Access to Collateral and Corporate Debt Structure: Evidence from a Natural Experiment*

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ABSTRACT

This paper uses the passage of a secured transactions reform in India that strengthened the rights of secured creditors to examine its effect on the equilibrium usage of secured debt by corporations. The law allowed secured creditors a quicker access to the pledged collateral in the event of default and was thus expected to reduce the deadweight cost of seizing collateral. Such a reform should improve welfare as it lowers the cost of borrowing and expands the space of available debt contracts for borrowers. A lower cost of borrowing should translate into more usage of secured debt. Contrary to this view, we find that the passage of the secured transactions law led to a movement away from secured debt. Specifically, we find that passage of this act led to a decrease in the usage of secured debt by corporations. This result thus suggests that strengthening of creditor rights may lead to adverse effects for some firms and that strengthening of creditor rights may not necessarily improve welfare in the *Pareto* sense.

JEL Codes: F34, F37, G21, G28, G33, K39.

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1. Introduction

The seminal paper by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) titled "Law and Finance" and subsequent literature have linked creditor rights with financial development by documenting a positive correlation between an index of creditor rights and the size of credit markets in cross-country regressions.[1] These findings have provided support for the view that ownership protection, particularly in credit markets, foster financial development by lowering the cost of credit. The major function attributed to law, according to this view, is that it empowers creditors to enforce their contracts.

The "Law and Finance" literature presents a strong case for strengthening creditor rights, arguing that strong creditor rights reduce borrowing costs and relax financial constraints.[2] The economic justification for stronger creditor rights is that it expands the space of debt contracts that can be written between the borrower and the lender. An expansion in contract space should constitute a *Pareto* improvement and consequently a major policy thrust is given to strengthening creditor rights.

An interesting contrast, however, is provided by the bankruptcy literature on the merits of Chapter 11 and bankruptcy reorganization, which has suggested that creditor rights could be excessive and lead to ex-post inefficiencies in the form of a liquidation bias (see Aghion, Hart, and Moore 1992; Hart, La Porta, Lopez-de Silanes, and Moore 1997)[3]. In light of these seemingly opposing views, the question of how far the law should go in protecting creditors naturally arises. This paper revisits the positive link between greater creditor protection and expansion of credit viewed through the lens of the bankruptcy law literature and asks whether there are situations in which strengthening creditor rights could lead to a decline in credit usage by firms.

Specifically, the paper exploits a natural experiment in India, the passage of a *mandatory* secured transactions law, the SARFAESI Act (Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests Act 2002), to investigate the effect of law

[1] La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997; Levine 1998, 1999; Djankov, McLiesh, and Shleifer 2005; Beck, Demirgüc-Kunt, and Levine 2004; Haselmann, Pistor, and Vig 2009; Visaria 2006

[2] The reduction in cost of borrowing may come through several channels. For instance, stronger creditor rights keep moral hazard by borrowers at check. It also lowers the deadweight cost of financing.

[3] See also Strömberg (2000), Pulvino (1998) and Povel (1999)

on corporate debt structure.[4] Using this exogenous policy reform that strengthens the rights of secured creditors, and employing a difference-in-differences (DID henceforth) methodology, the paper attempts to identify the effects of the change in the law on the volume of secured credit. Remarkably, in light of the "Law and Finance" literature, which predicts an increase in secured debt, this paper finds that an increase in the rights of secured creditors has actually led to a 5.8 percent decrease in the usage of secured debt by firms. This result can, however, be rationalized when viewed from the perspective of the bankruptcy literature that has stressed that stronger creditor rights may introduce inefficiencies in the form of a liquidation bias. This paper attempts to identify the cause of this response and indeed finds results consistent with the explanations provided by the bankruptcy literature, i.e., creditor protection imposes an extra cost on the borrowers, as is evident from borrowers' reduced reliance on secured debt.

The main arguments of how creditor rights affect the equilibrium level of financing can be broadly broken down into supply side arguments and demand side arguments. From the creditors' perspective (supply side), it is argued that protecting creditor rights increases creditors' willingness to supply capital. This can alternately be viewed as an increase in the debt capacity of firms. From the borrowers' perspective (demand side), there are two forces at work. On the one hand, strong creditor rights (improved access to collateral) lower the deadweight cost of secured debt. This should increase the demand for secured debt. On the other hand, strong creditor rights create a threat of premature liquidation. If the borrowers value continuation, say for instance due to private benefits, then this may reduce their demand for secured debt.

We combine the insights of the "Law and Finance" literature and the "Bankruptcy" literature into a simple stylized model that is motivated by the features of the empirical setting that we wish to analyze. The fundamental tradeoff in this paper, as developed in my model, rests on the relative bargaining power of creditors vis-á-vis borrowers. Creditors, because of the nature of their claims, have a bias towards liquidation. Equity holders, on the other hand, have a bias towards continuation, arising from non-contractible private benefits. We reason that a strengthening of creditor rights increases the threat of borrowers being prematurely liquidated. Consequently, they contract away from secured debt to evade this threat.

[4]The mandatory nature of the law does not allow the parties to opt out.

Specifically, we argue that an improvement in creditor rights generates two effects, namely, an "income effect" and a "substitution effect". The "income effect" follows from the increase in liquidation value of the asset brought about by an improvement in creditor rights. The increase in liquidation value of collateral increases borrowing capacity and reduces the costs of borrowing. Lower costs of secured borrowing translate into more secured borrowing, and thus, a strengthening of creditors rights should increase the equilibrium amount of secured debt.

The "substitution effect" comes from the threat of premature liquidation. The model will show that an increase in the liquidation value of the asset changes the incentives of the creditor and creates a commitment problem. Specifically, in the event of a liquidity shock, the creditor cannot commit not to liquidate the firm that is in financial distress and this makes borrowers reluctant to contract with secured debt. It is important to note that even though this explains the aversion to secured debt, this alone would not lead to a reduction in the usage of secured debt since the borrowers can always lower the liquidation value of the assets by pledging less collateral, i.e., they can privately undo the effect of the law. An important insight of the analysis is that the presence of indivisible ("lumpy") assets creates frictions in the contracting process and these frictions limit freedom of contracting. Put differently, the frictions do not necessarily expand the contract space but alter the existing contract space.

The model provides two important insights for the empirical strategy. First, the model stipulates that firms with more "lumpy" assets are likely to be more affected by secured debt regulation, relative to firms with fewer tangible assets. Hence, following Rajan and Zingales (1995), we group firms based on a measure of tangibility, calculated by taking the ratio of fixed assets to total assets prior to the passage of the Act. We classify the group with more "lumpy" assets as treatment group while the group with less "lumpy" assets is our control group. Second, the model conveys that the demand effect that we're trying to identify is negatively correlated with the other effects discussed earlier. We will exploit this negative correlation to identify borrowers' preferences for creditor rights. The identification strategy then involves comparing the differential effect of this law on secured debt and total debt usage across the various tangibility groups within an industry. Using a difference-in-differences methodology, we find that secured debt usage declined significantly more for

the highest tangibility group compared to the lowest tangibility group. Further, we find an overall reduction in total debt and a reduction in asset growth of firms, consistent with the view that firms in the treatment group are scaling down their investments.

The main source of inefficiency in the model comes from non-contractible private benefits. While we do not have exact information of what these private benefits are, a special feature of our data set helps us to get around this issue. We have data on both private and public firms. Since public corporations have a greater degree of separation of ownership and control as compared to privately held firms (where the manager is the ultimate owner of the firm) it is quite plausible to expect that private benefits in large publicly held corporations would be larger as compared to private corporations (Jensen and Meckling (1976), Jensen (1986)). Consistent with this view, we find that conditional on being in the treatment group (higher tangibility group) public firms reduce their secured debt usage more than private firms.

This natural experiment also provides us with an opportunity to employ another independent identification strategy to further validate the results. In India, the effectiveness of any Act that requires liquidation (including SARFAESI) depends critically on how employer-friendly the labor laws are in that state to facilitate plant closure. We, therefore, exploit the cross-sectional variation in labor regulation across Indian states and examine the effect this law had on firms located in different states. Using Besley and Burgess (2004) classification of Indian states into pro-employer and pro-labor, we find a higher reduction in both secured debt usage and total debt usage in pro-employer states as compared to pro-labor states. Both these findings are consistent with the notion that strengthening creditor rights imposes a cost on the borrower, causing her to reduce her usage of secured debt.

This paper connects several strands of literature. The law and finance literature pioneered by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) is an obvious starting point. There is now a fairly large literature that establishes creditor rights as an important determinant of credit market development (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998), Levine (1998, 1999), Djankov, McLiesh, and Shleifer (2005), Beck, Demirgüc-Kunt, and Levine (2004), Haselmann, Pistor, and Vig (2009), Gropp, Scholz, and White (1997)). There is an emergence of a general consensus that creditor rights promote financial development by relaxing financial constraints. This paper adds to this literature by arguing that strong creditor rights also impose costs on the borrower.

This paper also adds to the recent literature that examines the effect of legal institutions on financial contracts in cross-country settings. Gianetti (2003) finds that stronger creditor rights are associated not only with higher leverage but also with greater availability of long-term debt. In another paper Qian and Strahan (2005) explore the relationship between private contracts across different countries. They report that countries that have stronger secured creditor rights tend to have longer maturity loans and more secured debt. Acharya, John, and Sundaram (2005) analyze the effect of bankruptcy codes on capital structure of US and UK firms. Specifically, they find that the difference in leverage ratios between equity-friendly and debt-friendly regimes is a decreasing function of the liquidation value of the asset. Davydenko and Franks (2004) analyze recovery rates across the UK, France, and Germany and conclude that contracts adapt to changes in different bankruptcy codes and law. Private contracts are also reported to reflect variations in the legal origin and creditor rights, among other things. Once again, these are cross-sectional studies and therefore suffer from drawbacks similar to the ones stated earlier.

This paper also addresses the growing empirical literature that examines the effect of collateral or liquidation value of collateral on financial contracts.[5] Benmelech, Garmaise, and Moskowitz (2005) analyze debt maturity as a function of asset redeployability. They find that higher asset "redeployability" is associated with longer maturity and larger loans. They, however, find no effect on leverage. In some important empirical work on financially distressed firms, Alderson and Betker (1995) report that firms facing high liquidation costs choose capital structures in such a way that makes financial distress less likely. Asquith, Gertner, and Scharfstein (1994) document that debt structure affects the restructuring of financially distressed firms.

The rest of the paper is organized as follows: Section 2 provides a brief overview of legal infrastructure in India; Section 3 and Section 4 detail the model and the empirical strategy; Section 5 describes the data; Section 6 discusses empirical results; Section 7 provides further validation of the results; Section 8 concludes the paper.

[5]Most of the literature is build on the foundations of incomplete contracts. For example, (Aghion and Bolton (1992), Dewatripont and Tirole (1994), Hart (1998,1991,2001), Bolton and Scharfstein (1990),Bolton and Scharfstein (1996), Shleifer and Vishny (1992), Williamson (1988), Diamond (1991, 1993), Berglof and von Thadden (1994)) are some of the important papers in this area. See Hart (2001) for a complete review on the financial contracting literature.

2. Legal Reforms

Financial sector reforms in India started in 1991 with the primary objective of enhancing the efficiency and productivity of the financial system. Based on the recommendations of the Committee on Financial System (CFS henceforth), the Government and the Reserve Bank of India implemented a series of reforms targeted at speeding up the process of debt recovery in India.

The rigid legal process and associated judicial delays were seen as major obstacles to lending. In the event of default, a civil suit had to be filed with the Civil courts which in turn had to follow the Civil Procedure Code. There were detailed guidelines on how the trial had to be conducted. Furthermore, there were provisions for appeals on any interim as well as final orders, which rendered the entire process extremely vulnerable to delays.[6] Consequently, a large amount of bank funds were tied up in non-performing assets (NPAs), the value of which depreciated with the passage of time.

With the aim of removing bottlenecks in the legal process, the Government of India enacted two important laws aimed at strengthening creditor rights: 1) The Debt Recovery Tribunals Act (DRT Act, 1993), and 2) the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (SARFAESI Act henceforth). Under the DRT Act, specialized tribunals were established by the government for the recovery of loans by banks and financial institutions. These tribunals were not required to follow the Civil Procedure Code. Further, they were granted much flexibility to set up their own procedures for a speedy recovery of the defaulted loans.

The SARFAESI Act brought about an important change in the legal system of India, a transition from a pro-debtor regime to a strictly pro-creditor regime, by dramatically increasing the rights of secured creditors. Prior to SARFAESI, secured creditors could not seize and sell the asstes of the defaulting firms in order to recover their loans. The Act ushered a new era of creditor rights by allowing secured creditors to bypass the lengthy court process and seize assets of the defaulting firm. With the passage of SARFAESI Act, banks and financial institutions could take over the assets and control of any company that defaulted in payments

[6]The liquidation proceeding against companies registered under the Companies Act, 1956 was further tedious owing to the bureaucracy associated with the sale of assets.

for over six months by giving a notice of 60 days. Further, the borrowers could only appeal the creditor's decision after depositing 75 percent of the defaulted amount.

Some of the major benefits of the SARFAESI Act as intended by the legislators were as follows. First, the law would reduce the NPAs of banks and financial institutions. Second, a sound secured transactions law was considered important for attracting funds from foreign creditors, thus promoting trade and growth. Third, a creditor-friendly system was considered essential for the promotion of secured credit in India, which in turn was argued, would lead to economic prosperity in India.

The SARFAESI Act borrows several features from the Uniform Commercial Code (UCC) of the United States.[7] First, this law allows for financial assets to be assigned freely and irrespective of what is contained in any law or agreement. Second, the law defines security interests, created for repayment of loans, more generically, thereby giving importance to substance over form. Third, the law gives power of enforcement to banks and financial institutions. Fourth, the law defines property to cover a gamut of property rights. Fifth, SARFAESI treats mortgages on immovable properties as a security interest, thus allowing enforcement without intervention of courts. [8]

As for most laws, it is difficult to nail down the exact event date for our analysis. The official date of the Act is June 21, 2002. However, discussion in the press started as early as 1999. Due to the rising concerns about the NPAs, a high powered committee (Andhyarjuna committee), comprising of officials from the Reserve Bank of India, Ministry of Finance, Ministry of Law, and ICICI, was set up in February 1999 to formulate recommendations for the legal framework of the banking system. In March 2000, the panel submitted reports on the legal reforms, specifically stating the need for a law that strengthens the rights of banks and financial institutions ans allows them to seize assets of defaulting firm without court intervention. Definitive signs emerged between November 2000, after the panel met to finalize the draft for the new bill, and June 2001, when the legislators met to discuss the panel's recommendations and finalize details of the foreclosure law. The Act was first

[7] It actually goes much further than UCC because it makes creditors excessively powerful by allowing them to liquidate a firm without court intervention.

[8] The old law did not allow for enforcement on mortgages on immovable properties

promulgated as an Ordinance and later converted into an Act. The effective date of the Act was the date of the First Ordinance, i.e., June 21, 2002.

There is plenty of anecdotal evidence on the importance of this law. A flood of litigation suits immediately followed the passage of the Act. Borrowers challenged the constitutional validity of the SARFAESI Act and termed it as "draconian". Further, corporate lobby groups expressed concerns about excessive creditor rights. They argued that such a law would give banks and FIs excessive powers which they would abuse. For example, it was alleged that banks would falsely classify accounts as NPAs on their whims and fancies and then invoke SARFAESI. It was also argued that the law was unfair since the law gave borrowers practically no right to appeal. The contention was that if borrowers had resources to deposit the stipulated amount (75% of the total amount), they would not have defaulted in the first place. [9]

Recent and more scientific evidence also suggests that this Act had an effect. Visaria (2005) documents a positive stock price reaction for banks as a result of the Act.[10] Data on recovery and NPAs suggests that the law had a positive impact. As can be seen from Figure 1 the law led to a reduction of net NPAs of banks. [11] In the 2002-2003 report of the Reserve Bank of India on Trend and Progress of Banking India it is mentioned:

> *NPAs declined sharply in 2002-03, reflecting, inter alia, the salutary impact of earlier measures towards NPA reduction and the enactment of the SARFAESI Act ensuring prompter recovery without intervention of court or tribunal. The progress under this Act has been significant, as evidenced by the fact that during 2002-03, reductions outpaced additions, especially for PSBs and reflected in an overall reduction of non-performing loans to 9.4 per cent of gross advances from 14.0 per cent in 1999-2000.*

[9] In its landmark judgement on the Mardia Chemicals vs Union of India case on April 8th, 2004, the Supreme Court upheld the constitutional validity of the law with the exception of one provision that required the borrowers to deposit 75% of the claim amount in order to file an appeal against the action of the bank.

[10] In several interviews conducted in different banks, it was mentioned that, after SARFAESI Act was enacted, banks started to receive a lot of requests from entrepreneurs to unsecure their personal assets. A sample of hand collected data shows that there is a reduction in the usage of personal assets as security for loans.

[11] According to the World Bank Doing Business Report (2006), the time to recover collateral in India came down from 10 years to 6 months in some cases due to the enactment of a reform that made enforcing security significantly easier.

Summing up, the evidence, both anecdotal as well as statistical, indicates that the SARFAESI Act dramatically increased the power of secured creditors. While the Act was intended to promote secured lending in India, it led to a movement away from secured debt. The borrowers clearly understood the law and felt threatened by it. It is this tension between secured creditors and borrowers that is investigated in this paper.

3. Baseline Model

We present a theory of the choice between secured and unsecured debt that is based on the conflict between creditors and shareholders. The model is motivated by India's institutional environment and used to guide our empirical analysis.

3.1. Firms' Investment Projects

We consider an economy composed of a continuum of wealthless risk-neutral entrepreneurs, each with a project requiring an investment F at t=0 and another F at t=1, and generating publicly observable cash flows C_1 at t=1 and C_2 at t=2, where $C_t \in \{0, C\}$ and the probability that $C_t = C$ is given by θ. We assume that C_2 is drawn independently of C_1. The project can be "G-type" ($\theta = \theta_G > 0$) or "B-type" ($\theta = \theta_B = 0$) and the probability of a "G-type" project is p.

At t=0 the entrepreneur privately learns the project quality θ. At t=1, the project is either liquidated yielding L^1, or refinanced and allowed to continue. If continued, the project yields the entrepreneur additional non-contractible private benefits b, which are assumed to be significant for companies in India. The residual value of the firm at t=2 is L^2. The project cannot be financed with riskless debt, that is, $F > L^t$. For simplicity, we assume that there is no discounting and we normalize the risk-neutral interest rate to zero.

3.2. Firms' Financing Choices

At t=0, the entrepreneur can choose between secured or unsecured debt. A contract specifies $\{R^1, R^2(C), R^2(0)\}$, where R^1 is the coupon payment at t=1, $R^2(C)$ is the coupon payment

at t=2 conditional on a cash flow $C_1 = C$ at t=1. $R^2(0)$ is the payment to creditors in period 2 if the firm is refinanced after a 0 cash flow in period 1. The probability of refinancing is given by β_c where $\beta_c \in \{0,1\}$.

The main distinguishing feature of the two debt instruments discussed here is that the creditor's liquidation proceeds are greater with secured debt than with unsecured debt. Let L_s^t and L_{us}^t denote the liquidation value in period t with secured and unsecured debt, respectively, then $L_s^t > L_{us}^t$. For simplicity, we normalize the liquidation value of unsecured debt to 0 ($L_{us}^t = 0$). This normalization is innocuous and does not affect the qualitative nature of our analysis.

We assume that if liquidation is initiated by creditors, then $L_s^1 = L$ and $L_s^2 = \phi \cdot L$, where ϕ ($0 < \phi < 1$) can be interpreted as the depreciation of the assets of the firm. Collateral will be more valuable if it stays with the entrepreneur since there are deadweight cost of seizing collateral, i.e., it will be L^2 if it stays with the entrepreneur and $L_s^2 = \eta L^2$ if liquidated by the secured creditor ($0 < \eta < 1$). In addition, we assume that credit markets are competitive, i.e., the creditors just break even in expectation, and that pledgeable assets are indivisible ("lumpy"), i.e., the entrepreneur can pledge either the full asset or nothing. We will discuss the importance of this assumption later. Further, we assume that self-financing is not possible, i.e., entrepreneurs consume everything at the end of the period. Next, we make an additional assumption about the cash flows generated by the project.

Assumption 1 $p\theta C > F$.

Assumption 1 states that p (credit rating of the firm) is high enough so that the project can be financed with both secured as well as unsecured debt. This is a simplifying assumption to illustrate the basic trade-off between secured and unsecured debt. We will come back to this assumption later when we discuss the results.

The time line and extensive form game layout are shown in Figures 2 and 3 respectively.

3.3. Optimal Contract

We analyze the optimal contracting problem from the perspective of a G-type firm, i.e., we look at a contract that maximizes the value for G-type firms. Since b is large enough, B-types will always try to imitate the G-types as they will otherwise not receive any funding.

3.3.1. G-type Optimal Contract

The objective function of the G-type borrower is given by:

$$\max_{\left\{R^1,R^2(C),R^2(0),\beta_c,1_{\{c=s\}}\right\}} \quad \theta\left[(C-R^1)+\theta(C-R^2(C)+\phi\tfrac{L}{\eta})+(1-\theta)\cdot 1^c_{\{c=s\}}\cdot\phi\tfrac{L}{\eta}+b\right] \tag{1}$$

$$+(1-\theta)\beta_c\left[\theta\cdot(C-R^2(0)+\phi\tfrac{L}{\eta})+(1-\theta)\cdot 1^c_{\{c=s\}}\cdot\phi\tfrac{L}{\eta}+b\right]$$

$$+(1-\theta)(1-\beta_c)\cdot 1^c_{\{c=s\}}\cdot\tfrac{L}{\eta}$$

subject to lender's first period participation constraint (IR-1):

$$p\theta\cdot\left[R^1+\theta R^2(C)+(1-\theta)\cdot\phi\cdot L\cdot 1_{\{c=s\}}-F\right]+ \tag{2}$$

$$p(1-\theta)\left[(1-\beta_c)\cdot L\cdot 1_{\{c=s\}}+\beta_c\{\theta R^2(0)+(1-\theta)\cdot\phi\cdot L\cdot 1_{\{c=s\}}-F\}\right]+$$

$$(1-p)\left[(1-\beta_c)\cdot L\cdot 1_{\{c=s\}}+\beta_c(\phi\cdot L\cdot 1_{\{c=s\}}-F)\right]\geq F$$

lender's second period participation constraints (IR-2):

$$\theta\cdot R^2(C)+(1-\theta)\cdot\phi\cdot L\cdot 1_{\{c=s\}}\geq F \tag{3}$$

$$\hat{p}\theta R^2(0)+(1-\hat{p}\theta)\cdot\phi\cdot L\cdot 1_{\{c=s\}}\geq F+L\cdot 1_{\{c=s\}} \tag{4}$$

lender's incentive compatibility constraints (IC):

$$\beta_c=\arg\max_{\beta}[\hat{p}\theta R^2(0)+(1-\hat{p}\theta)\cdot\phi\cdot L\cdot 1_{\{c=s\}}-(F+L\cdot 1_{\{c=s\}})]\cdot\beta_c+L\cdot 1_{\{c=s\}} \tag{5}$$

and borrower's limited liability constraints (LL):

$$0\leq R^1\leq C, 0\leq R^2(C)\leq C+\phi\cdot L\cdot 1_{\{c=s\}} \text{ and } 0\leq R^2(0)\leq C+\phi\cdot L\cdot 1_{\{c=s\}}. \tag{6}$$

Here β_c denotes the probability of continuation from the first period to the second period given a 0 cash flow in the first period and $1_{\{c=s\}}$ is an indicator variable that takes a value of 1 if debt is secured and 0 if it is unsecured.[12]

To highlight the basic tradeoff that we wish to analyze, we additionally impose the following, merely structural, constraints that account for the "no-self-financing" assumption:

Denote $\hat{p} = \frac{p(1-\theta)}{p(1-\theta)+(1-p)}$ as the probability of the type being a G-type conditional on observing a 0 cash flow at t=1. We make the following assumption.

Assumption 2 $\hat{p}\theta C + \phi\frac{L}{\eta} + b > F + L$

Assumption 2 basically states that continuation (i.e., $\beta_c = 1$) is efficient.

Let L^* be the value of L that satisfies the following equation: $\hat{p}\theta C + \phi \cdot L = F + L$. Clearly, if $LL > L^*$, secured creditors face a threat of being prematurely liquidated.

We further define $\tilde{p} = \frac{\eta}{(1-\theta+\eta\theta)}$ and assume that $p > \tilde{p}$.

Lemma 1 *If $\hat{p}\theta C + \phi \cdot L \geq F + L$, then secured debt is preferred by the G-type entrepreneur.*

The above lemma states that in the absence of a liquidation threat, secured debt will always be preferred to unsecured debt by G-type firms. The intuition for this result is as follows. Collateral is fairly priced while cash flows are underpriced on account of asymmetric information. It is therefore cheaper for a G-type firm to offer collateral if the costs of asymmetric information outweigh the expected deadweight cost of liquidation with secured debt.[13]

Lemma 2 *If $\hat{p}\theta C + \phi \cdot L < F + L$, then $\exists\ \hat{b}$ such that if $b > \hat{b}$, firms prefer unsecured debt to secured debt.*

Please refer to the appendix for the proof. Lemma 2 states the following: If $b > \hat{b}$, then firms facing liquidation threats, i.e., firms with $\hat{p} \cdot \theta C + \phi L < F + L$, prefer unsecured debt to secured debt.

[12] $1^c_{\{c=s\}}$ is the complement of $1_{\{c=s\}}$. It is an indicator variable that takes on a value of 1 if debt is unsecured.

[13] The proof of this lemma is provided in the appendix.

The SARFAESI law allows secured creditors to liquidate the firm without court intervention. The Act can thus be understood to increase the liquidation value of the assets. Prior to SARFAESI, L was fairly low, and thus firms did not face any threat of premature liquidation with secured debt. This follows from assumption 2. In the post-SARFAESI regime, L increases to $(L+\delta)$. If δ is sufficiently high, then creditors prefer to liquidate the firm at t=1 after a zero cash flow. Putting it differently, some firms that were previously refinanced with secured debt now face a threat of being prematurely liquidated after a zero cash flow in the first period. This is given by the inequality: $\hat{p}\theta C + \phi(L+\delta) < F + (L+\delta)$.

This brings us to the following proposition.

Proposition 1 *In the post-SARFAESI regime, firms with $b > \hat{b}$ and $(L+\delta) > L^* > L$ move from secured debt to unsecured debt.*

The Proposition 1 follows directly from Lemma 1 and Lemma 2. The intuition for this result is as follows. On the one hand, the law increases the liquidation value of the secured assets. Such an increase would lead to an increase in the equilibrium quantity of secured debt being used. On the other hand, the increase in liquidations value is higher for the first-period value and, therefore, the law simultaneously increases the liquidation costs for the borrowers. The entrepreneurs lose b if there is premature liquidation. This increase in liquidation costs has an effect in the opposite direction, i.e., a move away from secured debt. If b is sufficiently high (assumption of the analysis), then it is possible that the second effect dominates the first, i.e., the law may end up increasing the overall liquidation costs for the borrower. As a result, the law may lead to a movement away from secured debt.

Summing up the above proposition, in the pre-SARFAESI regime firms preferred secured credit. However, the law introduces a liquidation bias with secured credit. As a result, firms move away from secured debt. Moreover, this effect is more pronounced for firms that have a high proportion of tangible (fixed) assets, since these firms are more affected by the secured transactions law.

3.4. Discussion

The goal of the theoretical model is to simply illustrate the trade-off between secured and unsecured debt and is motivated by the institutional setting that we are analyzing. The model is basically a variant of the Myers-Majluf model applied to secured debt. In the model, collateral is associated with a deadweight cost while cash flows are underpriced on account of adverse selection. Since the deadweight costs of posting collateral are lower than the asymmetric information costs, secured debt would be preferred to unsecured debt. The flip side is that if the collateral value is too high, then it introduces a liquidation bias, i.e., it exposes firms to the threat of premature liquidation. If private benefits of continuation are high, then firms choose to contract away from secured debt.

A natural question then is why firms can not contract around it. For example, firms would simply write a contract prohibiting the creditor from liquidating the firm in the event of a zero cash flow. Another possibility is that of stochastic contracts or stochastic liquidations. The SARFAESI Act is a mandatory Act and does not allow firms to opt out of it by writing a private contract, i.e., such contracts would simply not be enforceable by courts. It is important to note that in the current model, firms could simply write long-term contracts and this would take them back to the pre-SARFAESI regime. However, the model can be simply altered such that long-term contracts are no longer feasible.[14] In addition, we would like to add that contracts in general are incomplete. Under SARFAESI, the burden of the proof has shifted to the creditor and contractual incompleteness creates a commitment problem in the sense that in the case of a liquidity shock, the creditor cannot commit not to liquidate a firm that is in financial distress.[15]

The objective of the model was to illustrate that strengthening creditor rights can introduces premature liquidation threats and that firms thus may want to contract out of secured debt. It is generally understood that a strengthening of creditor rights expands the space of contracts that can written between borrowers and lenders. The model shows that the presence of "lumpy" assets creates frictions that restrict firm's freedom to contract around the law.

[14] The modified model can be obtained upon request from the author.

[15] A recent paper by Roberts and Sufi (2008) shows that a substantial number or long-term contracts are negotiated prior to their stated maturity and the effective maturity of a long-debt contract is quite similar to that of a short-term debt contract.

Hence, the new contract space may not be an expanded contract space but instead a different contract space. The movement away from secured debt does suggest that the contract space is altered, and thus claims that a strengthening of creditor rights improves welfare may need to be qualified.

4. Empirical Methodology

This paper relies on a legal reform in India, the passage of the SARFAESI Act. India offers an ideal laboratory for such an analysis for three reasons. First, India has undergone some very important changes in its legal structure. Institutional environments are generally endogenous and only evolve slowly over time. This makes answering questions on creditor rights extremely difficult. As a result, researchers generally resort to cross-country analysis for their study. Isolating and examining exogenous changes in institutions are key challenges faced by scholars. In this regard, India presents a unique opportunity that can be exploited to further our understanding of legal institutions and how they affect the nature of contracts. Second, like the US, India is a federal polity comprising of states with their own governments and a measure of policy autonomy. Over time, states develop distinct economic characteristics, partly due to inherent geographical features, and partly owing to differing economic policies pursued. Accordingly, it bypasses the limitations of cross-country studies (Rodrik 2005) by focusing on the effect of legal reforms on financial contracts within a country. Third, good quality firm level data on financial contracts is available to researchers. The cross-sectional and time-series variation in the data makes it amenable to regression analysis and provides an ideal laboratory to explore the effects of exogenous legal reforms on corporate debt structure.

We examine the effect of the law on firms by employing a difference-in-differences (DID henceforth) methodology. The DID methodology is ideally suited for establishing causal claims in a quasi-experimental setting similar to the one that is employed in this research. It basically compares the effect of an event (legal change in this case) on groups that are affected by the law (henceforth, treated) with those that are unaffected (henceforth, control). For example, if we want to evaluate the effect of a particular policy change on some variable of interest (say, firms' usage of secured debt), then we would calculate the usage of secured

debt after the law and subtract from it the usage before the law. This difference will give us the effect of the law on the usage of secured debt. However, other factors, both observable and unobservable, which potentially impact secured debt may have changed as well. Thus, a control group would be desirable in order to properly control for common economic shocks. We therefore compare the difference in the treated group with the difference in the control group. By differencing in this way, the DID strategy eliminates the bias that comes from changes other than the law and that could have affected the treated group.

The theoretical framework presented earlier provides two important insights that we exploit for the purpose of identification. First, the model helps in identifying the treated and the control groups for the DID analysis. According to the model, firms with $L > L^*$ are the ones that are affected by the law since these firms face the threat of being liquidated after default at t=1.[16] For firms with $L < L^*$ (Control group), the law raises the date 2 liquidation value of the assets without subjecting these firms to a premature liquidation risk. Even though creditors can access collateral at t=1 in the model, they will not liquidate these firms since the net present value of continuation (excluding private benefits) is positive.

Second, for firms that are above L^*, there are two forces at work. The law raises the liquidation value of the assets, thereby increasing the debt capacity of the firms (income effect). The second effect is that the law introduces a liquidation bias (substitution effect). The important insight from the model is that these two effects are negatively correlated. Since the law increases the liquidation value of the asset, this results in a supply shift. If this was the only effect, then we would have an instrument and thus the OLS would provide an unbiased estimate. However, there is an opposing demand effect and as a result, the estimated coefficient will be biased. Before going further, it is important to analyze the sign of the bias.

The bias can be understood by using a simple example. Let $Q_i^d = \lambda + \beta P_i + U_i$ and $Q_i^s = \phi + \delta P_i + V_i$ denote the demand and supply equations, where U_i and V_i represent demand and supply shocks, P_i is the price; Q_i^d and Q_i^s are respectively the quantity demanded and quantity supplied. So, if one regresses quantity on the demand shock, i.e $Q_{it} = \alpha_0 + \alpha_1 U_{it} + \varepsilon_{it}$, then $\hat{\alpha} = \alpha_1 + \frac{cov(U_i,V_i)}{var(V_i)}$ where the bias term is given by $\frac{cov(U_i,V_i)}{var(V_i)}$. The model tells us that

[16] L^* is the value of L that solves $\hat{p}\theta C + \phi \cdot \eta L = F + L$.

the supply and demand shocks are negatively correlated. Therefore, the OLS estimate is downward biased.

To evaluate the effect of the Act, we estimate the following regression specification using firm level data:

$$y_{it} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} * 1_{(A=H)} + \omega \cdot X_{it} + \varepsilon_{it}, \tag{7}$$

Here i indexes firms , t indexes time, j indexes industries, y_{it} is the dependent variable of interest (Debt/Assets etc), α_i and γ_t are firm and year fixed effect respectively; $1_{(E=1)}$ is an indicator variable that takes on a value of 1 if $E = 1$, i.e, if the law has been passed (years 2002, 2003, and 2004), and 0 otherwise (years prior to 2002); $1_{(A=H)}$ is an indicator variable that takes on a value of 1 if the firms belong to the treated group and 0 if they belong to the control group; X_{it} are some control variables (e.g., profitability, Tobin's Q, etc.) and ε_{it} is the error term. The firm fixed effects control for time invariant differences between the treated and the control group and the year fixed effects control for aggregate fluctuations. The variable of interest is η, which captures the DID effect.

We proxy for L in the model using a measure of "tangibility" as used in Rajan and Zingales (1995). Following Rajan and Zingales (1995), we define tangibility as net fixed assets to total assets. The basic rationale for using this measure is that these "tangible" assets are easier to secure. We then divide my sample into quantiles (terciles and quartiles) based on this measure of tangibility. For example, when dealing with quartiles, we define the highest quartile as the treated group and the lowest quartile as the control group. Firms with low tangibility will therefore be refinanced in period 1. Consequently, firms with low tangibility serve as a control group as they are affected by economic shocks but are relatively less affected by the law itself.

The DID specification above does not control for shocks contemporaneous with the legal change that affect the treated as well as the control group in a direction similar to what the above theory predicts. For example, there is a possibility that investment opportunities of different industries changed around the same time. This is a concern if some industries have higher tangibility than other industries. We control for such shocks by including an interaction term $\beta_j * \gamma_t$, where β_j is the industry fixed effect in addition to the traditional Tobin's Q variable. This is a non-parametric way of controlling for time-varying industry-

specific shocks. As a result, we compare high-tangibility firms with low- tangibility firms within the same industry. Finally, to address concerns about autocorrelation (see Bertrand, Duflo, and Mullainathan 2004), we cluster all my standard errors at the firm level.

5. Data

This research draws data from a number of sources. The primary database employed in the study is the Prowess database (Release 2.3), generated and maintained by the Center for Monitoring the Indian Economy (CMIE), a leading private think-tank in India. This database is increasingly employed in the literature for firm-level analysis on Indian industry for analysis of issues like the effect of foreign ownership on the performance of Indian firms (Chibber and Majumdar 1999) and the performance of firms affiliated to diversified business groups (Khanna and Palepu 2000, Bertrand, Mehta, and Mullainathan 2002 and Gopalan, Nanda, and Seru Forthcoming).

The sample contains financial information on over 20,000 firm-years, although sample size varies on account of missing information on some of the variables used in the analysis. Additionally, the database contains detailed information on the corporate debt structure of these companies extracted from their profit and loss accounts and balance sheets. More specifically, the database contains detailed information on total secured debt, unsecured debt, total short-term debt, long-term debt, and total debt. A detailed breakdown by industry is given in Table II. The database also contains detailed information on plant location and ownership (private or public). Overall, the database contains detailed information on large corporations in India, both listed and unlisted. The data spans years 1997-2004.

Information on macroeconomic variables is sourced from the Handbook of Statistics on Indian Economy (RBI, 2004b), which provides time series data on monetary and macroeconomic variables. The data on banking variables is extracted from the Report on Trend and Progress of Banking in India (RBI, various years), a statutory yearly publication of RBI, which provides aggregate information on prudential and financial ratios. A description of the variables employed in the study and the data sources is provided in Table I. The coding for labor laws is taken from Besley and Burgess (2004). They code labor laws as pro-worker, neutral, or pro-employer for each state.

In Table III, we present the means and standard deviations of the variables that are used in the analysis. There is significant variation in all the important variables. The average secured debt-to-assets ratio of all firms is 26.9% with a standard deviation of 17.9%. The average debt-to-assets ratio is 33.9% with a standard deviation of 18.9%. The average size of the firm, as measured by total assets, is 314.5 crores Indian Rupees (approx. 75 million USD) and the median is 40 crores Indian Rupees (approx. 10 million USD). The 99th percentile firm's size is approximately 1.2 billion USD, i.e., 5,200 crore Indian Rupees. On average, listed firms are slightly larger than unlisted firms. Around three-fourths of the total debt is secured and about two-fifths of the debt is short-term. Finally, profitability, as measured by EBIT/Assets, for all the firms is around 7%. In Table IV, we do a simple "pre" and "post" analysis by taking simple time-averages before and after the event date. This time-collapsing of the data ensures that the standard errors are robust to the Bertrand, Duflo, and Mullainathan (2004) critique. It can be seen that, on average, secured debt-to-assets ratios fell by 3.3% (median 4.1%) while debt-to-assets ratios fell by 2.3% (median 2.8%). Further, secured debt-to-debt ratios fell by about 4.2% (median 3.6%).

In Table V, we further divide my sample into terciles of tangibility using Rajan and Zingales (1995) definition.[17] The first-tercile firms have the lowest tangibility, the second-tercile firms have the medium tangibility and the third-tercile firms have the highest tangibility. It can be seen from table *V* that third-tercile firms are the ones that are most affected by the law whereas firms in the first tercile are least affected (in many cases unaffected) by the law. For example, secured debt-to-assets variables decreased by 5.8% for the third-tercile group and remained unchanged for the low-tercile group. A similar story holds for debt-to-assets and long-term debt-to-assets ratios. As expected, the second-tercile group has results that lie in between the other two tercile groups. For example, the reduction in secured debt-to-assets ratios of second-tercile group firms is 3.4%, which is between 5.8% (third tercile) and 0% (first tercile).[18]

[17] Rajan and Zingales (1995) define tangibility as fixed assets to total assets.

[18] Please see Table VI for detailed results of the basic empirical strategy.

6. Results

6.1. Secured Debt

The SARFAESI Act allows for easier access to collateral. More specifically, the Act allows creditors to liquidate the firm in the event of default. Prior to this law, the existing legal infrastructure caused substantial delays during which the security/collateral depreciated in value. As indicated in the basic model, creditors would only liquidate the firm at t=2. The law in law brought about liquidation at t=1. From Proposition 1 we, know that an increase in the rights of secured creditors can lead to a reduction in the equilibrium usage of secured debt. The argument presented earlier in this paper was that an increase in the rights of secured creditors has two effects. On the one hand, it increases the liquidation value of the asset (income effect) while on the other hand, it increases liquidation costs (loss of private benefits) for the entrepreneur. If private benefits are relatively high, then the effect of the law is a lower demand for secured debt (substitution effect).

In Figure 4, we plot separately the de-meaned time series of secured debt-to-assets ratios for both high-tangibility and low-tangibility groups. The high-tangibility group is the treated group, whereas the low-tangibility group serves as control group. It can be seen from Figure 4 that the ratios for the high-tangibility and low-tangibility firms move roughly together before the legal change. After the legal change, the high-tangibility firms reduce their usage of secured debt. This is consistent with the predictions from the theoretical model in which an increase in the rights of secured creditors leads to less secured debt as it introduces a liquidation bias.

Next, we show that the patterns in Figure 4 are statistically robust to the application of standard controls from the corporate finance literature. In Table VII, we investigate the impact of SARFAESI on the usage of secured debt using the standard DID framework. In Table VII, we report the results of a regression analysis with secured debt-to-assets as the dependent variable. To control for firm level heterogeneity, we use firm fixed effects in all regressions. We also include year fixed effects to control for aggregate economic shocks. In column 1, we report the basic regression results. It can be seen that average secured debt-to-assets ratios went down by 5.4% after the secured transactions law was passed. In column

2, we add some additional controls for profitability, size, and Tobin's Q. The results remain unchanged. As can be seen from Column 2, secured debt-to-assets for high-tangibility firms dropped by 5.3% after the SARFAESI Act was passed. To further test the robustness of these results, we control for industry specific-shocks by including an interaction of industry and year fixed effects. This is a non-parametric way of controlling for any observed or unobserved industry-specific changes that may be correlated with tangibility. The point estimate for the effect of the law on secured debt/assets remains roughly unchanged at 5.1%. Further, we redo this analysis separately for listed and unlisted firms.[19]. In conclusion, these results indicate that the SARFAESI Act, on average, led to a reduction of secured debt-to-assets ratios by about 5.2%.

In columns 4-6, we investigate the impact of SARFAESI using secured debt-to-debt as the dependent variable. It can be seen from column 4 of table VII that, on average, secured debt-to-debt declined by 3.5% in the basic specification. In column 5, we add some additional controls for profitability, Size, and Tobin's Q. The results remain unchanged at 3.6%. We further add industry times year fixed effects. The results remain fairly unchanged at 3.3%. All the results indicate that there is a reduction in the usage of secured debt as a percentage of total debt and that the magnitude of this reduction is about 3.3%. It is important to note that the secured debt-to-debt results are at odds with the pecking order theory a la Myers and Majluf (1984). Since secured debt is cheaper than unsecured debt (collateral is fairly priced), the pecking order theory would predict that firms first retire their more expensive debt, i.e., unsecured debt. Therefore, the pecking order theory would predict, an increase in the secured debt-to-debt ratio after the SARFAESI Act.

The effect of the Act on the equilibrium level of secured debt is negative. This is in contrast to the predictions from the "Law and Finance" literature that postulates a positive coefficient. As argued before, an improvement in secured creditor rights has two opposing effects, namely, an income effect and a substitution effect. The income effect predicts an increase in the usage of secured debt. The substitution effect, which comes from the liquidation bias, predicts a reduction in secured debt. These results indicate that the substitution effect has dominated the income effect.

[19]Results for listed and unlisted firms are not reported here. The basic results remain unaffected.

Recent empirical literature based on cross-sectional regressions finds somewhat similar results. Davydenko and Franks (2004) examine the effect of bankruptcy laws on financially distressed firms in the UK, Germany, and France. The reported usage of secured debt is 84% in UK and 124% in France despite the fact that the UK has a more creditor-friendly law. Since the Davydenko and Franks (2004) study is based on a cross-sectional setting, they are unable to distinguish between demand and supply effects. Their finding, however, is consistent with my model. Creditor rights affect both supply of credit as well as demand of it. Suppliers of secured credit are clearly better protected in the UK than in France and, therefore, are more willing to supply secured credit. However, stronger creditor protection also makes borrowers more cautious since it makes secured creditors less willing to compromise. It is quite plausible that this is the reason that less secured debt is used in the UK as compared to France. [20] In India, legislators envisaged that the law would boost secured credit. Corporate lobby groups on the other hand voiced their concerns over excessive creditor power. In equilibrium, we see that this led to a reduction in the usage of secured debt after the Act.

On a slightly tangential level, the predictions from my model are also consistent with the results of Gilson, John, and Lang (1990) and Asquith, Gertner, and Scharfstein (1994). Gilson, John, and Lang (1990) in their empirical study show that firms with fewer tangible assets are more likely to undergo out-of-court settlements as compared to firms with high tangibility that are more likely to be driven into bankruptcy. My model predicts similar results and underscores the dual side of tangibility. Firms that have high tangibility have larger debt capacity because creditors are more willing to supply credit to them. The flip side is that these firms also face a bigger liquidation threat. Similarly, Asquith, Gertner, and Scharfstein (1994) report that firms choose their debt structures in order to make financial distress less likely. The underlying theme, that with hard claims creditors are less forgiving, is the same.

[20] Further, a variation in the composition of collateral is reported.

6.2. Total Debt

The main result of this paper deals with the usage of secured debt. In section 6.1, we reported a reduction in the usage of secured debt. In this section, we investigate the impact of the SARFAESI Act on leverage. Following previous literature, we define leverage as debt to assets where debt is defined in one of three ways. In the first definition, debt is the sum of long-term and short-term debt, whereas in the second definition, debt simply stands for the total long-term debt of the firm. The third definition of debt includes cash as negative debt, i.e., debt is defined by the sum of long-term debt and short-term debt minus cash. For assets, we use the book value of assets.

In Figure 5 , we plot the de-meaned leverage for both the high and low tangibility groups. In Figure 5, leverage is defined as total debt (short-term + long-term debt) divided by total assets. [21] It can be seen from Figure 5 that leverage for the two groups (treated and control) moves together prior to the legal change; however, the high-tangibility firms reduce their leverage after the legal change. This is consistent with the predictions from the theoretical section where a decrease in secured debt is accompanied by a decrease in leverage for firms that are not able to borrow on an unsecured basis.

In Table VIII, we investigate the impact of the law on total debt where total debt is again defined as the sum of short-term and long-term debt. The dependent variable is total debt to assets. we use firm fixed effects in all the regressions to control for firm level heterogeneity. In column 1 of Table VIII, we report a reduction in leverage of 4.6% for the high-tangibility group as compared to the low-tangibility group. In column 2, we add some controls such as EBIT to assets, size, and Tobin's Q. The results remain stable at 4.4%. Further, these results are unaffected by the inclusion of industry times year fixed effects (column 3).

In columns 4-6 , we investigate the impact of SARFAESI on leverage as defined by total debt minus cash to assets. As can be seen, on average, leverage falls by about 4.4%. As before, we include firm fixed effects and year fixed effects in all my regressions. Further, in columns 2 and 3, we show that my results are robust to the inclusion of controls such as EBIT to assets, size, and Tobin's Q. The results remain stable at 4.4%. Further, these results are unaffected by the inclusion of industry times year fixed effects. Finally, in columns

[21] The patterns for the other specifications of leverage is exactly the same.

7-9, we redo the analysis with leverage defined as long-term debt to assets. The results remain unaffected. The above results indicate a decrease in leverage as a consequence of the SARFAESI Act.

6.3. Total Assets

In this section, we investigate the impact of SARFAESI on firms' total assets. To achieve this, we run a difference-in-differences specification with log of assets as dependent variable. It can be seen that firms with lower tangibility grew more than firms with high tangibility. These results suggest that firms with high tangibility (treated group) invested less than firms with low tangibility (control group). In Table IX, we redo the analysis using log of assets as my dependent variable. In columns 1 through 6 of Table IX, we report the results from the regression analysis. As before, we use firm fixed effects to control for firm level heterogeneity. Further, to address the Bertrand, Duflo, and Mullainathan (2004) critique, we cluster the standard errors at the firm level. It can be seen that the assets of high-tangibility firms grew much slower as compared to the assets of low-tangibility firms. These results clearly indicate that a change in assets is not driving the results. If anything, it is the firms with low tangibility that have increased assets more, and thus any variation in the assets works to only strengthen my results.[22]

7. Labor Laws

The Constitution of India designates powers of legislation on three lists: 1) Union List, 2) State List, and 3) Concurrent List. Only the Central government has powers to legislate items that belong to the Unions List. State governments legislate items enumerated in the State List, while both the Union and the States have power to legislate on matters enumerated in the Concurrent List. The Constitution of India places the Industrial Disputes (ID) Act of 1947 Act on the Concurrent List, thus allowing for amendments by both the center as well as the state.

[22]We redo my entire analysis using lagged assets in the denominator instead of current assets. My results remain unaffected. This clearly shows that the numerator is driving my results.

The ID Act provides the bedrock of the dispute resolution mechanism: a machinery for dealing with existing or apprehended industrial disputes. Apart from the provision for the formation of work committees with limited functions of consultations in units of a certain size (100 or more workers), the Act provides of consultation by a board or a conciliation officer, investigation by a court of inquiry, arbitration on mutual consent of parties and adjudication by labor courts and industrial tribunals. There is a special chapter governing the payment of lay-off and retrenchment compensation. There are sections dealing with strikes and lockouts, stipulation of the circumstances in which such disputes shall be deemed illegal, and the penalties thereof. It offers some protection to individuals in the matter of disciplinary proceedings under certain circumstances.

Laws enacted by Parliament generally extend throughout the territory of India whereas those enacted by State legislatures apply only within the territory of the State concerned. This generates inter-state variations in matters falling in the State and Concurrent Lists. The SARFAESI Act is a federal law and thus extends to all territories of India. In this section, we exploit differences in labor institutions across states to generate both cross-sectional as well as time-series variations in creditor rights. More specifically, we generate variation in creditor rights through the interaction between SARFAESI (Union List) and labor laws (Concurrent List). Tough labor laws are associated with strong unions, strikes, and lockouts and a lot of man days are lost as a result of that.[23]

The SARFAESI Act gives creditors the right to liquidate a firm in the event of default. However, the presence of Unions acts a big deterrent to liquidation. Thus, it is natural to expect that SARFAESI has less of a bite for firms that are located in pro-worker states. We follow the Besley and Burgess (2004) classification of pro-employer and pro-labor states. Following their classification, we classify Maharashtra, West Bengal, Gujarat, Orissa and Kerela into pro-worker states and Andhra Pradesh, Karnataka, Tamil Nadu and Rajasthan into pro-employer states. The classification is best understood by the following example that we quote from their paper:

- Andhra Pradesh: 1987: (Pro-employer): If in the opinion of the state government it is necessary or expedient for securing the public safety of the

[23]On average, states that are pro-employer tend to have less labor disruptions and as a result have higher profitability

maintenance of public order or services or supplies essential to the life of the community or for maintaining employment or industrial peace in the industrial establishment it may issue an order which (i) requires employers and workers to observe the terms and conditions of an order and (ii) prohibits strikes and lockouts in connection with any industrial dispute.

- West Bengal: 1980: (Pro-worker): The rules for lay-off, retrenchment and closure may according to the discretion of the state government be applied to industrial establishments which employ more than 50 workers. Under the central act, these rules only apply to establishments which employ more than 300 workers.

To test the above prediction, we exploit a very unique feature of the CMIE database. The database provides details of plant locations of all corporations. To simplify the analysis, we throw out firms that have plant locations in multiple states, since it is difficult to assess the exact location of the security offered. This reduces the sample to firms that operate in a single state. We then run the following regression specification:

$$y_{it} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1(i \in T) + \eta \cdot 1_{(E=1)} * 1(i \in T) + \omega \cdot X_{it} + \varepsilon_{it}. \qquad (8)$$

Here i indexes firms , t indexes time, j indexes industries, y_{it} is the dependent variable of interest (Debt/Assets etc), α_i and γ_t are firm and year fixed effect respectively; $1_{(E=1)}$ is an indicator variable that takes on a value of 1 if $E = 1$, i.e, if the law has been passed (years 2002, 2003 and 2004) and 0 otherwise (before the law); $1(i \in T)$ is an indicator variable that takes on a value of 1 if the firm i belongs to the treated group (pro-employer state) and 0 if it belongs to the control group (pro-worker state); X_{it} are some control variables (e.g., profitability, GDP) and ε_{it} is the error term. The firm fixed effects control for time invariant differences between the treated and the control group and the year fixed effects control for aggregate fluctuations. X_{it} are some firm level control variables such as profitability, Tobin's Q, size, and age of the firm. The variable of interest is η, which captures the DID effect. Finally, to address concerns about auto-correlation (see Bertrand, Duflo, and Mullainathan (2004)), we cluster all my standard errors at the state of the plant location.

The results from the above regressions are reported in Table X. The results are consistent with the hypothesis that secured debt has become costlier for the firms. In columns 1 and 2 of Table X, we report a reduction in the level of secured debt-to-assets of 1.4% in pro-employer states when compared to pro-worker states. In columns 3 and 4, I investigate the effect on

debt to assets. We document a reduction in leverage by 1.0% in the pro-employer states when compared to the pro-debtor states. Similar findings are obtained when leverage is defined as long-term debt to assets. It can be noted from columns 5 and 6 that the long-term debt-to-assets ratio declined by 0.7%. The effect on secured debt to debt has the expected sign (negative) but is not statistically significant.[24] Finally, these results are robust to the inclusion of controls and industry*year fixed effects, i.e., when the identification comes from within industry variations in treated and control states.

8. Conclusion

The "Law and Finance" literature has suggested that creditor rights have an important role in financial development, and that strengthening creditor rights facilitates credit usage. This paper suggests that there is a threshold level of creditor rights beyond which strengthening creditor rights may have adverse effects. Examining an exogenous policy reform, we find that an increase in the rights of secured creditors leads to a reduction in the quantity of secured credit. This result thus suggests that improvements in creditor rights have important demand side effects that have been ignored in previous literature.

It is important to emphasize that this paper does not take a stand on welfare implications of this law. While there are obvious benefits from strengthening creditor rights, such as better resource allocation, this paper indicates that stronger creditor rights may cause some firms to be worse off. In such situations, a statement on welfare implications involves making an implicit assumption about the importance of the worse-off firms. Since there is no objective way to decide this, the aggregate welfare effects of this law are not obvious.

This paper points to some research questions regarding the effect of creditor rights on bank relationships and the concentration of lenders. In the last few years, India has witnessed mergers of banks that specialized in short-term loans with Development Financial Institutions that specialized in long-term loans. When creditor rights were weak, separate cred-

[24]This is due to the fact that both secured debt and total debt fall as a result of this law. Thus, the ratio falls by less. For example, imagine a secured debt-to-debt ratio of 0.75. Now assume that secured debt falls by 5.0% (from 0.75 to 0.70) and total debt falls by 4.0% (1.0 to 0.96). The new ratio is 0.70/0.96 which is ≈ 0.73. Thus, when secured debt drops from 0.75 to 0.70 and total debt decreases from 1.0 to 0.96, the effect on the ratio is quite small (drops from 0.75 to 0.73).

itors (acting without regard to other creditors) were necessary to enforce borrowing discipline. With stronger creditor rights, it makes sense to remove duplication of monitoring costs across institutions, leading to mergers. Stronger creditor rights also make unobservable borrower information less important, which can only be acquired over time through relationships. This lowers a key entry barrier.

It is also likely that the ease of enforcement of any legal code will be different across different types of borrowers. For example, if one believes a priori that it is easier for a bank to enforce a strong law against an individual consumer rather than a corporate consumer, one would expect the bank portfolio to move more towards collateralized retail lending. So, the boom in real estate and auto loans in India over the past few years may have been catalyzed by SARFAESI.[25] My ongoing research attempts to investigate these questions further.

[25] Such consumer lending booms have also coincided with collateral law changes in several Eastern European countries.

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Appendix A. Proofs

Proof of Lemma 1: If $\hat{p}\theta C + \phi L \geq F + L, \forall p > \tilde{p}$ then secured debt is preferred by the G-type entrepreneur in the pre-SARFAESI regime. The above condition states that firms with secured debt face no liquidation threat in the event of a 0 cash flow in the first period. We want to show that secured debt dominates unsecured debt. Let $\Pi(s)$ denote the profits with secured debt and $\Pi(us)$ denote the profits from unsecured debt. It can be easily checked that:

$\Pi(s) = \frac{2[p\theta C - F]}{p} + b + \frac{\phi L}{p} + \theta(\frac{\phi L}{\eta} - \phi L)$, and

$\Pi(us) = \frac{2[p\theta C - F]}{p} + b + \frac{\phi L}{\eta}$

Further, denote $\Delta = \Pi(s) - \Pi(us)$. Simplifying we get $\Delta = (1-\theta) \cdot \frac{\phi L}{\eta} \cdot \left[\frac{\eta}{\hat{p}} - 1\right]$. If $\phi L > 0$ and $\eta > \hat{p}$ ($p > \tilde{p}$ by assumption), then $\Delta > 0$. Further, $\frac{\partial \Delta}{\partial \eta} > 0$, i.e., the higher the value of η, the higher the profits from choosing secured debt. This results from lower deadweight cost of the liquidation process which are borne by the entrepreneur. In contrast, $\frac{\partial \Delta}{\partial p} < 0$, i.e., with less asymmetric information about project types and cash flows, the preference tends towards unsecured debt.

q.e.d.

Proof of Lemma 2: An improvement in access to collateral brought about by the SARFAESI Act may lead to a reduction in secured debt. If $\hat{p}\theta C + \phi L \geq F + L, \forall p$, then it is clear that firms face no liquidation threat with secured debt and we saw in Proposition 1 that secured debt dominates unsecured debt for firms with $\eta > \hat{p}$. Now, consider the case in which $\hat{p}\theta C + \phi L < F + L, \forall p$. Let $\Pi(s)$ denote the profits with secured debt and $\Pi(us)$ denote the profits from unsecured debt. It is easy to verify that:

$\Pi(s) = \frac{(1-p\theta)\cdot L + p\theta[b + (1+\theta)C + (1-\theta)\cdot\phi L] - F(1+p\theta)}{p} + \theta^2 \frac{\phi L}{\eta}$, and

$\Pi(us) = \frac{2[p\theta C - F]}{p} + b + \frac{\phi L}{\eta}$.

Further, denote $\Delta = \Pi(s) - \Pi(us)$. On simplifying the expression for Δ, we get

$\Delta = \frac{(1-p\theta)(F+L) + p\theta[b - (1-\theta)\cdot(C - \phi L)]}{p} - b - (1-\theta^2)\frac{\phi L}{\eta}$.

So the big question is under what conditions is $\Delta < 0$. On rearranging the terms, we find that if $(1-p\theta)(F+L) + p\theta\left[b - (1-\theta)\cdot(C - \phi L)\right] \geq p\left[b + (1-\theta^2)\frac{\phi L}{\eta}\right]$, then $\Delta \geq 0$, else $\Delta < 0$.

Putting it in a different way, let $\hat{b} = b$ solve the equality

$(1-p\theta)(F+L) + p\theta\left[b - (1-\theta)\cdot(C - \phi L)\right] = p\left[b + (1-\theta^2)\frac{\phi L}{\eta}\right]$.

If $b > \hat{b}$, then $\Delta < 0$ and firms may prefer to switch out of secured debt.

q.e.d.

Table I
Data Variables List

Data Items	Variables	Source
Item 1	Total Assets (Book Value of Assets)	CMIE
Item 2	Plant and Machinery	CMIE
Item 3	Land and Building	CMIE
Item 4	Capital Work in Progress	CMIE
Item 5	Other Fixed Assets	CMIE
Item 6	Gross Fixed Assets	CMIE
Item 7	Net Fixed Assets	CMIE
Item 8	Cash and Bank Balance	CMIE
Item 9	Marketable Securities	CMIE
Item 10	Short-term Debt	CMIE
Item 11	Long-term Debt	CMIE
Item 12	Secured Debt (Secured by tangible assets)	CMIE
Item 13	Unsecured Debt (Not secured by tangible assets)	CMIE
Item 14	Total Debt = Item 10 + Item 11 or Item 12+ Item 13	Derived from CMIE
Item 15	Gross Fixed Assets = Item 2+ Item 3+ Item 4+ Item 5	Derived from CMIE
Item 16	Net Fixed Assets = Gross Fixed Assets (Item 6)-Accumulated Depreciation	Derived from CMIE
Item 17	Specific Assets (SA) = Item 2+Item 5	Derived from CMIE
Item 18	Non Specific Assets (NSA)=Item 3+ Item 8+ Item 9	Derived from CMIE
Item 19	Tangibility $=\frac{\text{Plant and Machinery+Other Fixed Assets}}{\text{Total Assets}}$	Derived from CMIE
Item 20	Tangibility2 $=\frac{\text{Specific Assets}}{\text{Specific Assets + Non Specific Assets}}$	Derived from CMIE
Item 21	Tobin's Q $=\frac{\text{Market Value of Assets}}{\text{Book Value of Assets}}$	Derived from CMIE

Table II
Industries

Industry Code	Industries	Number of firms	Observations
1	Poultry and Meat	9	48
2	Agricultural Products (includes rubber plantations)	192	905
3	Minerals products (extraction based-includes lube oil for example)	128	602
4	Vegetable oils	138	609
5	Processed Food + Tobacco	292	1410
6	Textiles	620	3178
7	Leather	41	201
8	Wood Products	19	123
9	Paper	161	812
10	Chemicals (includes drugs and pharmaceuticals)	722	3728
11	Plastics	316	1697
12	Cement (includes abrasives)	207	1062
13	Iron and Steel (includes Castings and forging+electrical appliances +copper+aluminum)	486	2370
14	Engines + material handling equipment	218	1156
15	Wires and Cables	200	1061
16	Consumer electronics	366	1659
17	Automobiles + ancillaries	232	1341
18	Misc items	43	219
19	Construction	168	798
20	Power generation	57	206
21	Services	874	3655
22	Diversified	47	300
	Total	5536	27140

Table III
Descriptive Statistics

Variables	All Firms	Listed Firms	Unlisted Firms
Debt/Assets	0.339	0.345	0.332
	[0.186]	[0.18]	[0.192]
	27150	14799	12351
Secured Debt/Assets	0.269	0.285	0.251
	[0.179]	[0.176]	[0.18]
	27150	14799	12351
Long-term Debt/Assets	0.209	0.217	0.2
	[0.17]	[0.163]	[0.176]
	27150	14799	12351
Secured Debt/Debt	0.769	0.795	0.737
	[0.261]	[0.232]	[0.288]
	27150	14799	12351
Short-term Debt/Debt	0.432	0.417	0.45
	[0.302]	[0.284]	[0.322]
	27150	14799	12351
Log (Assets)	3.878	4.202	3.49
	[1.632]	[1.622]	[1.557]
	27150	14799	12351
Total Assets	314.559	395.95	216.80
	[2319.468]	[2319.468]	[1480.549]
	27150	14799	12351
Log (EBIT)	1.361	1.707	0.944
	[1.909]	[1.931]	[1.797]
	22996	12557	10439
Log(Sales)	3.645	3.905	3.328
	[1.878]	[1.89]	[1.813]
	26741	14688	12053
EBIT/Assets	0.073	0.07	0.077
	[0.122]	[0.109]	[0.135]
	27150	14799	12351

Notes: This table reports summary statistics (mean,[standard deviation], and number of observations) for variables used in the analysis. Debt is defined as the total of short-term plus long-term debt. Secured debt is defined as any borrowing that is secured by a tangible asset. Short-term debt is any debt that has maturity of less than 3 years. Assets refer to the book value of assets and are reported in 10 million Indian Rupees (1 US Dollar is approximately 45 Indian Rupees). EBIT is defined as earnings before interest and taxes. Sample period is from 1997-2004. Source: CMIE (publishes detailed financial information on large Indian firms).

Table IV
Descriptive Statistics (Pre and Post Legal Change)

	Mean		Median		
Variables	Before	Difference	Before	Difference	Observations
Debt/Assets	0.348***	-0.023***	0.347***	-0.028***	27612
	(0.001)	(0.002)	(0.002)	(0.004)	
Secured-debt/Assets	0.281***	-0.033***	0.267***	-0.041***	27612
	(0.001)	(0.002)	(0.002)	(0.003)	
Short-term Debt/Assets	0.131***	-0.001	0.114***	-0.007***	27612
	(0.001)	(0.001)	(0.001)	(0.002)	
Long-term Debt/Assets	0.217***	-0.022***	0.191***	-0.031***	27612
	(0.001)	(0.002)	(0.002)	(0.003)	
Secured Debt/Debt	0.784***	-0.042***	0.871***	-0.036***	27612
	(0.002)	(0.003)	(0.002)	(0.004)	
Short-term Debt/Debt	0.423***	0.026***	0.385***	0.031***	27612
	(0.002)	(0.004)	(0.003)	(0.005)	
Interest Exp/Op Income	0.317**	-0.092	0.401***	-0.160***	27290
	(0.137)	(0.225)	(0.007)	(0.012)	
Interest Exp/Assets	0.046***	-0.013***	0.044***	-0.015***	27612
	(0.000)	(0.000)	0.000	(0.000)	
Interest Exp/Sales	0.249***	-0.052	0.048***	-0.019***	27203
	(0.092)	(0.152)	0.000	(0.001)	

Notes: This table reports the pre and post-event results. The event here is the passage of the SARFAESI Act. This law empowered secured creditors to seize and sell the assets of the defaulting firm without court intervention. The law was passed in the parliament in 2002. The data comes from CMIE which publishes financial information of large corporations in India. The data spans years 1997-2004. Standard errors are reported in parentheses. ***, ** and * implies significance at the 99 percent level, 95 percent level, and 90 percent levels respectively.

Table V
Descriptive Statistics

Notes: This table reports the before/after results for the terciles. The terciles are formed based on the pre-treatment levels of Tangibility. Tangibility is defined as net fixed assets to total assets. The event here is the passage of the SARFAESI Act. This law empowered the secured creditors to seize and sell the assets of the defaulting firm without court intervention. The law was passed in the parliament in 2002. Thus, "before" refers to years prior to 2002 and "after" refers to the years 2002-2004. Standard errors are reported in parentheses. ***, ** and * implies significance at the 99 percent level, 95 percent level, and 90 percent levels respectively. Source: CMIE (publishes detailed information on large Indian firms). Coverage: 1997-2004.

	Low Tangibility			Medium Tangibility			High Tangibility		
	Before	Difference	Observations	Before	Difference	Observations	Before	Difference	Observations
Debt/Assets	0.277***	0.002	8935	0.357***	-0.023***	8482	0.411***	-0.045***	8493
	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Secured Debt/Assets	0.212***	0	8935	0.292***	-0.034***	8482	0.342***	-0.058***	8493
	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Secured Debt/Debt	0.753***	-0.015**	8935	0.799***	-0.040***	8482	0.801***	-0.051***	8493
	(0.00)	(0.01)		(0.00)	(0.01)		(0.00)	(0.01)	
Long-term Debt/Assets	0.142***	-0.002	8935	0.217***	-0.025***	8482	0.295***	-0.046***	8493
	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Short-term Debt/Assets	0.134***	0.004	8935	0.140***	0.002	8482	0.116***	0.002	8493
	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Short-term Debt/Debt	0.346***	0.042***	8288	0.423***	0.042***	8482	0.319***	0.048***	8493
	(0.00)	(0.01)		(0.00)	(0.01)		(0.00)	(0.01)	
Log(Assets)	3.622***	0.326***	8935	3.744***	0.279***	8482	3.996***	0.297***	8493
	(0.02)	(0.04)		(0.02)	(0.04)		(0.02)	(0.04)	
EBITDA/Assets	0.094***	-0.011***	8935	0.108***	-0.002	8482	0.111***	0.017***	8493
	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
EBIT/Assets	0.079***	-0.015***	8935	0.078***	-0.007***	8482	0.066***	0.012***	8493
	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Log(EBIT)	1.003***	0.181***	7664	1.344***	0.161***	7286	1.577***	0.341***	7022
	(0.03)	(0.05)		(0.03)	(0.05)		(0.03)	(0.05)	
Log(EBITDA)	1.140***	0.220***	7950	1.559***	0.249***	7708	1.842***	0.379***	7721
	(0.03)	(0.04)		(0.03)	(0.04)		(0.03)	(0.05)	
Log(Sales)	3.346***	0.299***	8730	3.561***	0.399***	8409	3.668***	0.501***	8424
	(0.03)	(0.04)		(0.02)	(0.04)		(0.03)	(0.04)	
Interest Exp/Assets	0.035***	-0.007***	8935	0.048***	-0.012***	8482	0.055***	-0.018***	8493
	0.00	(0.00)		0.00	(0.00)		0.00	(0.00)	
Interest Exp/Op Income	0.25	-0.374	8756	0.514*	-0.012	8412	0.378	0.121	8456
	(0.21)	(0.34)		(0.27)	(0.47)		(0.25)	(0.44)	
Interest Exp/Sales	0.163***	0.185**	8730	0.431	-0.365	8409	0.162***	-0.092***	8424
	(0.06)	(0.09)		(0.28)	(0.48)		(0.02)	(0.03)	

Table VI
Empirical Strategy

Notes: This tables introduces the basic empirical strategy. We divide firms (by industry) into three bins based on this measure of tangibility, where tangibility is defined as net fixed assets to total assets. We label the top 50% firms (based on the measure of tangibility) as high tangibility firms and the bottom 50% as the "Low Tangibility" group. The "High Tangibility" is the treated group while firms belonging to the "Low Tangibility" group form the control group. The After variable refers to the period 2002, 2003 and 2004 and the Before variable refers to years prior to that. We next collapse the data into single data points (based on averages) both before and after. This results in two data points per firm, one data point for the pre-SARFAESI regime and one data point for the post-SARFAESI regime. In Panel A, we report the before-after results for the variable secured debt divided by assets. In Panel B, numerator is secured debt as before but the denominator is the pre-SARFAESI average asset values. In Panel C, the variable of interest is the ratio secured debt to total debt. The database is provided by CMIE which publishes financials of large corporations in India. The data spans years 1997-2004. Standard errors are reported in parentheses.

Panel A: Secured Debt to Assets

	Before	After	Difference	No. of observations
High Tangibility	0.322	0.269	-0.052	12734
	(0.004)	(0.004)	(0.006)	
Low Tangibility	0.242	0.231	-0.012	13059
	(0.003)	(0.004)	(0.005)	
		Difference	-0.041	
			(0.008)	

Panel B: Secured Debt to Assets

High Tangibility	0.322	0.350	0.029	12734
	(0.005)	(0.006)	(0.008)	
Low Tangibility	0.242	0.345	0.103	13059
	(0.006)	(0.007)	(0.009)	
		Difference	-0.074	
			(0.012)	

Panel C: Secured Debt to Debt

High Tangibility	0.815	0.764	-0.051	12734
	(0.005)	(0.006)	(0.008)	
Low Tangibility	0.762	0.745	-0.018	13059
	(0.006)	(0.007)	(0.009)	
		Difference	-0.033	
			(0.012)	

Table VII
Effect of SARFAESI Law on Secured Debt

Variables	Secured Debt/Assets			Secured Debt/Debt		
	1	2	3	4	5	6
AFTER*HIGH TANG DUM	-0.054***	-0.053***	-0.051***	-0.035***	-0.036***	-0.032***
	(0.005)	(0.005)	(0.005)	(0.008)	(0.008)	(0.009)
EBIT/Assets		-0.135***	-0.135***		-0.038**	-0.038**
		(0.021)	(0.021)		(0.019)	(0.018)
Log(Sales)		-0.002	-0.001		0.015***	0.017***
		(0.002)	(0.002)		(0.004)	(0.004)
Tobin's Q adjusted		0.335	0.312		0.446	0.443
		(0.217)	(0.218)		(0.329)	(0.329)
Tangibility		0.035***	0.034***		-0.002	0
		(0.013)	(0.013)		(0.022)	(0.022)
Constant	0.260***	0.265***	0.262***	0.791***	0.741***	0.734***
	(0.002)	(0.010)	(0.010)	(0.004)	(0.016)	(0.016)
Number of Firms	3298	3267	3267	3298	3267	3267
Observations	17428	17154	17154	17428	17154	17154
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	No	Yes	No	No	Yes
R-squared	0.821	0.826	0.829	0.714	0.714	0.717

Robust clustered standard errors in parentheses (clustering done at the firm level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} * 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. In columns 1-3, secured debt to assets is the dependent variable. Assets are measured as the book value of assets. In columns 4-6,secured debt to total debt is the dependent variable where total debt is defined as the sum of both short-term and long-term debt. Here, i indexes firms , t indexes time, j indexes industries, y_{it} is the dependent variable of interest, α_i and γ_t are firm and year fixed effect respectively; $1_{(E=1)}$ is an indicator variable that takes on a value of 1 if year is 2002, 2003 or 2004 and 0 otherwise. $1_{(A=H)}$ is an indicator variable that takes on a value of 1 if the firms belong to the treated group and 0 if they belong to the control group. We divide firms into three bins based on this measure of pre-treatment (average of tangibility before 2001) tangibility values. We define tangibility as net fixed assets to total assets. We designate the top 33% firms (based on the measure of pre-treatment tangibility) as "High Tangibility" firms and the bottom 33% as the "Low Tangibility" group. The "High Tangibility" group is the treated group while firms belonging to the "Low Tangibility" group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, size etc. Tobin's Q is defined as the market to book value of the stock. Profitability is defined as earnings before interest and taxes to total assets and log of sales proxies for size. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Table VIII
Effect of SARFAESI Law on Total Debt

Variables	Debt/Assets			(Debt-Cash)/Total Assets			Long-term Debt/Assets		
	1	2	3	4	5	6	7	8	9
AFTER*HIGH TANG DUM	-0.046***	-0.044***	-0.042***	-0.046***	-0.044***	-0.042***	-0.041***	-0.041***	-0.041***
	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.004)	(0.004)	(0.005)
EBIT/Assets		-0.144***	-0.143***		-0.144***	-0.143***		-0.147***	-0.148***
		(0.024)	(0.025)		(0.025)	(0.025)		(0.039)	(0.039)
Log(Sales)		-0.007***	-0.006**		-0.007***	-0.006**		0.003	0.005
		(0.003)	(0.003)		(0.003)	(0.003)		(0.008)	(0.008)
Tobin's Q adjusted		-0.078	-0.08		-0.081	-0.082		0.16	0.127
		(0.163)	(0.173)		(0.150)	(0.158)		(0.279)	(0.295)
Tangibility		0.037***	0.035**		0.039***	0.038***		-0.234***	-0.232***
		(0.014)	(0.014)		(0.014)	(0.014)		(0.029)	(0.029)
Constant	0.324***	0.318***	0.369***	0.319***	0.315***	0.364***	0.208***	0.243***	0.254
	(0.002)	(0.017)	(0.069)	(0.002)	(0.017)	(0.069)	(0.002)	(0.014)	(0.193)
Number of Firms	3298	3267	3267	3298	3267	3267	3298	3267	3267
Observations	17428	17143	17143	17428	17143	17143	17428	17143	17143
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	No	Yes	No	No	Yes	No	No	Yes
R-squared	0.821	0.828	0.831	0.822	0.829	0.832	0.833	0.836	0.838

Robust clustered standard errors in parentheses (clustering done at the firm level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} * 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. Leverage, as defined by debt to total assets, is the dependent variable in these regressions. Debt is defined in three different ways. In Columns 1-3, we defined debt as the sum of short-term and long-term debt. In Columns 4-6, we define total debt as sum of short-term debt+long-term debt-Cash. Further, in columns 7-9, we define debt as simply the long-term debt. Finally, total assets refers to the book value of total assets. Here, i indexes firms , t indexes time, j indexes industries, y_{it} is the dependent variable of interest, α_i and γ_t are firm and year fixed effect respectively; $1_{(E=1)}$ is an indicator variable that takes on a value of 1 if year is 2002, 2003 or 2004 and 0 otherwise. $1_{(A=H)}$ is an indicator variable that takes on a value of 1 if the firms belong to treated group and 0 if they belong to the control group. We divide firms into three bins based on this measure of tangibility where tangibility is defined as net fixed assets to total assets. We define the top 33% firms (based on the measure of tangibility) as "High Tangibility" firms and the bottom 33% as the "Low Tangibility" group. The "High Tangibility" is the treated group while firms belonging to the "Low Tangibility" group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, size etc. Tobin's Q is defined as the market to book value of the stock. Profitability is defined as earnings before interest and taxes to total assets and size is proxied by the variable log of sales. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Table IX
Effect of SARFAESI Law on Profitability and Assets

Variables	Log (EBIT)			EBIT/Assets			Log (Assets)		
	1	2	3	4	5	6	7	8	9
AFTER*HIGH TANG DUM	0.021	0.037	0.056*	0.022***	0.023***	0.022***	-0.153***	-0.125***	-0.128***
	(0.036)	(0.030)	(0.033)	(0.005)	(0.005)	(0.005)	(0.017)	(0.014)	(0.016)
Log(Sales)	0.793***	0.784***	0.031***	0.031***	0.234***	0.230***	0.291***	0.284***	-0.001
	(0.036)	(0.036)	(0.002)	(0.002)	(0.012)	(0.012)	(0.061)	(0.061)	(0.004)
Tobin's Q adjusted	1.647	1.404	0.191	0.151	-0.109	0.053	46.472**	47.800**	0.029
	(1.344)	(1.173)	(0.134)	(0.123)	(0.347)	(0.363)	(18.045)	(19.436)	(0.057)
Tangibility	-0.505***	-0.474***	-0.057***	-0.056***	-0.887***	-0.880***	-1.922***	-1.797***	-0.154***
	(0.094)	(0.093)	(0.018)	(0.018)	(0.057)	(0.058)	(0.292)	(0.291)	(0.021)
Constant	1.347***	-1.333***	-1.318***	0.099***	0.016	0.017	3.687***	3.223***	3.230***
	(0.020)	(0.139)	(0.137)	(0.002)	(0.012)	(0.013)	(0.009)	(0.052)	(0.052)
Number of Firms	3024	3024	3024	3298	3267	3267	3298	3267	3267
Observations	14686	14638	14638	17428	17154	17154	17428	17154	17154
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Affects	No	No	Yes	No	No	Yes	No	No	Yes
R-squared	0.899	0.925	0.927	0.535	0.554	0.561	0.975	0.983	0.984

Robust clustered standard errors in parentheses (clustering done at the firm level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} * 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. In Columns 1-3, the defendant variable is log of (EBIT). In Columns 4-6, the dependent variable is profitability defined as the ratio of EBIT divided by book value of assets and in columns 7-9 the dependent variable is given by log of book value of assets. Here, i indexes firms , t indexes time, j indexes industries, y_{it} is the dependent variable of interest, α_i and γ_t are firm and year fixed effect respectively; $1_{(E=1)}$ is an indicator variable that takes on a value of 1 if year is 2002, 2003 or 2004 and 0 otherwise. $1_{(A=H)}$ is an indicator variable that takes on a value of 1 if the firms belong to the treated group and 0 if they belong to the control group. We divide firms into three bins based on this measure of tangibility where tangibility is defined as fixed assets to total assets. We define the top 33% firms (based on the measure of tangibility) as "High Tangibility" firms and the bottom 33% as the "Low Tangibility" group. The "High Tangibility" is the treated group while firms belonging to the "Low Tangibility" group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, size etc. Tobin's Q is defined as the market to book value of the stock. Profitability is defined as earnings before interest and taxes to total assets and size is proxied by the variable log of sales. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Table X
Robustness: Labor Laws

Notes: This table reports the results from the following regression: $y_{it} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1(i \in T) + \eta \cdot 1_{(E=1)} * 1(i \in T) + \omega \cdot X_{it} + \varepsilon_{it}$, Here, i indexes firms , t indexes time, j indexes industries, y_{it} is the dependent variable of interest (given in columns), α_i and γ_t are firm and year fixed effect respectively; $1_{(E=1)}$ is an indicator variable that takes on a value of 1 if in years 2002, 2003 and 2004 (after law has been passed) and 0 (before the law) in years prior to that; $1(i \in T)$ is an indicator variable that takes on a value of 1 if the firm i belongs to the treated group (pro-employer state) and 0 if it belongs to the control group (pro-worker state); X_{it} are some firm level control variables such as profitability, Tobin's Q, size etc. Tobin's Q is defined as the market to book value of the stock. Profitability is defined as earnings before interest and taxes to total assets and size is proxied by the variable log of sales. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Variables	Secured Debt/Assets		Debt/Assets		Long-term Debt/Assets		Sec. Debt/Debt	
	1	2	3	4	5	6	7	8
AFTER*PROEMP-DUM	-0.014*	-0.015*	-0.010**	-0.010***	-0.007*	-0.008*	-0.01	-0.013
	(0.007)	(0.007)	(0.003)	(0.003)	(0.004)	(0.004)	(0.012)	(0.011)
EBIT/Assets	-0.310***	-0.314***	-0.306***	-0.303***	-0.138***	-0.132***	-0.068*	-0.076**
	(0.019)	(0.020)	(0.008)	(0.008)	(0.006)	(0.009)	(0.033)	(0.032)
Log (Sales)	0.007	0.007	0.003	0.002	-0.007*	-0.007	0.014***	0.014**
	(0.004)	(0.005)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
Tangibility	0.052**	0.047**	0.051**	0.046**	0.063***	0.061***	-0.001	-0.003
	(0.021)	(0.020)	(0.016)	(0.018)	(0.011)	(0.013)	(0.025)	(0.021)
Tobin's Q adj	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.321***	0.671***	0.347***	0.620***	0.279***	0.174***	0.988***	1.922***
	(0.010)	(0.014)	(0.010)	(0.012)	(0.022)	(0.015)	(0.021)	(0.185)
Number of Firms	1746	1746	1746	1746	1746	1746	1746	1746
Observations	8536	8536	8536	8536	8536	8536	8536	8536
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Effects	No	Yes	No	Yes	No	No	Yes	No
R-squared	0.838	0.844	0.837	0.842	0.839	0.844	0.749	0.757
Robust clustered standard errors in parentheses, clustering is done at the state of location of plant								
* significant at 10%; ** significant at 5%; *** significant at 1%								

Notes: Here we plot the Net NPA additions to Net Advances, where Net NPA additions are defined as NPA Additions less NPA Recovery Source: Trends and Progress Report, Reserve Bank of India. Years spanned 2000-2004.

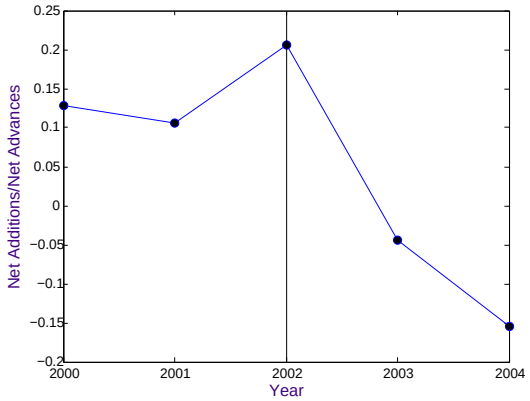
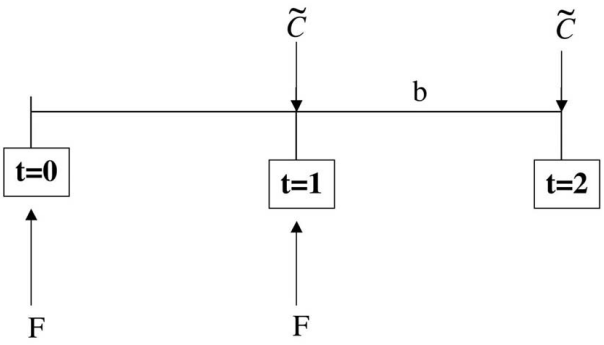


Figure 1. Net NPA Addtions/Net Advances

Figure 2. Time Line



E learns her type (Good or Bad) and chooses between Secured or Unsecured debt and invests F

Publicly observable cash flows $(\tilde{C})$ are realized. Investor decides whether to refinance (another F) the firm or to liquidate it for L_1

If allowed to continue publicly observable cash flows $(\tilde{C})$ are realized. Firms can be liquidated for L_2 in Period 2.

Good Firm

$\tilde{C}$ → θ → C
$\tilde{C}$ → 1-θ → 0

Bad Firm

$\tilde{C} \rightarrow 0 \rightarrow 0$

Figure 3. Extensive Form Game

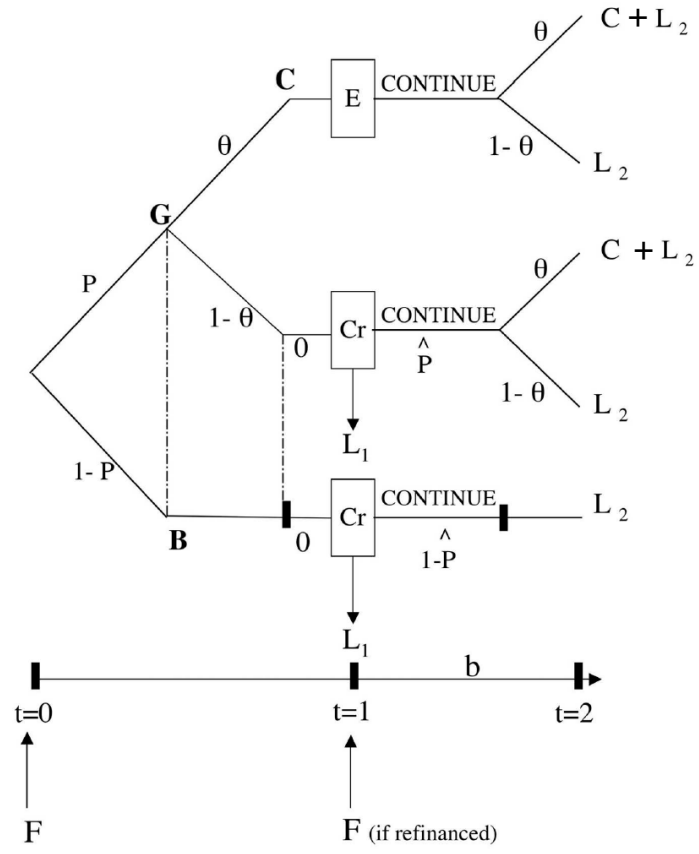
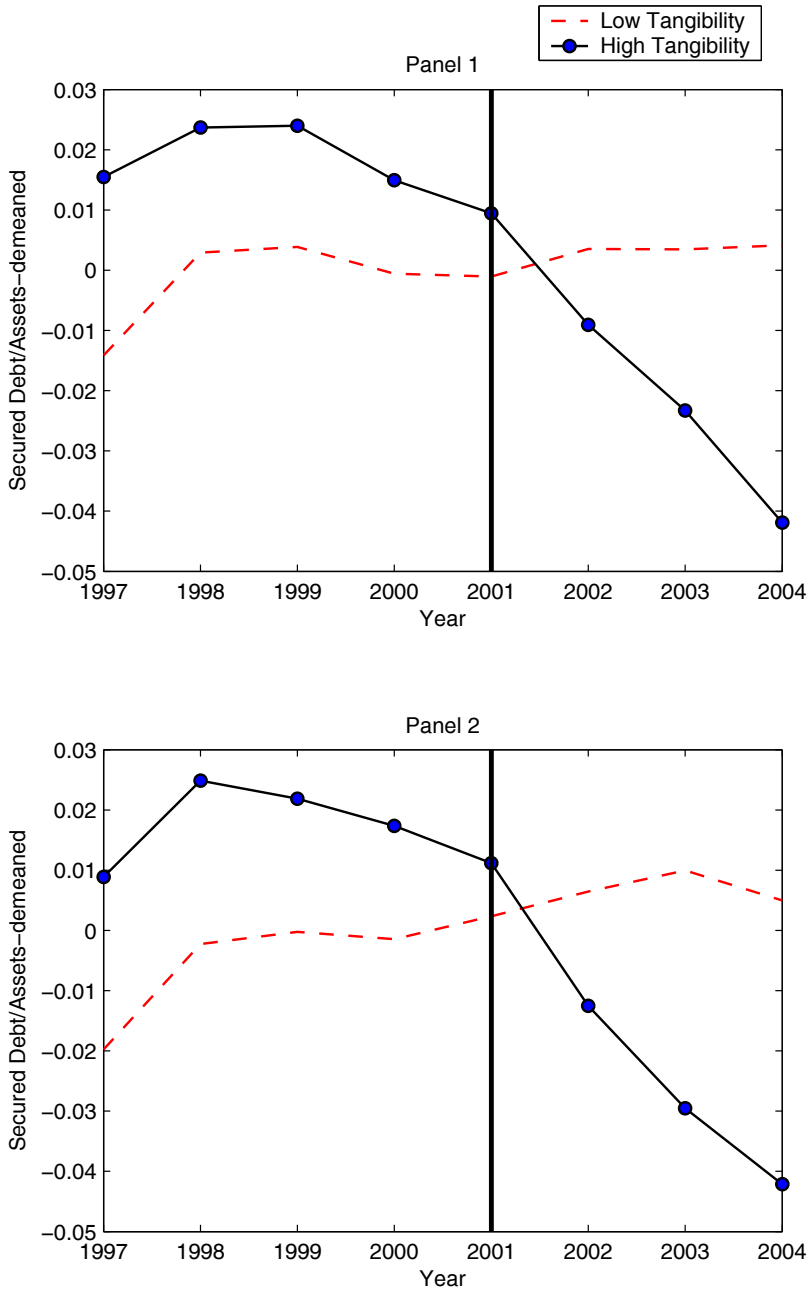
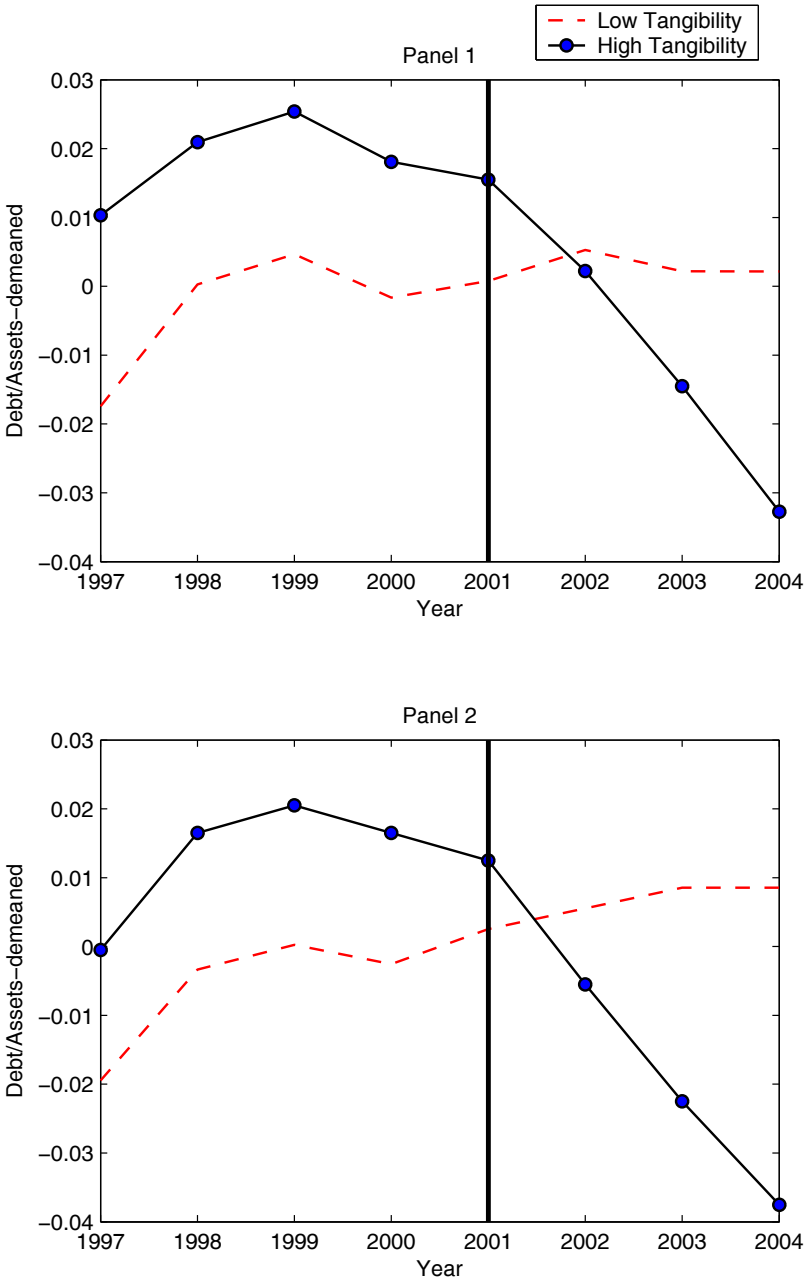


Figure 4. Secured Debt/Assets



Note: Here we plot the de-meaned values of the variable Secured Debt to Assets for both the high tangibility and low tangibility groups. In Panel 1, we divide firms into quartiles based on pre-treatment values of tangibility and plot the time-series of (de-meaned) secured debt to assets of both the highest tangibility quartile and the lowest tangibility quartile. In Panel 2, we repeat the exercise but group firms according to their pre-treatment values of tangibility terciles i.e plot firms in the lowest tangibility terciles and the firms in the highest tangibility tercile. Tangibility, as before, is defined as the ratio of net fixed assets to total assets. Source: CMIE database. Years spanned 1997-2004.

Figure 5. Debt/Assets



Note: Here, we plot the de-meaned values of the ratio of total debt to total assets for both the high tangibility and low tangibility groups. Total debt is defined as the sum of both short-term and long-term debt. In Panel 1, we divide firms into quartiles based on pre-treatment values of tangibility and plot the time-series of (de-meaned) total debt to total assets of both the highest tangibility quartile and the lowest tangibility quartile. In Panel 2, we repeat the exercise but group firms according to their pre-treatment values of tangibility terciles i.e plot firms in the lowest tangibility terciles and the firms in the highest tangibility tercile. Tangibility, as before, is defined as the ratio of net fixed assets to total assets. Source: CMIE database. Years spanned 1997-2004.