

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

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ABSTRACT

Much of our understanding of creditor's rights is based on the notion that creditors need to be well protected in order to facilitate the process of lending. As a result, in many countries, a major thrust is given to improvement in creditor rights. But what if these rights are too strong? This paper develops a theoretical model to analyze this question. Using firm-level data, I exploit variation in creditor rights generated by the passage of a secured transaction law in India to empirically document demand side (corporate) preferences. I find that improvement in the rights of secured creditors leads to a decrease in equilibrium usage of secured debt by firms. I also document a reduction in total debt. These results suggest that there is a threshold level of creditor rights beyond which strengthening of creditor rights may lead to adverse effects and that borrowers contract away from these potential inefficiencies.

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 has linked creditor rights with financial development by finding a positive correlation between an index of creditor rights and the size of credit markets in cross-country regressions.¹ These findings have provided new support for the view that ownership protections, 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.

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)². 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 secured transactions law, a.k.a. the SARFAESI Act (Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests Act 2002), to investigate the effect of law on

¹La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997; Levine 1998, 1999; Djankov, McLiesh, and Shleifer forthcoming; Beck, Demirgüç-Kunt, and Levine 2004; Haselmann, Pistor, and Vig 2006; Visaria 2006

²See also Strömberg (2000), Pulvino (1998) and Povel (1999)

corporate debt structure. Using this exogenous policy reform that strengthens the rights of secured creditors, and employing a differences-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. These results 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 takes a significant leap 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 borrower’s reduced reliance on secured debt.

Most of the existing “Law and Finance” literature has focused on the supply of credit (by investors) arguing for stronger creditor rights. Stronger creditor rights enforce financial discipline and increase the lenders’ propensity to supply capital. This leads to more positive NPV projects getting funded. An alternate argument suggests that an improvement in creditor rights leads to an increase in liquidation value of the asset, which reduces the deadweight costs of borrowing. Since it is the borrowers who benefit from this reduction in deadweight costs, it is therefore argued that an improvement in creditors’ rights should increase the equilibrium amount of secured debt. A similar argument can also be made using the notion of signaling through collateral a la Bester (1985). In Bester’s model, collateral is used as a signaling device, which helps sort borrowers into their respective ”types”. Pushing this argument further, it can be argued that poor creditor rights annul the role of collateral as a signaling tool whereas good creditor rights facilitate signaling by collateral. Improvement

in creditor's rights makes borrowing cheaper for the good firms and therefore should lead to an increase usage of secured debt.

The above arguments consider the effect of an increase in creditor rights on the lenders' propensity to supply capital and the marginal cost of lending. Clearly, creditor rights also affect the demand for credit (by firms). The fundamental tradeoff in this paper, as developed in my theoretical model, rests on the relative bargaining powers of creditors vis-à-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. Since an improvement in creditor rights raises the value from liquidation, I reason that it increases the creditors' bias towards liquidation. In this situation, lenders may be overly aggressive in liquidating a firm that is in financial distress.³ This may lead to ex-post inefficient liquidations of firms. Anticipating this, firms now alter their balance sheets by reducing their debt levels to mitigate this effect. The net effect of creditor rights on equilibrium secured debt thus depends on which of these two effects (increase in creditors' propensity to supply capital and reduction in deadweight costs, or, the increase in creditors' liquidation bias leading to borrowers reducing debt usage) dominates. Moreover, excessively strong creditor rights may also stifle entrepreneurial activity (see Fan and White 2003 for example). This paper attempts to further our understanding of the potential tradeoffs that accompany legal change.

My theoretical model implies that firms with more lumpy tangible assets are likely to be more affected by secured debt regulation, relative to firms with fewer tangible assets. Hence, following Rajan and Zingales (1995), I group firms based on a measure of tangibility, calculated by taking the ratio of fixed assets to total assets prior to the passage of this Act.

³This bias has been used in several papers. For a good example, see Dewatripont and Tirole (1994).

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. I find that both secured debt usage and total debt usage declined significantly more for the highest tangibility group compared to the lowest tangibility group.

This natural experiment also provides me with an opportunity to employ another independent identification strategy to further validate my 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. I, 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, I find that both secured debt usage and total debt usage declined more in pro-employer states when compared to the pro-labor states. Both these findings are entirely 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 adds to recent literature that exploits cross-country variation in creditor rights to investigate the relationship between legal institutions and corporate debt structure (Giannetti 2003, Acharya, John, and Sundaram 2005, Davydenko and Franks 2004, Qian and Strahan 2005). These empirical papers, even though extremely insightful, exploit the variability in legal institutions across countries, and thus raise some important concerns regarding the correlation between legal variables and country-level omitted variables. This can potentially bias the results.⁴

⁴Another drawback of cross-country studies is that countries differ in their accounting standards. This creates systematic noise in the financial variables that are reported. This error would be of little consequence if it were random in nature, as it would then lead to the traditional attenuation bias. This however is not the case.

This paper also contributes to the corporate finance literature that examines linkages between the liquidation value of the asset and debt structure of firms.⁵ Since a change in the secured creditor rights can be interpreted as a change in the liquidation value of assets, my paper provides yet another opportunity to test the existing theoretical findings and add to this scant empirical literature (see Alderson and Betker 1995; Gilson, John, and Lang 1990; Asquith, Gertner, and Scharfstein 1994, Benmelech, Garmaise, and Moskowitz 2005).

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 details 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.

2. Event: Legal Reforms

Financial sector reforms in India started in 1991 with the primary objective of enhancing 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 towards speeding the process of debt recovery in India.

Judicial delays were seen as one of the major obstacles to lending as lenders faced major difficulty with regards to the recovery of defaulted loans. The legal process was very rigid and was prone to long delays. In the event of default, a civil suit had to be filed with

The systematic bias comes from the fact that it is countries with weak institutions that have poor accounting standards. As a result, estimation results are potentially biased.

⁵Shleifer and Vishny (1992), Diamond (1991, 1993), Berglof and von Thadden (1994) are some of the important theoretical papers in this area. See Hart (2001) for a complete review on the financial contracting literature.

the Civil courts who 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 henceforth), 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 in India: 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 debt recovery 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 that was applicable to the suits filed in civil courts. Further, there was good amount of flexibility given to the tribunals 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 the SARFAESI Act, secured creditors did not have the right to seize and sell the securities of the defaulting firms in order to recover their dues. 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 manage-

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

ment of any company that defaulted in payments 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 perceived by the legislators were as follows. First, the law was intended to aid in the reduction of NPAs of banks and financial institutions in India. Second, a sound secured transactions law was considered important for attracting funds from foreign creditors thus promoting trade and growth. Third, a good creditor friendly system was considered essential for 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 Uniform Commercial Code (UCC) of the United States.⁷ First, this law allows for financial assets to be assigned freely irrespective of what is contained in any law or agreement. Second, the law defines security interest, created for repayment of loan, more generically, thereby giving importance to substance over form. Third, the law gave the 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 is the case with most laws, it is difficult to nail down the exact event date for the purpose of such an analysis. The official date of the Act is June 21st, 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 Re-

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

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

serve Bank of India, Ministry of Finance, Ministry of Law and ICICI, was set up in February 1999 to formulate specific recommendations in regard to the legal framework concerning the banking system. In March 2000, the panel submitted reports on the legal reforms specifically stating the need for a law that strengthens rights of banks and financial institutions by allowing them to seize the assets of the defaulting firm without court intervention. Definitive signs emerged between November of 2000, after the panel met to finalize the draft for the new bill and June of 2001 when the legislators met to discuss the recommendations of the panel and finalize details of the foreclosure law. The Act was first 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. 21st June, 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 serious concerns about excessive creditor powers. It was felt that such a law would give banks and FIs excessive powers which they would abuse. For example, 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 the borrowers practically no right to appeal. Their basic point was that if they (borrowers) had sufficient resources to deposit 75% of the total amount, they would not default on the interest payments to begin with.⁹

⁹On April 8th, 2004 the Supreme Court, in its landmark judgement on the Mardia Chemicals and Union of India case, 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.

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

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.

Summing up, the evidence, both anecdotal as well as statistical seems to clearly indicate that the SARFAESI Act dramatically increased the powers 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. Analytical Framework

The objective of this section is to develop a simple model to motivate my empirical analysis, guide my choice of variables and to understand better the tradeoffs concerning the

¹⁰In several interviews conducted in different banks, it was mentioned that banks, after SARFAESI Act was enacted, had started received a lot of requests from the 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 a security for the loan.

¹¹According 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.

use of secured debt. To accomplish this task, I present a simple framework that encapsulates secured and unsecured debt. The model borrows heavily from traditional theories of capital structure that are built on the central notion of bargaining. It uses the basic set up of Bolton and Scharfstein (1990) and combines that with Diamond's (1991) insight on the advantages of short-term debt.¹² The basic underlying theme revolves around the conflict between creditors and shareholders.¹³

3.1. Firms' Investment Needs

I consider an economy composed of a continuum of risk-neutral, cash constrained firms that need to access external funds in order to cover their investment outlays. Firms can fund their investment needs by using either secured debt or unsecured debt.¹⁴ A cash-constrained Entrepreneur (E) has a project that runs over three date points, $t=0, 1, 2$ (2 periods). The project requires external financing totalling $2F$. More specifically, each firm requires an investment amount F at $t=0$ and another F at $t=1$. I assume that the entrepreneur can not borrow $2F$ at $t=0$. This can be interpreted as a "no absconding constraint". The project yields cash flows at $t=1$ and $t=2$.¹⁵ For simplicity, I assume that cash flow can either take the value of either $C > 0$ or 0 at each point in time so there are only four possible states of nature {1st period, 2nd period}: $\{C, C\}, \{C, 0\}, \{0, C\}$ and $\{0, 0\}$. I assume no discounting and I normalize the risk-neutral interest rate to zero. The time line and extensive form game layout are shown in Figures 2 and 3 respectively.

¹²The set-up is different from the Bolton and Scharfstein (1990) framework as the cash flows in this model are verifiable.

¹³There are several papers that have modeled this conflict. For an example see Dewatripont and Tirole (1994) and Berglof and von Thadden (1994). They derive optimal capital structures on basis of this conflict.

¹⁴A more general model that incorporates equity can be obtained upon request from the author.

¹⁵A more general formulation would use F_1 and F_2 as period 1 investments and period 2 investments respectively but for simplicity I assume that $F_1 = F_2$. This assumption is innocuous and does not change the nature of my analysis.

The basic time line is as follows. At $t=0$, the entrepreneur privately learns about the value of the investment project. The investment project could be either “good” (G-type) or “bad” (B-type). The creditors simply observe a credit rating p of the firm. A credit rating of p could be interpreted as a probability of being a G-type firm. The entrepreneur then chooses between secured debt and unsecured debt to raise F for the project. At $t=1$, publicly observable returns are realized. I assume that self-financing is not possible in the second period, i.e. entrepreneur consumes everything at the end of each period. A G-type firm earns random cash flow \tilde{C} in every period, where \tilde{C} is a stochastic cash flow that equals C with probability θ and 0 with probability $1-\theta$, while the B-type firm earns 0 in every period. Thus, if a cash flow C is observed at $t=1$, the the type of the borrower gets revealed to the investors. On the other hand, if a cash flow 0 is observed, then investors cannot decipher between a G-type firm that has been hit by a bad shock or a B-type firm. In the event of 0 cash flow at $t=1$, the investors decides whether to liquidate the firm for L^1 or to refinance it. The entrepreneur earns a private benefit of b , if she is allowed to continue in the second period. I assume that b is large enough so that the entrepreneur always prefers to continue. If allowed to continue, firms generate \tilde{C} plus L^2 in the second period. It is important to state that L^1 and L^2 are the period 1 and period 2 liquidation value of the assets with $L^1 > L^2$. The amount generated upon liquidation will depend upon the type of debt used i.e. whether debt is secured or not.

3.2. Firm’s Financing Choices

Firms can choose between secured debt and unsecured debt.¹⁶ The main distinguishing feature between secured debt and unsecured debt are as follows:

¹⁶In a more general model I allow for firms to choose their investment scale as well.

1. **Secured Debt:** A contract with secured debt specifies a payment schedule given by $\{R_s^1, R_s^2(C), R_s^2(0)\}$, where R_s^1 is the coupon payment at $t=1$, $R_s^2(C)$ is the coupon payment in period 2 conditional on a C in at $t=1$ and $R_s^2(0)$ is the coupon payment in period 2 given a 0 cash flow at $t=1$. If the firm obtains a 0 cash flow in the first period, then creditors decide whether to refinance the firm or to liquidate it for L_s^1 . If the firm is refinanced, the firm continues to operate and cash flows are realized in the next period. If the firm obtains 0 cash flow at $t=2$, then secured creditors liquidate the firm at $t=2$ and get L_s^2 .
2. **Unsecured debt:** A contract with unsecured debt specifies a payment schedule, given by $\{R_{us}^1, R_{us}^2(C), R_{us}^2(0)\}$, where R_{us}^1 is the coupon payment at $t=1$, $R_{us}^2(C)$ is the coupon payment in period 2 conditional on a C in at $t=1$ and $R_{us}^2(0)$ is the coupon payment in period 2 given a 0 cash flow at $t=1$. If the firm obtains a 0 cash flow in the first period, then creditors decide whether to refinance the firm or to liquidate it for L_{us}^1 . If the firm is refinanced, the firm continues to operate and cash flows are realized in the next period. If the firm obtains 0 cash flow at $t=2$, then unsecured creditors liquidate the firm at $t=2$ and get L_{us}^2 .

The main difference between secured credit and unsecured credit that I wish to highlight are: 1) creditors recover more with secured debt and 2) secured creditors, after the law came into effect, can seize and sell the assets without court intervention. This will be modeled as an increase in the liquidation value of the asset. Unsecured creditors on the other hand have no such rights and have to follow the standard judicial process.

Denote $\hat{p} = \frac{p(1-\theta)}{p(1-\theta)+(1-p)}$ as the probability of the type being good (G-type) conditional on observing a 0 cash flow at $t=1$. I begin by normalizing $L_{us}^2 = L_{us}^1 = 0$. Further, for

simplicity, I assume that $L_s^1 = L$ and $L_s^2 = \phi L$ with $0 < \phi < 1$. This can be understood as a depreciation of the firm's assets. Finally, let $L = L^*$ solve $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)\phi L^* = F + L^*$. Here L^* denotes the threshold value of L below which, firms face no liquidation threat with secured debt.

I will next summarize the important assumptions of my analysis.

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. It will be shown later that not all firms are able to borrow on an unsecured basis.

Assumption 2 $\hat{p}\theta C + (1 - \hat{p}\theta)\phi L > F + L$

Assumption 2 simply states that the $L < L^*$. This implies firms do not face any liquidation threat with secured debt in the pre-SARFAESI regime. The next crucial assumption revolves around the private benefits b . I assume that the private benefits are large enough that the entrepreneurs always want to continue. Further, B-types will always try to imitate the G-types as otherwise they will not receive any funding. Thus the G-types of an observable risk class will always be pooled with the B-type firms of the same risk class. The assumption that private benefits are large ensures a pooling equilibrium. Further, I assume that the credit markets are competitive i.e. borrower has all the bargaining power. Finally, an important assumption for the analysis is that assets are assumed to be lumpy, i.e. I do not allow for partial collateralization of assets. This is generally the nature of almost all of the fixed assets of a firm.

3.3. Optimal Contract

I will consider the optimal contracting problem from the perspective of a G-type firm i.e. contract that maximizes value for the G-type firms. Since b is large enough, B-types will always try to imitate the G-types as otherwise they will not receive any funding. Thus the G-types of an observable risk class will always be pooled with the B-type firms of the same risk class.¹⁷

3.3.1. G-optimal contract with secured debt

I start by analyzing the optimal secured debt contract for a G-type firm. The optimal contract specifies a payment schedule $\{R_s^1, R_s^2(C), R_s^2(0)\}$, with $0 \leq R_s^1 \leq C$, $0 \leq R_s^2(C) \leq C$ and $0 \leq R_s^2(0) \leq C$.

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

$$\begin{aligned} \max \quad & \theta [(C - R_s^1) + \theta(C - R_s^2(C) + L_s^2) + b] + \\ & (1 - \theta)\beta_c [\theta \cdot (C - R_s^2(0) + L_s^2) + b] \end{aligned} \quad (1)$$

subject to lender's participation constraints (IR):

$$\begin{aligned} p\theta \cdot [R_s^1 + \theta R_s^2(C) + (1 - \theta)L_s^2 - F] + \\ p(1 - \theta) [(1 - \beta_c) \cdot L_s^1 + \beta_c \{\theta R_s^2(0) + (1 - \theta) \cdot L_s^2 - F\}] \\ + (1 - p) [(1 - \beta_c) \cdot L_s^1 + \beta_c(L_s^2 - F)] \geq F \end{aligned} \quad (2)$$

¹⁷It maybe possible in principle for the G-type firms to partially reveal themselves by offering a menu of contracts that would support a semi-separating equilibrium. I rule out this possibility as such an outcomes can only be supported by ad hoc beliefs.

and borrower's limited liability constraints (LL):

$$0 \leq R_s^1 \leq C; 0 \leq R_s^2(C) \leq C; 0 \leq R_s^2(0) \leq C \quad (3)$$

Here β_c denotes the probability of continuation. It can be seen that it is efficient to use secured debt if $\beta_c = 1$ i.e. if $\hat{p}\theta C + (1 - \hat{p}\theta)L_2^s \geq (F + L_1^s)$.

The G-optimal contract with unsecured debt is similar and can be obtained by substituting $L_1 = L_2 = 0$.

Lemma 1 *If $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)L_2^s \geq F + L_1^s, \forall p, \theta$ then secured debt is preferred by the G-type entrepreneur in the pre-SARFAESI regime.*

The above proposition states that in the absence of a liquidation threat, secured debt will always be preferred to unsecured debt by the G-type firms regardless of θ . The intuition for these results is as follows. Since 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 a collateral. All firms will therefore choose secured debt in the pre-SARFAESI regime.¹⁸

Lemma 2 *If $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)L_2^s \leq F + L_1^s$ then $\exists \hat{b}$ such that if $b > \hat{b}$, then 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 threat i.e. firms with $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)L_2 \leq F + L_1$ prefer unsecured debt over secured debt.

¹⁸The proof of this lemma is provided in the appendix.

I will now use Lemma 1 and Lemma 2 to show that after SARFAESI certain firms ($L > L^*$ and $b > \hat{b}$) move from secured debt to unsecured debt. 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 sufficient high then creditors prefer to liquidate the firm at $t=1$ after a zero cash flow. Putting it differently, some firms that were financed with secured debt face a threat of being prematurely liquidated after a 0 cash flow in the first period. This is given by the equation:

$$\hat{p}\theta C + (1 - \hat{p}\theta)\phi(L + \delta) < F + (L + \delta).$$

This brings us to the first 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.*

Proposition 1 follows directly from Lemma 1 and lemma 2. The intuition for these results is as follows. On one hand, the law increases the liquidation value ($t=1$) of the secured assets. Such an increase in liquidation value would lead to an increase in the equilibrium quantity of secured debt being used. On the other hand, the law simultaneously increases the liquidation costs for the borrowers. The entrepreneurs lose b if there is premature liquidation. This increase in liquidation cost has the effect in the opposite direction i.e. a move away from secured debt. If b is sufficiently high (assumption of the analysis), then 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, all 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 its these firms that are more affected by secured transactions law. The next proposition deals with the usage of total debt.

Proposition 2 *An improvement in access to collateral brought about by the SARAFESI Act will lead to a reduction in total debt for firms with $p < \tilde{p}$ where $\tilde{p} = \frac{F}{\theta C}$, $b > \hat{b}$ and $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)L_s^2 \leq F + L_s^1$.*

Please refer to the appendix for proof.

The simple model that was presented above highlighted a key trade-off between secured and unsecured debt. The main assumption used was the feasibility of using both secured and unsecured debt i.e. a given firm could borrow on both secured as well as unsecured basis. For a firm to borrow on an unsecured basis it has to be the case that $p > \frac{F}{\theta C}$.

I now enrich the model to generate some results about total debt. I introduce a decision regarding the investment the scale of the firm. For simplicity, firms choose between two options $\{F, f\}$ (with $F > f$) and the project employs a constant returns to scale technology. Further, I assume that the liquidation value $L_s^1 > L_{us}^1 > 0$ and $L_s^2 > L_{us}^2 > 0$. I also introduce equity in the form entrepreneur's wealth w is also invested in the project. As before private benefits are large enough so as to ensure a pooling equilibrium. Assume that $p \in [\underline{p}, \bar{p}]$, i.e. firms are distributed according to some credit rating. It is clear from our set up that firms with $p < \tilde{p}$ i.e. $p \in [\underline{p}, \tilde{p}]$, where $\tilde{p} = \frac{F}{\theta C}$, cannot borrow on a unsecured basis in this model.

These firms can either borrow on a secured basis, in which case they face a threat of being liquidated at $t=1$, or they can scale down the size of their investment from F to f and borrow on a unsecured basis.

I now briefly sketch the outcome from the model.¹⁹ Firms with $p \in [\tilde{p}, \bar{p}]$ move from secured to unsecured without changing the scale of the project. On the other hand, firms with $p \in [\underline{p}, \hat{p}]$, switch from secured to unsecured debt and scale down the size of the project as well. It is important to note that firms with $p \in [\underline{p}, \hat{p}]$ will borrow on an unsecured basis with a smaller scale project. Since w , the equity share, is the same in both cases, it is sub-optimal for these firms to borrow on an secured basis as they would face a even bigger threat of being liquidated at $t=1$ (the ratio of inside investment is larger when the scale is smaller). In summary, Modigliani and Miller (1958) theorem holds for firms with high credit rating i.e. firms with $p \in [\hat{p}, \bar{p}]$ in the model. For firms with $p \in [\underline{p}, \tilde{p}]$, Modigliani and Miller (1958) fails and for these firms law may lead to a decrease in investment as well.

Two observations follow from the above discussion. First, the SARFAESI Act can lead to a reduction in total debt (for firms with $p \in [\underline{p}, \tilde{p}]$). This, as discussed, is a consequence of movement out of secured debt (to unsecured debt and/or scaling down of project.) Second, and rather subtle observation, is that the reduction in secured debt should be higher than the reduction in total debt. Once again, these effects should be greater for firms that have higher tangibility, as these are the firms that are more affected by this law.

¹⁹The model can be obtained from the author.

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 their legal structure. Institutional environments are generally endogenous and evolve only slowly with 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, there is good quality firm level data on financial contracts that 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.

I examine the effect of the law on firms by employing a differences-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 firm's 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 things", 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 it this way, the DID strategy eliminates the bias that comes from these "other" changes that could affect the treated group, other than the law.

The theoretical framework presented earlier, provides two important insights that I 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 its these firms that face the threat of being liquidated after default at $t=1$.²⁰ 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 now, they will not liquidate the firm since the net present value (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 affect is that the law introduces a liquidation bias (substitution effect). The important insight from the model is that these two affects are negatively correlated. Since the law increases the liquidation value of the asset, this results in a supply shift. If this was the only affect, then we have an instrument and thus the OLS would provide an

²⁰ L^* is the value of L that solves $\hat{p}\theta C + (1 - \hat{p}\theta)\phi L = F + L$.

unbiased estimate. However, there is an opposing demand effects as well. 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 the supply and demand shocks are negatively correlated. Therefore, the OLS estimate is downward biased.

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

$$y_{it} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} * 1_{(A=H)} + \omega \cdot X_{it} + \varepsilon_{it}, \quad (4)$$

Here i indexes firms, t indexes time, j indexes industries, y_{it} is the dependant 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 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.

I proxy for L in the model using a measure of “tangibility” as used in Rajan and Zingales (1995). Following Rajan and Zingales (1995), I 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. I then divide my sample into quantiles (terciles and quartiles) based on this measure of tangibility. For example, when dealing with quartiles, I 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. I control for such shocks by including interaction term $\beta_j * \gamma_t$, where β_j is the industry fixed affect 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, I compare high tangibility firms with the low tangibility firms within the same industry. Finally, to address concerns about autocorrelation (see Bertrand, Duflo, and Mullainathan 2004), I 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 culled out 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, total debt etc. A detailed break down by industry is given in Table II. The database also contains detailed information on plant location, listed or unlisted and ownership (private or public). Overall, the database contains detailed information on the large corporations in India, both listed as well as unlisted. The data spans years 1997-2004.

The information on the 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 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 the labor laws is taken from Besley and Burgess (2004). They code labor laws as pro-worker, neutral and pro-employer for each state.

In addition to this, I use information on financial contracts that comes from one of the better performing India public sector banks. This information is extracted from the loans files that the bank maintains for each borrower. With the help of some bank officers, I obtained general information on corporate accounts. I have information on the type of loans for example if it's a term loans or a working capital loan etc. I also have information whether the loan is secured or unsecured. Further, if the loan is secured I have information on both the security that is used for the purpose as well as the market value of the security. In addition I collected information on the other accounts of the borrower within the same bank, the length of the relationship, industry of the borrower and the credit rating of the borrower as given by the bank. The data spans 1999-2005 and has a quarterly frequency. From this large database on all corporate accounts of the bank, I query the larger accounts i.e. accounts that have total outstanding balance (across all facilities) greater than 50 million Rupees (approximately 1.3 million dollars). The definition of all the variables is provided in Table I.

Table III, I present the means and standard deviations of the variables that are used in the analysis. It shows a fairly significant variation in all the important variables. The average secured debt to assets of all firms is 26.9% with a standard deviation of 17.9%. The average debt to assets is 33.9% with a standard deviation of 18.9%. The average size of the firm is 314.5 crores Indian Rupees (approx. 75 million USD) while the median is 40 crores Indian Rupees (approx. 10 million USD). The 99th percentile firm is approximately 1.2 billion USD i.e. 5200 crore Indian Rupees. On average listed firms are slightly larger

than the unlisted ones. Around three-fourths of the total debt is secured and about two-fifths of the debt is short-term. Finally, the profitability, as measured by EBIT/Assets for all the firms is around 7%. In Table IV, I do a simple “pre” and “post” analysis by taking simple time-averages before and after the event date. This time-collapsing of 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 fell by 3.3% (median 4.1%) while debt to assets fell by 2.3% (median 2.8%). Further, secured debt to debt fell by about 4.2% (median 3.6%).

In Table V, I further divide my sample into terciles of tangibility using Rajan and Zingales (1995) definition.²¹ The first tercile firms have the lowest tangibility, the second terciles firms have the medium tangibility and the third terciles firms have the highest tangibility. It can be seen from the table V that third terciles firms are the ones that are most affected by this law whereas firms in the first tercile are least affected (in many cases unaffected) by the law. It can be seen for example that the secured debt to assets variables decreased by 5.8% for the third terciles group and remains unchanged for the low tercile group. A similar story holds for debt to assets and long-term debt to assets. As expected, the second tercile group has results that lie in between first and third terciles groups. For example, the reduction in secured debt to assets of second terciles group is 3.4% which is between 5.8% (third tercile) and 0 (first tercile).²²

²¹Rajan and Zingales (1995) define tangibility as fixed assets to total assets.

²²Please see VI for the 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. Prior to the law, the creditors would only liquidate the firm at $t=2$, but now the law brought about liquidation at $t=1$. From Hypothesis 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 had two effects. On one hand it increased the liquidation value of the asset (income effect) while on the other it increased liquidation costs (loss of private benefits) for the entrepreneur. If private benefits are relatively high, then the effect of the law is to lower the demand for secured debt (substitution effect).

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

Next, I show that the above patterns in Figure 4 are statistically robust to application of standard controls from the corporate finance literature. In Table VII, I investigate the impact of SARFAESI on the usage of secured debt using standard DID framework. In Table VII, I report the results based on the regression analysis with secured debt to assets as the dependant variable. To control for firm level heterogeneity, I use firm fixed effects in all the regressions. I also include year fixed effects to control for aggregate economic shocks. In column 1, I report the basic regression results. It can be seen that average secured debt to assets went down by 5.4% after the secured transactions law was passed. In column 2, I 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 I control for industry specific shocks by including an interaction of industry times 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 law on secured debt/assets remains fairly unchanged at 5.1%. Further, I redo this analysis separately with listed and unlisted firms.²³ In conclusion, these results indicate that the SARFAESI Act, on average, led to a reduction of secured debt to assets by a magnitude of roughly 5.2%.

In columns 4-6, I investigate the impact of SARFAESI using secured debt to debt as the dependant 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, I add some additional controls for profitability, SIZE, and Tobin's Q. The results remain unchanged at 3.6%. I further add industry times year fixed effects. The results remain fairly unchanged at 3.3%.

²³Results with listed and unlisted firms are not reported here. The basic results remain unaffected

All the results indicate that there is a reduction in the usage of secured debt to total debt and the magnitude of this reduction is fairly constant at 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 should first retire their more expensive debt i.e. unsecured debt. Therefore, 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, improvement in secured creditor rights leads to two opposing effects namely the income effect and the 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.

A 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 UK, Germany and France. The reported usage of secured debt is, 84% in UK and 124% in France despite UK having a more creditor-friendly law. Since the Davydenko and Franks (2004) study is based on cross-sectional setting, they are unable to distinguish between demand and supply effects. Their finding however is consistent with my model. Creditor right affects both supply of credit as well as its demand. Suppliers of secured credit are clearly better protected in UK than in France and therefore are more willing to supply secured credit, however, more creditor protection also makes borrowers more

cautious since it makes secured creditors less willing to compromise. It is quite possible that this is why less secured debt is used in UK as compared to France.²⁴ 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 the 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 to bankruptcy. My model predicts similar results and underscores the dual side of tangibility. Firms that have high tangibility have a larger debt capacity as 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.

6.2. Total Debt

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

²⁴Further report a variation in the composition of collateral.

by sum of long-term debt and short-term debt minus cash. For assets, I use the book value of assets.

In Figure 5 , I 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.²⁵ 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 the secured debt is accompanied by a decrease in leverage for firms that are not able to borrow on an unsecured basis.

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

In columns 4-6 , I 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, I include firm fixed effects and year fixed effects in all my regressions. Further in columns 2 and 3 I show that my results are robust to inclusion of controls such as EBIT to assets, SIZE and Tobin's Q. The results remain stable at 4.4%. Further, these results remain unaffected on the inclusion of industry times year fixed effects. Finally, in columns 7-9, I

²⁵In another specification I define leverage as both (short-term debt+long-term debt-cash) divided by total assets and long-term debt to assets. The pattern is exactly the same.

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, I investigate the impact of SARFAESI on firm's total assets. To achieve this, I run a difference-in-difference specification with log of assets as my dependant variable. It can be seen that firms with lower tangibility grew more as compared to 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, I redo the analysis using log of assets as my dependant variable. In columns 1 through 6 of Table IX, I report the results from the regression analysis. As before, I use firm fixed effects to control for firm level heterogeneity. Further, to address the Bertrand, Duflo, and Mullainathan (2004) critique, I 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 clearly 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.²⁶

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

²⁶I 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.

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.

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 strike and lockouts, stipulation of the circumstances in which such disputes shall be deemed illegal and the penalties thereof. It offers some protection to individuals to 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 in India. In this section I exploit differences in labor institutions across states to generate both cross-sectional as well as time-series variations in creditor rights. More specifically, I generate variation in creditor's 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.²⁷

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. I follow the Besley and Burgess (2004) classification of pro-worker and pro-labor states. Following their classification, I classify Maharashtra, West Bengal, Gujarat, Orissa and Kerela into pro-worker states and Andhra Pradesh, Karnataka, Tamil Nadu and Rajasthan into pro-labor states. The classification is best understood by the following example that I 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 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, I exploit a very unique feature of CMIE database. The database provides details of plant locations of all corporations. To simplify the analysis, I throw out any firms that have plant locations in multiple states, as it is difficult to assess

²⁷On average, states that are pro-employer tend to have less labor disruptions and as a result have better profitability

the exact location of the security offered. This leaves with a sample consisting of firms that operating in a single state. I then run the following regression specification:

$$y_{it} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1(i \in T) + \eta \cdot 1_{(E=1)} * 1(i \in T) + \omega \cdot X_{it} + \varepsilon_{it}. \quad (5)$$

Here i indexes firms, t indexes time, j indexes industries, y_{it} is the dependant 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 treated group (pro-employer state) and 0 if they belong to the control group (pro-worker state); X_{it} are some control variables (e.g. profitability, GDP 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. X_{it} are some firm level control variables such as profitability, Tobin's Q, size, age etc. The variable of interest is η which captures the DID effect. Finally, to address concerns about auto-correlation (see Bertrand, Duflo, and Mullainathan (2004)), I cluster all my standard errors at the state of location of the plant.

The results from the above regressions are reported in Table X. The results are consistent with the idea that secured debt has become costlier for the firms. I columns 1 and 2 of Table X, I report a reduction in the levels of secured debt to assets by 1.4% in pro-employer states when compared to the pro-worker states. In columns 3 and 4, I investigate the effect on debt to assets. I document a reduction in leverage by 1.0% in the pro-employer states when compared to the pro-debtor states. A 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 declined by 0.7%. The effect on secured debt to debt even though has

the expected sign (negative) is not statistically significant.²⁸ Finally, these results are robust to 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 lead to adverse effects. Examining an exogenous policy reform, I find that an increase in the rights of secured creditors leads to a reduction in the quantity of secured credit. These results thus suggest that improvements in creditor rights have important demand side effects that have been ignored in prior 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 clearly 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 wit-

²⁸This is due to the fact that both secured debt and total debt fall as a result of this law. Thus ratio falls by less. For example: imagine 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 the 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).

nessed 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 creditors (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.²⁹ My ongoing research attempts to investigate these questions further.

²⁹Such 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 $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)L_2 \geq F + L_1, \forall p$ 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 Π_{us} denote the profits from unsecured debt. It can be easily checked that:

$$\Pi(s) = \frac{2[p\theta C - F]}{p} + b + \frac{L_2}{p}, \text{ and}$$

$$\Pi(us) = \frac{2[p\theta C - F]}{p} + b + L_2$$

Further, denote $\Delta = \Pi(s) - \Pi(us)$. Simplifying we get $\Delta = \frac{L_2(1-p)}{p}$. Since If $L_2 > 0$ then $\Delta > 0$. Further, $\frac{\partial \Delta}{\partial L_2} > 0$ i.e. higher the value of L_2 , higher the profits from choosing secured debt.

q.e.d.

Proof of Lemma 2: An improvement in access to collateral brought about by the SARAFESI Act may lead to a reduction in secured debt. If $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)L_2 \geq F + L_1, \forall p$, then its clear that firms face to liquidation threat with secured debt and we saw in proposition 1 that secured debt dominates unsecured debt. So, lets look at the case in which $\hat{p} \cdot \theta C + (1 - \hat{p}\theta)L_2 < F + L_1, \forall p$. Let $\Pi(s)$ denote the profits with secured debt and Π_{us} denote the profits from unsecured debt. It is easy to verify that:

$$\Pi(s) = \frac{L_1(1-p\theta) + p\theta(b+C+L_2+\theta C) - F(1+p\theta)}{p}, \text{ and}$$

$$\Pi(us) = \frac{2[p\theta C - F]}{p} + b + L_2.$$

Further, denote $\Delta = \Pi(s) - \Pi(us)$.

On simplifying the expression for Δ , we get $\Delta = L_1(1 - p\theta) + \frac{F(1-p\theta)}{p} - (1 - \theta)[b + L_2 + \theta C]$. So

the big question is under what conditons is $\Delta < 0$. On re-arranging the terms, we find that if $\frac{\theta(1-p)F}{1-\theta} + \frac{pL_1(1-p\theta)}{1-\theta} - pL_2 \geq p\theta C - F + pb$ then $\Delta \geq 0$ else $\Delta < 0$. Putting it in a different way,

let $\hat{b} = b$ solve the equality

$$\frac{\theta(1-p)F}{1-\theta} + \frac{pL_1(1-p\theta)}{1-\theta} - pL_2 = p\theta C - F + p\hat{b}.$$

If $b > \hat{b}$ then $\Delta < 0$. So if $b > \hat{b}$; 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)-Accumalated 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 Stell (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 [0.186] 27150	0.345 [0.18] 14799	0.332 [0.192] 12351
Secured Debt/Assets	0.269 [0.179] 27150	0.285 [0.176] 14799	0.251 [0.18] 12351
Long-term Debt/Assets	0.209 [0.17] 27150	0.217 [0.163] 14799	0.2 [0.176] 12351
Secured Debt/Debt	0.769 [0.261] 27150	0.795 [0.232] 14799	0.737 [0.288] 12351
Short-term Debt/Debt	0.432 [0.302] 27150	0.417 [0.284] 14799	0.45 [0.322] 12351
Log (Assets)	3.878 [1.632] 27150	4.202 [1.622] 14799	3.49 [1.557] 12351
Total Assets	314.559 [2319.468] 27150	395.95 [2319.468] 14799	216.80 [1480.549] 12351
Log (EBIT)	1.361 [1.909] 22996	1.707 [1.931] 12557	0.944 [1.797] 10439
Log(Sales)	3.645 [1.878] 26741	3.905 [1.89] 14688	3.328 [1.813] 12053
EBIT/Assets	0.073 [0.122] 27150	0.07 [0.109] 14799	0.077 [0.135] 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 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 interests and expenses. 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)

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

Notes: This table reports the pre and post-event results. 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. The data comes from CMIE, that publish the financial information of large corporations in India. The data spans years 1997-2004. Standard errors are reported in brackets. ***, ** 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).

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 years 2002, 2003 and 2004. The data comes from CMIE, that publish the financial of large corporations in India. The data spans years 1997-2004. Standard errors are reported in brackets. ***, ** 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*** (0.00)	0.002 (0.00)	8935	0.357*** (0.00)	-0.023*** (0.00)	8482	0.411*** (0.00)	-0.045*** (0.00)	8493
Secured Debt/Assets	0.212*** (0.00)	0 (0.00)	8935	0.292*** (0.00)	-0.034*** (0.00)	8482	0.342*** (0.00)	-0.058*** (0.00)	8493
Secured Debt/Debt	0.753*** (0.00)	-0.015** (0.01)	8935	0.799*** (0.00)	-0.040*** (0.01)	8482	0.801*** (0.00)	-0.051*** (0.01)	8493
Long-term Debt/Assets	0.142*** (0.00)	-0.002 (0.00)	8935	0.217*** (0.00)	-0.025*** (0.00)	8482	0.295*** (0.00)	-0.046*** (0.00)	8493
Short-term Debt/Assets	0.134*** (0.00)	0.004 (0.00)	8935	0.140*** (0.00)	0.002 (0.00)	8482	0.116*** (0.00)	0.002 (0.00)	8493
Short-term Debt/Debt	0.346*** (0.00)	0.042*** (0.01)	8288	0.423*** (0.00)	0.042*** (0.01)	8482	0.319*** (0.00)	0.048*** (0.01)	8493
Log(Assets)	3.622*** (0.02)	0.326*** (0.04)	8935	3.744*** (0.02)	0.279*** (0.04)	8482	3.996*** (0.02)	0.297*** (0.04)	8493
EBITDA/Assets	0.094*** (0.00)	-0.011*** (0.00)	8935	0.108*** (0.00)	-0.002 (0.00)	8482	0.111*** (0.00)	0.017*** (0.00)	8493
EBIT/Assets	0.079*** (0.00)	-0.015*** (0.00)	8935	0.078*** (0.00)	-0.007*** (0.00)	8482	0.066*** (0.00)	0.012*** (0.00)	8493
Log(EBIT)	1.003*** (0.03)	0.181*** (0.05)	7664	1.344*** (0.03)	0.161*** (0.05)	7286	1.577*** (0.03)	0.341*** (0.05)	7022
Log(EBITDA)	1.140*** (0.03)	0.220*** (0.04)	7950	1.559*** (0.03)	0.249*** (0.04)	7708	1.842*** (0.03)	0.379*** (0.05)	7721
Log(Sales)	3.346*** (0.03)	0.299*** (0.04)	8730	3.561*** (0.02)	0.399*** (0.04)	8409	3.668*** (0.03)	0.501*** (0.04)	8424
Interest Exp/Assets	0.035*** (0.00)	-0.007*** (0.00)	8935	0.048*** (0.00)	-0.012*** (0.00)	8482	0.055*** (0.00)	-0.018*** (0.00)	8493
Interest Exp/Op Income	0.25 (0.21)	-0.374 (0.34)	8756	0.514* (0.27)	-0.012 (0.47)	8412	0.378 (0.25)	0.121 (0.44)	8456
Interest Exp/Sales	0.163*** (0.06)	0.185** (0.09)	8730	0.431 (0.28)	-0.365 (0.48)	8409	0.162*** (0.02)	-0.092*** (0.03)	8424

Table VI
Empirical Strategy

Notes: This tables introduces the basic empirical strategy. I divide firms (by industry) into three bins based on this measure of tangibility, where tangibility is defined as net fixed assets to total assets. I 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. I 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, I 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, that publishes the financial of large corporations in India. The data spans years 1997-2004. Standard errors are reported in brackets.

Panel A: Secured Debt to Assets				
	Before	After	Difference	No. of observations
High Tangibility	0.322 (0.004)	0.269 (0.004)	-0.052 (0.006)	12734
Low Tangibility	0.242 (0.003)	0.231 (0.004)	-0.012 (0.005)	13059
		Difference	-0.041 (0.008)	
Panel B: Secured Debt to Assets				
High Tangibility	0.322 (0.005)	0.350 (0.006)	0.029 (0.008)	12734
Low Tangibility	0.242 (0.006)	0.345 (0.007)	0.103 (0.009)	13059
		Difference	-0.074 (0.012)	
Panel C: Secured Debt to Debt				
High Tangibility	0.815 (0.005)	0.764 (0.006)	-0.051 (0.008)	12734
Low Tangibility	0.762 (0.006)	0.745 (0.007)	-0.018 (0.009)	13059
		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*** (0.005)	-0.053*** (0.005)	-0.051*** (0.005)	-0.035*** (0.008)	-0.036*** (0.008)	-0.032*** (0.009)
EBIT/Assets		-0.135*** (0.021)	-0.135*** (0.021)		-0.038** (0.019)	-0.038** (0.018)
Log(Sales)		-0.002 (0.002)	-0.001 (0.002)		0.015*** (0.004)	0.017*** (0.004)
Tobin' Q adjusted		0.335 (0.217)	0.312 (0.218)		0.446 (0.329)	0.443 (0.329)
Tangibility		0.035*** (0.013)	0.034*** (0.013)		-0.002 (0.022)	0 (0.022)
Constant	0.260*** (0.002)	0.265*** (0.010)	0.262*** (0.010)	0.791*** (0.004)	0.741*** (0.016)	0.734*** (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 dependant variable. Assets are measured as the book value of assets. In columns 4-6, secured debt to total debt is the dependant 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 dependant 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. I divide firms into three bins based on this measure of pre-treatment (average of tangibility before 2001) tangibility values. I define tangibility as net fixed assets to total assets. I designate the top 33% firms (based on the measure of pre-treatment tangibility) as high tangibility firms, middle 33% as "Low Tangibility" group 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 measured defined as earnings before interests and taxes to total assets and log of sales proxies for the 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*** (0.005)	-0.044*** (0.005)	-0.042*** (0.006)	-0.046*** (0.005)	-0.044*** (0.005)	-0.042*** (0.006)	-0.041*** (0.004)	-0.041*** (0.004)	-0.041*** (0.005)
EBIT/Assets		-0.144*** (0.024)	-0.143*** (0.025)		-0.144*** (0.025)	-0.143*** (0.025)		-0.147*** (0.039)	-0.148*** (0.039)
Log(Sales)		-0.007*** (0.003)	-0.006*** (0.003)		-0.007*** (0.003)	-0.006*** (0.003)		0.003 (0.008)	0.005 (0.008)
Tobin' Q adjusted		-0.078 (0.163)	-0.08 (0.173)		-0.081 (0.150)	-0.082 (0.158)		0.16 (0.279)	0.127 (0.295)
Tangibility		0.037*** (0.014)	0.035*** (0.014)		0.039*** (0.014)	0.038*** (0.014)		-0.234*** (0.029)	-0.232*** (0.029)
Constant	0.324*** (0.002)	0.318*** (0.017)	0.369*** (0.069)	0.319*** (0.002)	0.315*** (0.017)	0.364*** (0.069)	0.208*** (0.002)	0.243*** (0.014)	0.254 (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 Effects	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, I defined debt as the sum of short-term and long-term debt. In Columns 4-6, I define total debt as sum of short-term debt+long-term debt-Cash. Further, in columns 7-9, I 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_{ijt} 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. I divide firms into three bins based on this measure of tangibility where tangibility is defined as net fixed assets to total assets. I call the top 33% firms (based on the measure of tangibility) as high tangibility firms, middle 33% as “Low Tangibility” group 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_{ijt} is the error term. X_{ijt} 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 measured defined as earnings before interests 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 (0.036)	0.037 (0.030)	0.056* (0.033)	0.022*** (0.005)	0.023*** (0.005)	0.022*** (0.005)	-0.153*** (0.017)	-0.125*** (0.014)	-0.128*** (0.016)
Log(Sales)	0.793*** (0.036)	0.784*** (0.036)	0.031*** (0.002)	0.031*** (0.002)	0.234*** (0.012)	0.230*** (0.012)	0.291*** (0.061)	0.284*** (0.061)	-0.001 (0.004)
Tobin' Q adjusted	1.647 (1.344)	1.404 (1.173)	0.191 (0.134)	0.151 (0.123)	-0.109 (0.347)	0.053 (0.363)	46.472** (18.045)	47.800** (19.436)	0.029 (0.057)
Tangibility	-0.505*** (0.094)	-0.474*** (0.093)	-0.057*** (0.018)	-0.056*** (0.018)	-0.887*** (0.057)	-0.880*** (0.058)	-1.922*** (0.292)	-1.797*** (0.291)	-0.154*** (0.021)
Constant	1.347*** (0.020)	-1.333*** (0.139)	-1.318*** (0.137)	0.099*** (0.002)	0.016 (0.012)	0.017 (0.013)	3.687*** (0.009)	3.223*** (0.052)	3.230*** (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 $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} * 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. 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 dependant variable is log of (EBIT). In Columns 4-6, the dependant variable is profitability defined as the ratio of EBIT divided by book value of assets and in columns 7-9 the dependant variable is given by log of book value of assets. Here, i indexes firms, t indexes time, j indexes industries, y_{it} is the dependant 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. I divide firms into three bins based on this measure of tangibility where tangibility is defined as fixed assets to total assets. I call the top 33% firms (based on the measure of tangibility) as high tangibility firms, middle 33% as "Low Tangibility" group 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} 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 measured defined as earnings before interests 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: $y_{it} = \alpha_i + \gamma_t + \delta \cdot 1_{(t=1)} + \theta \cdot 1_{(i \in T)} + \eta \cdot 1_{(t=1)} * 1_{(i \in T)} + \omega \cdot X_{it} + \varepsilon_{it}$. Here, i indexes firms, t indexes time, j indexes industries, y_{it} is the dependant variable of interest (given in columns), α_i and γ_t are firm and year fixed effect respectively; $1_{(t=1)}$ is an indicator variable that takes on a value of 1 if in years 2002, 2003 and 2004 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 treated group (pro-employer state) and 0 if they belong 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 measured defined as earnings before interests 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* (0.007)	-0.015* (0.007)	-0.010** (0.003)	-0.010*** (0.003)	-0.007* (0.004)	-0.008* (0.004)	-0.01 (0.012)	-0.013 (0.011)
EBIT/Assets	-0.310*** (0.019)	-0.314*** (0.020)	-0.306*** (0.008)	-0.303*** (0.008)	-0.138*** (0.006)	-0.132*** (0.009)	-0.068* (0.033)	-0.076** (0.032)
Log (Sales)	0.007 (0.004)	0.007 (0.005)	0.003 (0.003)	0.002 (0.004)	-0.007* (0.004)	-0.007 (0.004)	0.014*** (0.004)	0.014** (0.005)
TANGIBILITY	0.052** (0.021)	0.047** (0.020)	0.051** (0.016)	0.046** (0.018)	0.063*** (0.011)	0.061*** (0.013)	-0.001 (0.025)	-0.003 (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*** (0.010)	0.671*** (0.014)	0.347*** (0.010)	0.620*** (0.012)	0.279*** (0.022)	0.174*** (0.015)	0.988*** (0.021)	1.922*** (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 I 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.

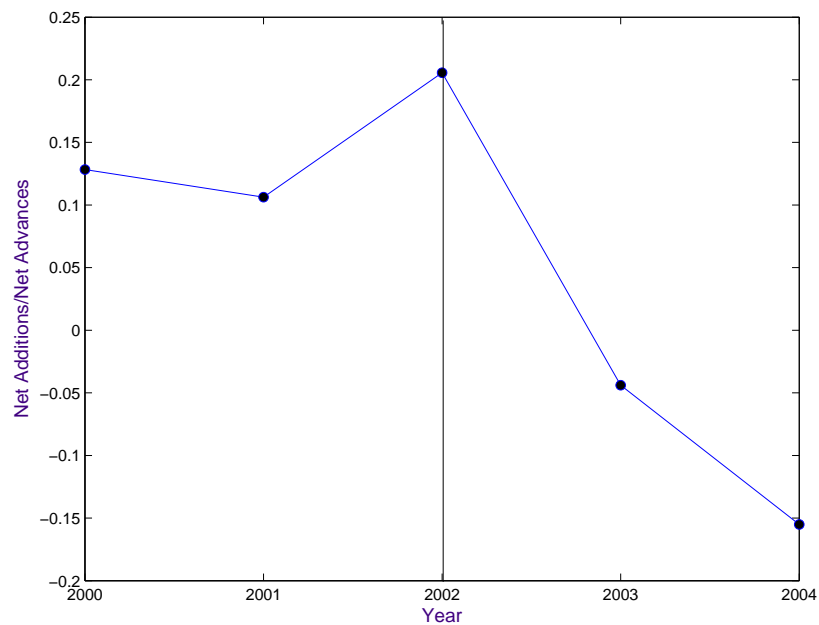


Figure 1. Net NPA Additions/Net Advances

Figure 2. Time Line

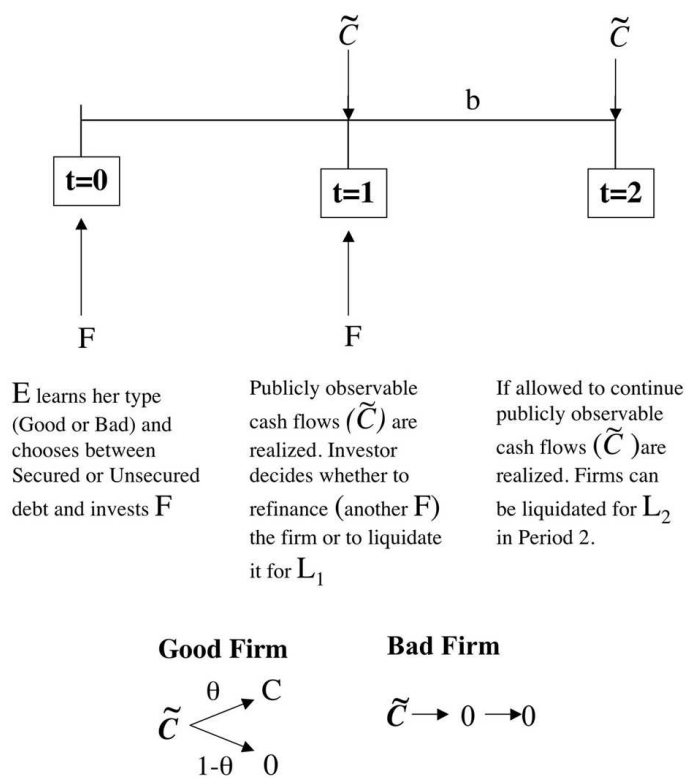


Figure 3. Extensive Form Game

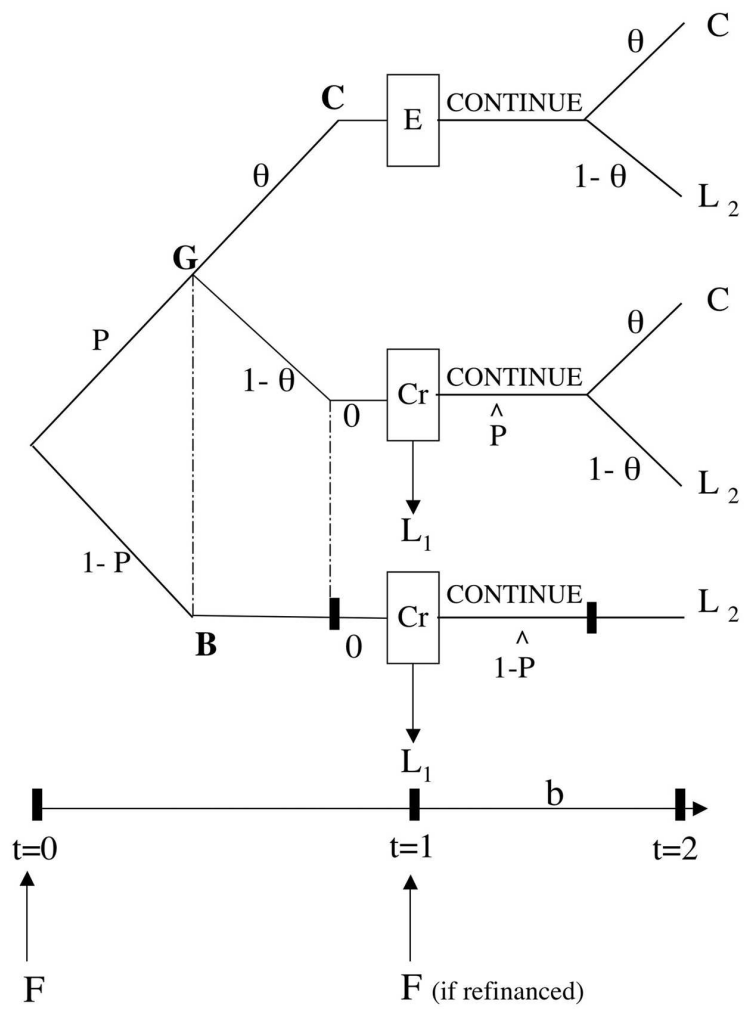
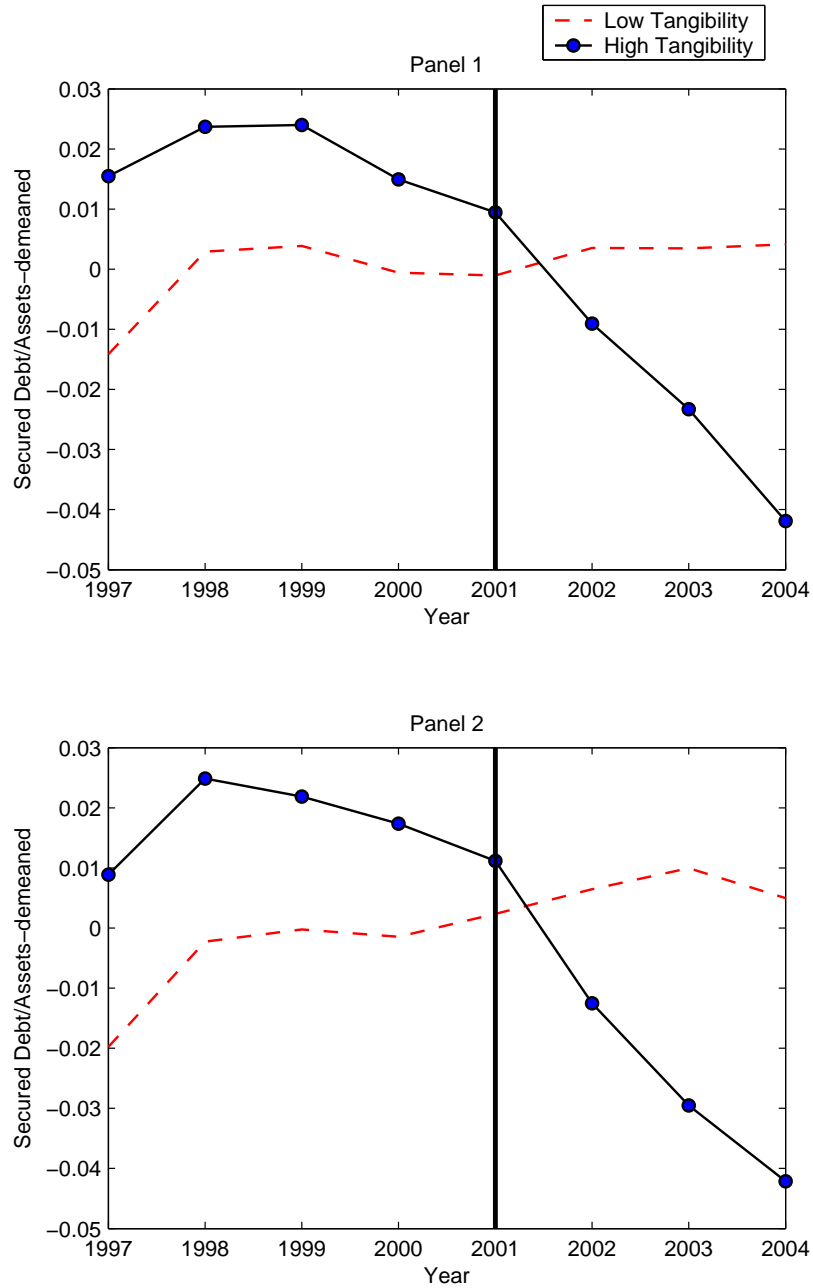
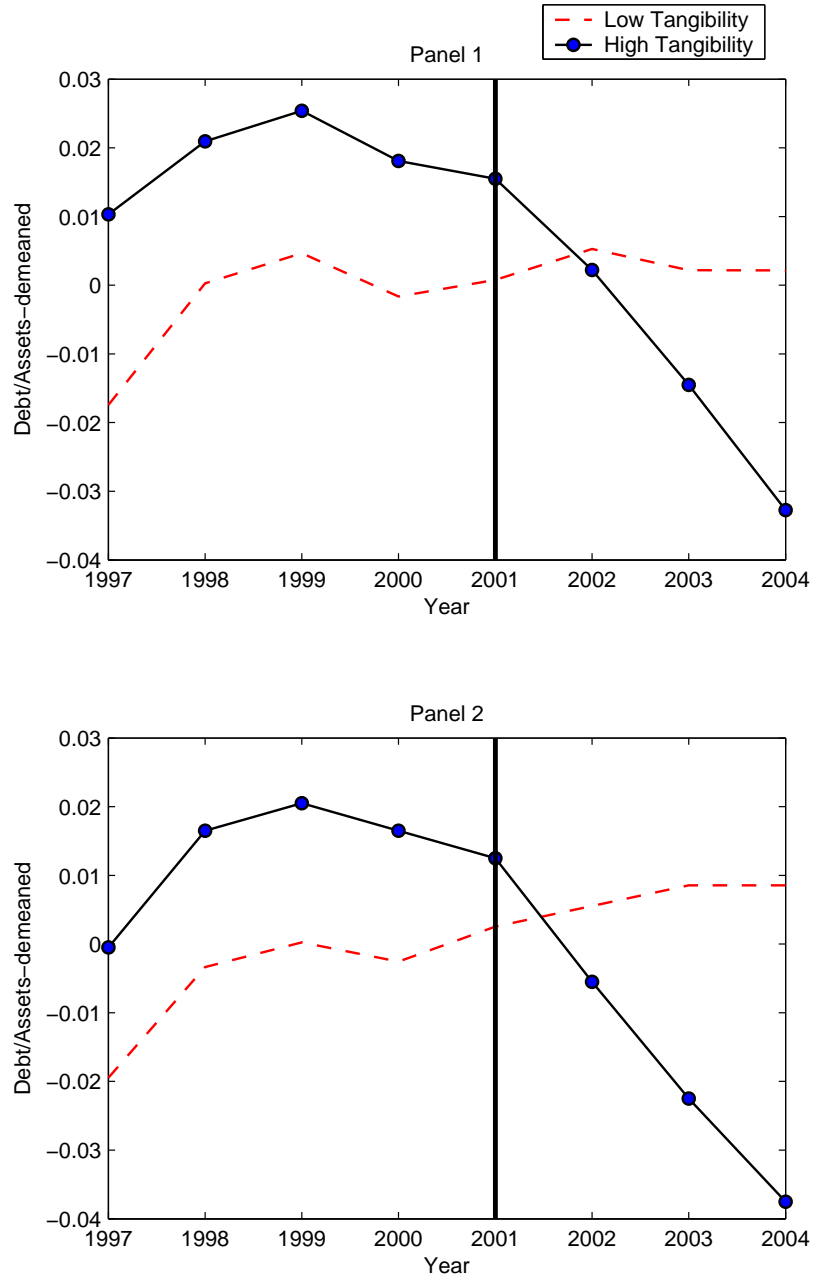


Figure 4. Secured Debt/Assets



Note: Here I plot the de-meaned values of the variable Secured Debt to Assets for both the high tangibility and low tangibility groups. In Panel 1, I 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, I 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, I 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, I 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, I 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.