". A week later, on 13 March 2020, "Yes bank" was bailed out as part of the RBI scheme by a group of eight banks led by India's largest government-owned bank, the State Bank of India (SBI). SBI injected around 70% of rescue capital, and other seven banks injected the remaining 30% of rescue capital. As part of the rescue plan, 75% of shares held by existing shareholders were locked in for three years. If the number of shares held by old shareholders is less than 100, then there is no lock-in. Shares purchased after 13th March are not locked in. SBI infused capital of ₹60.5 billion for around 35% stake in "Yes bank". Eight banks, including SBI, picked up almost 49% of "Yes bank" stocks for ₹10 per share by infusing ₹100 billion in "Yes bank". For three years, they were mandated to hold at least 75% of their shares bought as part of the rescue plan.

[6]ICRA does not explicitly state if they only consider uninsured deposits when rating instruments. On the other hand, CARE Ratings typically rates certificates of deposit (CDs) one notch higher due to the added stability provided by deposit insurance.

The market reacted positively to the rescue as the stock price of "Yes bank" jumped more than 100% from ₹26 to ₹54 in the next four trading days (Figure 1). Furthermore, ICRA upgraded the rating for "Yes bank" debenture from D (Default) to BB+ (Inadequate Safety) as shown in Table 1. The tremendous positive response by the market and rating upgrade by credit rating upgrade indicates an unexpected rescue of the Bank. The sharp positive reaction by the market where the stock price of "Yes bank" more than doubled and ended up even higher than the pre-rescue price level highlights the unexpected nature of the rescue by the government. Furthermore, the credit rating agencies also upgraded the "Yes bank's" bond rating by multiple notches post-rescue. It implies that the market and other agents such as rating agencies were not expecting the rescue of "Yes bank". This allows me to use the unexpected rescue of the Bank as an exogenous shock to other banks, and their customers.

2.3 Indian Banking System

The Indian banking system is a mix of public sector banks, private sector banks, foreign banks, cooperative banks, and regional rural banks. The Reserve Bank of India (RBI) is the central bank and regulator of the Indian banking system. Public sector banks used to dominate the Indian banking system. However, over the years, the share of private sector banks has grown. Indian economy greatly relies on banks for credit, with over 50% of financial assets owned by banks.[7] This is due to the underdeveloped corporate bond market and the limited availability of alternative sources of finance (Ganguly (2019)). This has also led to several challenges, such as high levels of non-performing assets (NPAs), which have impacted banks' profitability and lending capacity.

[7]See https://data.bis.org/topics/TOTAL_CREDIT/tables-and-dashboards

2.4 Private Sector Banks versus Government Banks

The Indian banking sector can be broadly classified based on ownership into two main categories: private sector and government banks. As the name suggests, private sector banks are owned by private entities, whereas government banks have more than 50% direct or indirect ownership by the state.

Distressed government banks in the last two decades have been bailed out by either merger with bigger and better-performing government banks or capital infusion. However, this does not hold for private banks. Historically depositors' money has mostly been protected (although not timely), but shareholders of private banks have taken the brunt and in many scenarios lost all value. "Yes bank" rescue was a rare case when a government-owned institute injected capital into a failed private bank, avoiding the destruction of existing shareholder wealth. This sets a precedent that may lead other banks to expect similar treatment in the future. If banks anticipate that their shareholders will be protected in the event of failure, they may engage in riskier lending practices or financial behaviors, knowing that the downside risks are mitigated by potential government bailouts. With the implicit guarantee of government support, banks may lower their lending standards, leading to an accumulation of riskier assets on their balance sheets.

3 Conceptual Framework and Hypotheses

This research investigates changes in bank risk driven by moral hazard following an unexpected bailout. Using the unexpected rescue of a private bank as a natural experiment, the study examines how such interventions affect other private banks' behavior. By raising bailout expectations, the intervention may incentivize risk-taking, insulating banks from the consequences of failure through implicit or explicit rescue guarantees.

The "Yes Bank" bailout provides a unique context, as it marked an unprecedented government capital infusion into a failing private bank without eroding shareholder value. This

intervention likely alters future bailout expectations for private banks due to their historical treatment. Since government banks already receive multiple capital infusions and benefit from rescue guarantees, they are not expected to revise their perceived likelihood of rescue in response to this unexpected bailout. This study analyzes how private banks adjust their risk-taking behavior relative to government banks. In line with the conceptual framework, I develop the following hypotheses.

Hypothesis 1: Unexpected bailout will induce other private banks to increase risk. The unexpected rescue of a failed bank increases the perceived likelihood of rescue for private competitor banks. Cross-sectional transmission of moral hazard would occur if the response to the unexpected rescue is consistent across private banks. Since government banks already have implicit and explicit bailout guarantees from the government, only private banks are expected to revise their perceived likelihood of receiving a bailout. This safety net reduce the extent to which private banks bear the costs of their risk-taking while allowing them to reap all the associated benefits (Farhi and Tirole (2012)). As a result, banks are incentivized to increase risk.

Hypothesis 2: The unexpected bailout of "Yes bank" will lead to increased risk-taking by not only private banks similar to "Yes bank", but also by other private banks. The unexpected rescue of "Yes bank" is likely to prompt private banks of comparable or larger size to update their perceived likelihood of being rescued, as size is closely associated with systemic risk. Banks of similar or greater size are naturally seen as having equal or higher systemic importance. Additionally, Acharya and Yorulmazer (2007) argue that the "too-many-to-fail" phenomenon incentivizes even smaller banks to herd and take on more risk. Furthermore, the unexpected bailout of a private bank might signal to other private banks that they are deemed systemically important, reinforcing their belief that they can rely on government support during times of distress.

Hypothesis 3: Low-capitalized and smaller private banks will respond more to changed incentives arising from an increased likelihood of bailout. Smaller and low-capitalized banks

generally have weaker financial buffers, making them more susceptible to adverse market conditions. If they perceive an increased likelihood of being bailed out, they might be more willing to take on additional risk since the potential downside of failure appears to be reduced (Merton (1977)). This can lead to riskier lending practices, as the perceived safety net diminishes the fear of insolvency.

Hypothesis 4: Private banks will have a higher volume of outstanding loans following the unexpected bailout. The bailout creates a perception that private banks will receive government support during distress, reducing the risks of aggressive lending. This safety net encourages private banks to extend credit more confidently, knowing severe consequences are less likely. By relaxing credit standards, such as lowering collateral requirements, banks can broaden their customer base, driving a significant increase in lending activity.

4 Data and Sample Selection

To test the hypothesis, I obtain accounting and stock price information for firms and banks from the Prowess database maintained by the Centre for Monitoring Indian Economy (CMIE), which contains audited financial statements and stock trading data for both banks and firms.

I gather loan-level and restructuring data from the database maintained by the Ministry of Corporate Affairs (MCA) under the Government of India. The MCA data encompasses all registered secured loans. Non-registration of a loan results in the loss of certain privileges associated with secured loans, making it likely that nearly all secured loans are registered. The MCA data provides details such as the identities of both lenders and borrowers, the loan amount, the date of disbursal, any restructuring dates, and the final loan repayment date. The database does not provide information on interest rates or loan performance.

Details on variable definitions, sample construction, and summary statistics are presented in Table A.1, Table A.2, and Table 2, respectively.

5 Results

My research objective is to study the change in banks' risk in response to bailout expectation updates induced by the unexpected rescue of a competitor bank. The central hypothesis of my paper explores the impact of a private bank's unexpected rescue on the risk-taking of other private banks. In this section, I examine the causal effect of the unexpected bailout on the risk-taking of private banks relative to government banks (control group), using difference-in-differences (DID) analyses with fixed effects.

5.1 Moral hazard transmission

In the first result I regress measures of bank risk, on the interaction between post-event and Private bank indicators. This is a standard difference in the difference model with private sector banks (Private) as a treated group and government banks as a control group. I use the below specification to test the hypothesis and measure moral hazard transmission:

$$Bank\,Risk_{i,t} = \alpha + \beta_1 Private_b + \beta_2 Post_t + \beta_3 Private_b \times Post_t + \beta_4 X_{b,t} + \gamma_b + \lambda_t + \epsilon_{b,t}, \tag{1}$$

where $Bank\,Risk_{i,t}$ is the main dependent variable for bank b in the quarter (or month) t proxied by non-performing assets (NPA) and monthly stock return volatility. Explanatory variables are $Post_t$ and $Private_b$. $Post_t$ takes a value of 1 if the period t is greater than March 2020, otherwise 0. $Private_b$ takes a value of 1 if bank b is a private sector bank, otherwise 0. The main coefficient of interest is β_3. It will give average treatment effect for the treated (ATT) for the private sector bank as a treated group and treatment as the moral hazard shock arising due to the unexpected bailout of "Yes bank". Private is an indicator for private sector banks. $X_{b,t}$ is bank-level control vector that has one-year lagged values of log of bank assets, log of bank deposits, capital ratio, and return on assets (ROA). γ_b is bank fixed effect, and λ_t is the time fixed effect. The standard errors are clustered bank level.

The coefficient on the interaction term $Private_b \times Post_t$ is the key variable of interest. In columns 1 and 2 of Table 3, I estimate OLS without bank level controls. This is the baseline specification. To partially address endogeneity issues arising due to confounding by unobservable bank measures and time effects, in my tightest specification, I use bank fixed effects and year-quarter fixed effects in columns 5 and 6 of Table 3. In all six specifications, I find the coefficient on interaction term as positive and significant at the 1% level. This implies that post-bailout of "Yes bank", private sector banks' risk increased by 3.358 percentage points more than the risk change in the control group. This is a more than 40% increase in risk compared to the unconditional mean risk of banks. The increase in risk is economically significant.

I also consider bank stock volatility as another measure of bank risk. Stock volatility measured at a monthly frequency is a more concurrent market-based measure of bank risk. Furthermore, monthly volatility has a higher frequency compared with NPA which is reported only at the quarterly level. The findings with stock market volatility as the bank risk measure are shown in Table A.3. In all six specifications, I find the coefficient on interaction term as positive and significant at the 1% level. The qualitative results hold with the new risk measure as I observe a 0.4 percentage points increase in stock market volatility after the unexpected bailout of "Yes bank". This is a 16% increase in risk compared to the unconditional mean stock market volatility of banks. The increase in risk is economically significant.

I find that the magnitude of the result does not depend on the fixed effects used. Therefore, one can reasonably conclude that the unexpected bailout of the private bank leads to an increase in the risk of other private banks relative to control banks.

5.2 Pretrends

To address any concerns relating to the possibility that my results represent a continuation of a pre-existing trend, I modify the difference-in-differences (DID) specification to include

variables that account for pre-trends, i.e., indicator variables representing quarters before and after the "Yes bank" rescue. The dynamic DID regression specification is as follows:

$$Bank\,Risk_{b,t} = \alpha + \sum_{k=-9}^{-2} \beta_k Pre_{k_t} + \sum_{j=0}^{8} \beta_j Post_{j_t} + aX_{b,t} + \gamma_b + \lambda_t + \epsilon_{b,t}, \tag{2}$$

where $Bank\,Risk_{i,t}$ is the dependent variable for bank b in the quarter (or month) t proxied by non-performing assets (NPA). The main explanatory variables are Pre_{k_t} and $Post_{j_t}$. Pre_{k_t} takes a value of 1 for treated banks k quarters before the rescue of "Yes bank"; zero for all other observations. $Post_{j_t}$ takes a value of 1 for treated banks j quarters after the rescue of "Yes bank"; zero for all other observations. The coefficients of interest are β_i for $\forall\, i \in \{-9, 8\}$. $X_{b,t}$ is bank-level control vector that has one-year lagged values of log of bank assets, log of bank deposits, capital ratio, and return on assets (ROA). γ_b is bank fixed effect, and λ_t is time fixed effect. The standard errors are clustered bank level.

The trend plot is shown in Figure 2. They measure the risk difference between private and government banks over time. In Figure 2, we see that the risk difference between private and government banks was stable before the unexpected bailout, suggesting no pre-trend.[8] After the bailout, NPA for private banks consistently increased compared to government banks. The increase in NPA for private banks touches 5 percentage points after around 6 quarters and stabilizes. The increase in the risk of private banks does not reverse even after 12 quarters. This suggests a lasting impact and a permanent shift in equilibrium.

5.3 Both close and non-close banks to "Yes bank" increase risk

I find that all private banks increase risk in response to the unexpected bailout of "Yes bank". This result is new and a slight departure from the existing understanding. As per the dominant view, the closest peers of "Yes bank" are those who are likely to draw the

[8] I also conduct dynamic difference-in-differences analysis using *stock return volatility* as an alternative measure of bank risk. I find no pre-trend and significant increase in monthly return volatility for private banks relative to government banks after the unexpected bailout.

strongest signal about the prospects of future bailouts. Therefore, the effect of "Yes bank's" unexpected rescue should have the strongest impact on the closest banks. However, if all private banks change their expectation of rescue, then we should see an increase in risk for all private banks even after controlling for the closest peers. I use the below specification to test the hypothesis:

$$Bank\,Risk_{b,t} = \alpha + \beta_1 Private_b \times Post_t + \beta_2 Closest\,3/5_b \times Post_t + aX_{b,t} + \gamma_b + \lambda_t + \epsilon_{b,t}, \tag{3}$$

where $Closest\,5_b$ takes the value of 1 for the 5 closest privately owned non-TBTF banks to "Yes bank" based on asset size in March 2019, and zero otherwise. $Closest\,3_b$ takes the value of one for the 3 closest private banks to "Yes bank" based on asset size in March 2019, and zero otherwise. The remaining variables are as defined in equation Equation 1. The results are shown in Table 4 with NPA as a measure of bank risk.[9] I control for the $Closest\,3_b$ and $Closest\,5_b$ private banks to "Yes bank" based on Asset size in March 2019. The main coefficient of interest β_1 for $Private_b \times Post_t$ remains unchanged in columns 2 and 3, implying that the unexpected bailout changes incentives for all private banks, irrespective of whether a private bank is a close peer of "Yes bank".

I do subsample analysis in columns 4 to 6. Column 4 (5) contains only the closest 3 (5) private banks and all government banks. Column 6 only has non-close private banks along with all government banks. The main coefficient of interest β_1 for $Private_b \times Post_t$ is positive and significant in all three columns, implying that post the unexpected bailout, all private banks – close and non-close- increase risk relative to government banks.

[9]In Table A.4 I present result with return volatility as an alternate measure of bank risk. The results hold with both measures of risk.

5.4 Do only low-capitalized and small private banks increase risk?

Is the effect only concentrated for low-capitalized and smaller private banks? Riskier banks that are close to failure are expected to respond more to changed incentives arising from an increased likelihood of bailout. To answer the question I regress bank risk on triple interaction of private, post, and lagged bank characteristics. The specification is as follows:

$$\begin{aligned} Bank\,Risk_{i,t} = \alpha + \beta_1 Private_b \times Post_t + \beta_2 Bank\,Characteristics_{b,t} \\ + \beta_3 Private_b \times Bank\,Characteristics_{b,t} \\ + \beta_4 Post_t \times Bank\,Characteristics_{b,t} \\ + \beta_5 Private_b \times Post_t \times Bank\,Characteristics_{b,t} \\ + aX_{b,t} + \gamma_b + \lambda_t + \epsilon_{b,t}, \end{aligned} \tag{4}$$

where $Bank\,Characteristics_{b,t}$ are time-varying one-year lagged features of banks, namely, $Small\,Bank_{b,t}$ and $High\,Capital_{b,t}$. The results with $NPA_{b,t}$ as the dependent variable are shown in Table 5.[10] In columns 1 and 2 I include a $Small\,Bank$ indicator which takes the value of 1 if bank assets are below the median in the one-year lagged period. In columns 3 and 4 I include a $High\,Capital$ indicator which takes the value of 1 if the bank capital ratio is above the median in the lagged period. In columns 5 and 6 I include both $Small\,Bank$ and $High\,Capital$. The remaining variables are defined in Equation 1. The main coefficient of interest β_1 for $Private_b \times Post_t$ remains positive and significant in all 6 columns. β_5, coefficients of $Private_b \times Post_t \times Bank\,Characteristics_{b,t}$, is insignificant in all 6 columns. The results imply that the unexpected bailout induces all private banks to increase risk, irrespective of whether a private bank is small or large, and low capital or high capital.

In columns 1, 2, 5, and 6, the positive coefficient on $Private_b \times Post_t \times Small\,Bank_{b,t}$ although insignificant, suggests that small banks increase risk more than large private banks.

[10] I also conduct my empirical analysis using *stock return volatility* as an alternative measure of bank risk. The results are qualitatively similar.

In columns 3, 4, 5, and 6, the negative coefficient on $Private_b \times Post_t \times High\,Capital_{b,t}$ although insignificant, suggests that the low-capitalized banks increase more risk than high-capitalized banks.

6 Mechanism

Having established that after the unexpected rescue of "Yes bank", other private banks are more likely to increase risk than government banks, I next analyze the mechanism driving the phenomena.

6.1 Private banks increase the size of the loan portfolio

How do private banks respond to changed incentives? Do they increase the size of their loan portfolios? To test whether private banks increase the size of their loan portfolios I use secured corporate loan data at the bank-borrower-quarter level from 2017 to 2022. The data contains all private and public borrowers.[11] I regress the log of the outstanding loan amount on the interaction of post and private. The specification is as follows:

$$Y_{b,f,t} = \alpha + \beta Post_t \times Private_b + aX_{b,t} + \gamma_b + \lambda_t + \delta_{j,t} + \theta_{f,t} + \epsilon^j_{b,f,t}, \tag{5}$$

where b subscripts bank, f subscripts firms, t subscripts quarter, and j superscripts industry. The dependent variable $Y_{b,f,t}$ is $Loan\,Outstanding_{b,f,t}$, which is the log of loans outstanding for a firm-lender pair in quarter t. γ_b is bank fixed effect, λ_t is year-quarter fixed effect, $\delta_{j,t}$ is industry-year-quarter fixed effect, and $\theta_{f,t}$ is firm-year-quarter fixed effect. The remaining variables are as defined for Equation 1.

The results are shown in Table 6. The coefficient on the interaction term $Post_t \times Private_b$ is positive in all 6 columns. The coefficient is statistically significant in all the columns ex-

[11] I also conduct an empirical analysis on the subsample comprising only public borrowers. The results remain qualitatively similar.

cept column 6. It implies that private banks increase the size of their portfolio compared to government banks. Columns 1 and 2 are the baseline specification with year-quarter and bank fixed effects. In columns 3 and 4 I include industry-year-quarter and bank fixed effects to control for time-variant industry factors and time-invariant bank factors, respectively. Within an industry-year-quarter private banks increase loan size by 4.1 percentage points compared to government banks. In columns 5 and 6 I include firm-year-quarter and bank fixed effects, controlling for time-variant firm factors and time-invariant bank factors, respectively. Within a firm-year-quarter private banks increase loan size by 5.5 percentage points compared to government banks. This suggests that private banks increase the size of their loan portfolios.

6.2 Private banks increase loan outstanding to risky borrowers

Moral hazard would induce banks to benefit from increased risk-taking. In the previous subsection, we saw that private banks increased their loan portfolio relative to government banks. If the increase in loan portfolio concentrates on low-risk borrowers, the overall risk for private banks should decrease. To test whether private banks increase the risk of their loan portfolio, I do sub-sample analysis for risky borrowers using corporate loan data at the bank-borrower-quarter level from Q1 2017 to Q3 2022. Since I do not have risk measures for private companies, I do risk analysis only for public listed borrowers.

The previous subsection 6.1 does not tell us whether private banks have increased outstanding loan size to marginally risky borrowers compared to government banks. It could be the case that although private banks have increased exposure to more borrowers, the exposure to risky borrowers is less. To test whether private banks' increased loan exposure to risky borrowers I run Equation 1 on a sub-sample of risky borrowers. A borrower is identified as risky if its Profit Before Interest and Taxes (PBIT) is less than zero, or Profit After Tax (PAT) is less than zero, or Interest Coverage Ratio (ICR) is less than 1.

The results of the subsample analysis for risky borrowers are shown in Table 7. Columns 1

and 2 are the baseline specification with year-quarter and bank fixed effects. In columns 3 and 4 I include industry-year-quarter and bank fixed effects to control for time-variant industry factors and time-invariant bank factors, respectively. In the tightest specification in column 6, I include firm-year-quarter and bank fixed effects along with bank control variables. In the baseline specification, I find that that private banks increase loan exposure to risky borrowers by 13.1 percentage points compared to government banks. Within an industry-year-quarter private banks increase loan exposure to risky borrowers by 9.2 percentage points compared to government banks. Within a firm-year-quarter private banks increase loan exposure to risky borrowers by 14.3 percentage points compared to government banks. The coefficient on the interaction term $Post_t \times Private_b$ is positive and statistically significant in all 6 columns. This implies that private banks increase the size of their loan exposure to risky borrowers relative to government banks.

Additionally, the coefficients of Table 7 are at least twice as large as those of Table 6. This suggests that, compared to government banks, private banks increase the size of their loan portfolios more for risky borrowers compared to less risky borrowers. In other words, private banks not only increase loan outstanding to riskier borrowers, but they also increase their exposure to risky borrowers at a rate that exceeds the rate at which they increase loan exposure to other borrowers.

6.3 Borrowers exposed to private banks become more risky

Do borrowers with more exposure to private banks become more risky after bailout? To address the question I run the following specification on firm-year-quarter data from Q1 2017 to Q3 2022:

$$Borrower\,Risk_{f,t} = \alpha + \beta Private\,exposure_{f,t} \times Post_t + \lambda_t + \delta_j + \theta_f + \epsilon^j_{f,t}, \qquad (6)$$

where j represents industry, f represents firm, and t represents quarter. The dependent variables are indicators based on interest coverage, Altman Z, profit after tax (PAT). λ_t is time fixed effect, δ_j is industry fixed effect, and θ_f is firm fixed effect. The coefficient of interest is β. The results are shown in Table 8.

In columns 1 and 2, the dependent variable, interest coverage, takes the value of 1 if the firm's interest coverage is below the median for the period, and zero otherwise. In columns 3 and 4, the dependent variable, Altman Z, takes the value of 1 if the firm's Altman Z is below the median for the period, and zero otherwise. In columns 5 and 6, the dependent variable, I(PAT), takes the value of 1 if the firm's PAT is below zero for the period, and zero otherwise. The main explanatory variable $Private\,exposure_{f,t}$ represents the proportion of the borrower's outstanding loans with private banks. For example, if a borrower has a total of ₹100 in outstanding loans, and ₹62 of those are with private banks, *Private Exposure* would take a value of 0.62.[12] The remaining variables are as defined for Equation 1.

In all six columns, the main coefficient of interest, β, on $Private\,exposure_{f,t} \times Post_t$ is positive and significant. In my most conservative estimates, shown in columns 1, 4, and 6, increasing a firm's exposure to private banks from 0 to 1 is associated with a 3.3 percentage point higher likelihood of below-median interest coverage, a 4.1 percentage point higher likelihood of below-median Altman Z-score, and a 1 percentage point higher likelihood of negative profits after the unexpected bailout. These findings suggest that firms with greater exposure to private banks increase risk following the unexpected bailout of "Yes bank".

6.4 Private banks extend more new loans to risky borrowers following the unexpected bailout

In the above subsection, we saw that private banks increased the size of their loan portfolio, and tilted the portfolio toward risky borrowers post the unexpected bailout of "Yes bank".

[12] I also conduct my empirical tests using an alternative measure $Private\,exposure\,2_{f,t}$, defined as the proportion of the borrower's relationship with private banks. The results, as shown in Table A.5, are qualitatively similar.

In this section I will analyze whether the increased loan portfolio and tilt toward risky firms is driven by new loans. To test whether private banks issue more new loans I use secured corporate new loan data for private and public borrowers at the bank-borrower-quarter level from 2017Q1 to 2022Q3. The data contains all private and public borrowers. I start by analyzing the share of new secured corporate loans issued by government and private banks before and after the unexpected bailout of "Yes Bank." The results are illustrated in Figure 3. The share is calculated relative to the total new corporate loans issued by scheduled commercial banks, both government and private banks. The 'before' period covers Q1 2017 to Q4 2019, while the 'after' period covers Q1 2020 to Q3 2022.

The share of government banks is depicted in *blue*, while the share of private banks is shown in *orange*. The pie chart on the left indicates the share of new loan issuance before the unexpected rescue. The pie chart on the right indicates the share of new loan issuance after the unexpected rescue. The share of new loans issued by private banks increases from 40.98% before the bailout to 52.06% after the bailout. This implies that private banks issued more new loans than government banks after the bailout. This suggests that private banks increase the size of their loan portfolios as they issue more new loans than government banks.

To test whether private banks' increased new loan issuance concentrates only on less risky borrowers I regress $NewLoan_{b,f,t}$ on triple interaction of $Private_b \times Post_t \times Risky\,Borrower_{f,t}$. For firm health, I use three indicators, namely, $PBIT < 0$, $PAT < 0$, and $ICR < 1$. $PBIT < 0$ is a dummy variable that equals one for firm-quarters where Profit Before Interest and Taxes (PBIT) is negative, and zero otherwise. $PAT < 0$ is a dummy variable that equals one for firm-quarters where Profit After Taxes (PBIT) is negative, and zero otherwise. $ICR < 1$ is a dummy variable that equals one for firm-quarters where the Interest Coverage Ratio (ICR) is less than 1, and zero otherwise.

Using the above measures, I estimate the following regression specification:

$$Y_{b,f,t} = \alpha + \beta_1 Post_t \times Private_b + \beta_2 Risky\,Borrower_{f,t} + \beta_3 Private_b \times Risky\,Borrower_{f,t}$$

$$+ \beta_4 Post_t \times Risky\,Borrower_{f,t}$$
$$+ \beta_5 Private_b \times Post_t \times Risky\,Borrower_{f,t} + aX_{b,t} + \gamma_b$$
$$+ \lambda_t + \delta_{j,t} + \theta_{f,t} + \epsilon^j_{b,f,t}, \tag{7}$$

where b subscripts bank, f subscripts firms, t subscripts quarter, and j superscripts industry. The dependent variable $Y_{b,f,t}$ is $NewLoan_{b,f,t}$, which is an indicator variable that takes a value of one if the bank b gives a fresh loan to the borrower f in the quarter t, zero otherwise. γ_b is bank fixed effect, λ_t is time fixed effect, $\delta_{j,t}$ is industry-year-quarter fixed effect, and $\theta_{f,t}$ is firm-year-quarter fixed effect. The remaining variables are as defined for Equation 1. The coefficient of interest is β_5. The triple interaction coefficient informs us about the additional number of new loans that private banks issue to risky borrowers compared to government banks, over and above any differences in lending to safe borrowers.

I use secured corporate loan data at the bank-borrower-quarter level from Q1 2017 to Q3 2022 for public firms because I do not have risk measures for private companies. The results are shown in Table 9. $Risky\,Borrower_{f,t}$ is represented using three indicators, namely, $PBIT < 0$ in columns 1 and 2, $PAT < 0$ in columns 3 and 4, and $ICR < 1$ in columns 5 and 6. A $Risky\,Borrower_{f,t}$ value of one indicates a risky borrower.

Across all 6 columns the coefficient on $Private_b \times Post_t \times Risky\,Borrower_{f,t}$h is positive and statistically significant at 1% level. This indicates that new lending relationships are concentrated among riskier firms. The results in this section suggest that private banks not only issue more new loans than government banks at the aggregate level but also extend more new loans to high-risk borrowers.

6.5 Loan portfolio of private bank tilts towards riskier borrowers

Do private banks increase the proportion of loans to firms with poor financial health after the unexpected bailout? To test the hypothesis I run Equation 1 on bank-quarter data from Q1 2017 to Q3 2022 with $Portfolio\,Risk_{b,t}$ as the dependent variable. The dependent

variables are loan size-weighted averages of risk indicators based on Profit Before Interest and Tax (PBIT), interest coverage ratio (ICR), and Profit After Tax (PAT). The results are shown in Table 10. In columns 1 to 3, the weighting is based on the loan outstanding of the borrower f with a bank b in quarter t. In columns 4 to 6, the weighting is based on the total new loan amount granted to the borrower f by the bank b in quarter t. In columns 1 and 4, the dependent variable is the loan size-weighted average of the $PBITindicator$, which takes the value of 1 if the firm's PBIT is below the median for the financial year, and zero otherwise. In columns 2 and 5, the dependent variable is the loan size-weighted average of the $Interestcoverageindicator$, which takes the value of 1 if the firm's interest coverage is below the median for the financial year, and zero otherwise. In columns 3 and 6, the dependent variable is the loan size-weighted average of the $PATindicator$, which takes the value of 1 if the firm's PAT is below zero for the financial year, and zero otherwise.

The coefficient on $Post_t \times Private_b$ is positive for all 6 columns, and statistically significant for 4 columns. This implies that Private banks not only increase the size of their loan portfolio but also make marginally more loans to risky borrowers. The above results suggest that private banks increase the proportion of active relationships with poor financial health firms after the unexpected bailout.

6.6 Private banks increase restructuring

Restructuring of loans involves modification of loan terms to help borrowers who are facing financial difficulty. More restructuring suggests a higher risk-taking by banks with existing borrowers and zombie lending.[13] In the above subsection 6.4, we saw that banks give more risky new loans. What about the existing borrowers? Do private banks do more loan restructuring compared to government banks post the unexpected bailout? To test for restructuring I run Equation 5 on bank-borrower-quarter data from Q1 2017 to Q4 2022 with $Restructuring_{b,f,t}$ as the dependent variable, which is an indicator variable that takes

[13]See Caballero et al. (2008)

a value of one if the bank b restructures a loan to the borrower f in the quarter t, zero otherwise. The results are shown in Table 11.

The coefficient on the interaction term $Post_t \times Private_b$ is positive and significant in the first four columns. Column 1 is the baseline specification with bank and quarter fixed effects. Positive and significant coefficient implies that private banks do more restructuring of loans compared to government banks after the unexpected bailout. The coefficient remains positive on inclusion of industry-year-quarter fixed effects in columns 3 and 4. This implies that private banks do more restructuring of loans within an industry-year-quarter.

When firm-year-quarter fixed effects are included in the analysis in columns 5 and 6, the coefficient of interest becomes insignificant. This shift suggests that, within the same firm, private banks do not significantly increase restructuring efforts compared to control banks. This observation implies that the relationship observed without these fixed effects might be driven by differences across firms within a period rather than by any actions taken within the same firm in the same period.[14]

One interpretation is that private banks might be selecting riskier firms within an industry-year-quarter, targeting borrowers that are already vulnerable. Additionally, these findings hint at the possibility that private banks may be influencing their existing borrowers to become riskier over time. For example, through the type of financial products they offer or by being more lenient in monitoring, private banks could indirectly contribute to the increased risk profile of their borrowers. However, when controlling for time variant firm factors, there is no evidence that private banks are engaging in more restructuring within the same firm-period compared to control banks.

It is important to interpret the firm-year-quarter fixed effect results in columns 5 and 6 with caution. Adding firm-year-quarter fixed effects reduces the dataset by over 25%, potentially affecting the robustness of the conclusions. Despite this limitation, the overall direction of the regression does not support the notion that private banks systematically push

[14]The coefficient of interest remains positive and significant on including firm fixed effects.

for increased restructuring for the same firm within the same period compared to control banks. Instead, the results suggest that any observed riskiness may be more related to which firms private banks choose to engage with across time and in an industry-quarter rather than how they treat those firms in a particular period.

7 Alternate Explanations and Robustness

7.1 COVID-19 exposure before pandemic

The unexpected bailout of "Yes bank" happened in March 2020. Post bailout period of "Yes bank" coincides with COVID-19. The increase in risk for private banks relative to government banks could be due to more exposure of private banks to borrowers belonging to industries that were affected most during COVID-19. If the ex-ante lending portfolio of private banks has more share of industries sensitive to COVID-19 then the main result of increasing risk of private banks could be driven by COVID-19 shock rather than moral hazard induced by increased likelihood of bailout. I test whether my results are driven by more exposure of private banks to COVID-19-exposed industries.

In 2020 Kamath committee identified 26 industries that needed additional support and debt relief due to more exposure to COVID-19 shock. The list includes sectors such as Hotels, restaurants, Tourism, Automobiles, Auto components, Aviation, Construction, Consumer durables, and Jewellery.[15] I estimate equation Equation 1 on Bank-Quarter level data for period from Q1 2017 to Q4 2019 with $COVID\,exposure_{b,t}$ as dependent variable to test whether private banks are more exposed to COVID-19 sensitive industries than state banks before the bailout. The results are shown in columns 1 to 3 of Table 12.

$COVID\,exposure_{b,t}$ represents the proportion of a bank's outstanding loans to COVID-sensitive industries as identified by the Kamath Committee. For instance, if a bank has

[15] More details in https://www.rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=1157

a total of ₹100 in outstanding loans, and ₹53 of those loans are held by firms in COVID-sensitive industries, "COVID exposure" would take a value of 0.53. The independent variable is $Private_b$ which takes a value of 1 for private banks, and zero otherwise. Since the sample includes only the pre-bailout period, $Post_t$ is zero for all observations and is therefore omitted from the results.

We are interested in the coefficient on Private banks. If the coefficient is positive and significant then that would imply that private banks have a higher share of relationship with borrowers belonging to COVID-19-affected industries. In columns 1 to 3 of Table 12, I find no positive association between private banks and exposure to COVID-19 affected industries pre-pandemic. This means that private banks do not have more exposure to COVID-19 industries compared with government banks.[16]

This implies that private banks do not have a greater proportion of active relationships or outstanding loans to COVID-19 industries before the bailout and COVID-19 pandemic. This suggests that my main results of private banks increasing risk relative to the risk of government banks are not mechanically driven by private bank's more ex-ante exposure to COVID-19 sensitive industries.

7.2 Increase in exposure to COVID-19 industries after bailout

In the above section, we have seen that before the unexpected bailout of "Yes bank" and before the pandemic private banks did not have more exposure to COVID sensitive industries. However, post-bailout private banks could increase their exposure to the risky COVID-19 sensitive industries. To test this I estimate equation Equation 1 on Bank-Quarter level data for period from Q1 2017 to Q4 2022 with $COVID\,exposure_{b,t}$ as the dependent variable. $COVID\,exposure_{b,t}$ represents the proportion of a bank's outstanding loans to COVID-

[16] I further test the hypothesis using more granular pre-bailout bank-borrower-quarter level data by regressing the log of outstanding loan amounts on the interaction between *Private* and the *COVID indicator*, which takes a value of one if the borrower belongs to a COVID-affected industry, zero otherwise. The results, presented in columns 1 to 3 of Table A.6, are qualitatively similar, suggesting that private banks did not have greater exposure to COVID-affected industries prior to the pandemic.

sensitive industries as identified by the Kamath Committee. Results are shown in columns 4 to 6 of Table 12. The coefficients are insignificant in all three columns, implying that private banks do not establish more relationships with COVID sensitive industries post-bailout compared to government banks.[17]

7.3 Government bank mergers

In September 2019 merger of 10 government banks into 4 banks was announced. The aim was to strengthen the government banks and increase efficiency. The announcement happened six months prior to the unexpected bailout of "Yes bank". Since both the pre-merger and post-merger period coincides with my study period from 2017 to 2022, the relative increase in the risk of private banks compared to government banks could be because of government banks reducing risk and not because of private banks' growing risk in response to changed incentive due to increased likelihood of a bailout. In all prior results shown I already exclude the merged banks since they ceased to exist in the post period. However, I still include the merged banks. Since the 4 merged banks were standalone in most parts of the pre-period and merged in most parts of the post-period, there is a concern that results are driven by the consolidation of 10 government banks.

To address the concern, I re-estimate my main regression specified in equation Equation 1 after excluding all the 10 government banks that underwent mergers. The 10 banks are removed from both pre and post-periods. The results are shown in Table A.7. The coefficients of interest are positive, significant, and similar to the main results despite the reduced sample size. This strongly supports that the relative increase in the risk of private banks compared to government banks is not driven by the series of government bank mergers.

[17] I also test the hypothesis using more granular bank-borrower-quarter level data by regressing the log of outstanding loan amounts on the triple interaction between *Private*, *Post*, and the *COVID indicator*, which takes a value of one if the borrower belongs to a COVID-affected industry and zero otherwise. The results, presented in columns 4 to 6 of Table A.6 provides mixed evidence on whether private banks, compared to government banks, increase exposure to COVID-affected industries relative to other industries post the bailout of "Yes bank."

7.4 Too big to fail banks

Three banks in India are explicitly recognized by the RBI, the Central Bank of India, as Domestic Systemically Important Banks (D-SIBs), equivalent to being too-big-to-fail (TBTF). These banks are the State Bank of India (SBI), ICICI, and HDFC. SBI is a public-sector bank, while ICICI and HDFC are private-sector banks. These three are the largest in terms of total assets, total liabilities, and market capitalization. No other banks in India are explicitly recognized by the government as TBTF.[18] SBI, ICICI, and HDFC were designated as TBTF in 2015, 2016, and 2017, respectively, based on their financial data from preceding years.

TBTF banks are different from non-TBTF banks on multiple dimensions. TBTF banks are subject to heightened regulatory scrutiny and are required to hold additional capital, maintain robust risk management practices, and adhere to stricter regulatory requirements to mitigate the systemic risks they pose. Regulatory authorities also have special resolution plans in place to address the failure of TBTF banks in a way that minimizes systemic disruptions. Non-TBTF banks, on the other hand, are smaller and less systemically important than TBTF banks. Due to the structural differences between TBTF and non-TBTF banks, there could be a concern about the analysis while comparing relative risk changes for private banks due to an increase in bailout likelihood.

To address the concern, I re-estimate my main regression specified in equation Equation 1 after excluding all the 3 TBTF banks. The TBTF banks are removed from both pre and post-periods. The results are shown in Table A.8. The coefficients of interest are positive, significant, and stronger than the main results despite the reduced sample size. This strongly supports that the relative increase in the risk of private banks compared to government banks is not driven by the inclusion of TBTF banks.

[18] For a detailed explanation on TBTF banks in India see Agrawal et al. (2023)

8 Conclusion

I estimate the cross-sectional transmission of moral hazard from the unexpected bailout of a non-TBTF private bank on change in risk-taking by other private banks. I use the "Yes bank" rescue in India as my main event. The bank's unexpected bailout is considered a moral hazard shock for other private banks because of an increased likelihood of a government bailout. After the unanticipated rescue of the bank, the risk of other private banks increased by over 15% relative to government banks. This suggests increased risk-shifting by affected banks due to changed incentives. The relative change in risk of private banks persists for more than 12 quarters post-event, suggesting a shift in equilibrium due to a change in the bailout likelihood of private banks.

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Figure 1: Yes bank stock price around bailout benchmarked with total market capitalization of all banks

This figure illustrates the daily closing stock price of "Yes bank" around its moratorium and bailout announcements, benchmarked against the aggregate market capitalization of all banks. The Yes Bank stock price is depicted in *blue*, while the market capitalization of banks is shown in *orange*. The x-axis indicates days relative to the bailout event. The primary y-axis on the left represents Yes Bank's closing stock price and the secondary y-axis on the right reflects the market capitalization of banks, calculated from their respective closing prices.

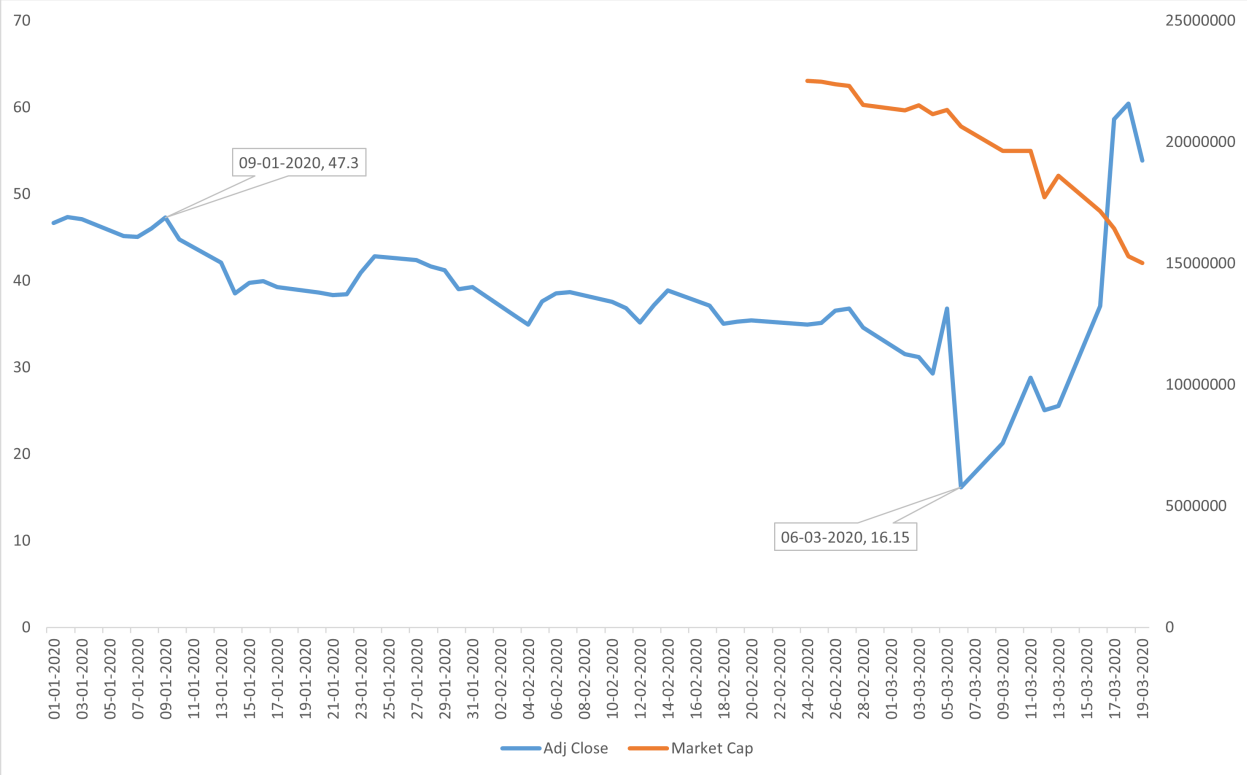


Figure 2: Pretrend and post trend for NPA – Quarterly frequency

The figure plots the coefficients of the dynamic version of the difference-in-differences design of the main regression. The sample is at the bank-quarter level from Q4 2018 to Q1 2022. The dependent variable is non performing asset ratio (NPA). The explanatory variables pre2, pre3, pre4, pre5, pre6, pre7, pre8 and pre9 are one for 2, 3, 4, 5, 6, 7, 8, and 9 quarters before the unexpected rescue of Yes bank, and zero otherwise. post0, post1, post2, post3, post5, post6, post7, post8, and post9 are one for current quarter, 1, 2, 3, 4, 5, 6, 7, and 8 quarters after the bank bailout, zero otherwise. The dots represent the point estimates of the coefficient, while the span of the lines represents a 95% confidence interval. Bank and quarter fixed effects are included along with control variables log lagged asset, log lagged deposit, lagged capital ratio, and lagged ROA. The standard errors are clustered at the bank level.

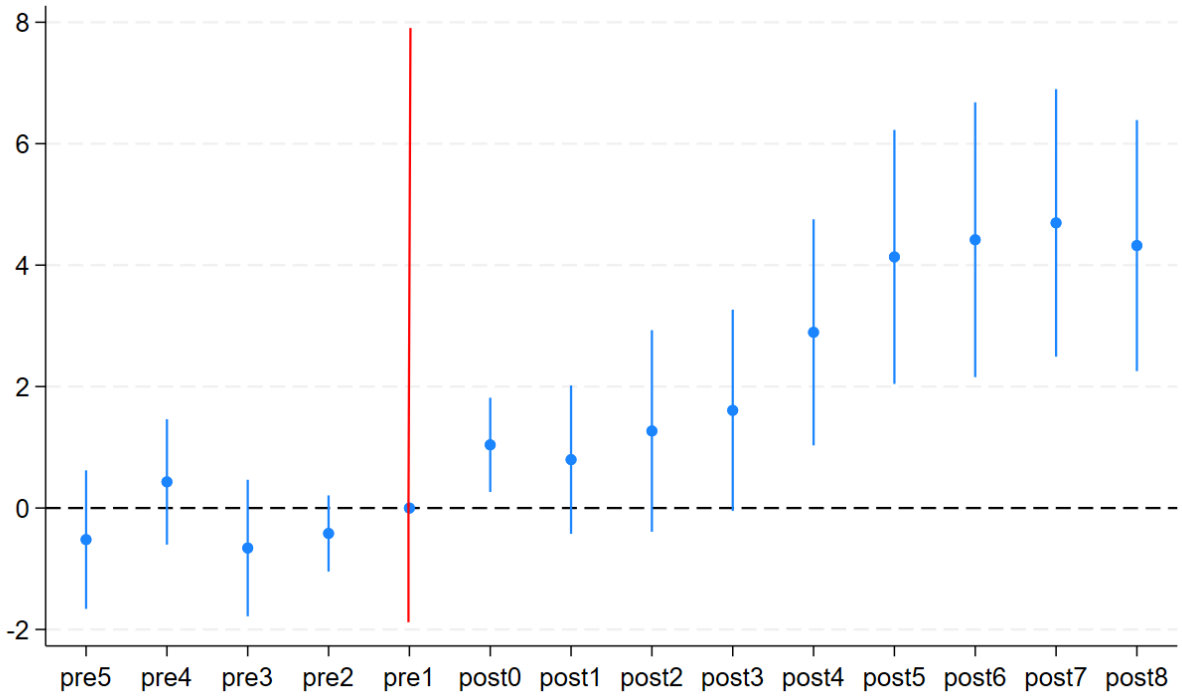


Figure 3: Share of New Loans by Government Banks and Private Banks Before and After the Unexpected Bailout

This figure, using two pie charts, illustrates the share of new secured corporate loans issued by government and private banks before and after the unexpected bailout of "Yes Bank." The share is calculated relative to the total new corporate loans issued by scheduled commercial banks, both government and private banks. The 'before' period covers Q1 2017 to Q4 2019, while the 'after' period covers Q1 2020 to Q3 2022. The share of government banks is depicted in *blue*, while the share of private banks is shown in *orange*. The pie chart on the left indicates the share of new loan issuance before the unexpected rescue. The pie chart on the right indicates the share of new loan issuance after the unexpected rescue.

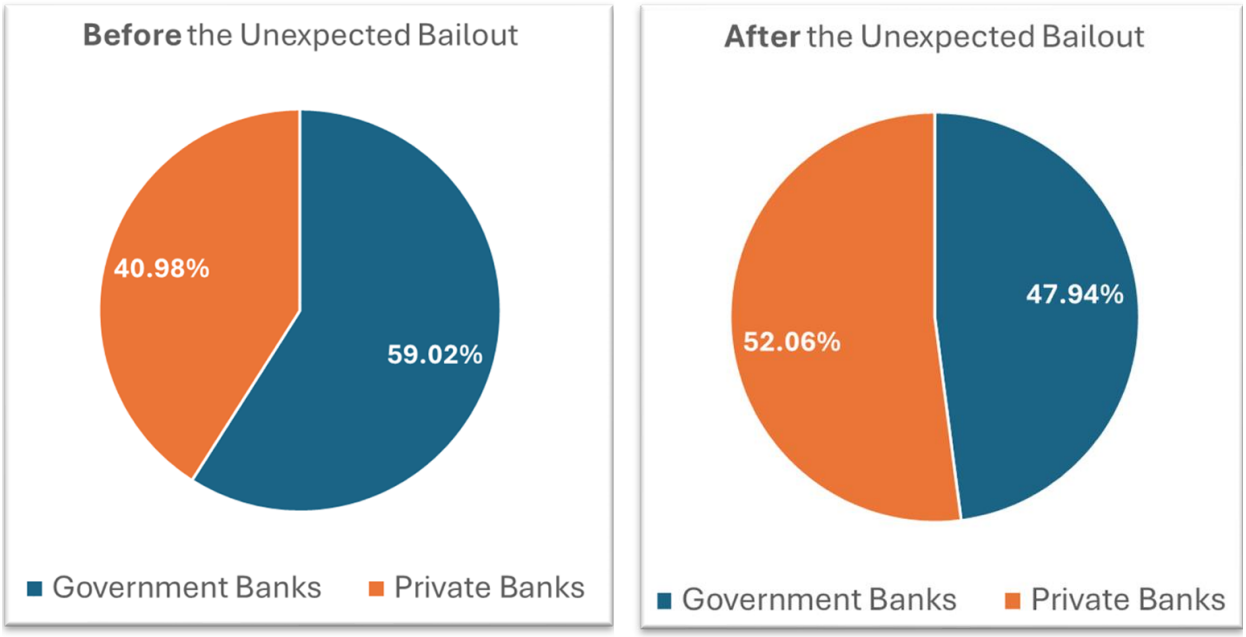


Table 1: Credit rating changes of "Yes bank" securities before and after the event

The table reports the credit ratings of "Yes bank" securities surrounding the unexpected bailout announcement on March 13, 2020, by India's major credit rating agencies, namely, CARE, Brickwork, ICRA, and CRISIL. The data is sourced from Prowess CMIE.

Rating Agency	**Date**	**Security Type**	**Rating**	**Rating Definition**
Before Rescue of Yes Bank				
CARE	6th March 2020	Debentures / Bonds / notes / bills	D	Default
BRICKWORK	6th March 2020	Debentures / Bonds / notes / bills	D	Default
ICRA	6th March 2020	Debentures / Bonds / notes / bills	D	Default
After Rescue of Yes Bank				
CRISIL	19th March 2020	Certificate of deposit	A 2	High Safety
ICRA	24th March 2020	Debentures / Bonds / notes / bills	BB+	Inadequate Safety

Table 2: Descriptive Statistics

In this table, we report the descriptive statistics relating to the main variables used in the paper. The sample period is from 2017 to 2020. The variables have been defined in Table A.1.

	Obs	Mean	Median	StDev	P25	P75	Min	Max
Bank-Quarter data								
NPA	714	8.15	6.66	6.11	3.22	11.16	0.51	24.72
Private	714	0.53	1	0.5	0	1	0	1
Post	714	0.5	1	0.5	0	1	0	1
Closest 3	714	0.1	0	0.3	0	0	0	1
Closest 5	714	0.17	0	0.37	0	0	0	1
Small Bank	700	0.5	0.5	0.5	0	1	0	1
High Capital	707	0.5	1	0.5	0	1	0	1
PBIT_wt	690	0.07	0.051	0.115	0.025	0.074	0	0.692
ICR_wt	690	0.225	0.209	0.108	0.169	0.253	0.055	0.701
PAT_wt	690	0.091	0.071	0.114	0.038	0.1	0	0.692
PBIT_wt2	661	0.015	0	0.05	0	0.004	0	0.63
ICR_wt2	661	0.234	0.187	0.218	0.053	0.36	0	1
PAT_wt2	661	0.033	0	0.093	0	0.022	0	0.815
COVID exposure	690	0.387	0.378	0.122	0.328	0.442	0.074	0.779
ln_assets	700	14.59	14.65	1.29	13.69	15.65	11.68	17.69
ln_deposits	696	14.36	14.47	1.29	13.45	15.45	11.32	17.47
capital_lag	707	14.31	13.74	3.3	11.88	15.99	9.16	25.14
roa_lag	708	0.13	0.33	1.1	0.09	0.66	-3.69	2
Bank-Borrower-Quarter outstanding loan data								
Loan Outstanding	962720	18.818	19.114	2.371	17.371	20.419	-18.715	29.095
Private	962720	0.407	0	0.491	0	1	0	1
Post	962720	0.48	0	0.5	0	1	0	1
New Loan	980616	0.045	0	0.207	0	0	0	1
Restructuring	841417	0.021	0	0.145	0	0	0	1
COVID	935039	0.46	0	0.498	0	1	0	1
Risky Borrower - PBIT¡0	196627	0.202	0	0.402	0	0	0	1
Risky Borrower - PAT¡0	196627	0.291	0	0.454	0	1	0	1
Risky Borrower - ICR¡1	181650	0.25	0	0.433	0	0	0	1
Borrower-Quarter data								
Interest Coverage	61642	0.503	1	0.5	0	1	0	1
Altman Z	48765	0.523	1	0.499	0	1	0	1
I(PAT¡0)	69610	0.281	0	0.449	0	1	0	1
Private Exposure	484078	0.372	0.006	0.451	0	1	0	1
Private Exposure 2	484078	0.395	0.25	0.432	0	1	0	1
Post	484078	0.473	0	0.499	0	1	0	1
Bank-Month data								
Return Volatility	1778	0.025	0.022	0.012	0.017	0.03	0.008	0.072
Private	1779	0.528	1	0.499	0	1	0	1
Post	1779	0.576	1	0.494	0	1	0	1
Closest 3	1779	0.101	0	0.302	0	0	0	1
Closest 5	1779	0.169	0	0.375	0	0	0	1

Table 3: Risk shifting by banks exposed to Moral Hazard Shock

The table shows the association between bank risk and private banks relative to control banks after and before the unexpected rescue of Yes Bank. The coefficients are of the difference-in-differences design of the main regression. The sample is at the bank-quarter level from Q1 2017 to Q4 2022. The dependent variable is the non-performing asset ratio (NPA). The explanatory variable is Private, which takes the value of one for privately-owned banks, and zero for government-owned banks. Post is one for all year-quarters greater or equal to the unexpected rescue period for Yes Bank, and zero otherwise. Year-quarter fixed effects are included from columns 3 to 6. Bank fixed effects are included in columns 5 and 6. Control variables are 1 year lagged values of assets, deposits, ROA, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES			NPA			
Private	-11.357***	-9.221***	-11.358***	-9.128***		
	(0.408)	(0.502)	(1.591)	(1.549)		
Post	-4.274***	-2.921***				
	(0.419)	(0.394)				
Private × Post	4.588***	3.506***	4.589***	3.361***	4.602***	3.668***
	(0.575)	(0.537)	(1.284)	(1.131)	(1.281)	(0.976)
Observations	714	690	714	690	714	690
R-squared	0.607	0.690	0.624	0.705	0.887	0.906
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	Yes	Yes
Year-Quarter FE	No	No	Yes	Yes	Yes	Yes

Table 4: Risk shifting for private banks controlling for three/ five closest banks

The table shows the association between bank risk and private banks relative to control banks after and before the unexpected rescue of Yes bank controlling for closest 3 and closest 5 private non-TBTF banks to Yes Bank. The coefficients are of the difference-in-differences design of the main regression. The sample is at the bank-quarter level from Q1 2017 to Q4 2022. The dependent variable is non-performing asset ratio (NPA). The explanatory variable is Private which takes value of one for privately-owned banks, and zero for government-owned banks. Post is one for all quarter greater or equal to the unexpected rescue period for Yes Bank, and zero otherwise. The closest 5 takes the value of one for the 5 closest privately owned non-TBTF banks to Yes bank based on asset size in March 2019, and zero otherwise. The closest 3 takes the value of one for the 3 closest privately owned non-TBTF banks to Yes bank based on asset size in March 2019, and zero otherwise. Columns 1 to 3 contains all sample. Column 4 (5) contains only the closest 3 (5) private banks and all government banks. Column 6 only has non-close private banks along with government banks. Bank and quarter fixed effects are included in all columns. Control variables are 1 year lagged values of assets, deposits, ROA, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Private Bank Sample	All	All	All	Closest 3	Closest 5	Non-Close
VARIABLES				NPA		
Private × Post	3.668***	3.972***	3.890***	2.442**	2.863***	3.777***
	(0.976)	(1.051)	(0.995)	(0.929)	(0.919)	(0.984)
Closest 5 × Post		-0.978				
		(0.640)				
Closest 3 × Post			-1.128*			
			(0.616)			
Observations	690	690	690	407	450	575
R-squared	0.906	0.907	0.907	0.889	0.897	0.898
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 5: Risk Shifting by Small and Low Capitalized Banks

The table examines the relationship between bank risk and private banks, classified by size and capital, relative to control banks before and after the unexpected rescue of "Yes bank". The sample is at the bank-quarter level, covering the period from Q1 2017 to Q4 2022. The dependent variable is the non-performing asset (NPA) ratio. The variable "Small Bank" is equal to 1 if the bank's lagged size is below the median, and 0 otherwise. "High Capital" is equal to 1 if the bank's lagged capital is above the median, and 0 otherwise. "Rescue" is equal to 1 for the eight banks that purchased shares of Yes Bank and 0 for all other banks. "Private" is equal to 1 for privately-owned banks and 0 for government-owned banks. "Post" is equal to 1 for all quarters on or after the quarter of Yes Bank's unexpected rescue, and 0 otherwise. All columns include bank and quarter fixed effects. Control variables are 1 year lagged values of assets, deposits, ROA, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES				NPA		
Post × Private	2.357*	1.748*	5.355***	5.366***	2.515	2.873**
	(1.202)	(0.880)	(1.478)	(1.358)	(1.566)	(1.380)
Small Bank	-2.163	-2.029			-2.141	-1.983
	(1.847)	(1.764)			(1.783)	(1.677)
Private × Small Bank	0.142	1.077			0.107	1.285
	(2.048)	(1.851)			(1.992)	(1.821)
Post × Small Bank	-2.052	-1.760			-1.511	-1.298
	(3.276)	(3.015)			(3.205)	(2.861)
Post × Private × Small Bank	4.291	3.785			3.947	3.115
	(3.387)	(3.068)			(3.341)	(2.942)
High Capital			-1.677	-0.463	-1.190	-0.129
			(1.130)	(0.800)	(1.029)	(0.708)
Private × High Capital			1.683	1.877*	1.207	1.034
			(1.323)	(1.075)	(1.141)	(0.936)
Post × High Capital			3.572*	3.463**	2.851	2.876**
			(2.000)	(1.502)	(1.773)	(1.320)
Post × Private × High Capital			-3.698	-4.853**	-2.289	-3.289*
			(2.185)	(1.906)	(1.985)	(1.710)
Observations	700	690	707	690	698	690
R-squared	0.898	0.913	0.892	0.914	0.902	0.919
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 6: Outstanding loan analysis using loan-level data

The table presents the relationship between outstanding loan amounts with private banks relative to control banks, both before and after the unexpected rescue of Yes Bank. The sample is structured at the bank-borrower-quarter level, covering the period from Q1 2017 to Q3 2022. The sample includes listed and unlisted borrowers. The dependent variable is the logarithm of the total loan outstanding for a borrower with a given bank. The key explanatory variables are Private and Post. Private equals one for privately-owned banks and zero for government-owned banks. Post equals one for all quarters on or after the quarter of "Yes Bank's" unexpected rescue and zero otherwise. All columns include bank and year-quarter fixed effects. Industry-year-quarter fixed effects are included in all columns except for columns 1 and 2. Columns 5 and 6 include firm-year-quarter fixed effects. Bank control variables are the one-year lagged values of assets, deposits, and capital. The standard errors reported in parentheses are robust and clustered at the bank-quarter level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Log(Loan Outstanding)					
Private × Post	0.033**	0.046***	0.032**	0.041***	0.066*	0.055
	(0.014)	(0.014)	(0.016)	(0.016)	(0.035)	(0.034)
Observations	962,720	949,492	916,699	903,992	678,594	666,498
R-squared	0.047	0.046	0.141	0.141	0.599	0.600
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	Yes	Yes
Industry FE	No	No	Yes	Yes	No	No
Industry-Year-Quarter FE	No	No	Yes	Yes	No	No
Firm-Year-Quarter FE	No	No	No	No	Yes	Yes

Table 7: Loan exposure to risky borrowers

The table presents the relationship between outstanding loan amounts to risky borrowers with private banks relative to control banks, both before and after the unexpected rescue of Yes Bank. The sample is structured at the bank-borrower-quarter level, covering the period from Q1 2017 to Q3 2022. The table reports results for the subsample of risky borrowers. A borrower is identified as risky if its Profit Before Interest and Taxes (PBIT) is less than zero, or Profit After Tax (PAT) is less than zero, or Interest Coverage Ratio (ICR) is less than 1. Due to data availability for risk measures, the sample is limited to listed firms. The dependent variable is the logarithm of the total loan outstanding for a borrower with a given bank in a quarter. The key explanatory variables are Private and Post. Private equals one for privately-owned banks and zero for government-owned banks. Post equals one for all quarters on or after the quarter of Yes Bank's unexpected rescue and zero otherwise. All columns include bank and quarter fixed effects. Industry-year-quarter fixed effects are included in all columns except 1 and 2. Columns 5 and 6 also include firm-year-quarter fixed effects. Bank control variables are the one-year lagged values of assets, deposits, and capital. The standard errors reported in parentheses are robust and clustered at the bank-quarter level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Log(Loan Outstanding)					
	Subsample of Risky Borrowers					
Private × Post	0.131***	0.135***	0.117**	0.092**	0.198***	0.143**
	(0.038)	(0.037)	(0.046)	(0.044)	(0.061)	(0.061)
Observations	48,233	47,497	47,173	46,437	42,293	41,587
R-squared	0.062	0.061	0.291	0.291	0.550	0.553
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	Yes	Yes
Industry FE	No	No	Yes	Yes	No	No
Industry-Year-Quarter FE	No	No	Yes	Yes	No	No
Firm-Year-Quarter FE	No	No	No	No	Yes	Yes

Table 8: Relationship between borrower risk and exposure to private banks

The table shows the association between borrower risk and relationship with private banks, relative to control banks, before and after the unexpected rescue of Yes Bank. The sample is at the borrower-quarter level from Q1 2017 to Q3 2022. The dependent variables are indicators based on interest coverage, Altman Z, and Profit After Tax (PAT). In columns 1 and 2, the dependent variable, interest coverage, takes the value of 1 if the firm's interest coverage is below the median for the period, and zero otherwise. In columns 3 and 4, the dependent variable, Altman Z, takes the value of 1 if the firm's Altman Z is below the median for the period, and zero otherwise. In columns 5 and 6, the dependent variable, I(PAT), takes the value of 1 if the firm's PAT is below zero for the period, and zero otherwise. The explanatory variable, *Private Exposure* represents the proportion of the borrower's outstanding loans with private banks. For example, if a borrower has a total of ₹100 in outstanding loans, and ₹62 of those are with private banks, *Private Exposure* would take a value of 0.62. Post is one for all quarter-years greater than or equal to the quarter of the unexpected rescue of Yes Bank and zero otherwise. Quarter and Industry fixed effects are included in all columns. Firm fixed effects are included in columns 2, 4, and 6. The standard errors reported in parentheses are robust and clustered at the industry level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Interest Coverage		Altman Z		I(PAT<0)	
Post × Private Exposure	0.033***	0.036***	0.047***	0.041***	0.016**	0.010*
	(0.009)	(0.006)	(0.010)	(0.007)	(0.008)	(0.005)
Private Exposure	-0.147***	-0.035***	-0.186***	-0.020*	-0.147***	-0.013
	(0.007)	(0.009)	(0.008)	(0.011)	(0.006)	(0.008)
Observations	61,641	61,631	48,765	48,755	69,609	69,595
R-squared	0.172	0.653	0.233	0.731	0.143	0.608
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes

Table 9: New loans to risky borrowers

The table presents the relationship between new loans issued and the interaction of borrower financial health with private banks relative to control banks, both before and after the unexpected rescue of Yes Bank. The sample is structured at the bank-borrower-quarter level, covering the period from Q1 2017 to Q3 2022. The sample is restricted to public firms, as risk data is only available for these firms. The dependent variable is new loan, which is an indicator variable that takes a value of one if the bank b gives a fresh loan to the borrower f in the quarter t, zero otherwise. The key explanatory variables are *Private*, *Post*, and *Risky Borrower*. *Private* equals one for privately-owned banks and zero for government-owned banks. *Post* equals one for all quarters on or after the quarter of Yes Bank's unexpected rescue and zero otherwise. *Risky Borrower* is measured using different indicators: Profit Before Interest and Taxes (PBIT) in columns 1 and 2, Profit After Tax (PAT) in columns 3 and 4, and the Interest Coverage Ratio (ICR) in columns 5 and 6. In columns 1 and 2, *Risky Borrower* is set to one for all firm-quarters with PBIT less than zero. In columns 3 and 4, *Risky Borrower* is one for all firm-quarters with PAT less than zero. In columns 5 and 6, *Risky Borrower* is one for all firm-quarters with an ICR below one. A *Risky Borrower* value of one indicates a risky borrower. All columns include bank and year-quarter fixed effects. Industry-year-quarter fixed effects are included in all columns. Columns 2, 4, and 6 also include firm-year-quarter fixed effects. Bank control variables are the one-year lagged values of assets, deposits, and capital. The standard errors reported in parentheses are robust and clustered at the bank-quarter level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	New Loan					
Risky Borrower Indicator=1, if	PBIT<0		PAT<0		ICR<1	
Private × Post	-0.026***	-0.031***	-0.028***	-0.034***	-0.028***	-0.035***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)
Risky Borrower	-0.022***		-0.023***		-0.024***	
	(0.002)		(0.002)		(0.002)	
Private × Risky Borrower	-0.037***	-0.041***	-0.038***	-0.044***	-0.033***	-0.042***
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)
Post × Risky Borrower	-0.014***		-0.009***		-0.004	
	(0.003)		(0.003)		(0.003)	
Private × Post × Risky Borrower	0.035***	0.032***	0.032***	0.032***	0.031***	0.034***
	(0.006)	(0.007)	(0.005)	(0.006)	(0.005)	(0.007)
Observations	191,858	164,007	191,858	164,007	177,139	154,020
R-squared	0.081	0.317	0.082	0.317	0.082	0.314
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Year-Quarter FE	No	Yes	No	Yes	No	Yes

Table 10: Loan size weighted average of risk indicator at Bank-Quarter level

The table shows the association between loan portfolio risk and private banks, relative to control banks, before and after the unexpected rescue of Yes Bank. The sample is at the bank-quarter level from Q1 2017 to Q3 2022. The dependent variables are loan size-weighted averages of risk indicators based on Profit Before Interest and Tax (PBIT), interest coverage ratio (ICR), and Profit After Tax (PAT). In columns 1 to 3, the weighting is based on the loan outstanding of the firm with a bank. In columns 4 to 6, the weighting is based on the fresh loan amount granted to the firm by the bank. In columns 1 and 4, the dependent variable is the loan size-weighted average of the PBIT indicator, which takes the value of 1 if the firm's PBIT is below the median for the financial year, and zero otherwise. In columns 2 and 5, the dependent variable is the loan size-weighted average of the interest coverage indicator, which takes the value of 1 if the firm's interest coverage is below the median for the financial year, and zero otherwise. In columns 3 and 6, the dependent variable is the loan size-weighted average of the PAT indicator, which takes the value of 1 if the firm's PAT is below zero for the financial year, and zero otherwise. The explanatory variable, Private, takes the value of one for privately-owned banks and zero for government-owned banks. Post is one for all quarter-years greater than or equal to the quarter of the unexpected rescue of Yes Bank and zero otherwise. Bank and quarter fixed effects are included in all columns. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Loans Outstanding			New Loans		
	Loan Size Weighted Average of Risk Indicator					
VARIABLES	PBIT_wt	ICR_wt	PAT_wt	PBIT_wt2	ICR_wt2	PAT_wt2
Private × Post	0.014*	0.008	0.031***	0.019**	0.014	0.044***
	(0.008)	(0.018)	(0.009)	(0.007)	(0.037)	(0.012)
Observations	690	690	690	661	661	661
R-squared	0.981	0.900	0.971	0.107	0.174	0.120
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 11: Restructuring analysis for loan level data

This table shows the association of loan restructuring and private banks relative control banks after and before the unexpected rescue of "Yes Bank." The dependent variable is Restructuring, which is an indicator variable that takes a value of one if the bank restructures a loan to the borrower in the quarter, zero otherwise. The explanatory variable, Private, takes the value of one for privately-owned banks and zero for government-owned banks. Post is one for all quarter-years greater than or equal to the quarter of the unexpected rescue of Yes Bank and zero otherwise. Bank and year-quarter fixed effects are included in all columns. Columns 3 to 6 include industry-year-quarter fixed effects. Columns 5 and 6 include firm-year-quarter fixed effects. Bank control variables are one-year lagged values of assets, deposits, and capital. The sample is at the bank-borrower-quarter level from Q1 2017 to Q3 2022. The standard errors reported in parentheses are robust and clustered at the bank-time level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Restructuring					
Private × Post	0.009***	0.009***	0.009***	0.009***	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	980,616	967,069	933,500	920,497	696,746	684,304
R-squared	0.010	0.010	0.036	0.036	0.427	0.430
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	No	No	No	Yes	Yes
Industry FE	No	No	Yes	Yes	No	No
Industry-Year-Quarter FE	No	No	Yes	Yes	No	No
Firm-Year-Quarter FE	No	No	No	No	Yes	Yes

Table 12: COVID exposure before the pandemic and post bailout

The table analyzes the association between COVID industry exposure and private banks relative to control banks, both before the pandemic and the unexpected rescue of Yes Bank, as well as post-bailout. The sample is at the bank-quarter level. Columns 1 to 3 cover the pre-pandemic period from Q1 2017 to Q4 2019, while columns 4 to 6 include data for the full sample period from Q1 2017 to Q3 2022. The dependent variable is "COVID exposure," which represents the proportion of a bank's outstanding loans to COVID-sensitive industries as identified by the Kamath Committee. For instance, if a bank has a total of ₹100 in outstanding loans, and ₹53 of those loans are held by firms in COVID-sensitive industries, "COVID exposure" would take a value of 0.53. The key explanatory variable, "Private," equals one for privately-owned banks and zero for government-owned banks. The variable "Post" is set to one for all quarters on or after the quarter of Yes Bank's unexpected rescue and zero otherwise. Bank control variables include one-year lagged values of assets, deposits, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	COVID Exposure					
Private	-0.042	-0.042	-0.006	-0.042		
	(0.042)	(0.043)	(0.050)	(0.043)		
Private × Post				0.008	0.008	0.000
				(0.013)	(0.013)	(0.014)
Observations	360	360	323	690	690	637
R-squared	0.030	0.030	0.301	0.031	0.954	0.946
Bank Controls	No	No	Yes	No	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	Yes	Yes
Quarter FE	No	Yes	Yes	No	Yes	Yes

Appendices

Table A.1: Variables Definition

In this table, we present the description of all variables used in the study.

Variables	**Definition**
NPA	NPA stands for non-performing assets ratio of the bank in the quarter.
Return Volatility	Monthly stock return volatility of Banks
Private	A variable that identifies if the bank is Private sector in the quarter, zero otherwise
Post	A variable that identifies if the quarter is after the Yes Bank bailout, zero otherwise
Capital Ratio	Ratio of equity capital to total risk weighted assets of the bank in the quarter reported as per Basel guidelines.
ROA	Stands for return on assets ratio reported by the bank in the quarter.
Assets	Log of value of total assets of the bank in the quarter.
Deposits	Log of value of total deposits of the bank in the quarter.
Closest 3	An indicator that takes the value of one for the 3 closest privately owned non-TBTF banks to Yes bank based on asset size in March 2019, and zero otherwise.
Closest 5	An indicator that takes the value of one for the 5 closest privately owned non-TBTF banks to Yes bank based on asset size in March 2019, and zero otherwise.
Small Bank	An indicator that is equal to 1 if the bank's lagged total assets is below the median, and 0 otherwise.
High Capital	An indicator that is equal to 1 if the bank's lagged capital is above the median, and 0 otherwise.
Loan Outstanding	Logarithm of the total loan outstanding for a firm with a given bank in a quarter.
New Loan	An indicator variable that takes a value of one if the bank issues a fresh loan to the borrower in the quarter, zero otherwise.
Risky Borrower - PBIT<0	Risky borrower is set to one for all firm-quarters with Profit Before Interest and Taxes (PBIT) less than zero, zero otherwise
Risky Borrower - PAT<0	Risky borrower is set to one for all firm-quarters with Profit After Taxes (PAT) less than zero, zero otherwise
Risky Borrower - ICR<1	Risky borrower is set to one for all firm-quarters with Interest Coverage Ratio (ICR) less than one, zero otherwise
Interest Coverage	An indicator that takes the value of 1 if the firm's interest coverage is below the median for the period, and zero otherwise.
Altman Z	An indicator that takes the value of 1 if the firm's Altman Z is below the median for the period, and zero otherwise.
I(PAT<0)	An indicator that takes the value of 1 if the firm's Proft After Taxes (PAT) is below zero for the period, and zero otherwise.
Private Exposure	It represents the proportion of the borrower's outstanding loans with private banks. For example, if a borrower has a total of ₹100 in outstanding loans, and ₹62 of those are with private banks, 'Private_b' would have a value of 0.62.
Private Exposure 2	It represents the proportion of the borrower's relationship with private banks. For example, if a borrower has a total of 10 banks with outstanding loans and 3 of those banks are private, 'Private_a' would take a value of 0.3.
PBIT_wt(2)	Outstanding (New) loan size-weighted average of risk indicators at bank-quarter level based on Profit Before Interest and Tax (PBIT). The PBIT indicator takes the value of 1 if the firm's PBIT is below the median for the financial year, and zero otherwise.
ICR_wt(2)	Outstanding (New) loan size-weighted average of risk indicators based at bank-quarter level on interest coverage ratio (ICR). The interest coverage indicator takes the value of 1 if the firm's interest coverage is below the median for the financial year, and zero otherwise.
PAT_wt(2)	Outstanding (New) loan size-weighted average of risk indicators at bank-quarter level based on Profit After Tax (PAT). The PAT indicator takes the value of 1 if the firm's PAT is below zero for the financial year, and zero otherwise.
Restructuring	An indicator variable that takes a value of one if the bank restructures a loan to the borrower in the quarter, zero otherwise.
COVID Exposure	It represents the proportion of a bank's outstanding loans to COVID-sensitive industries as identified by the Kamath Committee. For instance, if a bank has a total of ₹100 in outstanding loans, and ₹53 of those loans are held by firms in COVID-sensitive industries, "COVID exposure" would take a value of 0.53.
COVID	It is set to one for firms in COVID-sensitive industries as identified by the Kamath Committee and zero otherwise.

Table A.2: Sample Construction

In this table, we report details about the sample used. The sample excludes "Yes bank", the private bank that was unexpectedly bailed out. The terms have been defined in Table A.1.

Particulars	Count
Bank-Quarter level	
Sample Period	Q1 2017 to Q4 2022
Number of Quarters	24
Number of Bank-Quarter level Observations	714
Number of Private Bank-Quarter level Observations	378
Number of Government Bank-Quarter level Observations	336
Number of Distinct Banks	30
Number of Distinct Private Sector Banks	16
Number of Distinct Government Banks	14
Number of Distinct TBTF Banks	3
Number of Distinct Private Sector TBTF Banks	2

Table A.3: Risk shifting by banks exposed to Moral Hazard Shock: Monthly return volatility as measure of risk

The table shows the association between bank risk and private banks relative to control banks after and before the unexpected rescue of Yes Bank. The coefficients are of the difference-in-differences design of the main regression. The sample is at the bank-year-month level from January 2017 to December 2022. The dependent variable is the monthly stock return volatility. The explanatory variable is Private, which takes the value of one for privately-owned banks, and zero for government-owned banks. Post is one for all year-months greater or equal to the unexpected rescue period for Yes Bank, and zero otherwise. Year-month fixed effects are included from columns 3 to 6. Bank fixed effects are included in columns 5 and 6. Control variables are 1 year lagged values of assets, deposits, ROA, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Monthly Stock Return Volatility					
Private	-0.006***	-0.007***	-0.006***	-0.009***		
	(0.001)	(0.001)	(0.001)	(0.002)		
Post	0.002***	0.004***				
	(0.001)	(0.001)				
Private × Post	0.003***	0.003***	0.003***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	1,778	1,773	1,778	1,773	1,778	1,773
R-squared	0.059	0.100	0.402	0.434	0.475	0.476
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	Yes	Yes
Year-Month FE	No	No	Yes	Yes	Yes	Yes

Table A.4: Risk shifting for private banks controlling for three/ five closest banks with Return Volatility as dependent variable

The table shows the association between bank risk and private banks relative to control banks after and before the unexpected rescue of Yes bank controlling for closest 3 and closest 5 private non-TBTF banks to Yes Bank. The coefficients are of the difference-in-differences design of the main regression. The sample is at bank-month level from January 2017 to December 2022. The dependent variable is monthly return volatility. The explanatory variable is Private which takes value of one for privately-owned banks, and zero for government-owned banks. Post is one for all month greater or equal to the unexpected rescue period for Yes Bank, and zero otherwise. The closest 5 takes the value of one for the 5 closest privately owned non-TBTF banks to Yes bank based on asset size in March 2019, and zero otherwise. The closest 3 takes the value of one for the 3 closest privately owned non-TBTF banks to Yes bank based on asset size in March 2019, and zero otherwise. Columns 1 to 3 contains all sample. Column 4 (5) contains only the closest 3 (5) private banks and all government banks. Column 6 only has non-close private banks along with government banks. Bank and month fixed effects are included in all columns. Control variables are 1 year lagged values of assets, deposits, ROA, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Private Bank Sample	All	All	All	Closest 3	Closest 5	Non-Close
VARIABLES			Return Volatility			
Private × Post	0.004***	0.004***	0.004***	0.006***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Closest 5 × Post		0.000				
		(0.001)				
Closest 3 × Post			0.001			
			(0.001)			
Observations	1,773	1,773	1,773	1,020	1,140	1,473
R-squared	0.476	0.476	0.476	0.480	0.476	0.453
Bank Controls	Yes	Yes	Yes	Yes	Yes	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Month FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A.5: Relationship between borrower risk and exposure to private banks

The table shows the association between borrower risk and relationship with private banks, relative to control banks, before and after the unexpected rescue of Yes Bank. The sample is at the borrower-quarter level from Q1 2017 to Q3 2022. The dependent variables are indicators based on interest coverage, Altman Z, and Profit After Tax (PAT). In columns 1 and 2, the dependent variable, interest coverage, takes the value of 1 if the firm's interest coverage is below the median for the period, and zero otherwise. In columns 3 and 4, the dependent variable, Altman Z, takes the value of 1 if the firm's Altman Z is below the median for the period, and zero otherwise. In columns 5 and 6, the dependent variable, I(PAT), takes the value of 1 if the firm's PAT is below zero for the period, and zero otherwise. The explanatory variable, *Private Exposure 2* represents the proportion of the borrower's relationship with private banks. For example, if a borrower has a total of 10 banks with outstanding loans and 3 of those banks are private, *Private Exposure 2* would take a value of 0.3. Post is one for all quarter-years greater than or equal to the quarter of the unexpected rescue of Yes Bank and zero otherwise. Quarter and Industry fixed effects are included in all columns. Firm fixed effects are included in columns 2, 4, and 6. The standard errors reported in parentheses are robust and clustered at the industry level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Interest Coverage		Altman Z		I(PAT<0)	
Post × Private Exposure 2	0.040***	0.049***	0.058***	0.056***	0.010	0.008
	(0.010)	(0.007)	(0.011)	(0.007)	(0.008)	(0.006)
Private Exposure 2	-0.149***	-0.031***	-0.182***	-0.017	-0.160***	-0.008
	(0.008)	(0.010)	(0.008)	(0.011)	(0.006)	(0.009)
Observations	61,641	61,631	48,765	48,755	69,609	69,595
R-squared	0.170	0.653	0.229	0.731	0.144	0.608
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	Yes	No	Yes

Table A.6: Loans to COVID sensitive industries before the pandemic and post bailout

The table analyzes the association between COVID industry exposure and private banks relative to control banks, both before the pandemic and the unexpected rescue of Yes Bank, as well as post-bailout. The sample is at the bank-borrower-quarter level. Columns 1 to 3 cover the pre-pandemic period from Q1 2017 to Q4 2019, while columns 4 to 6 include data for the full sample period from Q1 2017 to Q3 2022. The dependent variable is the logarithm of the total loan outstanding for a firm with a given bank. The key explanatory variable, "Private," equals one for privately-owned banks and zero for government-owned banks. The variable "Post" is set to one for all quarters on or after the quarter of Yes Bank's unexpected rescue and zero otherwise. The variable "COVID" is set to one for firms in COVID-sensitive industries as identified by the Kamath Committee and zero otherwise. Bank control variables include one-year lagged values of assets, deposits, and capital. The standard errors reported in parentheses are robust and clustered at the bank-time level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Log(Loan Outstanding)					
Private × Post				0.001	0.007	0.030
				(0.022)	(0.023)	(0.031)
Private × COVID	-0.111***	-0.235***	-0.138***	-0.232***	-0.238***	-0.144***
	(0.027)	(0.023)	(0.021)	(0.023)	(0.024)	(0.021)
Private × Post × COVID				0.066**	0.070**	0.034
				(0.033)	(0.034)	(0.030)
COVID	0.087***					
	(0.012)					
Observations	477,579	476,554	320,321	916,399	903,691	633,242
R-squared	0.053	0.161	0.601	0.154	0.154	0.601
Bank Controls	No	No	No	No	Yes	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-Year-Quarter FE	No	Yes	Yes	Yes	Yes	Yes
Firm-Year-Quarter FE	No	No	Yes	No	No	Yes

Table A.7: Main regression results on excluding government banks from sample with merger announcement in 2019

The table shows the association between bank risk and private banks relative to control banks after and before the unexpected rescue of Yes Bank. The coefficients are of the difference-in-differences design of the main regression. The sample is at the bank-quarter level from Q1 2017 to Q4 2022. The sample excludes the government banks for which merger announcements were made in 2019. The dependent variable is the non-performing asset ratio (NPA). The explanatory variable is Private, which takes the value of one for privately-owned banks, and zero for government-owned banks. Post is one for all quarter-years greater or equal to the unexpected rescue quarter for Yes Bank, and zero otherwise. The quarter fixed effect is included in columns 3 and 4. Bank and quarter fixed effects are included in columns 5 and 6. Control variables are 1 year lagged values of assets, deposits, ROA, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	NPA					
Private	-12.686***	-10.435***	-12.686***	-10.360***		
	(0.441)	(0.544)	(1.884)	(1.705)		
Post	-5.431***	-4.081***				
	(0.486)	(0.461)				
Private × Post	5.745***	4.533***	5.746***	4.408***	5.759***	4.578***
	(0.622)	(0.586)	(1.555)	(1.417)	(1.552)	(1.310)
Observations	618	594	618	594	618	594
R-squared	0.646	0.720	0.660	0.732	0.897	0.912
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	Yes	Yes
Quarter FE	No	No	Yes	Yes	Yes	Yes

Table A.8: Main regression results on excluding TBTF banks from the sample

The table shows the association between bank risk and private banks relative to control banks after and before the unexpected rescue of Yes Bank. The coefficients are of the difference-in-differences design of the main regression. The sample is at the bank-quarter level from Q1 2017 to Q4 2022. The sample excludes TBTF banks, namely, SBI, ICICI, and HDFC. The dependent variable is the non-performing asset ratio (NPA). The explanatory variable is Private, which takes the value of one for privately-owned banks, and zero for government-owned banks. Post is one for all quarter-years greater or equal to the unexpected rescue quarter for Yes Bank, and zero otherwise. The quarter fixed effect is included in columns 3 and 4. Bank and quarter fixed effects are included in columns 5 and 6. Control variables are 1 year lagged values of assets, deposits, ROA, and capital. The standard errors reported in parentheses are robust and clustered at the bank level. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES			NPA			
Private	-11.942***	-9.343***	-11.945***	-9.258***		
	(0.423)	(0.543)	(1.618)	(1.664)		
Post	-4.279***	-2.895***				
	(0.427)	(0.407)				
Private × Post	4.874***	3.653***	4.877***	3.510***	4.896***	3.905***
	(0.595)	(0.563)	(1.371)	(1.212)	(1.367)	(1.032)
Observations	642	619	642	619	642	619
R-squared	0.638	0.707	0.656	0.724	0.886	0.904
Bank Controls	No	Yes	No	Yes	No	Yes
Yes Bank removed	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	Yes	Yes
Quarter FE	No	No	Yes	Yes	Yes	Yes