Creditor Rights and Relationship Banking: Evidence from a Policy Experiment*

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Abstract

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Key Words: Creditor Rights, Bank Relationships, Information Asymmetry, Bank Credit

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Abstract

We examine how creditor rights shape the choice between arms length and relationship banking, exploiting natural variation due to changes in law. We show that arms length lending increases after a 2002 law that significantly expands creditor rights in India. The results are stronger when banks that enjoy greater informational advantage, for small firms, non-group firms and lenders empowered under the law. The results are confirmed by placebo tests and external validation tests using staggered implementation of an earlier, though weaker, law. Creditor rights determine not only the quantity but also the *type* of credit in an economy.

1 Introduction

We examine the relation between creditor rights and the incidence of arm's length versus relationship lending, exploiting natural variation induced by changes in the law concerning creditor rights. Our study contributes to two distinct streams of work. One is the literature on creditor rights. The other is the traditional finance literature on relationship banking. To help place our main hypotheses in perspective, we briefly overview related work in these two areas.

Creditor rights define the ability of the lenders to recover debt from borrowers. These rights are typically set by country laws, which define how creditors can enforce the repayment of debt. Djankov, McLiesh, and Shleifer (2007) discuss how to measure creditor rights and find that they are functions of legal origin. Other studies examine the economic effects of creditor rights. Acharya and Subramanian (2009) and Acharya, Amihud, and Litov (2011) point out that creditor rights increase the threat of liquidation, which can reduce risk-taking and innovation. Vig (2013) points out that liquidation threats can reduce leverage. Lilienfeld-Toal, Mookherjee, and Visaria (2012) argue that creditor rights have redistributive effects.[1]

Boot (2000) surveys the extensive work on bank relationships. He defines relationship banks as intermediaries that invest in information gathering and provide financial services through multiple interactions with the same customer. Relationship banking has both benefits and costs. The information gathered in screening and monitoring is reusable across services, over time, and potentially across other similar borrowers (Allen (1990), Diamond (1984), Greenbaum and Thakor (2007)). Lenders can smooth and spread costs (Petersen and Rajan (1995); Boot and Thakor (2000)). Thus, relationships can lower the costs of credit (Fama (1985); Berger and Udell (1995); Bharath, Dahiya, Saunders, and Srinivasan (2009)) and also increase its supply (Hoshi, Kashyap, and Scharfstein (1990); Petersen and Rajan (1994)). Other spillover benefits include better access to capital

[1]Other work in this area includes López de Silanes, La Porta, Shleifer, and Vishny (1998), Levine (1998), Levine (1999), Beck, Demirguc-Kunt, and Levine (2005), and Visaria (2009).

market and credit services (James (1987); Gopalan, Udell, and Yerramilli (2011)) and better monitoring and governance (Dass and Massa (2010)).

Relationship banking also has a dark side. The easier renegotiability of contracts under relationship lending leads to soft budget constraints on borrowers (Dewatripont and Maskin (1995); Bolton and Scharfstein (1996)). In addition, the superior information possessed by relationship banks confers them informational monopolies over borrowers and hold up, a point prominently made by Rajan (1992). During difficult economic times, relationship banks may behave opportunistically by extracting higher rents from the borrowers (Santos and Winton (2008)). Finally, if relationship banking requires specialization, banks that form relationships with borrowers may not be able to meet the growing needs of the borrowing firms (Houston and James (1996), Gopalan, Udell, and Yerramilli (2011)).

We test whether enhancing creditor rights leads to a move away from relationship to arm's length banking. As motivation, consider the environment in Rajan (1992), where relationship banking endows inside banks information about the firm. Banks can make more effective liquidation decisions by preventing inefficient continuation, which mitigates the lack of formal creditor rights. However, the inside banks now enjoy monopoly power, which lets them extract greater rents in good states. Uninformed banks cannot prevent continuation in bad states but do not extract rents in good states either. In this world, increasing creditor rights benefits arm's length banks more. The intuition is that creditor rights matter more in liquidation states, which arm's length lenders face more often. Thus, increasing creditor rights benefits arm's length banks more relative to relationship banks. Transactional bank lending becomes more viable when creditor rights are enhanced.[2]

The above discussion motivates our empirical analysis. We study the impact of the increase in creditor rights on relationship banking. The empirical setting for this paper is the passage of the Securitization and Reconstruction of Financial Assets and Enforce-

[2]Additionally, increasing the outside arms-length options impairs a borrower's ability to commit to long term relationships. Thus, increased creditor rights provide less incentives for banks to continue investing in learning about or monitoring borrowers, lowering the benefits of relationship banking (Petersen and Rajan (1994), Jayaraman and Thakor (2014)).

ment of Security Interest Act (SARFAESI) in India in 2002 (Vig (2013)). The act was a significant event in India's move to increase creditor rights because it empowered banks to seize defaulters' assets by simply issuing a notice to borrowers with non-performing loans. Secured creditors could thus bypass slow and very complex court processes. SARFAESI has been the most effective tool for recovery in India. For instance, internal data in India's central bank indicate that in 2013-2014, there are 194,707 SARFAESI enforcement actions, 7 times the 28,258 enforcements in debt recovery tribunals, the fast track bankruptcy courts studied by Visaria (2009).

Our baseline tests examine the effect of the shock to creditor rights on relationship banking. We then turn to numerous heterogeneity tests. We examine informationally opaque firms relative to more transparent firms. We then turn to different types of lenders. Here, we exploit the fact that the Indian banking industry comprises of both public sector and private sector banks with differences in geographical coverage. We examine results by whether firms belong to business groups and by the nature of bank competition and conduct falsification, placebo, and external validation tests. These results generate more confidence in the results in a statistical sense, and also, importantly, help shed light on their economics. We discuss these points more extensively below.

The workhorse treatment effects estimator is apt for our setting. We estimate the before-after differences for treatment and control groups. We form these two groups based on the likely impact of SARFAESI. In line with Vig (2013), we classify firms with a higher proportion of tangible assets as our treatment group and those with lower proportion of tangible assets as our control group. Firms with more tangible assets should experience greater effects from changes in creditor rights. We construct multiple measures of relationship banking. While we discuss the details later, the bottom line is straightforward. The measures of relationship banking decline by between 3.6% and 4.8% for treatment firms in the post-SARFAESI period when compared to the pre-SARFAESI period. In addition, we find that the propensity to initiate new banking associations increase by between 9.3% and 10.3% in the post-SARFAESI period relative to the pre-

SARFAESI period.

We divide the sample into small and large firms and test for continuation of relationships. Informational advantages are likely to be more important for relationship banking in small firms. We test whether the impact of increased creditor rights on relationship banking is greater for these firms. As expected, we find that in the sample of small firms, our measures of relationships show a decline in the post-SARFAESI period for treatment firms relative to control group firms. The magnitude of decline ranges from 8.6% to 9.1%.

We classify firms into those belonging to an established business group and those that do not. Banks lending to business group firms rely on soft collateral in the form of intra-group firm transfers (Gopalan, Nanda, and Seru (2007)). Relationship banking breakdown is concentrated among non-group firms where the hard rather than soft collateral channel is important. We also examine the impact of increased creditor rights on relationship banking in areas with different levels of banking competition. Banks have greater holdup powers when competition is low, so we expect that ruptures in relationship banking should be more likely in the high bank concentration areas. We find supportive evidence. The push away from relationship lending is more concentrated in areas that had lower level of banking competition before SARFAESI.

We next examine if the impact on relationship banking depends on the type of lenders. These tests are at the lender rather than the firm level. In the Indian context, public sector banks are older and have a wider reach than private sector banks (Cole (2009)). It is plausible that public sector banks specialize in information based relationship lending while private sector counterparts are transactional and focus on revenue generation through more efficient services. We hypothesize that the impact of breakdown in relationships should be higher among borrowers from public sector banks. In the post-SARFAESI period, the ratio of relationship borrowers to total borrowers is likely to fall by 6.8% for public sector banks when compared to other type of lenders.

We also test whether the impact of breaking relationship banking is more severe for rural banks when compared to urban banks. Rural banks are more likely to operate under

relationship banking mode in the pre-SARFAESI period given the opacity and lack of banking competition in rural areas. Thus, we expect the impact to be higher for rural banks when compared to urban banks. We find our measure relationship banking falls by 7.0% for rural banks when compared to urban banks. The law provides another interesting variation in lender type. SARFAESI applies to banks but specifically excludes certain categories of lenders such as inter-corporate lenders and non-banking finance companies (NBFCs). We find greater that treatment group firms move away from lenders for whom SARFAESI is applicable to lenders for whom it is not applicable.

We provide evidence on credit costs. Because of the reduction in deadweight costs of credit enforcement, costs of credit could decline. We find some evidence of such a reduction for the treatment group firms in the post SARFAESI period, with point estimates of between 135 to 182 basis points. The numbers represent an indirect estimate of the deadweight costs imposed on the economy due to weak creditor rights. We perform other robustness tests. We confirm the existence of parallel trend between treatment and control groups in the pre-treatment period (Bertrand, Duflo, and Mullainathan (2004)). For internal validation, we conduct placebo tests by considering false treatment years. The relationship break-up results are obtained when SARFAESI enactment year is used as the year of treatment. Our baseline tests use 3 years as the minimum length of a lending relationship. We alter the required association to 4 or 5 years. Our results remain unchanged.

For external validation of our results, we exploit another change in creditor rights, the establishment of Debt Recovery Tribunals (DRTs) between 1993 and 1998 (Visaria (2009)). The DRTs are essentially fast-track bankruptcy courts with the feature that their implementation is staggered across jurisdictions in India, which aids statistical identification. The on-the-ground effect of DRTs has been less than anticipated (Phadnis and Prabhala (2016)). One issue is that the scope of DRTs is limited to certifying whether a debt is legally owed by a borrower. Thus, claims by debtors on any other issue or contractual matter requires rulings and dispensation from civil courts. This could

reintroduce the delays that the DRTs were intended to address in the first place.

SARFAESI actions are also more potent because of the nature of the process. Borrowers who contest SARFAESI actions must deposit a minimum of 25% of disputed amounts and up to 75% at the discretion of the judge. This amount is a special challenge for borrowers under stress. The power of SARFAESI is reflected in the fact that close to 80% of all bankruptcy recoveries in India are through SARFAESI actions. Nevertheless, DRT's serve as a useful tool for external validation especially around their initial enactment. At that point of time, DRTs threatened to disrupt a long-standing status-quo of a pro-borrower regime. In addition, methods of circumventing DRTs or stalling DRT proceedings were not understood, giving the law special teeth around the time of its passage. We thus analyze data around DRT introduction, exploiting their staggered implementation in their initial phases. We find results that are directionally similar to our main results using SARFAESI.

The issue of creditor rights we study is part of a larger "law and finance" literature on investor protection laws. López de Silanes, La Porta, Shleifer, and Vishny (1997) and López de Silanes, La Porta, Shleifer, and Vishny (1998) argue that outside investors are more willing to supply capital to firms when capital is better protected. Our main point is similar in spirit and our results support the viewpoint that investor rights matter. However, the specifics of the channel are somewhat different. Our focus is on inside versus arm's length debt. The feasibility of the latter depends on the differential likelihood of reaching nodes where rights matter, and the feedback effect on ex-ante provision of credit. Relatedly, Bhattacharya and Thakor (1993) show that development of arms length banking is an intermediate step between relationship banking and full-fledged public bond markets. One interpretation of our results is that they represent micro-level evidence that the enhancement of creditor rights as a tool for developing corporate bond markets in emerging economies.[3]

[3]Bond market development in emerging economies is a well known challenge with multiple challenges including investor rights. See, e.g., the IOSCO (International Organization of Securities Commissions) report at https://www.iosco.org/library/pubdocs/pdf/IOSCOPD127.pdf, accessed May 2016.

The rest of the paper is organized as follows: Section 2 describes the Indian banking Industry. Section 3 provides a brief overview of the credit recovery mechanism in India and also explains the relevant provisions of the SARFAESI Act. Section 4 provides a brief description of the related literature. Section 5 details the data. Section 6 describes the empirical methodology and also explains the empirical results. Section 7 provides details pertaining to the robustness test conducted. Section 7.3 presents the results of external validity tests. Section 8 concludes.

2 India's Banking Industry

The elements of India's current banking infrastructure have been present for a long period of time (Cole (2009)). For nearly 22 years after India's independence in 1947, private sector banks coexisted with public sector (government-owned) banks. In 1969, the government launched a nationalization program. The largest private banks with assets in excess of ₹500 million (then about $ 50 million) were nationalized.[4] The exercise was again repeated in 1980, but this time with a cutoff of ₹2 billion (then about $200 million). The reason for nationalization was the sense that credit was a scarce resource that needed to be rationed to serve public purposes. In the government's view, private banks could not serve this developmental need.

The banking industry in India continues to be regulated. Unlike the state-level laws that have historically governed U.S. banks, India's banking sector has always been a national market. This does not mean that bank growth is unregulated. Branching regulations exist, but operate on a national scale and aim to incentivize banks to serve India's rural population. For instance, in 1969, the government obliged banks to open 4 branches in unbanked areas in order to get a license to operate in an area where a bank was already present. The policy had a significant impact in terms of banking access and poverty in previously unbanked locations (Berger, Klapper, Martinez Peria, and Zaidi

[4] ₹ is the symbol for India's local currency, the rupee. Conversions are at historically prevalent rates. In May 2016, $1 ≈ ₹67.

(2008); Burgess, Pande, and Wong (2005)).

The commercial banking sector in India has three types of banks: public sector (state-owned) banks, private sector banks, and foreign banks. Public sector banks dominate the banking landscape. These banks account for over 70% of bank credit in 2013. The largest among these is State Bank of India, formerly Imperial Bank of India. It accounts for about a third of the banking industry. Commercial bank entry requires licensing and permission from its central bank. Relatively modern private sector banks emerged after 1993, in the wake of India's economic liberalization in 1991. Private sector banks account for about a quarter of India's bank credit. Foreign banks have relatively limited footprints and branching networks in India. Other banks include very small cooperative banks and regional rural banks that cover underserved rural markets.

India is also an interesting setting to study relationship banking. Although the regulations permit existing banks to grow relatively freely, they impose high entry barriers to new bank entry. In fact, between 2004 and 2014, no new domestic bank has been licensed. Following Petersen and Rajan (1995), such an environment should lead to increased relationship banking. Second, the law enforcement mechanism in India works at a slow pace. For instance, during our sample period, World Bank's "Doing Business" ranks India 186 in terms of ease of doing business. As per the report, it takes 1420 days to enforce contracts.[5] Thus, banks have to rely more on relationships than on contract enforcements in India. Third, informal relationships matter. For instance, caste affiliation between loan officers and borrowers influence lending (Fisman, Paravisini, and Vig (2012)). Finally, accounting statements prepared by smaller firms (that are not listed) leave room for judgment, e.g., in classifying loans, advances, and investments in affiliated firms. Thus, bankers must rely to a large extent on soft information and relationships.

[5]See http://www.doingbusiness.org/data/exploretopics/enforcing-contracts

3 Creditor Rights in India and SARFAESI

Indian bankruptcy process is slow, which is often exploited by opportunistic entrepreneurs.[6] Lawmakers have not been unmindful of this situation. Since the 1980s, there have been periodic attempts to create a more pro-creditor regime.

An early effort to reform the bankruptcy process is the Sick Industrial Companies Act, which led to the creation of a Board of Industrial and Financial Reconstruction (BIFR). Companies entering BIFR were entitled to an automatic stay on all payments. The idea was to help sick firms restructure rather than liquidate. However, the deficiencies in the Act led to unintended outcomes. Entry norms for restructuring are one example. BIFR admitted sick firms whose accumulated losses exceeded tangible equity. Restructuring these firms is likely difficult. Data downloaded from the BIFR website suggests that only 20% of cases were settled in 5 years of reference to BIFR and 35% of cases remained unresolved even after 10 years of such reference. This delay in settlement of cases referred to BIFR places significant burdens on banks dealing with BIFR borrowers. Bank NPAs in India climbed to 14% of gross advances in the late 1990s.[7]

The next attempt to reform bankruptcy came in the 1990s through Debt Recovery Tribunals, or fast track bankruptcy courts. These courts are created to deal exclusively with debt recovery cases and given certain procedural exemptions so that the cases could be settled quickly (Visaria (2009)). The courts have not been effective. India's 2016 Economic Survey reports that cases at DRTs exceed ₹4 trillion (about $60 billion). The courts' own website reports monthly settlement rates of between 1% and 4% of the stock of cases. Phadnis and Prabhala (2016) discuss these and related issues with fast track courts. Because NPAs continued to mount in the 1990s, the Indian government appointed the Andhyarujina Committee to suggest ways of further strengthening the legal framework for credit recovery in India. The committee's report led to the SARFAESI Act that we

[6]See media reports such as http://expressindia.indianexpress.com/ie/daily/19990627/ibu27028.html or http://business.gov.in/closing_business/sica.php.

[7]See Reserve Bank of India on Trend and Progress of Banking India 2002-2003. State Bank of India, India's largest lender had more than ₹40 billion (about $700 million in 2016) tied up in companies referred to BIFR in the year 2011.

study.

SARFAESI empowered the banks and financial institutions to directly seize pledged assets in cases of default without court proceedings. The act laid only two pre-conditions. The loan should have been classified as an NPA and the bank or a financial institution should give a 60 day notice post default. The most important provision was that the creditor could proceed with the recovery without waiting for courts. The creditor friendliness of the act was further strengthened by requiring borrowers to deposit at least 75% of the claim amount, which was reduced to a 25% minimum, in order to appeal against court verdicts. The act was applicable to existing loans as well. According to India's central bank, the Reserve Bank of India, SARFAESI has been the most effective mechanism to recover loans written off as NPAs.[8] In the financial year 2013-2014 194,707 loans, were recovered by applying banker's rights under SARFAESI. The value of NPAs recovered using SARFAESI amounted to nearly 80% of all NPAs recovered by banks during the year 2013-2014. Thus, the regime shift due to SARFAESI is significant.

The next decadal effort in reforming the bankruptcy process has occurred in May 2016, in the wake of a new cycle corporate stress. Both houses of India's parliament passed a bankruptcy law that envisages a new resolution process for resolving distress. The revised bankruptcy law envisages a new cadre of "insolvency professionals" to resolve bankruptcy cases and sets time lines of under a year to resolve bankruptcy cases.

4 Related Work

To provide additional context, we add to the review of related work discussed in Section 1. A theoretical framework that informs our analysis is the hold-up problem analyzed by Rajan (1992). Banks must invest in information production by analyzing the businesses of potential borrowers and by monitoring the loans that are made. Rajan (1992) points out that these costs are recovered in good states, when the relationship bank can extract

[8]Speech delivered by Mr. R. Gandhi, Reserve Bank of India Deputy Governor, on January 30, 2015

surpluses from borrowers who wish to proceed with investments. Arms-length bankers do not invest in information gathering costs but do not have the ability to stop investments in bad states. Thus, arm's length bankers face liquidation states more often and benefit more from laws such as SARFAESI that empower creditors and enhance recovery in bad states. Appendix A sketches a simple model along these lines. We certainly make no claims that it is a complete theory but present it as a tool that formalizes the thinking behind the tests conducted here.

When borrowing from arm's length banks becomes more feasible, a larger set of lenders become available to firms. Following Petersen and Rajan (1995), greater competition from a broader set of lenders can reduce relationship lending. These effects are likely to be more meaningful where relationships matter, such as in small firms or in markets served by fewer banks. Likewise, Boot and Thakor (2000) argue that banks insulate themselves from price competition through relationship banking. Competition blunts the depth of relationship banking, thus the value added per relationship, so the investment in information production or specialization per borrower declines.

Vig (2013) studies the changes in creditor rights in SARFAESI. His work has a different focus from ours. Vig addresses the level of credit. He discusses an agency channel in which a manager extracting rents is threatened by an increase in creditor rights and thus exhibits less preference for debt capital (Acharya, Amihud, and Litov (2011)). Our study addresses a different force, the informational frictions between firms and banks. Moreover, our study examines the composition of credit, or the *nature* of bank credit rather than its level. Several tests based on heterogeneity in treatment effects speak to these compositional effects. Jayaraman and Thakor (2014) argue that increased creditor rights reduce the need for bank monitoring. In their model bank monitoring is primarily induced by *equityholders*. Our study can be viewed as providing complementary evidence on a relationship banking channel for this effect.

We mention another force that could drive a shift towards transactional lending when creditor rights increase. Public sector banks in India are subject to discretionary ex-

post audit by government vigilance officials with no clear time limits. Tools such as these reduce incentives to gather soft information and pushes loan officers to make loans based on collateral. Because laws such as SARFAESI make collateral more enforceable and valuable, banks are pushed away from the costly collection of soft information to transactional banking (Manove, Padilla, and Pagano (2001)).

Our work is also related studies of bank competition. All else equal, more banks should be willing to lend to a borrower when creditor rights are enhanced. Therefore, directionally, the impact of higher creditor rights on relationship banking could mimic that of increased competition in banking. There is no consensus on the potential sign of this effect. Petersen and Rajan (1995) and Chan, Greenbaum, and Thakor (1986) argue that increased competition leads to reduced incentives to acquire information, because in a competitive environment there is a very high chance of borrower switching loyalties. Others such as Boot and Thakor (2000) argue that competition could lead to more relationship banking if it is used as a tool for differentiation in a competitive market.

5 Data

Our primary data source is the Prowess database maintained by the Center for Monitoring Indian Economy (CMIE). CMIE, a leading business information company in India, was established in the year 1976. This database has been used in several other academic studies. Prowess contains data on about 27,000 Indian firms with book value of assets ranging from ₹0.1 million to ₹3.1 trillion.

Our analysis centers around the passage of SARFAESI in 2002. We thus sample firms between 1999 and 2005 excluding government owned firms. The Prowess database provides information about bankers to about 21,000 non-financial firms listed in the database. The information about the bankers of a firm is available in the "Associates and Subsidiary Company Name" sub-section in the "Query by Ownership Structure and Governance Indicators" section. This data is sourced from the annual reports of the

borrowing firms. We cross verify the information provided by Prowess for a random sample of 30 firms and find that Prowess records the data accurately.

Prowess also provides detailed information about company financials analogous to the U.S. COMPUSTAT database. This information is available in the "Annual Financial Statements" subsection in "Query by Financial Statements and Ratings" section. We use this information for testing the implications of higher creditor rights on relationship banking. Further, information about incorporation year, ownership type and industry classification of a firm are also available in the "Identity Indicators" section. From the ownership type, we can infer whether a firm belongs to an established business group. Table 1 provides the relevant details.

As Boot (2000) points out, repeated dealings between lenders and borrower either over time or across products form the basis of relationship lending. Banks obtain considerable hard and soft information about borrowers through these interactions (Ramakrishnan and Thakor (1984)) and through ongoing monitoring (Diamond (1984); Rajan and Winton (1995)). We use the length of continuous engagement as a measure of relationship banking. For our main tests, we consider bank b as a relationship banker to firm i in year j if bank b makes loans to firm i in year j, $j-1$, and $j-2$. For robustness, we re-run our main results using 4 and 5 years of continuous engagement as a measure of relationship.

A question is how to measure the change from relationship banking to transaction banking and vice-versa. Our tests use the following three measures that vary by the stringency by which we define a relationship and its transition to transactional banking.

1. Exclusively relationship banking: In this case, a firm i is considered to have a banking relationship in year j only if all of its bankers in year j are relationship bankers. We count a transition to a single non-relationship banker in a year as transition to transaction banking.

2. Proportion of relationship bankers: In this case, we calculate the proportion of relationship bankers to total number of bankers. This is a continuous measure. A

decrease in the ratio is considered as a movement towards transaction banking.

3. At least one relationship banker: In this case, a firm i is considered to have relationship banking in year j if at least one of its bankers in year j is a relationship banker. Having no relationship banker in a year is counted as transition to transaction banking.

6 Results

6.1 Summary Statistics

Table 2 presents summary statistics. Panel A of the table reveals that firms borrow significantly from relationship bankers. Most bank-borrower pairs are relationship banks according to our definitions. On average, each firm deals with 1.72 bankers in a year. We also report leverage (Debt to Assets) and profitability (EBIT to Assets) ratios for all the firms in the sample. In Panel B and Panel C, we report the numbers separately for pre-SARFAESI and post-SARFAESI period. We note that all measures of relationship banking decrease on average in the post-SARFAESI period.

In Panel D of Table 2, we present data relating to the proportion of firms classified according to the number of banks they deal with. In column 2, we report the proportion of firms that deal with a single bank in a year. Column 3 to 5 report the same proportion for banks that deal with more than one bank in a year. We find that the proportion of firms that deal with a single bank falls from 38.9% just before the SARFAESI act was introduced to 34.8%, three years after. On the other hand number of banks that deal with five or more banks increases from 13.9% to 17.6% in the same period. The data suggest that dependence on single banking relationships decline and the tendency to form multiple relationships increases in the post SARFAESI period when compared to pre SARFAESI period. These are descriptive results that we sharpen in difference in difference specifications.

In panels E, F and G of table 2, we report the proportion of firms classified according to the number of relationship banks they deal with. As before, three years of uninterrupted borrowing from the same bank qualifies as a relationship. In all three panels, "high" and "low" refers to high and low tangibility. In panel E, we report the results for the entire sample. We do not find a consistent pattern from the results presented in Panel E. Overall, in the post waiver period, there is a small decline in the proportion of firms dependent on a single bank. However, low tangibility firms (our "control") show a higher decline in this regard. However, low tangibility firms also show greater declines in the probability of having 3 bankers in the post period relative to the pre period.

The changes in the relationship banking become clearer when we look at small and large firms separately. In Panel F, which reports data for large firms, we see that relationships decline after SARFAESI among high tangibility firms. Among low tangibility firms, we see a nearly 2% increase in the proportion of firms locked to a single relationship banker. We do not see this pattern with regard to dependence on more than one bank. For example, dependence on three banks remains virtually same for both types of firms among small firms. In Panel G, which reports data for large firms, the pattern is the opposite. Low tangibility firms show a higher decline in single bank relationships and a higher increase in multiple bank relationship. Small businesses depend more on information based banking relationships, which can explain the differences in the descriptive statistics in Panels F and G.

In Table 3, we report the results of before-after tests conducted for our treatment and control groups separately based on asset tangibility, on the lines of Vig (2013). Vig argues that firms that have more tangible assets are likely to be impacted more than firms that rely on intangible assets. A bank is likely to find tangible assets much easier to value and monitor when compared to intangible assets. In addition, tangible assets are easier to identify, repossess, and proceed on compared to intangible assets during the bankruptcy process. Thus, the impact of higher creditor rights is likely to be higher on firms with high tangible assets when compared to firms with low tangible assets.

Following Rajan and Zingales (1995), we define tangibility as net fixed assets to total assets. We divide firms into terciles based on tangibility. Our "treatment" group consists of top tercile firms and our "control" group consists of bottom tercile firms. We also report results for the medium tangibility group but these results are for completeness rather than a hypothesis test. Firms belonging to the medium tangibility group are left out for the tests discussed below. The column titled as difference reports the coefficient for the before-after difference. For example, Column 2 of Table 3 reports the difference in relationship banking measures and other variables for low tangibility firms.

The results reported in Table 3 indicate that relationship banking declines in a difference-in-difference sense between treatment firms and control firms. The table also reports the two legs of the difference in difference. The exclusive measure of relationship banking (reported in row 2 of Table 3) increases in the post period among the control group firms but the change is statistically insignificant among the treatment firms. In case of other two relationship measures (reported in rows 1 and rows 3 of Table 3), the increase is higher among control group firms when compared to treatment group firms. This finding also points to a relative decrease in relationships in a difference-in-difference sense. In Row 4 of Table 3, we report changes in relationship banking with public sector banks. Public sector bank relationships increase by nearly 1.2% among control group firms whereas it declines by nearly 2.4% among the treatment group firms.

An interesting within-test is suggested by the nature of the SARFAESI law, which do not apply to all categories of lenders. SARFAESI excludes inter-corporate lenders and non-banking finance companies (NBFCs). Non-banking finance companies were included in the ambit of SARFAESI only in 2011, after our sample period. We find greater declines in relationship banking with non-SARFAESI lenders among control group firms relative to treatment firms. The results indicate a movement of the treatment group firms away from lenders for whom SARFAESI is applicable to lenders for whom it is not applicable.

In Panel B of Table 3, we examine changes in our relationship measures for small and large firms separately. We separately define the treatment and control groups within the

sample of small and large firms. Among small firms, all our measures of relationship banking increase in control group firms in the post SARFAESI period, whereas the same measures decline for treatment group firms. The increases range between 7.9% to 8.5% and declines range between 1.1% and 0.07%. Among small firms which are also likely to be opaque, high tangibility firms are more likely to reduce relationship banking post an increase in creditor rights. Rows 4 to 6 report the same results for the treatment and control group firms in a sample of large firms. Here, we do not find significant movements. In any event, the point of the difference in difference methodology is that the relative differences matter because they are a closer measure of counterfactuals rather than the raw difference levels. We move to multivariate specifications that employ the difference-in-difference framework.

6.2 Difference-in-Difference (DID) Specification

SARFAESI is applicable very widely to all borrowers except agricultural borrowers and those who borrow less than ₹100,000 (about $1,500 as of May 2016). We do not have such borrowers in our sample. We treat intervals of time after 2002 as our post-SARFAESI years. We vary the exact interval to assess robustness.

6.3 Baseline

The main question we examine whether an increase in creditor rights leads to less relationship banking. We employ a standard difference-in-difference (DID) framework:

$$\begin{aligned} Y_{\text{ij}} &= \alpha + \nu_i + \delta_j + \theta_{sj} + \beta_1 \times \text{After} \times \text{HighTan} + \\ &\quad \beta_2 \times \text{HighTan} + \beta_3 \times \text{After} + \beta_4 \times X_{ij} + \epsilon_{ijs} \end{aligned} \tag{1}$$

The analysis is at firm year level. Here the dependent variable of interest Y_{ijs} refers to our measures of relationship banking. The independent variable *After* refers to years after

2001. δ_j refers to year fixed effects, ν_i refers to firm fixed effects and θ_{sj} refers to industry-year interactive fixed effects to control for industry specific factors affecting relationship banking that may vary year by year. X_{ijs} refers to a vector of controls. We follow the literature in including profitability (the ratio of earnings before interest and taxes to Assets) and log sales as controls for profitability and size. To address specification issues (Bertrand, Duflo, and Mullainathan (2004)), we cluster the errors at the firm level. A crucial assumption of the DID framework is the assumption of parallel trends. Figures 1-3 show that the parallel trend assumption is reasonable for all the three measures of relationship banking.

Our main independent variable of interest is the interaction term, $After \times HighTan$, which can be represented as;

$$\begin{aligned} \beta_1 \quad = \quad & (\overline{Y}_{\text{High Tangibility firms}} - \overline{Y}_{\text{Low Tangibility firms}})\big|_{\text{Post SARFAESI}} \\ & - (\overline{Y}_{\text{High Tangibility firms}} - \overline{Y}_{\text{Low Tangibility firms}})\big|_{\text{Pre SARFAESI}} \end{aligned} \tag{2}$$

For firm i, this expression compares difference in intensity of relationship banking in the post- SARFAESI period with the difference in the same intensity in the pre SARFAESI period. A negative sign for the coefficient β_1 would indicate a decline in relationship banking in a DID sense.

The results are presented in Table 4A. The columns vary by how we define relationships. Columns 1 and 2 use the exclusive relationship banking definition. We find that this measure of relationship banking falls by a statistically and economically significant 4.8% (without controls) and 3.6% (with controls) in the post SARFAESI period. Columns 3 and 4 use the ratio measure. Once again, we find that in the post SARFAESI period, the relationship banking measure declines by 4.6% (without using additional controls) and 3.7% (using additional controls). In columns (5) and (6), we use the most liberal definition, where having a single transaction with even one of the existing relationship banker is considered as continuation of relationship banking. The measure of relationship declines by 4.1% or 3.5% depending on specification. Profitability, size and growth

prospects do not appear to make a material difference to the results. Thus, our results indicate that an increase in creditor rights leads to a movement away from relationship banking by firms.

We next examine the impact of increased creditor rights on the duration of bank firm association.[9] Before describing the results, we illustrate the definition of our main dependent variable with an example. Suppose a firm i banks with 3 banks j1, j2 and j3 during the year t and the number of years of continuous bank firm association between firm i and bank j1, j2 and j3 as at the end of year t is respectively 2, 3 and 5 years, then our variable *FIRMDUR* takes the value of $10 = 2 + 3 + 5$. If during year t1, the firm breaks its association with bank j1 and enters into a new banking association with bank j4, then $FIRMDUR$ for year t1 is $11 = 4 + 6 + 1$.

We hypothesize that there is a difference in difference decrease in the above duration measure during the post SARFAESI period. We estimate a specification similar to equation (1) with our measure of duration as the dependent variable. The main independent variable of interest is the interaction between After and High tangibility dummies. We employ firm level controls and fixed effects as specified before. The number of banks a firm deals with can mechanically drive our results in this specification. Thus, we include the number of banks that a firm deals with as an explanatory variable. The results are reported in Table 4B.

In line with our main hypothesis, our measure of firm bank relationship duration declines for the treatment group firms post waiver in a difference in difference sense. The decline is between 6.8% to 7.8% and the results are significant at the 99% confidence level. Economically, the decline is comparable to our main results. Also note that, in line with our expectations, number of banks significantly explains $FIRMDUR$. The results are perhaps not very surprising given the many measures of relationships we study before, so we regard it as a robustness test that directly controls for the number of banks that firm i transacts with in year t.

[9]We thank without implicating Anjan Thakor for suggesting this analysis.

An interesting implication of the break in relationship banking is the possibility of increased initiation of *new* banking engagements in the post SARFAESI period relative to the pre SARFAESI period. We examine if that is the case by re-estimating regression equation (1) but with a different dependent variable. Our Y variable is a dummy variable that takes a value of 1 if firm i borrows for the first time with a bank j during a year t. We report the results in Panel B of Table 4C. We find that the tendency to form a new banking engagement increases from between 9.3% to 10.3% in the post SARFAESI period when compared to pre SARFAESI period.

6.4 Bank Type

We test whether an increase in creditor rights is likely to reduce information based relationship banking. We test this proposition using the following specification

$$\begin{aligned} Y_{\text{ij}} &= \alpha + \nu_i + \delta_j + \theta_{sj} + \beta_1 \times \text{After} \times \text{HighTan} + \\ &\quad \beta_2 \times \text{HighTan} + \beta_3 \times \text{After} + \epsilon_{ijs} \end{aligned} \tag{3}$$

The analysis is at firm year level. Here the dependent variable of interest, Y_{ij},refers to our measures of relationship banking with public sector banks or other banks depending on the model being estimated. In all specifications, the main independent variable of interest is the interaction between treatment group, high tangibility firms, and the post-2002 dummy that reflects a time period after SARFAESI.

6.4.1 Government Owned versus Private or Foreign Banks

Following the discussion in Section 2, the Indian banking Industry has been dominated by public sector banks especially prior to the early 1990s. Burgess and Pande (2004) and Burgess, Pande, and Wong (2005) show that RBI's bank branching norms led to an enormous increase in the public sector branch network. Public sector banks were compelled to enter unbanked markets. Therefore, it is reasonable to assume that public

sector banks have information monopoly on a significant chunk of borrowers.

Other work is consistent with the viewpoint that government owned banks have informational hold over borrowers. Fisman, Paravisini, and Vig (2012) study the lending pattern of a public sector bank. They show that a loan officer increases lending to borrowers belonging to the same social group as that of the loan officer. They show that such soft information leads to desirable outcomes for the bank. Lending increases and default rate goes down. They attribute the findings to the loan officer's ability to collect soft information about borrowers belonging to the loan officer's social group. Private sector banks that have invested in information technology may also gain informational advantages to the extent that these generate special insights about borrowers not readily available to public sector banks. A similar push to soft information likely exists for banks with special presence in rural areas where lack of information forces banks to rely on soft information. Likewise, foreign banks can develop privileged access to and information about their multinational customers (Berger, Klapper, Martinez Peria, and Zaidi (2008)).

The results are reported in Panel A of Table 5 for the max relationship measure, which equals 1 if there is at least one relationship banker. As we see in column (2), we see a 2.4% decline in our measure of relationship banking when the relationship banker is a public sector bank. In column (4), we measure the impact on relationship banking where a foreign bank is the relationship banker. Not surprisingly, we see a mild decline of 1% in our measure of relationship banking. For other type of lenders such as private sector banks (column 3), public financial institutions[10] (column 5) and cooperative banks[11](column 6), we cannot reject the hypothesis that our measures of relationship banking remain unchanged.

[10]Public financial institutions are long term infrastructural lenders notified as public financial institutions by the India's 1956 Companies Act.

[11]These are banks formed by local communities. They are subject to dual regulation from RBI as well as the concerned state governments (Iyer and Puri (2012).)

6.4.2 Institutions *Not* Subject to SARFAESI

While our focus is on expansion of creditor rights, an important feature of India's SARFAESI act is that not all institutions are granted extra creditor rights under SARFAESI. The non-SARFAESI banks thus provide an interesting holdout sample.

Column 7 of Table 5 examines lenders for whom the SARFAESI act is not applicable. These include lenders in the inter-corporate lending market, debt venture capital funds, and non-banking financial companies (NBFCs), etc. Here, we notice a 0.4% statistically significant increase in our relationship measure. At this stage, it is important to note that relationship lending is not the exclusive domain of banks (Carey, Post, and Sharpe (1998)). It has been shown that other lenders also engage in relationship lending. Thus, results in column 5 indicates that the affected borrowers are moving away from lenders for whom SARFAESI is applicable to lenders for whom it is not applicable. Our results indicate such a possibility.

6.5 Specification By Bank-Year

We next test the proposition by re-arranging the data by bank-years. The dependent variable here is the ratio between the number of relationship borrowers to total borrowers in a year. Here we define a relationship borrower as a borrower with whom the bank has had a lending relationship for at least 3 years. We estimate the following model:

$$\begin{aligned} Y_{\text{ij}} &= \alpha + \nu_i + \delta_j + \beta_1 \times \text{After} \times \text{Public} + \beta_2 \times \text{Public} + \\ &\quad \beta_3 \times \text{After} + \beta_4 \times X_{ij} + \epsilon_{ij} \end{aligned} \tag{4}$$

Here, the independent variable of interest in column 1 is the interaction between public bank dummy and the post SARFAESI period. Public bank dummy takes the value of one if the bank under consideration is a government owned (public sector) bank and zero otherwise. We provide a list of public sector banks in the Appendix B. We also include

year and bank fixed effects. The results are reported in Panel B of Table 5.

The measure of relationship banking declines by 6.8% in the post SARFAESI period for public sector banks when compared to other banks. In column 2, we repeat the same exercise for comparing rural banks with others. Rural bank is a dummy that takes the value of 1 if the ratio of rural branches to total branches for a bank is above the median value of the said ratio for the entire banking system. Here, we expect the impact of creditor rights on relationship banking to be higher for rural banks for the same reasons mentioned in the case of public sector banks. We find that our measure of relationship banking declined by 7.0% for rural banks when compared to urban banks in a difference in difference sense.

6.6 Borrower Size

We next analyze if the impact of creditor rights on relationship banking differs based on borrower size. Small firms are more informationally opaque and face more contracting frictions (see, e.g., Berger, Klapper, and Udell (2001)). It is more likely that banks can engage in inter-temporal smoothing of interest rates for small firms. Large firms have fewer of the contracting and informational issues that confront small firms. They are more likely to be followed by analysts and media. We thus expect that SARFAESI should have greater impact on relationship banking where the borrower is a small firm.

We estimate equation (1) separately for small firms and large firms. The results are reported in Table 6. In Panel A, we report the results for small firms. The dependent variable is one of our measures of relationship banking. In column (1) and (2), we use the exclusive relationship banking measure, in columns (3) and (4), we use the ratio measure and in columns (5) and (6), we use the relationship banking measure, which is based on at least one banker being a relationship banker. As can be seen from the table, all measures of relationships decline in the post SARFAESI period for the treatment group. The decline ranges between 8.6% to 9.1%, which is both economically and statistically

significant. In Panel B, we look at the impact on large firms. All three measures of relationship banking do not show any meaningful decline. Thus, we cannot reject the null hypothesis that the relationship measures remain unchanged. The coefficient for the interaction between post SARFAESI period and high tangibility firms is statistically insignificant so the change in creditor rights is unlikely to have any impact on relationship banking.

6.7 Group versus Non-Group Firms

The Indian corporate sector comprises of many large business groups such as the Tata Group or the Aditya Birla Group. Owners hold majority stakes in group firms. Banks may find it relatively easier to make decisions about lending to firms belonging to large business groups as information about the credibility and track record of the owners is available easily. The borrowers also have more reputation capital at stake as defaults in one firm may trigger stoppage of credit to other group firms. Such issues are not relevant to non-group firms where banks must make greater investments in information acquisition. The increase in creditor rights is likely to have greater effect on bank relationships for non-group firms.

We divide our sample into group and non-group firms based on the "ownership group" criteria in the "Identity Indicator" section of Prowess. We run regression equation (1) separately on these samples. Results are reported in Table 7. Panel A reports the results for non-group firms and Panel B for group firms. Three measures of relationships are ordered in the same manner as in other tables. In panel A, we see a significant decline in relationship banking among treated firms in the post-SARFAESI period. The magnitude of the decline ranges from 3.8% to 6.7%. These coefficients are economically as well as statistically significant. Panel B shows the results for the group firms. We do not find any significant differential decline in relationship banking among treatment firms in the post SARFAESI period.

6.8 Bank Competition

We next examine the impact of change in creditor rights in geographical areas that have different levels of banking competition. Areas with low banking competition before SARFAESI are likely to have more intense banking relationships. Greater creditor rights increases the willingness of arms-length lenders to lend to firms with collateral, which reduces the value of relationship banking and the ability of the relationship banks to extract rents inter-temporally. This is not likely to be the case in areas where banking competition already exists (Petersen and Rajan (1995)). Here, an increase in creditor rights is unlikely to have significant effects. We report the results in Table 8. We define banking competition based on Vig (2013). We report the results for low banking competition regions in Panel A and for high banking competition regions in panel B. As can be seen from the table, all three measures of relationship banking decline between 6% and 10%. However, we do not observe such a pattern in regions where banking competition was high before the increase in creditor rights.

6.9 Auxiliary Results

Our setting lets us conduct two additional tests, one for the supply of credit effects and another for the costs of credit. Both shed light on the nature of the banking relationship effects of changes in creditor rights. We briefly discuss these tests and related results below.

6.9.1 SARFAESI and Credit Flow

Ongena and Smith (2000), show that a move away from relationship banking is likely to worsen the availability of credit. Additionally, Houston, Lin, Lin, and Ma (2010) show that banks' willingness to take risks increases when creditor rights are enhanced. The increased risk taking should expand the supply of credit. Since the observed results are based on equilibrium outcomes, it is difficult to separate the impact of demand from

supply. [12]

While inessential to our main point, our setting offers a possibility to separate out supply effects if we can exploit the fact that the Indian firms, especially small and medium enterprises, are credit constrained (Banerjee and Duflo (2014)). Thus, changes in lending to small firms are more likely supply driven. This interpretation is plausible. Our data suggest that 18% of firms regularly use trade credit as a financing option. Using the methodology employed by Petersen and Rajan (1994), De and Singh (2011) estimate that the cost of trade credit in India exceeds 30%. Thus, we conjecture that increased creditor rights leads to reduced investment in acquisition of information, which is an alternative channel that can explain the reduction in leverage once creditor rights are expanded.

To test the above proposition, first we confirm if there is a reduction in the usage of secured credit after SARFAESI among the treatment group borrowers. We run the following regression equation;

$$\begin{aligned} Y_{\text{ij}} &= \alpha + \nu_i + \delta_j + \theta_{sj} + \beta_1 \times \text{After} \times \text{HighTan} + \\ &\quad \beta_2 * \text{HighTan} + \beta_3 * \text{After} + \beta_4 * X_{ij} + \epsilon_{ijs} \end{aligned} \tag{5}$$

The dependent variable here is natural logarithm of secured credit. The observations are organized at a firm year level. The independent variables have same meaning as in equation (1). The results are reported in Table 9. In columns 1 and 2, the dependent variable is the natural logarithm of the total secured borrowing and in column 3 and 4, it is log total debt. We see a decline in the usage of secured credit. The magnitude of the decline ranges from 21% to 28.9%.

6.9.2 Lending rates

Jayaraman and Thakor (2014) argue that increased creditor rights tilt the capital

[12] Acharya, Amihud, and Litov (2011) also show that higher creditor rights are associated with reduced risk taking.

structure of a firm towards debt as emphasis on monitoring by creditors goes down. In their setup, increased leverage leads to increased risk taking on the part of the bank. In turn, this leads to increase in interest rates. However Vig (2013) argues for the opposite effect. Reasons such as reduction in deadweight costs and reduction in hold up costs are likely to lead to a reduction in lending rates. Ongena and Smith (2000) show that moving away from a single bank relationship lowers hold up costs. We test the conflicting hypothesis by estimating the following regression specification

$$\begin{aligned} Y_{\text{ij}} &= \alpha + \nu_i + \delta_j + \theta_{sj} + \beta_1 \times \text{After} \times \text{HighTan} + \\ &\quad \beta_2 * \text{HighTan} + \beta_3 * \text{After} + \beta_4 * X_{ij} + \epsilon_{ijs} \end{aligned} \tag{6}$$

The dependent variable is the interest rate paid by a firm i in year j, which we define as the ratio of interest expense to debt outstanding in year j. Other terms are as before. The results are reported in Table 10. We find that the effective cost of borrowing declines from between 135 basis points to 182 basis points for treatment firms when compared to control group firms.

In Panels B and C of Table 10, we examine impact of borrowing costs of small and large firms separately. We find that interest cost for small firms decline by between 184 basis points to 202 basis points but the decline for large firms is a more modest 61 to 65 basis points. The above results adds to our earlier findings that the impact of creditor rights via relationship banking channel is likely to be higher for smaller firms when compared to larger firms.

7 More Robustness Tests

7.1 Definition of Relationship Banking

As explained in Section 6, we treat a banking engagement as relationship banking if the same pair of borrower and banker deal with each other for at least 3 years. We test

the robustness of our results by considering the length of the relationship as 4 or 5 years. We estimate equation (1) with the changed definition of relationship banking. We report the results in Table 12. Panel A uses the 4-year definition and Panel B uses a 5-year definition. The results are robust.

7.2 Internal Validation: Placebo Time Periods

To strengthen the interpretation that our results are due to the passage of SARFAESI Act, we conduct placebo tests. We randomly chose different event windows outside the 1997-2004 window and estimate specifications similar to equation (1). Table 11 reports the results for the event windows 1993-1999 with the year 1996 as the placebo event year and 2005-2010 with 2008 as the placebo event year. Panel A reports the results for 1993-1999 period and Panel B reports the results for the 2005-2010 period. We do not detect any statistically significant decline in relationship banking for the treatment group firms in the post-period when using false treatment years. In fact, in some cases, we document an increase in relationship banking.

7.3 External Validation: Debt Recovery Tribunals

We next consider the *external* validity of our results. To this end, we exploit another institutional feature that increased the creditor rights in India, the establishment of Debt Recovery Tribunals, or DRTs. These tribunals were established as fast track courts for distress resolution. DRTs were introduced as a part of package of financial sector reforms in the 1990s. The DRT Act came into effect on June 24, 1993. The Act allows the Government of India to establish debt recovery tribunals "for expeditious adjudication and recovery of debts due to banks and financial institutions".[13]

The establishment of DRTs in different states was not a smooth and unhindered process. The initial challenges occurred in India's capital, Delhi. In July 1994, the Delhi

[13] Visaria (2009) has a detailed review of the DRT Act and the institutional aspects.

Bar Association challenged the DRT law in the Delhi High Court. In August 1995, the Delhi High Court questioned the validity of the Act and directed the Delhi DRT to stay its operation. In the final verdict on March 10, 1995, it ruled that DRTs violated the independence of judiciary and the executive. The government appealed the judgment in the Supreme Court. In an interim order on March 18, 1996, the Supreme Court ruled that notwithstanding any stay order passed in any writ petitions, DRTs should resume functions.

The break in DRT establishment caused by the 1995 Delhi high court ruling suggests that DRTs set up after 1996 were more effective than those set up before 1996, as the early DRTs functioning might have been affected by the uncertainty about their legality and the fact that they were new. Following Visaria (2009), we split the states into two groups based on the date of DRT establishment. Group 1 states are the ones where DRTs were established before the 1995 Supreme Court ruling and Group 2 include the ones where DRTs were established after the ruling (See Appendix C).

We estimate specification (1). Here, the after dummy is 1 for all the years after the DRT establishment with additional conditioning on the state in which the DRT applies. We report the results for Group 1 states in Panel A and for Group 2 states in panel B. As can be seen from the table, ratio and at least one relationship banker measures of relationship banking decline by between 4.9% and 6.2%. The "All" relationship banking measure also declines but is insignificant. However, we do not observe such a pattern in the states where the effectiveness of DRT is under question.

8 Conclusion

The nature of creditor rights and their economic consequences are of interest in the finance and economics literature. We focus on the effects of creditor rights on the type of credit supplied in an economy, more specifically arm's length banks relative to relationship banks. We hypothesize that increases in creditor rights push firms away from relationship

banks to transaction banks. We study the effect of creditor rights on banking relationships using a policy experiment in India, the passage of a law, SARFAESI, that substantially increased creditor rights.

Our key results are easily summarized. We find a decline in relationship banking in the regime with greater creditor rights. We conduct placebo tests as means of internal validation. We examine external validation by exploiting staggered introduction of fast-track bankruptcy courts in an earlier period. Our results are robust. The reduction in relationship banking is greater among smaller firms, among firms that do not belong to a business group, among government-owned banks and in geographically concentrated banking markets where the (positive and negative) role of the inside bank is likely greater. Thus, creditor rights alter not only the amount but also the nature of the credit supplied to borrowers in an economy.

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Table 1: Variable Definitions

Table 1(A) reports the definitions and sources of the key variables of interest.

Item #	Variables
1	Sales
2	Depreciation
3	Amortisation
4	PBDITA
5	Total Assets
6	Plant and machinery, computers and electrical assets, net
7	Furniture, social amenities and other fixed assets
8	Land and Buildings

Derived Indicators

Item #	Variables	Description
9	Relationship bank*	A bank having a banking transaction with a firm for more than or equal to three years in a continuous spell
10	Transaction bank*	A bank having a banking transaction with a firm for less than three years in a continuous spell
11	Ratio	Ratio of relationship banks to total banks in a given firm-year pair
12	Min Dummy	is equal to 1 if all banks in a given firm-year are relationship type and 0 otherwise
13	Max Dummy	is equal to 1 if at least one bank in a given firm-year is relationship type and 0 otherwise
14	EBIT	Earnings before Income and Taxes (= Item 4 - Item 2 - Item 3)
15	Tangibility	Tangibility is defined as (Item 6 + Item 7 + Item 8)/Item 5
16	Tangibility 2	Tangibility 2 is defined as (Item 8)/Item 5

* Source -Query by Ownership Structure & Governance Indicators Section - Associates & Subsidiary Company Name

Table 1(B): Variable reconciliation

Table 1(B) reports the number of observations for each data item and the reasons for any omission

Variables	obs	Missing entries	Reason
Number of banks	45218		
Total Assets	44,833	385	Missing Total Assets
Log(Assets)	44,821	12	Zero Total assets
EBIT/Assets	44,821	0	
Sales	37,036	7785	Missing sales info
log(Sales)	37,030	6	Zero Sales
Debt	34,866	2,164	Missing Debt
Debt/ Total Assets	34,750	116	Missing Debt/Assets - 116; due to zero/missing total assets
Ratio of relationship banks/ Total banks	28,142	6,608	Firms with missing bank relationship data
Dummy (=1) if all relationship banks	28,142	0	
Dummy (=1) if at least one relationship bank	28,142	0	
Secured borrowings/ Total assets	26,394	1,748	Missing secured borrowing data

Table 2: Summary Statistics

Table 2 reports summary statistics for key variables. Panel A reports the statistics for the entire period of study (1999-2005). Panel B and C reports the summary statistics for the pre-SARFAESI (1999-2001) and post-SARFAESI period (2002-2005) separately. Panel D shows the results of the proportion of firms with 1, 2, 3, 4 and more than 5 bankers (not necessary relationship type) by year. Panel E shows the results pertaining to proportion of firms with 1, 2 and 3 relationship banks. Panel F provides data for small firms whereas Panel G provides the same for large firms.

Panel A: Period 1999-2005

Variable	Obs	Mean	Median	S.D.	Min	Max
Ratio of relationship banks/ Total banks	28142	0.79	1	0.38	0	1
Dummy (=1) if all relationship banks	28142	0.73	1	0.44	0	1
Dummy (=1) if at least one relationship bank	28142	0.83	1	0.38	0	1
Number of banks	45218	1.72	1	2.37	0	43
Sales	37036	1305.68	163.8	9466.23	0	8.90E+05
Long term borrowing/ Debt	13830	0.27	0.19	0.26	0	1
Debt/ Total Assets	34750	0.54	0.36	0.7	0	5.49
Secured borrowings/ Total assets	26394	0.38	0.27	0.44	0	2.62
Secured bank borrowings/ Total assets	22521	0.23	0.18	0.21	0	1.23
Log(Assets)	44833	4.81	4.98	2.31	-0.92	9.57
Total Assets	44833	853.62	145.3	2005.71	0.4	14311.6
log(Sales)	37030	4.64	5.1	2.69	-2.3	9.67
EBIT/Assets	44821	0.05	0.04	0.12	-0.36	0.5
Tobin's Q	18801	1.02	0.71	0.99	0.13	7.44
Interest (%)	39281	7.52	6.94	7.47	0	32.2
Spread	39281	-0.01	-0.49	7.31	-11.22	26.26

Panel B: Pre-SARFAESI Period 1999-2001

Variable	Obs	Mean	Median	S.D.	Min	Max
Ratio of relationship banks/ Total banks	11286	0.82	1	0.36	0	1
Dummy (=1) if all relationship banks	11286	0.76	1	0.43	0	1
Dummy (=1) if at least one relationship bank	11286	0.85	1	0.35	0	1
Number of banks	15339	2.02	1	2.38	0	26
Sales	13474	1138.4	192.85	7047.04	0	4.50E+05
Long term borrowing/ Debt	4987	0.23	0.14	0.24	0	0.970
Debt/ Total Assets	12909	0.48	0.37	0.45	0.01	2.39
Secured borrowings/ Total assets	10725	0.37	0.28	0.35	0	1.8
Secured bank borrowings/ Total assets	9348	0.21	0.17	0.18	0	0.88
Log(Assets)	15232	5.27	5.26	1.9	0.47	9.32
Total Assets	15232	884.68	192.9	1900.29	1.6	11110.2
log(Sales)	13472	4.88	5.26	2.4	-1.2	9.26
EBIT/Assets	15231	0.04	0.04	0.11	-0.32	0.31
Tobin's Q	8327	0.89	0.65	0.76	0.14	4.71
Interest (%)	13631	10.54	11.4	8.16	0	32.2
Spread	13631	0.62	1.34	8.37	-11.22	26.26

Panel C: Post-SARFAESI period 2002-2005

Variable	Obs	Mean	Median	S.D.	Min	Max
Ratio of relationship banks/ Total banks	16856	0.78	1	0.39	0	1
Dummy (=1) if all relationship banks	16856	0.72	1	0.45	0	1
Dummy (=1) if at least one relationship bank	16856	0.81	1	0.39	0	1
Number of banks	29879	1.56	1	2.34	0	43
Sales	23562	1401.34	148	10603.4	0	8.90E+05
Long term borrowing/ Debt	8843	0.3	0.23	0.27	0	1
Debt/ Total Assets	21841	0.57	0.35	0.8	0	5.49
Secured borrowings/ Total assets	15669	0.39	0.25	0.49	0	2.62
Secured bank borrowings/ Total assets	13173	0.25	0.19	0.24	0	1.23
Log(Assets)	29601	4.57	4.78	2.47	-0.92	9.57
Total Assets	29601	837.64	119.3	2057.71	0.4	14311.6
log(Sales)	23558	4.51	5	2.84	-2.3	9.67
EBIT/Assets	29590	0.05	0.04	0.13	-0.36	0.5
Tobin's Q	10474	1.13	0.75	1.13	0.13	7.44
Interest (%)	25650	5.92	4.48	6.53	0	28.15
Spread	25650	-0.34	-1.88	6.66	-7.11	22.08

Panel D: % of firms with 1,2,3,4 and more than 5 bankers, by year

	Proportion of banks with				
Year	1 bank	2 banks	3 banks	4 banks	5+ banks
1999	38.60%	22.20%	15.70%	9.60%	13.90%
2000	38.30%	21.60%	16.20%	9.00%	14.90%
2001	38.90%	22.80%	14.60%	9.70%	13.90%
2002	37.00%	23.00%	15.70%	9.90%	14.40%
2003	36.90%	22.30%	16.00%	9.80%	15.00%
2004	35.10%	23.60%	15.00%	10.30%	16.00%
2005	34.80%	23.90%	14.00%	9.60%	17.60%

Panel E: % of firms by # *Relationship* Banks, Year, and High or Low Tangible Assets.

Year	1 Bank			2 Banks			3 Banks		
	Overall	High	Low	Overall	High	Low	Overall	High	Low
1999	34.00%	30.90%	35.60%	18.30%	16.70%	19.20%	13.40%	11.60%	14.30%
2000	33.60%	30.40%	35.50%	18.80%	17.20%	19.70%	13.10%	12.80%	13.20%
2001	32.40%	29.00%	34.50%	19.70%	19.00%	20.10%	12.50%	12.50%	12.60%
2002	33.80%	31.40%	35.30%	20.30%	19.50%	20.80%	12.90%	13.00%	12.80%
2003	32.10%	30.00%	33.50%	19.60%	19.30%	19.90%	13.80%	12.90%	14.30%
2004	31.40%	30.90%	31.70%	21.30%	19.50%	22.50%	12.70%	11.50%	13.60%
2005	32.60%	31.90%	33.10%	20.80%	20.00%	21.30%	12.40%	11.60%	13.00%

Panel F: % Firms by # Relationship Banks for Small Firms and High or Low Tangibility

	All	Low	High	All	Low	High	All	Low	High
year_n	Single	Single	Single	Two	Two	Two	Three	Three	Three
1999	46.49%	36.96%	51.57%	17.37%	16.46%	17.85%	10.36%	10.87%	10.08%
2000	46.34%	37.09%	51.54%	18.38%	18.68%	18.21%	9.58%	11.54%	8.49%
2001	43.53%	32.68%	50.39%	19.36%	21.95%	17.72%	9.54%	11.95%	8.01%
2002	46.67%	35.71%	54.03%	21.03%	23.72%	19.21%	9.64%	11.99%	8.06%
2003	43.28%	34.10%	49.73%	22.06%	24.68%	20.21%	10.08%	12.21%	8.59%
2004	44.14%	36.98%	49.60%	22.97%	23.70%	22.42%	10.02%	10.68%	9.52%
2005	45.58%	39.88%	49.78%	22.54%	23.17%	22.08%	10.21%	10.56%	9.96%

Panel G: % Firms by # Relationship Banks for Large Firms and High or Low Tangibility

	All	Low	High	All	Low	High	All	Low	High
year	Single	Single	Single	Two	Two	Two	Three	Three	Three
1999	23.71%	24.65%	22.98%	18.10%	15.07%	20.47%	15.76%	13.12%	17.83%
2000	23.00%	23.88%	22.25%	18.15%	14.42%	21.30%	16.16%	14.42%	17.64%
2001	21.82%	22.38%	21.33%	19.15%	15.43%	22.42%	15.75%	14.66%	16.71%
2002	22.10%	23.33%	21.08%	19.61%	15.44%	23.08%	16.73%	16.64%	16.81%
2003	22.33%	23.84%	21.00%	17.82%	14.90%	20.41%	18.05%	16.89%	19.09%
2004	20.37%	22.01%	18.94%	20.21%	15.94%	23.94%	16.57%	16.29%	16.82%
2005	21.03%	21.45%	20.65%	19.57%	17.27%	21.61%	15.47%	15.27%	15.65%

Table 3: Univariate Differences

Table 3 reports the univariate differences in key explanatory variables used in the study. We split the sample into terciles based on tangibility. Standard errors are reported in the parenthesis. ***, **, * represents statistical significance at the 1%, 5% and 10% levels, respectively.

	Mean		Low tangibility		Medium tangibility		High tangibility	
Variables	before	difference	before	difference	before	difference	before	difference
				Panel A				
Relationship Banks to	0.792***	0.028***	0.682***	0.064***	0.825***	0.027***	0.832***	0.005*
Total banks	(0.002)	(0.002)	(0.005)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)
Min REL	0.734***	0.022***	0.616***	0.056***	0.762***	0.025***	0.786***	-0.002
	(0.002)	(0.002)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)
Max REL	0.826***	0.027***	0.727***	0.063***	0.862***	0.024***	0.857***	0.008***
	(0.002)	(0.002)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Public Relationship	0.611***	-0.009***	0.479***	0.012***	0.638***	-0.008***	0.672***	-0.024***
Banks to total banks	(0.002)	(0.002)	(0.005)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)
Non-SARFAESI	0.004***	-0.002***	0.004***	-0.003***	0.004***	-0.002***	0.003***	-0.000***
relationship to total lenders	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tangibility ratio	0.324***	-0.024***	0.060***	0.026***	0.292***	-0.021***	0.621***	-0.075***
	(0.002)	(0.001)	(0)	(0.001)	(0.001)	(0.001)	(0.004)	(0.002)
Secured borrowing/Assets	0.379***	0.167***	0.273***	0.148***	0.296***	0.075***	0.514***	0.264***
	(0.005)	(0.02)	(0.015)	(0.023)	(0.004)	(0.011)	(0.007)	(0.047)
Interest cost (%)	10.753***	-3.292***	8.094***	-1.903***	12.459***	-3.741***	11.581***	-4.139***
	(0.047)	(0.042)	(0.1)	(0.086)	(0.076)	(0.073)	(0.06)	(0.059)
Log(Sales)	4.841***	0.185***	3.947***	0.200***	5.425***	0.167***	4.992***	0.189***
	(0.014)	(0.007)	(0.027)	(0.015)	(0.02)	(0.01)	(0.022)	(0.01)
EBIT/Total Assets	0.143***	0.016	0.193***	-0.073***	0.117***	0.018***	0.118***	0.103***
	(0.012)	(0.013)	(0.034)	(0.034)	(0.003)	(0.005)	(0.002)	(0.019)
				Panel B				
				Small Firms				
Relationship Banks	0.752***	0.029***	0.634***	0.085***	0.779***	0.023***	0.801***	-0.007*
to Total Banks	(0.003)	(0.003)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.004)
Min REL	0.711***	0.027***	0.601***	0.079***	0.739***	0.024***	0.769***	-0.011**
	(0.004)	(0.003)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)
Max REL	0.783***	0.026***	0.697***	0.083***	0.811***	0.016***	0.825***	-0.007**
	(0.003)	(0.003)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
				Large Firms				
Relationship Banks	0.843***	0.022***	0.760***	0.021***	0.860***	0.030***	0.868***	0.013***
to Total banks	(0.002)	(0.002)	(0.007)	(0.006)	(0.003)	(0.003)	(0.004)	(0.004)
Min REL	0.770***	0.015***	0.674***	0.009*	0.781***	0.027***	0.808***	0.005
	(0.003)	(0.003)	(0.008)	(0.007)	(0.004)	(0.004)	(0.005)	(0.004)
Max REL	0.879***	0.023***	0.807***	0.019***	0.899***	0.029***	0.893***	0.019***
	(0.002)	(0.002)	(0.007)	(0.006)	(0.003)	(0.003)	(0.004)	(0.004)

Table 4: Creditor Rights and relationship banking

Table 4A: Creditor Rights and relationship banking measures

This table reports the regression results for the regression of different measures of relationship banking on firm characteristics. In columns 1 and 2, the dependent variable is the dummy that equals to one for a firm-year if all the banking transactions of the firm are relationship types. Here the relationship is defined as the banking transaction with a firm of more than or equal to three continuous years. In column 3-4, the dependent variable is the ratio of relationship banks to total banks for a firm-year. In columns 5-6, the dependent variable is a dummy that equals to one if atleast one banking transaction is a relationship type. After dummy is one for the post- SARFAESI period, that is, equal to one for the years 2002, 2003, 2004 and 2005. Firms are divided into three bins based on pre-treatment (before 2002) values of tangibility. Here tangibility is defined as the ratio of total tangible assets to total assets. The top tercile is the treatment group while the bottom tercile is the control group. Profitability is measured using Earnings before interest and taxes to total assets and log of sales proxies for size. The specification includes firm, year and industry-year fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels, respectively

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Min Dummy		Ratio		Max Dummy	
After * High tangibility	-0.048***	-0.036*	-0.046***	-0.037***	-0.041***	-0.035***
	(0.018)	(0.018)	(0.013)	(0.013)	(0.013)	(0.013)
Log(Sales)		-0.003		0.003		0.006
		(0.006)		(0.005)		(0.005)
EBIT/Assets		0.006		-0.019		-0.021
		(0.042)		(0.032)		(0.031)
Observations	15,584	14,417	15,584	14,417	15,584	14,417
R-squared	0.607	0.602	0.734	0.734	0.760	0.761
Adj R-squared	0.495	0.486	0.659	0.656	0.692	0.692
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 4B: Creditor Rights and duration of bank firm engagement.

This table presents regression results for duration of bank firm relationship on change in creditor rights and other covariates. The dependent variable- is log of firmdur, which is a continuous measure that tracks the number of years of continuous engagement between a firm i and bank $j_1, j_2, .., j_n$ as at the end of year t. It is the sum of the years of continuous engagement with each bank. Covariates After and High Tangibility have the same meaning as in Table 4A. The main independent variable of interest is the interaction between After and High tangibility dummies. In column 1, we employ only firm and year fixed effects along with the main independent variable. In column 2, we use firm level controls such as natural logarithm of sales, EBIT/Assets and number of banks a firm i is associated with in year t and also firm and year fixed effects. Standard errors are clustered at firm level and adjusted for heteroskedasticity. ***, **, * represents statistical significance at the 1%, 5% and 10% levels, respectively.

VARIABLES	LOG DUR	LOG DUR
After * High tangibility	-0.068***	-0.078***
	(0.022)	(0.023)
num_bank	0.172***	0.165***
	(0.012)	(0.012)
Log(Sales)		-0.005
		(0.007)
EBIT/Assets		-0.138**
		(0.059)
Observations	15,584	14,417
R-squared	0.914	0.918
Adj R-squared	0.89	0.894

Table 4C: Creditor Rights and borrowing from a new bank

This table reports the results of the regression of a dummy indicating the beginning of a new banking engagement with a firm (whether relationship or transactional) on firm characteristics. Firms are divided into three bins based on pre-treatment (before 2002) values of tangibility. Here tangibility is defined as the ratio of total tangible assets to total assets. The top tercile is the treatment group while the bottom tercile is the control group. Profitability is measured using Earnings before interest and taxes to total assets and log of sales proxies for size. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroskedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels, respectively.

	(1)	(2)
VARIABLES	New Engagement	
After * High tangibility	0.093***	0.103***
	(0.017)	(0.018)
Log(Sales)		0.027***
		(0.005)
EBIT/Assets		-0.029
		(0.043)
Observations	15,584	14,417
R-squared	0.383	0.386
Adj R-squared	0.207	0.207

Table 5: Creditor Rights and bank type

This table reports results of the regression of ratio of different types of relationship banks to total banks on firm characteristics. Panel A, reports the results for public, private, foreign, public financial institutions, cooperative banks and Non-SARFAESI institutions (private financial institutions where SARFAESI Act is not applicable). Panel B views relationships from the bank's side. The dependent variable is the ratio of relationship borrowers to total borrowers. The public bank dummy is one for PSU banks. The rural bank dummy is one for banks that have above median number of rural bank branches. The specification includes bank and year fixed effects. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

Panel A: By Bank Type

VARIABLES	PUBLIC	PRIVATE	FOREIGN	PFI	COOP	NOT SARFAESI
After * High tangibility	-0.024*	-0.012	-0.009*	-0.001	-0.000	0.004***
	(0.013)	(0.008)	(0.005)	(0.001)	(0.004)	(0.001)
Observations	15,584	15,584	15,584	15,584	15,584	15,584
R-squared	0.798	0.804	0.821	0.623	0.838	0.698
Adj R-squared	0.741	0.749	0.770	0.516	0.791	0.612

Panel B: Relationship lending viewed from the bank's side

	(1)	(2)
VARIABLES	Ratio of relationship borrowers/ Total borrowers	
After * Rural dummy	-0.068**	
	(0.033)	
After * Public Bank dummy		-0.070**
		(0.033)
Observations	428	2,423
R-squared	0.496	0.581
Adj R-squared	0.399	0.426

Table 6: Creditor Rights and relationship lending by firm size

This table reports the results of the regression of different measures of relationship banking on firm characteristics for large and small firms separately. We use the same specification that is used in Table 4. Large firms are the firms which are above median in terms of their size (calculated as the sum of total assets and sales), while small firms are those that are below median. In columns 1 and 2, the dependent variable is the dummy that equals to one for a firm-year if all the banking transactions of the firm are relationship types. Here the relationship is defined as the banking transaction with a firm of more than or equal to three continuous years. In column 3-4, the dependent variable is the ratio of relationship banks to total banks for a firm-year. In columns 5-6, the dependent variable is a dummy that equals to one if atleast one banking transaction is a relationship type. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

Panel A: Small Firms

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Min Dummy		Ratio		Max Dummy	
After * High tangibility	-0.090***	-0.086***	-0.090***	-0.084***	-0.091***	-0.086***
	(0.027)	(0.028)	(0.022)	(0.022)	(0.021)	(0.022)
Log(Sales)		0.002		0.005		0.006
		(0.008)		(0.006)		(0.006)
EBIT/Assets		-0.078		-0.079*		-0.082*
		(0.060)		(0.046)		(0.042)
Observations	6,594	6,135	6,594	6,135	6,594	6,135
R-squared	0.636	0.649	0.732	0.747	0.753	0.768
Adj R-squared	0.521	0.528	0.648	0.660	0.675	0.689

Panel B: Large Firms

After * High tangibility	-0.009	-0.008	-0.007	-0.007	0.002	0.000
	(0.022)	(0.022)	(0.014)	(0.015)	(0.014)	(0.014)
Log(Sales)		-0.009		0.000		0.003
		(0.010)		(0.008)		(0.007)
EBIT/Assets		0.072		0.036		0.053
		(0.063)		(0.048)		(0.045)
Observations	8,986	8,898	8,986	8,898	8,986	8,898
R-squared	0.543	0.542	0.700	0.699	0.738	0.738
Adj R-squared	0.430	0.427	0.626	0.623	0.673	0.672
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: Creditor Rights and relationship lending by group affiliation

This table reports the results of the regression of different measures of relationship banking on firm characteristics for the Group vis-a-vis Non-Group firms. We use the same specification that is used in Table 4. In columns 1 and 2, the dependent variable is the dummy that equals to one for a firm-year if all the banking transactions of the firm are relationship types. Here the relationship is defined as the banking transaction with a firm of more than or equal to three continuous years. In column 3-4, the dependent variable is the ratio of relationship banks to total banks for a firm-year. In columns 5-6, the dependent variable is a dummy that equals to one if atleast one banking transaction is a relationship type. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

Panel A: Firms not belonging to a group

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Min Dummy		Ratio		Max Dummy	
After * High tangibility	-0.067***	-0.055**	-0.052***	-0.044**	-0.042**	-0.038**
	(0.023)	(0.024)	(0.018)	(0.018)	(0.017)	(0.017)
Log(Sales)		0.004		0.008		0.011**
		(0.007)		(0.006)		(0.006)
EBIT/Assets		-0.007		-0.051		-0.061
		(0.054)		(0.043)		(0.040)
Observations	9,779	8,932	9,779	8,932	9,779	8,932
R-squared	0.618	0.614	0.732	0.732	0.756	0.758
Adj R-squared	0.504	0.495	0.652	0.650	0.684	0.684

Panel B: Group Firms

After * High tangibility	-0.026	-0.013	-0.037*	-0.024	-0.038**	-0.026
	(0.028)	(0.029)	(0.020)	(0.020)	(0.019)	(0.019)
Log(Sales)		-0.009		-0.002		-0.001
		(0.010)		(0.008)		(0.008)
EBIT/Assets		0.000		0.014		0.035
		(0.068)		(0.051)		(0.047)
Observations	5,703	5,370	5,703	5,370	5,703	5,370
R-squared	0.593	0.587	0.745	0.743	0.775	0.775
Adj R-squared	0.481	0.471	0.675	0.671	0.713	0.712
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: Creditor Rights and relationship lending by competition

This table reports the results of the regression of different measures of relationship banking on firm characteristics for firm incorporated in low and high competition areas. We use the same specification that is used in Table 4. In columns 1 and 2, the dependent variable is the dummy that equals to one for a firm-year if all the banking transactions of the firm are relationship types. Here the relationship is defined as the banking transaction with a firm of more than or equal to three continuous years. In column 3-4, the dependent variable is the ratio of relationship banks to total banks for a firm-year. In columns 5-6, the dependent variable is a dummy that equals to one if atleast one banking transaction is a relationship type. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

Panel A: Low Competition						
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Min Dummy		Ratio		Max Dummy	
After * High tangibility	-0.099***	-0.084***	-0.089***	-0.072***	-0.079***	-0.063***
	(0.029)	(0.030)	(0.023)	(0.023)	(0.023)	(0.022)
Log(Sales)		-0.007		-0.002		0.000
		(0.010)		(0.008)		(0.008)
EBIT/Assets		0.068		-0.013		-0.056
		(0.057)		(0.048)		(0.047)
Observations	6,608	6,257	6,608	6,257	6,608	6,257
R-squared	0.606	0.606	0.727	0.733	0.751	0.760
Adj R-squared	0.497	0.495	0.652	0.658	0.682	0.693
Panel B: High Competition						
After * High tangibility	-0.028	-0.004	-0.032	-0.017	-0.027	-0.016
	(0.028)	(0.029)	(0.020)	(0.020)	(0.019)	(0.019)
Log(Sales)		-0.008		-0.002		0.000
		(0.009)		(0.006)		(0.005)
EBIT/Assets		-0.096		-0.050		-0.001
		(0.072)		(0.055)		(0.049)
Observations	5,134	4,652	5,134	4,652	5,134	4,652
R-squared	0.591	0.581	0.729	0.728	0.757	0.759
Adj R-squared	0.479	0.461	0.655	0.649	0.690	0.690
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 9: Creditor Rights and Credit Supply

The table reports the results of the regression of different measures of credit on firm characteristics. In columns 1 and 2, the dependent variable is the natural logarithm of the total secured borrowing of the firm i as at the end of year j. In column 3-4, the dependent variable is the natural logarithm of the total debt owed by firm i as at the end of year j. After dummy is one for the post- SARFAESI period, that is, equal to one for the years 2002, 2003, 2004 and 2005. Firms are divided into three bins based on pre-treatment (before 2002) values of tangibility. Here tangibility is defined as the ratio of total tangible assets to total assets. The top tercile is the treatment group while the bottom tercile is the control group. Profitability is measured using Earnings before interest and taxes to total assets and log of sales proxies for size. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

	(1)	(2)	(3)	(4)
VARIABLES	log(Secured borrowing)		log(Debt)	
After * High tangibility	-0.289***	-0.273***	-0.250***	-0.210***
	(0.055)	(0.055)	(0.050)	(0.050)
Log(Sales)		0.180***		0.165***
		(0.022)		(0.018)
EBIT/Assets		-1.600***		-1.379***
		(0.157)		(0.129)
Observations	14,078	13,241	17,986	15,883
R-squared	0.915	0.918	0.921	0.928
Adj R-squared	0.890	0.892	0.899	0.906
Industry*Year Fixed Effects	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes

Table 10: Creditor Rights and cost of credit

This table reports the regression results for the regression of cost of credit on firm characteristics. Here, the dependent variable is the average interest cost (in percentage) of borrowings for a firm-year. After dummy is one for the post- SARFAESI period, that is, equal to one for the years 2002, 2003, 2004 and 2005. Firms are divided into three bins based on pre-treatment (before 2002) values of tangibility. Here tangibility is defined as the ratio of total tangible assets to total assets. The top tercile is the treatment group while the bottom tercile is the control group. Profitability is measured using Earnings before interest and taxes to total assets and log of sales proxies for size. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

	(1)	(2)	(3)	(4)
VARIABLES		Interest cost (%)		
After * High tangibility			-1.815***	-1.351***
			(0.243)	(0.270)
After dummy	-4.624***	-5.142***		
	(0.277)	(0.301)		
Log(Sales)		0.935***		0.934***
		(0.093)		(0.093)
EBIT/Assets		-1.890***		-1.641**
		(0.706)		(0.699)
Observations	20,767	17,632	20,767	17,632
R-squared	0.709	0.707	0.711	0.708
Adj R-squared	0.629	0.620	0.632	0.622
Industry*Year Fixed Effects	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes

Table 10 (continued), Panel A: Small Firms

VARIABLES	Interest cost (%)			
After * High tangibility			-2.020***	-1.835***
			(0.392)	(0.420)
After dummy	-4.492***	-4.456***		
	(0.420)	(0.448)		
Log(Sales)		0.952***		0.942***
		(0.119)		(0.118)
EBIT/Assets		-2.681***		-2.314**
		(0.963)		(0.944)
Observations	9,278	8,374	9,278	8,374
R-squared	0.677	0.698	0.680	0.700
Adj R-squared	0.584	0.599	0.587	0.602

Table 10 (continued), Panel B: Large Firms

After * High tangibility			-0.647**	-0.606*
			(0.314)	(0.312)
After dummy	-5.656***	-5.883***		
	(0.365)	(0.360)		
Log(Sales)		0.827***		0.832***
		(0.142)		(0.142)
EBIT/Assets		-1.230		-1.095
		(1.072)		(1.072)
Observations	9,790	9,634	9,790	9,634
R-squared	0.664	0.672	0.664	0.673
Adj R-squared	0.580	0.589	0.581	0.590
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes

Table 11: Falsification tests

This table estimates the specification used in Table 4 for the 1993-1999 and 2005-2010 periods as falsification tests. We report the results of the regression of different measures of relationship banking on firm characteristics. Year 1998 is used as the placebo treatment year in Panel A. In Panel B, 2008 is the placebo treatment year. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroskedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels, respectively

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Min Dummy		Ratio		Max Dummy	
Panel A: Assume pre-SARFAESI is 1993-1999 with Act passed in 1996						
After * High tangibility	-0.022	-0.016	-0.018	-0.014	-0.015	-0.012
	(0.021)	(0.022)	(0.015)	(0.016)	(0.014)	(0.015)
Log(Sales)		0.011		0.017**		0.020***
		(0.009)		(0.008)		(0.007)
EBIT/Assets		-0.014		-0.043		-0.060
		(0.069)		(0.052)		(0.050)
Observations	10,853	10,261	10,853	10,261	10,853	10,261
R-squared	0.567	0.559	0.681	0.668	0.702	0.687
Adj R-squared	0.450	0.438	0.595	0.578	0.622	0.602
Panel B: Assume pre-SARFAESI is 2005-2010 with Act passed in 2008						
After * High tangibility	0.011	0.002	-0.007	-0.005	-0.020	-0.009
	(0.022)	(0.026)	(0.017)	(0.019)	(0.016)	(0.018)
Log(Sales)		0.004		0.010*		0.010*
		(0.007)		(0.006)		(0.006)
EBIT/Assets		0.031		-0.016		-0.029
		(0.044)		(0.034)		(0.033)
Observations	15,418	13,839	15,418	13,839	15,418	13,839
R-squared	0.592	0.586	0.736	0.735	0.769	0.767
Adj R-squared	0.468	0.457	0.656	0.653	0.699	0.696
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 12: Robustness tests: Definition of a relationship bank

This table reports the results of a regression of different measures of relationship banking on firm characteristics. Here the relationship is defined as the banking transaction with a firm of more than or equal to 4 continuous years (Panel A) or 5 years (Panel B). The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Min Dummy		Ratio		Max Dummy	
			Panel A: 4 Years			
After * High tangibility	-0.053***	-0.039*	-0.050***	-0.038***	-0.053***	-0.042***
	(0.019)	(0.020)	(0.014)	(0.014)	(0.014)	(0.014)
Log(Sales)		-0.006		0.004		0.010**
		(0.007)		(0.005)		(0.005)
EBIT/Assets		-0.005		-0.042		-0.045
		(0.044)		(0.034)		(0.033)
Observations	15,584	14,417	15,584	14,417	15,584	14,417
R-squared	0.668	0.665	0.790	0.790	0.811	0.813
Adj R-squared	0.573	0.568	0.730	0.729	0.757	0.759
			Panel B: 5 Years			
After * High tangibility	-0.047***	-0.039**	-0.049***	-0.038***	-0.044***	-0.032***
	(0.018)	(0.019)	(0.013)	(0.013)	(0.012)	(0.012)
Log(Sales)		0.001		0.011**		0.016***
		(0.006)		(0.005)		(0.005)
EBIT/Assets		0.022		-0.019		-0.055*
		(0.043)		(0.032)		(0.032)
Observations	15,584	14,417	15,584	14,417	15,584	14,417
R-squared	0.750	0.748	0.859	0.861	0.881	0.885
Adj R-squared	0.679	0.675	0.819	0.820	0.848	0.852
Industry-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 13: External validity: DRT in group 1 and group 2 states

This table reports the results of the regression of different measures of relationship banking on firm characteristics for firms incorporated in Group 1 and Group 2 states. Grouping of states is done based on the time of implementation of Debt Recovery Tribunal Act in different states. In columns 1 and 2, the dependent variable is the dummy that equals to one for a firm-year if all the banking transactions of the firm are relationship types. Here the relationship is defined as the banking transaction with a firm of more than or equal to three continuous years. In column 3-4, the dependent variable is the ratio of relationship banks to total banks for a firm-year. In columns 5-6, the dependent variable is a dummy that equals to one if atleast one banking transaction is a relationship type. The specification includes firm, year and industry fixed effects. Standard errors reported in the parentheses are robust to heteroscedasticity and are clustered by firms. ***, **, * represents statistical significance at the 1%, 5% and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Min Dummy		Ratio		Max Dummy	
			Panel A: Group 1 States			
After * High tangibility	-0.011	-0.005	-0.020	-0.008	-0.019	-0.004
	(0.042)	(0.042)	(0.036)	(0.037)	(0.036)	(0.037)
Log(Sales)		0.009		0.011		0.009
		(0.015)		(0.013)		(0.013)
EBIT/Assets		0.045		-0.035		-0.077
		(0.106)		(0.088)		(0.089)
Observations	4,428	4,298	4,428	4,298	4,428	4,298
R-squared	0.403	0.401	0.477	0.478	0.479	0.481
Adj R-squared	0.302	0.297	0.389	0.388	0.392	0.391
			Panel A: Group 2 States			
After * High tangibility	-0.033	-0.040	-0.033*	-0.039**	-0.040**	-0.046**
	(0.024)	(0.025)	(0.018)	(0.019)	(0.017)	(0.018)
Log(Sales)		-0.006		0.007		0.013
		(0.010)		(0.008)		(0.008)
EBIT/Assets		0.110		0.076		0.075
		(0.087)		(0.074)		(0.073)
Observations	6,416	6,262	6,416	6,262	6,416	6,262
R-squared	0.395	0.397	0.471	0.474	0.470	0.475
Adj R-squared	0.303	0.304	0.390	0.392	0.390	0.393
Industry*Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm, Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Figure 1: Ratio of relationship bankers to total bankers.

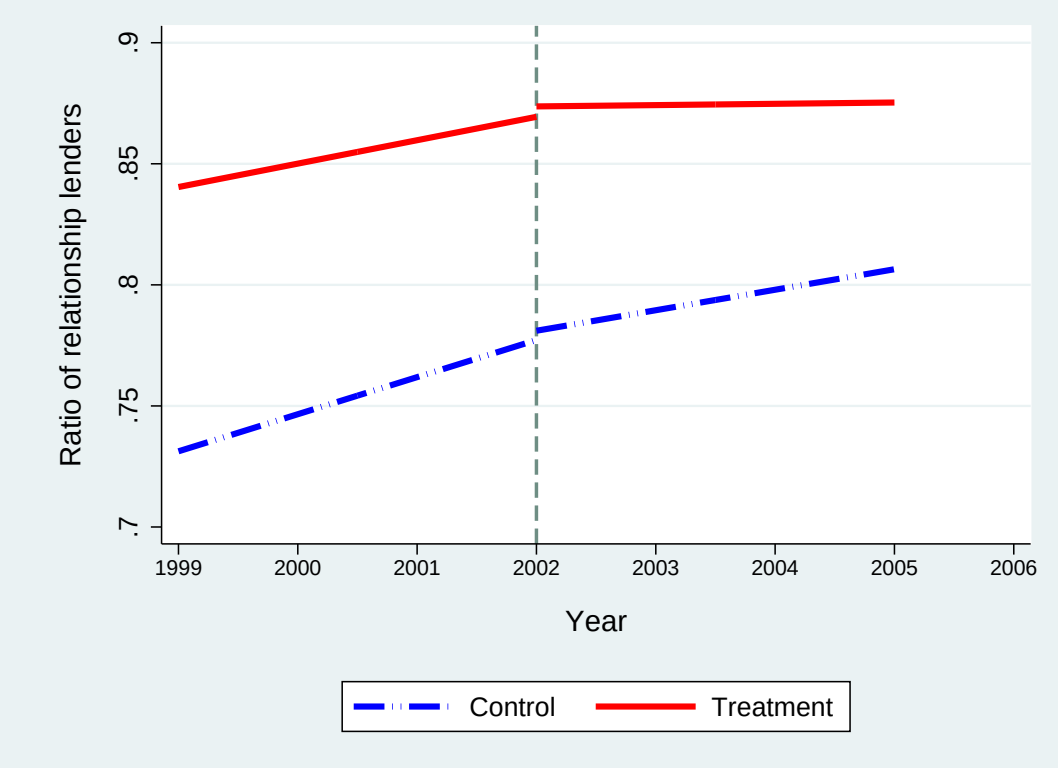


Figure 2: Min Dummy: =1 if **all** bankers are relationship type, 0 otherwise

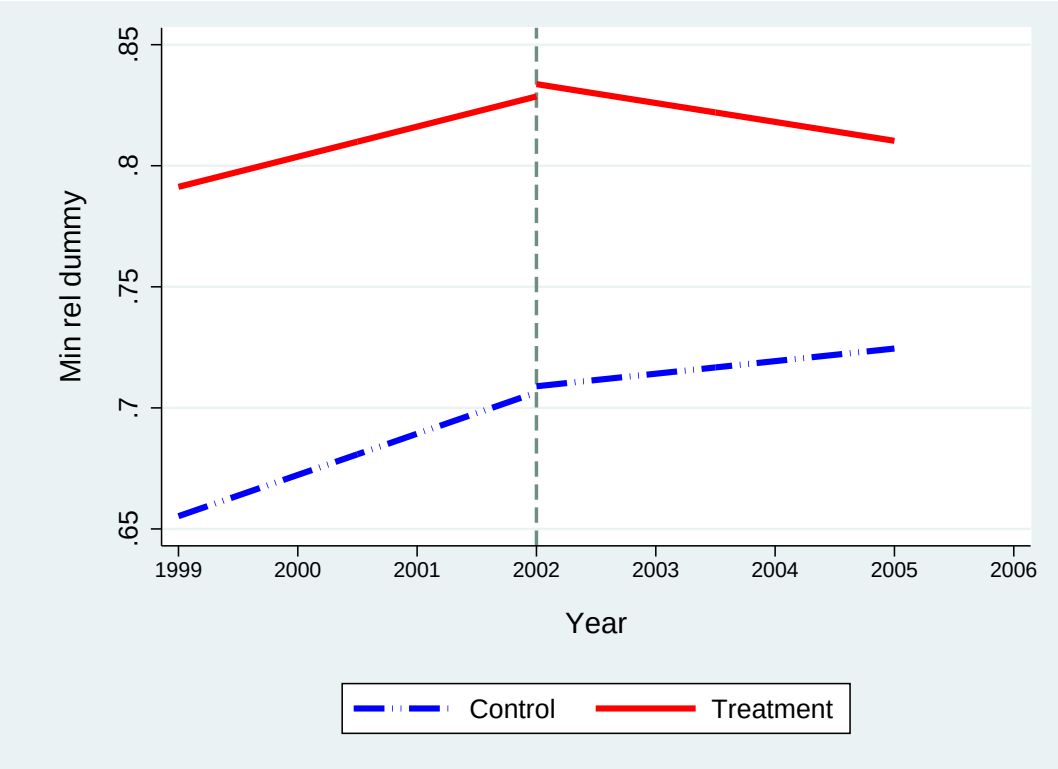
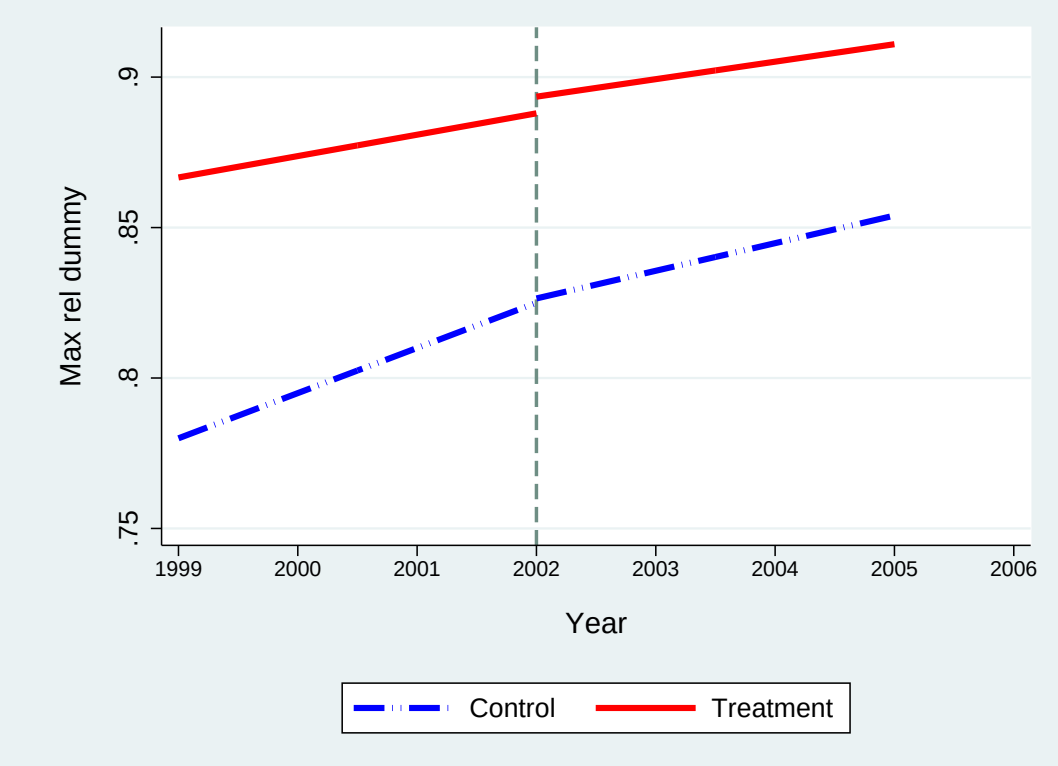


Figure 3: MAX DUMMY: =1 IF **at least** ONE BANKER IS RELATIONSHIP TYPE, 0 OTHERWISE



Appendix A: Model

We present a parsimonious model to capture the intuition that creditor rights increase the viability of arm's length financing. In our setup, a relationship bank has an informational advantage that lets it liquidate enterprises efficiently. However, the informational advantage also endows the bank rents that it extracts in non-liquidation states. Arm's length lenders do not have the informational advantages of relationship banks so their liquidation decisions are less efficient but they are also unable to extract rents in non-liquidation states. The tradeoff captures the essence of our tests in a simple way.

There are three periods, $t = 0, 1, 2$. At time $t = 0$, a firm borrows an amount F through an informed relationship bank or an arm's length bank. The funds are for an investment opportunity that requires investment at $t = 1$. At $t = 2$, investment payoffs are realized and repayments are made. If the firm borrows F from a relationship bank, it must repay an amount F_r. If there is arm's length financing from a transactional bank, the firm repays an amount F_a. Firms and banks are risk neutral and we normalize the expected rate of return to zero.

The investment project has an ex-ante $t = 2$ payoff as follows. With probability p, the payoff is high H and with probability $1 - p$, the payoff is low L. These payoffs are realized at $t = 2$. Bankruptcy is the state when the firm realizes the low payoff L. To make the bankruptcy event economically meaningful, we specify that $L < F_r, F_a < H$. Better creditor rights improve bankruptcy processes and increase the liquidation value in the low state L.

The last element of the model is an entrepreneur's benefit from being in control. We model this in a relatively standard way as a benefit b that accrues to the manager if she continues to run the firm until $t = 2$. Other things equal, the manager likes to run the company and the amount b is the benefit from doing so.

Relationship Bank

The (informed) relationship bank learns about the quality of the project at $t = 1$. If

the low payoff state is realized, it is profitable for the bank to stop the investment and in that situation, this lender gets back its face value F. This is a simplification: the crucial assumption is that the payoff from early stoppage is sufficiently greater than with continuation. If the high payoff state is observed, the relationship bank can allow the project to continue. It has the incentive to do so because its ability to hold up the borrower (Rajan (1992)) lets it extract relationship rent r so its payoffs from continuation are $F + r$ while stoppage payoff is F. The expected payback to the relationship lender is thus $p(F + r) + (1 - p)F = F + pr$ and the return net of amount loaned is pr. Given competition among banks to become relationship banks, the return to relationship lending should equal c, the amount spent to become a relationship bank.

With the above structure, the expected return to the entrepreneur from borrowing from a relationship bank is

$$\pi_r = p(H - F) + pb - pr = p(H - F) + pb - c \tag{7}$$

Arm's Length Financing

The non-relationship transaction bank does not learn about the project state at $t = 1$. If the project proceeds and the high state is realized, the bank earns F_a while in the low state, the bank earns $L < F_a$. We interpret L as the liquidation value net of all costs of being in the bankrupt state when investment has occurred and the payoff is low. L increases when there is a better creditor rights regime such as SARFAESI.

The face value demanded by the transaction lender F_a is such that $F = pF_a + (1-p)L$. The entrepreneur's payoff from borrowing from the transaction bank is

$$\pi_t = p(H - F_a) + b = pH - F + (1 - p)L + b \tag{8}$$

What Type of Debt?

From equations (7) and (8), it follows that the net payoff to the entrepreneur from arm's

length banking over relationship banking is $\pi_t - \pi_r$, equivalently

$$\begin{aligned} \pi_t - \pi_r &= (pH - F + (1-p)L + b) - (p(H-F) + pb - c) \\ &= (1-p)(L+b) - F(1-p) + c \end{aligned} \tag{9}$$

The main result follows immediately. Better creditor rights increase L, liquidation values realized in arm's length financing through the transaction bank, which becomes more viable relative to relationship banking. Equivalently, $\pi_t - \pi_r$ increases in L, whose benefits ultimately flow to the entrepreneur as the banks realize their reservation payoffs. Thus, better creditor rights increase the viability of arm's length financing relative to relationship banking.

Other comparative statics have straightforward intuition. With the transactional bank, the borrower benefits from remaining in control in all states rather than just the state in which high payoffs are realized, which would be the case with borrowing from a relationship bank. The first term in equation (9) reflects this benefit. Additionally, the borrower saves on the costs c of becoming a relationship bank, which is recovered by the relationship bank to make its participation viable. This is the third term in equation (9). These two benefits are traded against efficient liquidation with a relationship bank, which is the middle term in the expression.

Appendix B
List of public and private banks

Public Banks	Private Banks
Allahabad Bank	Axis Bank Ltd.
Andhra Bank	Bank Of Karad Ltd.
Bank Of Baroda	Bank Of Madurai Ltd.
Bank Of India	Bank Of Punjab Ltd.
Bank Of Maharashtra	Bank Of Rajasthan Ltd.
Canara Bank	Bareilly Corporation Bank Ltd.
Central Bank Of India	Benares State Bank Ltd.
Corporation Bank	Bharat Overseas Bank Ltd.
Dena Bank	Catholic Syrian Bank Ltd.
I D B I Bank Ltd.	Centurion Bank Of Punjab Ltd.
Indian Bank	City Union Bank Ltd.
Indian Overseas Bank	Commerce Bank
New Bank Of India [Erstwhile]	D C B Bank Ltd.
Orient Bank Of Commerce	Dhanlaxmi Bank Ltd.
Oriental Bank Of Commerce	Federal Bank Ltd.
Punjab & Sind Bank	Ganesh Bank Of Kurundwad Ltd.
Punjab National Bank	Global Trust Bank Ltd.
State Bank Of Bikaner & Jaipur	H D F C Bank
State Bank Of Hyderabad	I N G Bank N V
State Bank Of India	I N G Vysya Bank Ltd.
State Bank Of Indore	I C I C I Bank
State Bank Of Mysore	Indbank Merchant Banking Services Ltd.
State Bank Of Patiala	Indusind Bank Ltd.
State Bank Of Saurashtra [Merged]	Industrial Bank Ltd.
State Bank Of Sikkim	Industrial Investment Bank Of India Ltd.
State Bank Of Travancore	Jammu & Kashmir Bank Ltd.
Syndicate Bank	Karnataka Bank Ltd.
Uco Bank	Karur Vysya Bank Ltd.
Union Bank Of India	Kotak Mahindra Bank Ltd.
United Bank Of India	Lakshmi Vilas Bank Ltd.
Vijaya Bank	Lord Krishna Bank Ltd.
	Nainital Bank Ltd.
	National Westminster Bank Group
	Nedungadi Bank Ltd.
	Ratnakar Bank Ltd.
	S B I Commercial & International Bank Ltd.
	Sangli Sahakari Bank Ltd.
	South Indian Bank Ltd.
	Tamilnad Mercantile Bank Ltd.
	Times Bank Ltd.
	United Industrial Bank Ltd.
	Yes Bank Ltd.

Appendix C: Dates of DRT Establishment

City of DRT	Date of establishment	Jurisdiction
Group 1 states		
Kolkata	27-Apr-94	West Bengal, Andaman and Nicobar Islands
Delhi	5-Jul-94	Delhi
Jaipur	30-Aug-94	Rajasthan, Himachal Pradesh, Haryana, Punjab, Chandigarh
Bangalore	30-Nov-94	Karnataka, Andhra Pradesh
Ahmedabad	21-Dec-94	Gujarat, Dadra & Nagar Haveli, Daman and Diu
Group 2 states		
Chennai	4-Nov-96	Tamil Nadu, Kerala, Pondicherry
Guwahati	7-Jan-97	Assam, Meghalaya, Manipur, Mizoram, Tripura, Arunachal Pradesh, Nagaland
Patna	24-Jan-97	Bihar, Orissa
Jabalpur	7-Apr-98	Madhya Pradesh, Uttar Pradesh
Mumbai	16-Jul-99	Maharashtra, Goa