

Creditor Rights and Corporate Debt Structure*

Vikrant Vig[†]

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ABSTRACT

Much of our understanding of creditor rights is based on the notion that better enforcement of contracts reduces borrowing costs, thereby relaxing financial constraints. But what if these rights are too strong? We empirically investigate this question by examining the effect of a securitization reform that strengthened secured creditors rights on corporate debt structure. Strikingly, we find that the reform led to a reduction in secured debt, total debt, debt maturity, and asset growth. These results suggest that strengthening of creditor rights may lead to adverse effects and that firms alter their debt structures to contract around these inefficiencies.

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

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[†]London Business School. Please refer all correspondence to Vikrant Vig (vvig@london.edu).

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

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 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 quasi-natural experiment in India, the passage of a mandatory secured transactions law, the SARFAESI Act (Securitization and Reconstruction of Financial Assets and Enforcement of Security Interests Act 2002), to investigate the effect of law on corporate debt structure. Prior to the SARFAESI Act, the slow and rigid judicial process created severe bottlenecks in the recovery of security interests. To liquidate the firm, secured lenders would have to go through a prolonged judicial process, during which the value of collateral considerably depreciated in value. The reform significantly increased the rights of secured creditors by allowing them to bypass the lengthy and judicial process and seize and liquidate the assets of the defaulting firm, thus improving the ability of lenders to access the collateral of the firm.

Using this securitization reform that strengthens the rights of secured creditors, and employing a difference-in-differences (DID henceforth) methodology, the paper attempts to identify the effects of the change in law on the quantity of secured credit used by firms. 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 actually led to a 5.2 percent decrease in the usage of secured debt by firms. This paper attempts to identify the cause of this response

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

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

and finds that creditor protection imposes an extra cost on the borrowers, as is evident from borrowers' reduced reliance on secured debt.

The Law and Finance literature presents a strong case for strengthening creditor rights, arguing that strong creditor rights reduce borrowing costs and thus relax financial constraints.³ The economic justification for stronger creditor rights is that it expands the space of debt contracts that can be written between the borrower and the lender. An expansion in contract space should constitute a Pareto improvement as it makes no borrower worse off, since they can revert back to the old regime, but makes certain borrowers better off as it enhances their borrowing capacity.

The above argument relies on an important assumption that borrowers have enough contractual flexibility (freedom of contracting) to revert back to the old regime. While the mandatory nature of the SARFAESI law does not allow the firms to explicitly opt-out of the law, as such a contract would not be enforced in the court, firms can undo the effect the law through other means (if they are concerned about some inefficiencies), for example, by reducing the amount of collateral for the same amount of secured loan.⁴

To see this, consider a loan contract between an entrepreneur (debtor) and a lender (creditor). The entrepreneur wishes to purchase some asset and offers these assets as a collateral for the loan. Consider the simple Hart and Moore (1994) set up. In this set-up the entrepreneur needs financing at date 0 to invest in an asset that generated cash flows at $t = 1$ and $t = 2$. Cash flows are observable, but not contractible; assume that the entrepreneur has all the bargaining power. Assume that at $t=1$, the creditor can liquidate the firm (if there is a default) for \$50,000. Since by assumption the entrepreneur has all the bargaining power, the maximum amount that the entrepreneur can borrow in such a scenario is limited by the liquidation value of the asset. Now let's examine a reform that strengthens secured creditor rights, by improving their access to the pledged collateral. Essentially, such a reform allows secured creditors to liquidate the collateral, for a higher amount, say \$75,000. Clearly, this reform expands the space of feasible contracts; it allows borrowers to borrow more if they desire to do so. If for some reason, the borrowers are worried about strong secured creditor rights (creditor hold-up, liquidation bias), that accompanies an increase in the liquidation value of the collateral, the borrowers can presumably reduce the amount of pledged collateral (in this example pledge two-thirds of what

³The reduction in the cost of borrowing may come through several channels. For instance, stronger creditor rights keep moral hazard by borrowers at check. It also lowers the deadweight cost of liquidation.

⁴The bankruptcy law in the US is also mandatory as it does not allow parties to opt-out.

they had pledged before), thus bringing the liquidation value back to \$50,000 (reverting back to the old regime). This essentially is the crux of the Law and Finance argument.⁵

In summary, a reform that strengthens secured creditor rights would either cause secured debt usage to increase or to remain the same – secured debt would increase for those borrowers who were financially constrained and could not borrow before and stay the same for those borrowers who feel threatened by the reform as they have the status quo option, which is exercised by using less collateral for the same amount of secured debt.⁶ It is important to note that such an expansion in contract space would thus constitute a *Pareto* improvement – it makes no borrower worse off but some borrowers clearly better off (by relaxing their financial constraints).

In an important paper, Lipsey and Lancaster (1956) formalize the general theory of second best. According to this theory, in a world with a large number of constraints or frictions, a piece-meal policy response that fixes or relaxes one of the constraints can actually reduce welfare rather than increasing it. Put differently, in an economy with several sources of market imperfections, an attempt by the regulators to fix a market failure may have an unintended effect of reducing welfare rather than increasing it. While this paper is silent on the welfare implication of the law, the main result of this paper, that is, firms reduced secured debt relative to other forms of financing suggests that the contract space may not have expanded, but rather the secured transactions reform may have altered the contract space.⁷ Thus, policy recommendations become a bit more subtle and require careful evaluation of the situation.⁸

We illustrate the above intuition in a simple stylized model that is motivated by the features of the empirical setting analyzed. In this framework we show that an increase in the liquidation value increases secured debt capacity. We then introduce an extra friction in this problem, that secured assets are “lumpy”, where lumpiness captures some sort of indivisibility or complementarities between different assets. In such a scenario, we show that an increase in the liquidation value, while it increases secured debt capacity, it also introduces a threat of being prematurely liquidated. Specifically, we argue that in the presence of “lumpy” assets, a stan-

⁵This is exactly what the legislators intended the secured transactions reform would do and were genuinely surprised why credit did not pick up initially (Chakravarty (2005)).

⁶A similar argument can also be made using the notion of signaling through collateral (Bester (1985)). In Bester’s model, collateral is used as a signaling device, which helps sort borrowers into their respective types. According to that model, a reduction in the deadweight costs of collateral implies that firms need to post more collateral to achieve separation. Thus, an increase in the liquidation value caused by the strengthening of secured creditors rights would result in the usage of more secured debt.

⁷Under some assumption about the firms production technology a revealed preference argument can be made that firms that reduce the usage of secured debt are actually worse off.

⁸In a paper that is in a similar vein to this paper, Aghion and Hermalin (1990) theoretically argue that legal restrictions on private contracts can in certain situations improve welfare.

standard secured debt contract leads to inefficient liquidations and firms contract out of secured debt to undo some of those inefficiencies. The model simply illustrates that in the presence of other frictions, relaxing financial constraints may result in a reduction of both secured debt and welfare.

Specifically, we argue that in the presence of “lumpy” assets, an improvement in creditor rights generates two effects, namely, an *income* effect and a *substitution* effect. The income effect follows from the increase in liquidation value of the asset brought about by an improvement in creditor rights. The increase in liquidation value of collateral increases borrowing capacity and reduces the costs of borrowing. The substitution effect comes from the threat of premature liquidation. The model illustrates that an increase in the liquidation value of the asset changes the incentives of the creditor and thus creates a commitment problem. Specifically, in the event of a liquidity shock, the creditor cannot commit not to liquidate the firm that is in financial distress, and this makes borrowers reluctant to contract with secured debt. An important insight of the analysis is that the presence of indivisible (“lumpy”) assets creates frictions in the contracting process and that these frictions limit freedom of contracting. Put differently, the stronger creditor rights do not necessarily expand the contract space but instead alter it (i.e., indivisibility of assets creates “holes” in the contract space).

Alternatively, the main arguments regarding how creditor rights affect the equilibrium level of financing can be broadly broken down into supply side arguments and demand side arguments. From the creditors’ perspective (supply side), it is argued that protecting creditor rights increases creditors’ willingness to supply capital. This can alternately be viewed as an increase in the debt capacity of firms. From the borrowers’ perspective (demand side), there are two forces at work. On the one hand, strong creditor rights (improved access to collateral) lower the deadweight cost of secured debt. This should increase the demand for secured debt. On the other hand, strong creditor rights create a threat of premature liquidation. If the borrowers value continuation, and more important do not have the contractual flexibility as discussed above, then this may reduce their demand for secured debt.

The empirical strategy employed in this paper is essentially a difference-in-difference methodology. We exploit cross-sectional variation in firms ability to collateralize assets to generate variation in the treatment effect. It is natural to expect that firms with more assets that can be collateralized are more affected by the secured transactions reforms as compared to firms with less collateral. Since only tangible assets in India can be effectively collateralized, we use the Rajan and Zingales (1995) measure of assets tangibility to classify firms into the treatment and

control groups, with firms in the high asset tangibility group being our treatment group while those in the low asset tangibility group constitute our control group.⁹¹⁰ We find that secured debt usage declined significantly more for the highest tangibility group compared to the lowest tangibility group. We interpret this as a Coasian response by firms to undo some of the inefficiency that is caused by the strengthening of secured creditor rights. In addition, we document some heterogeneity in treatment effects. Examining within our high tangibility and low tangibility groups, we find that the most aggressive reduction in secured debt comes from firms that have higher cost of financial distress. These are firms that have higher growth opportunities, have lower liquidity buffers younger and smaller firms. We discuss these results in more detail in section IV.B.

In addition to the usage of secured debt, we also examine the effect of the secured transactions reform on other aspects of the balance sheet. We also document a reduction in total leverage. We interpret this result to suggest that firms are not able to seamlessly switch from secured to unsecured debt. In addition, we find that firms respond to stronger secured creditor rights by hoarding more liquidity. We interpret this as a Coasian response by the firms; cash helps to reduce the threat of premature liquidation caused by a strengthening of secured creditor rights as it helps them avoid default. Since default is now more costly for the firms, firms tend to hoard more liquid reserves to undo some of the inefficiency that is created by stronger secured creditor rights. Furthermore, we document a shortening of corporate debt maturity, a reduction in total investments of firms, an increase in profitability. Finally, we examine the effect of SARFAESI on leasing of assets and creditor concentration and document a negative impact, although the statistical significance of these results is weak. A reduction in leasing is consistent with the view that both leasing and creditor concentration might be viewed as substitutes to creditor rights. Once creditor rights are strengthened, there is less a need for these activities.

This paper connects several strands of the literature. The Law and Finance literature pioneered by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) is an obvious starting point. There is now a fairly large literature that establishes creditor rights as an important determinant of

⁹In the SARFAESI regime, security interests can only be created in identifiable assets. This means that security interests created in non-identifiable assets, such as non-fixed or future inventory/receivables, would merely be executory contracts and these in bankruptcy are treated no better than an unsecured claim. Since firms with large fixed assets, such as manufacturing firms ay have a larger proportion of fixed assets, they are likely to have larger pool of identifiable assets in which to use as collateral for secured loans. Consistent with this we do find that firms with a great pool of fixed assets have larger amounts of secured loans. An alternate economic justification for this measure can also be motivated by Myers and Rajan (1998), where they argue that there more liquid assets are also easy to expropriate, so generate relatively lower values in liquidations.

¹⁰We have also done our analysis where we classify firms into treatment and control groups based on their pre-treatment level of secured debt. The results are very similar and can be obtained from the author upon request.

credit market development (La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998), Levine (1998, 1999), Djankov, McLiesh, and Shleifer (2005), Beck, Demirgüç-Kunt, and Levine (2004), Haselmann, Pistor, and Vig (2009), Gropp, Scholz, and White (1997), Scott and Smith (1986)). There is an emergence of a general consensus that creditor rights promote financial development by relaxing financial constraints. This paper adds to this literature by arguing that strong creditor rights also impose costs on the borrower and that mandatory changes in laws do not necessarily expand the contract space as is suggested by the Law and Finance literature.¹¹

This paper also adds to the recent literature that examines the effect of legal institutions on financial contracts in cross-country settings. Gianetti (2003) finds that stronger creditor rights are associated not only with higher leverage but also with greater availability of long-term debt. In another paper, Qian and Strahan (2005) explore the relationship between private contracts and creditor rights across different countries. They report that firms in countries that have stronger secured creditor rights tend to have longer maturity loans and more secured debt. Acharya, John, and Sundaram (2005) analyze the effect of bankruptcy codes on capital structures of US and UK firms. Specifically, they find that the difference in leverage ratios between equity-friendly and debt-friendly regimes is a decreasing function of the liquidation value of the asset. Davydenko and Franks (2004) analyze recovery rates across the UK, France, and Germany and conclude that contracts adapt to changes in different bankruptcy codes and laws. Private contracts are further reported to reflect variations in the legal origin and creditor rights, among other things. These papers, however, exploit cross-sectional variation in creditor rights, so while they are extremely informative about the relationship, omitted variables pose a valid concern.

This paper further addresses the growing empirical literature that examines the effects of collateral and liquidation value on financial contracts, as the passage of the secured transaction reform can be construed as a perturbation to the liquidation value of the assets.¹² Benmelech, Garmaise, and Moskowitz (2005) analyze debt maturity as a function of “asset redeployability”. They find that higher asset redeployability is associated with longer maturity and larger loans.

¹¹Fan and White (2003), Acharya, Amihud and Litov (2010), Acharya and Subramanian (2010), and Loal-Lilienfeld et al. (2010) are examples of recent papers that suggest that there might be a cost associated with strong creditor rights.

¹²Most of the literature is built on the foundations of incomplete contracts. For example, Aghion and Bolton (1992), Dewatripont and Tirole (1994), Hart and Moore (1999); Hart (2001), Bolton and Scharfstein (1990), Rajan and Winton (1995), Bolton and Scharfstein (1996), Shleifer and Vishny (1992), Williamson (1988), Diamond (1991, 1993), Berglof and von Thadden (1994) are some of the important papers in this area. See Hart (2001) for a complete review on the financial contracting literature.

They, however, find no effect on leverage. In some important empirical work on financially distressed firms, Alderson and Betker (1995) report that firms facing high liquidation costs choose capital structures in such a way that financial distress becomes less likely. Asquith, Gertner, and Scharfstein (1994) document that debt structure affects the restructuring of financially distressed firms. It also speaks to a small but growing empirical literature on debt structure of firms (Rauh and Sufi (2009) and Erel et al. (2010) are few papers on this topic).

Finally, the paper contributes to two widely contested debates in the bankruptcy scholarship. The first debate revolves around the merits of Chapter 11 and Chapter 7. Chapter 11 is criticized on the grounds that it leads to excessive continuation, while Chapter 7 is thought to lead to inefficient liquidations of healthy firms. Since the SARFAESI Act can be construed as a move from a pro-debtor (Chapter 11) to a pro-creditor (Chapter 7) regime, the paper contributes to this literature by documenting some costs of stronger creditor rights. The second debate circles around the justifications for the current mandatory rules in the US bankruptcy code (see Rasmussen (1992), Schwartz (1997), Schwarcz (1999) for more details). Some scholars criticize mandatory rules (i.e., rules that parties cannot contract round) on the grounds that it is unlikely that these rules are optimal for all the parties and that allowing the freedom to contract to suit individual requirements is likely to benefit more parties. Mandatory rules, however, are justified by arguing that, while theoretically appealing, freedom to contract is difficult to implement in practice, especially since debtors are likely to have many creditors, thus creating ex-post inefficiencies.

The rest of the paper is organized as follows: Section I provides a brief overview of the legal infrastructure in India; Section II describes the model; Section III details the data and describes the empirical methodology; Section IV discusses empirical results and Section V concludes.

I. Legal Reforms in India

While India ranks quite high in terms of the LLSV creditor rights index and attains the maximum score of 4, the enforcement of creditor rights has been seen a major impediment to lending in India. The judicial process was extremely rigid, marked by bureaucratic delays and it took a long time before creditors could access the collateral. In the event of default, a civil suit had to be filed with the civil courts, which in turn had to follow a lengthy 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.¹³ Consequently, a large amount of bank funds were tied up in non-performing assets (NPAs), the value of which depreciated with the passage of time.

In an attempt to remove the bottlenecks in the legal process, the Government of India enacted two important reforms that were aimed at strengthening creditor rights: 1) The Debt Recovery Tribunals Act (DRT Act, 1993), and 2) the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (SARFAESI Act henceforth).

Under the DRT Act, specialized tribunals were established by the government for the recovery of loans by banks and financial institutions. These tribunals were not required to follow the Civil Procedure Code and were granted considerable flexibility to set up their own procedures for speedy recovery on the defaulted loans. Visaria (2006) provides a detailed discussion of this Act. She finds that the establishment of these tribunals led to a significant reduction in both delinquency rates and the cost of loans.

The SARFAESI 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. The SARFAESI Act was retroactive, that is, it applied to both old as well as new contracts. Further, the Act only applied to secured loans and not unsecured loans. With the passage of the SARFAESI Act, banks and financial institutions could liquidate secured assets of a firm that defaulted in payments for more than six months by giving a notice of 60 days.¹⁴ The Act allowed for recovery through modes of securitization, asset reconstruction and enforcement of security interests without court intervention.

A. Pre-SARFAESI Creditor Rights

Prior to the passage of the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (SARFAESI Act), secured creditors held no power to claim an asset outside of court/tribunal proceedings. According to Kang and Nayar (2003), the length of liquidation or rehabilitation proceedings under prior laws, was typically 10 to 15 years. Further, workers often misused their veto power to block reorganization plans that could threaten jobs further delaying the proceedings. As a result, assets would often be misappropriated, transferred, or just devalued over the course of lengthy proceedings, leading to significantly lower

¹³The liquidation proceeding against companies registered under the Companies Act, 1956 was further tedious owing to the bureaucracy associated with the sale of assets.

¹⁴It is important to note that SARFAESI only applies only to banks and defined financial institutions, but since most lending in India is provided by banks, this distinction in practice is minimal.

secured credit recovery values than would likely have been achieved through a swifter asset recovery process.

In comparison to other developed countries like the US, UK, France and Germany, secured creditors in India had relatively weaker protections. The UK and most other common law countries, as well as Germany, generally have no automatic stay (La Porta et al. (1998)), thus enabling secured creditors to seize and liquidate the assets in which they have security interests without much delay. In contrast, France and some Civil law countries are often likely to include automatic stays in its proceedings. The US similarly includes an automatic stay in its proceedings. Even still however, strong remedial rights typically mitigate weaker creditor protections in these countries (La Porta et al. (1998)). Secured creditors in the US are permitted to “foreclose” or seize title to security when debtors default. A stay on the assets is implemented once bankruptcy proceedings have been initiated.¹⁵ Prior to SARFAESI, however, Indian law actually prevented creditors from seizing security at anytime without a tribunal order, whether prior to or after the insolvency proceedings. Recovery of security interests was thus effectively stayed, pending the resolution of these tribunal proceedings, by the lack of extra-proceeding mechanisms.

The objective of creditor rights varies from countries to countries. For instance, in the UK, the primary objective is the repayment of creditor claims (pro-creditor regime), while in the US the objective is to maintain the business as a going concern (pro-debtor regime). In France, the objective is to safeguard workers’ jobs and maintain the business operations (White (1989)). Prior to the passage of the SARFAESI, the legal regime in India had a flavor of a very pro-debtor regime, closer to France than the US, driven primarily by the objective of keeping the firm as an ongoing concern and protecting the interests of the workers, much of which was motivated by political economy concerns, as massive lay-offs could have an adverse effect on electoral outcomes.

B. Post SARFAESI Creditor Rights

The SARFAESI Act brought an important change in the legal system in India, a transition from a pro-debtor system to a pro-creditor regime, by increasing the rights of secured creditors. SARFAESI did little to change property rights in security, but merely changed the manner in which security interests were enforced. After providing 60 days notice to debtors demanding

¹⁵In the US, the state property law governs security interests, while the bankruptcy law is federal in nature.

that the debtors meet its obligation, secured creditors were now entitled to seize the security if the debtor failed to meet the demand. Although SARFAESI does afford an appellate venue, generally, such appeals cannot occur until after the property is seized, after which a debtor can file an application against such measures. An inquiry would then proceed before the Debt Recovery Tribunal with a secondary appellate level also available called an Appellate Tribunal. This process is therefore rather punitive on debtors who generally must wait until after seizure to appeal such an action. Moreover, if the borrowers were to seek an injunction, they could only do so after depositing 75% of the defaulted amount with a debt recovery tribunal.

Under the SARFAESI regime, secured creditors have the right to take over management of the secured assets or even business, during which the secured creditor can sell off the secured asset to recover the obligation. In effect, therefore, the appointed manager in these types of situations acts more like a custodian over the assets with the primary obligation of managing the asset, unless the transfer of the asset is utilized as a means of recovering the value of the secured asset.¹⁶ In form, the provision is somewhere between the debtor friendly regimes that enable the management to typically stay in control of the firm such as the US, and the more punitive regimes where management is nearly always automatically removed as is typical in the UK; since the Indian regime does not automatically remove management in insolvency. The Indian regime, however, in practice is strongly creditor friendly in that it actually permits the creditors to decide whether to leave management in place or take over management of the assets.

Priority rights in insolvency, were also mostly unaffected by SARFAESI. Just as was the case prior to SARFAESI, under Indian insolvency laws, secured creditors share top priority *pari passu* with workmen's dues. Government dues and other preferential claims then follow (Umarji (2004)). The difference, however, is that secured creditors can seize the security and sell such assets, provided that the creditor distributes proceeds for workmen's dues pursuant to the requirements of the Companies Act.

While numerous countries give some form of priority to government and workers claims, secured creditors in India generally have weaker priority than do secured creditors in most developed countries. Although there is some derivation in the US, secured creditors are still technically superior in right there. France is probably the closest parallel, where the bankruptcy judge appoints an official to represent the state's interest and secured creditors have little to say about how the assets are utilized, either in reorganization or liquidation (White (1989)). In

¹⁶See Batra (2003) and Umarji (2004) for more details on the SARFAESI Act.

such situations, it is conceivable if not likely that workers would be de facto elevated to similar priority to secured creditors, even if workers dues did not technically share top priority.

Another pre-SARFAESI rule preserved after implementation of the law is the exclusion of cram-down provisions that would make compromise binding without approval of the requisite block of creditors (Kang and Nayar (2003)). Instead, any restructuring plans remain limited to mergers and acquisitions or voluntary compromise approved by three quarters of all creditors by value. Similarly, when assets are used for joint financing or if assets secure the debt of multiple secured creditors, no single secured creditor is permitted to enforce the security without the agreement of secured creditors representing three fourths of the security by value.¹⁷ In such a situation, the agreement by three fourths of the creditors by value is binding on all of the secured creditors.¹⁸

To summarize, SARFAESI provides additional measures to enforce security interests. Pre-SARFAESI, the burdensome enforcement process sometimes permitted the erosion of secured creditors rights. Post-SARFAESI, secured creditors can conceivably better enforce their property rights, by promptly seizing assets before such rights can be eroded through insolvency proceedings. The SARFAESI Act has shifted the burden of proof to the debtor. Prior to SARFAESI, the lender would have through an elaborate legal process trying to recover the dues. In the interim the firm continued to operate. With the passage of SARFAESI Act, all that a lender had to do was prove that there was a default on the loan. After that they could begin the liquidation process. With the changes implemented by SARFAESI, Indian creditor protections have significantly improved from what were amongst the weakest on a comparative basis. Now, creditors in India, while not the very strongest in the world, place it on the stronger end of the spectrum.

Some of the major benefits of the SARFAESI Act as intended by the legislators were as follows. First, the law was intended to reduce the NPAs of banks and financial institutions. Second, a sound secured transactions law was considered important for attracting funds from foreign creditors, thus promoting trade and growth. Third, a creditor-friendly system was considered essential for the promotion of secured credit in India, which in turn would lead to economic growth in India (Umarji (2004)). According to M.R. Umarji, Chief Architect of the *SARFAESI Act* (2002):

¹⁷See Batra (2003).

¹⁸Section 13(9) of the Act stipulated that for secured loans with multiple creditors an agreement among 75 percent of the creditors (by value) is required in order for SARFAESI to be invoked. This was primarily done to avoid any inefficient liquidations generated by potential creditor runs.

Establishment of a legal regime that promotes secured credit not only aids in the cultivation and growth of individual business, but also can have a positive effect on the economic prosperity of the State

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

There is plenty of anecdotal evidence on the importance of this law. A flood of litigation suits immediately followed the passage of the Act. Borrowers challenged the constitutional validity of the SARFAESI Act and termed it as "draconian". Further, corporate lobby groups expressed concerns about strong creditor rights. They argued that such a law would give banks and financial institutions excessive powers which they would abuse. For example, it was alleged that banks would falsely classify accounts as NPAs on their whims and fancies and then invoke SARFAESI. It was also argued that the law was unfair since it gave borrowers practically no right to appeal. The contention was that if borrowers had resources to deposit the stipulated amount (75% of the total amount), they would not have defaulted in the first place.¹⁹

Recent and more scientific evidence also suggests that this Act had an effect. Visaria (2006) documents a positive stock price reaction for banks as a result of the Act.²⁰ Data on recovery and NPAs suggests that the law had a positive impact. As can be seen from Figure 1, the law

¹⁹In its landmark judgement on the Mardia Chemicals vs Union of India case on April 8th, 2004, the Supreme Court upheld the constitutional validity of the law with the exception of one provision that required the borrowers to deposit 75% of the claim amount in order to file an appeal against the action of the bank.

²⁰In several interviews conducted in different banks, it was mentioned that, after SARFAESI Act was enacted, banks started to receive a lot of requests from entrepreneurs to unsecure their personal assets. A sample of hand collected data shows that there is a reduction in the usage of personal assets as security for loans.

led to a reduction of net NPAs of banks.²¹ In the 2002-2003 report of the Reserve Bank of India on Trend and Progress of Banking India it is mentioned:

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

[Figure 1 about here]

Summing up, the evidence, both anecdotal as well as statistical, indicates that the SARFAESI Act dramatically increased the power of secured creditors. At the same time, commentators were puzzled about the slow credit growth in the economy (Chakravarty (2003)). 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.

II. A simple example

We present a model of secured debt that is based on the conflict between creditors and shareholders. The model is motivated by India's institutional environment and the primary objective of this exercise is to simply illustrate the theory of second best put forth by Lipsey and Lancaster (1956). We show that in an economy with several frictions, an attempt to fix one friction can actually reduce welfare rather than increasing it. Specifically, we show that a secured transactions reform that relaxes financial constraints with secured debt, modeled as an increase in the liquidation value of the asset, can have an unintended effect of reducing secured debt and overall welfare.

²¹According 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 rights significantly easier.

A. Liquidation Threat Model of Secured Debt

We consider an economy composed of a continuum of wealthless risk-neutral entrepreneurs, each with a project opportunity requiring an investment F at $t=0$, to be raised in competitive capital markets. The project can be one of two types, “G-type” or “B-type”, and the probability of a “G-type” project is given by $v < 1$. If the project is G-type, it generates publicly observable cash flows $C \in \{C_H, C_L\}$ at $t=2$, where the a priori probability of $Pr\{C = C_H\}$ is given by θ and $C_H > F > C_L$. A B-type project will generate a zero cash flow for sure. Further, the project yields both entrepreneurs non-contractible private benefits of b in each period.

[Figure 2 about here]

At $t=0$, the entrepreneur privately learns the project quality and chooses between secured or unsecured debt. A contract specifies $\{R_1, R_2\}$ where R_t is the payment at time t (Note that a short-term contract sets $R_2 = 0$). At $t=1$, the creditors obtain a publicly observable signal which perfectly reveals the project type and payoffs at $t=2$ (i.e., cash flows become deterministic). Based on that signal, the project is either refinanced and allowed to continue or liquidated yielding L .²² The main distinguishing feature of the two debt instruments discussed here is that the creditor’s liquidation proceeds are greater with secured debt than with unsecured debt. Let L_s and L_{us} denote the liquidation values with secured and unsecured debt, respectively, then $L_s > L_{us}$.

Assumption 1 $v \cdot (\theta C_H + (1 - \theta)C_L) > F$.

Assumption 2 $C_L + b > L$

Assumption 1 states that expected cash flows are high enough so that the project can be financed with either secured or unsecured debt, long-term or short-term. This is a simplifying assumption to illustrate the basic trade-off between secured and unsecured debt. Assumption 3 states that continuation is efficient.

Lemma 1 *If $C_L > L_s$, then secured debt is preferred by the G-type entrepreneur.*

²²Note that with short-term debt, in the case of a liquidity shock, firms are always given the opportunity to seek external refinancing before a liquidation decision is made by creditors. Here, however, external refinancing capacity is limited by the publicly observable perfect signal about cash flows.

The above lemma states that in the absence of a liquidation threat ($C_L > L_s$), G-type firms will always prefer secured debt to unsecured debt. (This follows from Assumption 3). The intuition for this result is straightforward. Compared to unsecured debt, providing collateral allows creditors to recoup more value when liquidation occurs. Since liquidation is only of concern for B-type firms, G-type firms optimally choose secured debt (the least cost financing choice). We model the effect of SARFAESI as an increase in the liquidation value of the asset from L_s to $L_s + \delta$.

It is important to note that the profits of the firm are monotonically increasing in L , the liquidation value of the asset, up to the cut-off L^* , where L^* is given by C_L . If $L > L^*$, then G-type will be prematurely liquidated at $t = 1$, in which case they stand to lose the private benefits. If private benefits are large enough, then firms may be worse off since the creditor does not internalize the private benefits when deciding whether to liquidate the firm or not. Here private benefits can be thought of as that part of the cash flow that cannot be pledged to the outside investors and will be consumed (or stolen) by the entrepreneur. Note, however, that if L is greater than L^* , then firms always can reduce the pledged collateral and pledge on L^* in which case they will not be liquidated. In other words, if assets are divisible or partial pledging of assets is possible then the model illustrates that an increase in L expands the contract space; there are borrowers who could have not borrowed F before can borrow because of an increase in L and borrowers that face the liquidation threat by having a very high value of L can lower the L by simply withdrawing some collateral and ensuring that the $L < L^*$. Thus a reform that increases L in this set up always leads to a *Pareto* improvement. We next introduce an extra friction in this model: the collateral is indivisible or “lumpy”.

Assumption 3 *To the existing set of assumption, we add an extra assumption that pledged assets are “lumpy” or indivisible.*

We show that in the presence of lumpy assets, an increase in L can in certain situations reduce welfare rather than increase it. In other words, we show that the presence of lumpy assets does not necessarily expand the contract space, but introduces holes in the contract space. Consequently, firm may not have the option of reverting back to the old regime. In such a world, an increase in secured creditors rights can be welfare reducing since the new contract space is no the expanded contract space, but an altered space.

Lemma 2 *If $C_L < L_s + \delta$, then there exists \hat{b} such that if $b > \hat{b}$, firms prefer unsecured debt to secured debt.*

Please refer to the appendix for the proof. Lemma 2 states the following: If private benefits are large ($b > \hat{b}$), then firms facing liquidation threats, i.e., firms with $C_L < L_S + \delta$, prefer unsecured debt to secured debt (Here, δ reflects an increase in the creditor's liquidation proceeds due to stronger secured creditor rights). Thus we have:

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

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

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

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

B. Numerical Example

We consider the following simple numerical example:

Project information: $F = 300$, $C_H = 1000$, $C_L = 100$, and $b = 300$

Types and prior: $\theta = 0.70$ and $\nu = 0.60$

Value of collateral: $L_S = 80$, $L_{us} = 0$ and $\delta = 30$

Suppose that the initial creditor rights were fairly low, which is reflected in a low liquidation value of secured debt. Since $L_S < C_L$, there is no threat of premature liquidation, and G-Type firms prefer capital structures with short-term secured debt ($\Pi_S = 883$ and $\Pi_{us} = 830$). Now, as a result of the regime change which facilitated access to collateral, G-type firms find themselves exposed to premature liquidation risk ($L_S + \delta > C_L$). Because private benefits are high ($b > \hat{b}$) and the impact of adverse selection is not too strong, firm's move from secured debt to unsecured debt ($\Pi_S = 816$ and $\Pi_{us} = 830$). So in this case, the policy is doing exactly the opposite of what policymakers intended.

The objective of the model was to illustrate that strengthening creditor rights can introduce premature liquidation threats and that firms may thus want to contract out of secured debt due to limits of contracting. While it is generally understood that a strengthening of creditor rights expands the space of contracts that can be written between borrowers and lenders, the model shows that the presence of "lumpy" assets creates frictions that restrict firm's freedom to contract around the law. Hence, the new contract space may not be an expanded contract space but instead a different one. The movement away from secured debt does suggest that the contract space is altered, and thus claims that strengthening of creditor rights improves welfare may need to be qualified.

III. Data and Empirical Methodology

A. 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 issues such as 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 (2010)).

Our sample contains financial information on over 20,000 firm-years, although sample size varies on account of missing information for some of the variables used in the analysis. The database contains detailed information on corporate debt structures, extracted from companies' profit and loss accounts and balance sheets. More specifically, the database contains information on total secured debt, unsecured debt, short-term debt, long-term debt, total debt, cash and bank balance of firms, number of creditors, information on leasing among other variables. Overall, it provides detailed information on large corporations in India, both listed and unlisted. A description of the variables employed in the study is provided in Table I and a breakdown of the sample by industries is shown in Table II. The data spans years 1997 to 2004.

[Tables I and II about here]

The data on banking variables is extracted from the Report on Trend and Progress of Banking in India (RBI, various years), a statutory yearly publication of RBI, which provides aggregate information on prudential and financial ratios. Information on macroeconomic variables is sourced from the Handbook of Statistics on Indian Economy (RBI, 2004b), which provides time series data on monetary and macroeconomic variables.

In addition, we use information on financial contracts that comes from one of the better performing Indian public sector banks. This information is extracted from loan files that the bank maintains for each borrower. With the help of some bank officers, we obtained general information on corporate accounts. We have information on the type of loans, for example, if it is a term loan or a working capital loan, and information on whether the loan is secured or unsecured. Further, in cases in which the loan is secured, we have information on both the type of security and its market value. In addition, we collected information on other accounts of the borrower within the same bank, the length of the relationship, industry affiliation, and credit rating of the borrower as assigned by the bank. The data spans 1999 to 2005 with quarterly frequency. From this large database on all corporate accounts of the bank, we query the larger accounts, i.e., accounts that have total outstanding balances (across all facilities) of more than 50 million Rupees (approximately 1.3 million dollars).

In Table III, we present means and standard deviations of the variables used in the analysis. There is significant variation in all the important variables. The average Secured Debt/Assets

ratio of all firms is 27.9% with a standard deviation of 17.5%. The average Debt/Assets ratio is 34.5% with a standard deviation of 18.2%. The average size of the firm, as measured by total assets, is 197.6 crore Indian Rupees (approx. 45 million USD) and the median is 36 crore Indian Rupees (approx. 8 million USD). The 99th percentile firm's size is approximately 630 million USD, i.e., 2,843 crore Indian Rupees. On average, listed firms are slightly larger than unlisted firms. Around three-fourths of the total debt is secured and about two-fifths of the debt is short-term. Finally, profitability, as measured by EBIT/Assets, averages around 10%.

[Table III about here]

B. Identification Strategy

We examine the effect of the law on firms by employing the difference-in-differences (DID henceforth) methodology. The DID methodology is ideally suited for establishing causal claims in a quasi-experimental setting similar to the one that is employed in this research. It basically compares the effect of an event (legal change in this case) on groups that are affected by the law (henceforth, treated) with those that are unaffected (henceforth, control). For example, if we want to evaluate the effect of a particular policy change on some variable of interest (say, firms' usage of secured debt), then we would calculate the usage of secured debt after the law and subtract from it the usage before the law. This difference will give us the effect of the law on the usage of secured debt. However, other factors, both observable and unobservable, which potentially impact secured debt usage may have changed as well. Thus, a control group would be desirable in order to properly control for common economic shocks. We therefore compare the difference in the treated group with the difference in the control group. By differencing in this way, the DID strategy eliminates the bias that comes from changes other than the law and that could have affected the treated group.

Since the legal reform happens at the country level and applies to all firms, we do not have any natural treatment and control groups for our analysis. Clearly, however, the reform does not affect all firms in the same manner and we use this to construct our treatment and control groups. Essentially, firms that have more collateralizable assets (more tangible assets) are those that are more likely to be affected by the reform as compared to the firms that have less assets to collateralize. We exploit the pre-treatment cross-sectional variation in the amount of asset tangibility, where asset tangibility is defined as the ration of fixed assets to total assets (Rajan and Zingales (1995)), to classify firms into, what we loosely term the treatment and control

groups. Specifically, we divide our sample into terciles based on this measure of tangibility, that is, we divide firms into three groups (top 33 %, middle 33 % and the bottom 33 %), based on their pre-treatment measure asset tangibility.²³ We define the highest tercile as the *treated* group and the lowest tercile as the *control* group.

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

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

The bias can be understood by using a simple example. Let $Q_i^d = \lambda + \beta P_i + U_i$ and $Q_i^s = \phi + \delta P_i + V_i$ denote the demand and supply equations, where U_i and V_i represent demand and supply shocks, P_i is the price, and 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 which means that our empirical results can be regarded as conservative estimates.

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

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

²³We use three years of pre-treatment data to construct our measure. The results are robust to other classifications.

Here i indexes firms, t indexes time, j indexes industries, y_{ijt} is the dependent variable of interest (Debt/Assets etc.), α_i and γ_t are firm and year fixed effects 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 firm belongs to the treated group (high tangibility group) and 0 if it belongs to the control group (low tangibility group); X_{ijt} are some control variables (e.g., profitability, Tobin’s Q, etc.) and ε_{ijt} 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.

While the DID specification allows us to control for omitted variables that affect both the treatment and the control group in a similar manner, identification of the causal effect requires controlling for any systematic shocks to the treatment group that are correlated with the legal change, that is, controlling for other shocks that might be correlated with tangibility and the SARFAESI law. For example, it might be the case that investment opportunities of different industries changed around the same time and this is a concern since some industries have higher tangibility than other industries.²⁴

We address such concerns in two ways. First in addition to using the traditional Tobin’s Q variable, we control for such shocks by augmenting our regression specification to include the interaction term $\beta_j * \gamma_t$, where β_j is the industry fixed effect. This is a non-parametric way of controlling for time-varying industry-specific shocks. As a result, we compare high-tangibility firms with low-tangibility firms within the same industry. Second, we further exploit some cross-sectional heterogeneity in our treatment and control groups in what can be interpreted as a DDD specification. We discuss this in more detail in section IV.D. Finally, we double cluster all our standard errors at the firm and year levels (Petersen 2009 and Bertrand et al. 2004).

IV. Results

In Table IV, we report the results from a simple “pre” and “post” analysis by taking simple time-averages before and after the event date. This time-collapsing of the data ensures that the standard errors are robust to the Bertrand, Duflo, and Mullainathan (2004) critique. It can be seen that, on average, Secured Debt/Assets ratios fell by 3.2% (median 3.8%) while

²⁴It is important to note that omitted variables that are orthogonal to asset tangibility get differenced out and we thus only need to worry about omitted variables that are correlated with asset tangibility.

Debt/Assets ratios fell by 2.3% (median 2.8%). Further, Secured Debt/Debt ratios fell by about 3.7% (median 3.1%).

[Table IV about here]

In Table V, we further divide our sample into terciles of tangibility using the Rajan and Zingales (1995) definition. The first-tercile firms have the lowest tangibility, the second-tercile firms have the medium tangibility, and the third-tercile firms have the highest tangibility. It can be seen that third-tercile firms are the ones that are most affected by the law, whereas firms in the first tercile are least affected (and in many cases unaffected). For example, Secured Debt/Assets decreased by 5.7% for the third-tercile group and basically remained unchanged for the first-tercile group. A similar story holds for Debt/Assets and Long-term Debt/Assets ratios. As expected, the second-tercile group has results that lie in between the other two tercile groups. For example, the reduction in Secured Debt/Assets ratios of second-tercile group firms is 3.2%, which is between 5.7% (third tercile) and 0.1% (first tercile).

[Table V about here]

A. 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. Before we begin a more formal analysis, we provide a graphical snapshot of our results. In Figure 4, we plot separately the de-meaned time series of Secured Debt/Assets ratios for both the high-tangibility and the low-tangibility groups.²⁵ The high-tangibility group is the treated group, whereas the low-tangibility group serves as control group. It can be seen from Figure 4 that the ratios for the high-tangibility and low-tangibility firms moved roughly together before the legal change. After the legal change, the high-tangibility firms reduce their usage of secured debt. This is consistent with the predictions from the theoretical model in which an increase in the rights of secured creditors leads to less secured debt as it introduces a liquidation bias. In addition, in Figure 6 we plot the Epanechnikov kernel densities of Secured Debt/Assets for both the treatment and control groups for before and after the law. It can be seen that there is

²⁵The de-meaning is done relative to each group cell.

a leftward shift of the kernel density for the treatment group after the passage of SARFAESI, while there is no shift in the density of the control group post-SARFAESI. Further, this shift in the density for the treatment group is statistically significant since the Kolmogorov-Smirnov test for the equality of the distribution functions is rejected at the 1% level. These figures thus depict a reduction in the usage of secured debt for the treatment group but no reduction for the control group.

[Figures 4 and 6 about here]

The main identification strategy is best captured by Table VI. We divide firms (by industry) into three bins based on our measure of tangibility. We label the top 33% firms as high tangibility firms and the bottom 33% as “Low Tangibility” group. The After variable refers to the period 2002, 2003 and 2004 and the Before variable refers to years prior to that. We next collapse the data into single data points (based on averages) both before and after. This results in two data points per firm, one for the pre-SARFAESI regime and one for the post-SARFAESI regime. In Panel A, we report the before-after results for the variable secured debt divided by assets. As can be seen, Secured Debt/Assets declined by 4.4% more for the high tangibility group as compared to the low tangibility group. In Panel B, numerator is secured debt as before but the denominator is the pre-SARFAESI average asset values. This panel illustrates that the main result is driven by the variation in the numerator, i.e., variation in secured debt usage. Finally, in Panel C, the variable of interest is the ratio of secured debt to total debt. It once again shows that the drop in the usage of secured debt is larger for the treatment group as compared to our control group.

[Table VI about here]

Next, we show that the patterns in Figure 4 are statistically robust to the application of standard regression analysis. In addition, we control for variables that are understood to affect debt structure of firms. In Table VII, we investigate the impact of SARFAESI on the usage of secured debt using the standard DID framework. To control for firm level heterogeneity, we use firm fixed effects in all regressions. We also include year fixed effects to control for aggregate economic shocks. In column 1, we report the basic regression results. It can be seen that average Secured Debt/Assets ratios went down by 5.2% after the secured transactions law was passed. In column 2, we add some additional controls for profitability, size, and Tobin’s Q.

The results remain basically unchanged. To further test the robustness of these results, we control for industry specific-shocks by including an interaction of industry and year fixed effects. This is a non-parametric way of controlling for any observed or unobserved industry-specific changes that may be correlated with tangibility. The point estimate for the effect of the law on Secured Debt/Assets remains roughly unchanged at 4.8%. Further, we redo this analysis separately for listed and unlisted firms.²⁶ Finally, we redo the analysis with interactions between the After variable and our controls as our treatment and control groups are not identical. The qualitative nature of our results remains unaffected. In conclusion, these results indicate that the SARFAESI Act, on average, led to a reduction of Secured Debt/Assets ratios by about 5.0%.

[Table VII about here]

In columns 5-8 of Table VII, we investigate the impact of SARFAESI using Secured Debt/Debt as dependent variable. It can be seen from column 5 that, on average, Secured Debt/Debt declined by 3.2% in the basic specification. In column 6, we add some additional controls for profitability, Size, and Tobin's Q. The results remain unchanged at 3.3%. We further add industry times year fixed effects. The results remain fairly unchanged at 2.6%. All the results indicate that there is a reduction in the usage of secured debt as a percentage of total debt and that the magnitude of this reduction is about 3.0%.

B. Total Debt

While the main thrust of this paper is on the usage of secured debt, the passage also allows us to examine the effect of SARFAESI on total debt. In this section, we therefore investigate the impact of the SARFAESI Act on leverage. Following previous literature, we define leverage as debt to assets where debt is defined in one of three ways. In the first definition, debt is the sum of long-term and short-term debt, whereas in the second definition, debt simply stands for the total long-term debt of the firm. The third definition of debt includes cash as negative debt, i.e., debt is defined by the sum of long-term debt and short-term debt minus cash. For assets, we use the book value of assets.

As before, we provide a graphical snapshot of our main results. In Figure 5, we plot the de-meaned leverage for both the high and low tangibility groups. Leverage is defined as total

²⁶Results for listed and unlisted firms are not reported here. The basic results remain unchanged.

debt (short-term and long-term) divided by total assets.²⁷ It can be seen that leverage for the two groups moved together prior to the legal change; however, high-tangibility firms reduce their leverage after the legal change. In addition, in Figure 7 we plot the Epanechnikov kernel densities of Total Debt/Assets ratios for both the treatment and control groups before and after the law. It can be seen that there is a leftward shift of the kernel density for the treatment group after the passage of SARFAESI, while there is no such shift for the control group. Further, this shift in the density for the treatment group is statistically significant since the Kolmogorov-Smirnov test for the equality of the distribution functions is rejected at the 1% level. These figures thus depict a reduction in the usage of total debt for the treatment group but no reduction for the control group.

[Figures 5 and 7 about here]

In Table VIII, we investigate the impact of the law on total debt where total debt is again defined as the sum of short-term and long-term debt. The dependent variable is total debt to assets. We use firm fixed effects in all our regressions to control for firm level heterogeneity. In column 1 of Table VIII, we report a reduction in leverage of 4.6% for the high-tangibility group as compared to the low-tangibility group. In column 2, we add some controls such as profitability, size, and Tobin's Q. The results remain stable at 4.4%. Further, these results are unaffected by the inclusion of industry times year fixed effects (column 3). In columns 4-6, we investigate the impact of SARFAESI on leverage as defined by total debt minus cash to assets. As can be seen, on average, leverage falls by about 5.7% (5.3% when adding some controls). The above results indicate a reduction in leverage as a consequence of the SARFAESI Act. Further, we redo this analysis separately for listed and unlisted firms.²⁸ Finally, we redo the analysis with interactions between the After variable and our controls as our treatment and control groups are not identical. The qualitative nature of our results remains unaffected.²⁹

[Table VIII about here]

The intuition for this result is as follows. We have argued that a strengthening of secured creditor rights introduces a liquidation bias and that borrowers therefore want to contract out of secured debt. So what do these borrowers do? If these borrowers can substitute their secured

²⁷The patterns for the other specifications of leverage is exactly the same.

²⁸Results for listed and unlisted firms are not reported here. The basic results remain unchanged.

²⁹All these results can be obtained from the author.

borrowings with unsecured borrowings then one would not observe a reduction in total debt but only a shift in the composition of financing. However, this may be unlikely for a couple of reasons. First, a strengthening of secured creditors rights imposes a negative externality on the unsecured creditors and this may raise the cost of unsecured financing. Second, unsecured financing may only be available to borrowers with very high credit quality. Both these facts imply that not all secured debt can thus be substituted for unsecured debt. As a result, a reduction in secured debt may correspond to a reduction in total debt and perhaps a reduction in asset growth. An obvious implication of this argument is that the reduction in secured debt should be larger than the reduction in unsecured debt. This is consistent with what we find in the sample; secured debt decreases by 5.2% while total debt decreases by 4.6%.

C. Debt Maturity, Leasing, and Number of Creditors

The law also gives us the opportunity to examine the effect of this reform on the maturity structure of debt. Giannetti (2003) finds that strengthening of creditor rights is correlated with longer debt maturity. Benmelech, Garmaise, and Moskowitz (2005) analyze debt maturity as a function of “asset redeployability”. They find that higher asset redeployability is associated with longer maturity and larger loans. In practice there are two major distinctions between the types of loans that are used by corporations. Firms generally use both short-term loans meant for needs related to working capital and term loans that are meant for capital expenditures. Most of the long-term loans are secured by tangible assets such as land, buildings, and plant and machinery. On the other hand, short-term loans are secured by working capital, such as accounts receivables. Unsecured loans also tend to have shorter duration (Hart (1995)). Putting it differently, firms generally cannot borrow long-term on an unsecured basis. This implies that a movement from secured debt to unsecured debt has an indirect effect of shortening the debt maturity. Further, short-term loans are secured by relatively liquid assets and as Myers and Rajan (1998) have suggested, these assets are difficult to seize. Summing up, we should see little or no effect on short-term loans. In Table IX, we redo the regression analysis with Short-term Debt/Assets and Long-term Debt/Assets as dependent variables. It can be seen that the effect of the law on Short-term Debt/Assets is not statistically significant. Further, the law led to a shortening of debt maturity as can be seen by an increase in the ratio of short-term debt to total debt.

[Table IX about here]

Next, in Table X we examine the effect of the law on the leasing of assets. Leasing can be considered as an extreme form of creditor rights as the lessor can always seize the assets in the event of default. Leasing is thus a way of boosting debt capacity when creditor rights are weak (Eisfeldt and Rampini (2009)). A strengthening of creditor rights potentially reduces the need for leasing assets. We redo our analysis with leased assets to total assets as dependent variable and find a slight reduction in the usage of leased assets. Finally, our data allows us to examine the effect of this law on the number of credit relationship. The data is only available for a small sample of firms. As can be seen from Table X, the law did not have a significant effect on the number of credit relationships.

[Table X about here]

D. Liquidity Management

In this section, we examine the effect of SARFAESI on cash holdings by firms. Consistent with the precautionary motive of cash, we find that firms respond to SARFAESI by hoarding more cash. Since cash offer an insurance against liquidity shocks, firms in the treatment group end up hoarding more cash as compared to firms in the control group. To identify this effect, we employ the same specification as before and used cash to total assets as our dependent variable. As can be seen from Table XI, firms increase their cash holdings by 0.6 percent more for the treatment group as compared to the control group.

E. Total Assets, Profits, and Profitability

In this section, we investigate the impact of SARFAESI on firms' profitability and total assets. To achieve this, we run a difference-in-differences specification with log of EBIT and EBIT/Assets as dependent variables. In columns 1 through 6 of Table XII, we report the results from this regression analysis. Interestingly, we find that the law had no significant effect on firms' overall profits. However, profitability significantly improved as fewer assets were used to generate the same profits. This is consistent with the view that hard claims discipline management (Hart (1995) and Jensen (1986)). In columns 7-9, we redo the analysis using log of assets as our dependent variable. It can be seen that firms with lower tangibility grew more than firms with high tangibility. These results suggest that firms with high tangibility (treated group) invested less than firms with low tangibility (control group). These results also confirm

our previous finding that a change in assets is not driving the results. If anything, it is the firms with low tangibility that have increased assets more, and thus any variation in the assets works to only strengthen our results.³⁰

[Table XII about here]

F. Alternate Explanations

This paper shows that both secured debt and total debt ratios have come down as a result of a secured transactions law. In this section, we evaluate the robustness of our results to alternate stories and specifications. To start with, it might have been the case that the passage of the law coincided with the development of the equity market in India and that, as a result, firms were simply tapping another source of capital that was previously unavailable. At first glance, this may potentially explain the reduction in both secured debt and total debt usage by firms. Alternatively, this could simply be a story of market timing, where market timing refers to the practice of issuing equity when the market prices are high relative to the book values and repurchasing it when they are low. As Baker and Wurgler (2002) have shown, firms do indeed tend to time equity markets. So could this have simply been a market-timing story? Since our empirical methodology relies on a DID specification, for market timing to be an issue, it would have to be the case that market timing is more pronounced in the treated group as compared to the control group.³¹ Further, a special feature of our dataset helps us further address these concerns. Since we have detailed information on whether firms are listed or unlisted we redo our analysis restricting our sample to only unlisted firms. The economic and statistical significance of our results remains unchanged. The above analysis suggests this does not bias our results.

Second, the passage of SARFAESI may have coincided with differing accounting practices in the classification of secured debt. Elaborating further, it might have been the case that prior to SARFAESI, both secured and unsecured debt were loosely defined since it did not matter that much, but that accountants and auditors were more careful about these classifications post-SARFAESI. In other words, the reduction may solely be driven by changes in the quality of the accounting variables. Such a shift, even though if caused by SARFAESI, would not have any economic relevance. It is important to note that if this was the case, then the passage of the

³⁰We redo our entire analysis using lagged assets in the denominator instead of current assets. Our results remain unaffected. This clearly shows that the numerator is driving our results.

³¹If the market timing effects are the same across the two groups, they would simply get differenced out.

law should have only changed the composition of secured and unsecured debt, but should not have affected total debt. Our analysis, however, suggests that SARFAESI led to the reduction in total debt. Hence, this alternative is likely not driving our results.

Third, it is quite likely that SARFAESI increased the transaction costs of contracting with secured debt, for example, due to increased cost of compliance. This could have resulted in a reduction in secured debt as the transaction costs would have increased secured debt prices relative to unsecured debt or equity. Since there is no market data on prices of secured debt and unsecured debt to examine this claim, we hand collect data on a subset of loans (working capital loan contracts). As loan contracts differ along several price and non-price dimensions, we focus on contracts that have the same duration and are given to borrowers with similar ratings. An analysis of 231 working capital loan contracts with a one-year maturity suggests that rates for secured debt have dropped 77 basis points more than for unsecured debt since the implementation of the Act. These results suggest that the cost of borrowing with secured debt has come down more than with unsecured debt.³²

Finally, to address sample selection and attrition issues, we redo our analysis with a balanced panel and conduct a host of other tests. Our results are robust to these specifications checks.

V. Conclusion

The Law and Finance literature makes a strong case for strengthening creditor rights arguing that stronger creditor protection promotes finance and growth. The economic justification for this view is that strengthening of creditor rights expands the space of contracts and this constitutes a *Pareto* improvement. In this paper, we investigate the effect of strengthening of creditor rights and find that an increase in the rights of secured creditors led to a reduction in the usage of secured debt. These results suggest that mandatory legal reforms may not necessarily expand the contract space, rather it may alter the contract space as these results suggest. Thus, welfare implications of strengthening creditor rights are not that clear cut.

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

³²This should not come as a surprise, since the law has a direct effect on secured debt. Further, the law may cause a negative spill over effect to unsecured debt since secured creditors impose a negative externality on unsecured creditors.

be worse off. In such situations, a statement of welfare implications involves making an implicit assumption about the importance of the firms that are worse-off . Since there is no objective way to decide this, the aggregate welfare effects of this law are not obvious.

Recent empirical literature based on cross-sectional regressions finds somewhat similar results. Davydenko and Franks (2004) examine the effect of bankruptcy laws on financially distressed firms in the UK, Germany, and France. The reported usage of secured debt is lower in the UK than in France, despite the fact that the UK has a more creditor-friendly law. Since the Davydenko and Franks (2004) study is based on a cross-sectional setting, they are unable to distinguish between demand and supply effects. Their finding, however, is consistent with our analysis. Creditor rights affect both supply of credit as well as demand of it. Suppliers of secured credit are clearly better protected in the UK than in France and, therefore, are more willing to supply secured credit. However, stronger creditor protection also makes borrowers more cautious since it makes secured creditors less willing to compromise. It is quite plausible that this is the reason that less secured debt is used in the UK as compared to France.

This paper points to some research questions regarding the effect of creditor rights on bank relationships and the concentration of lenders. In the last few years, India has witnessed mergers of banks that specialized in short-term loans with Development Financial Institutions that specialized in long-term loans. When creditor rights were weak, separate 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, which can only be acquired over time through relationships, less important. 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.³³ Our ongoing research attempts to investigate these questions further.

³³Such consumer lending booms have also coincided with collateral law changes in several Eastern European countries.

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Appendix A. Proofs

Throughout this section, we will use the following notation:

Π_s	Expected profits for G-type firms with secured debt
Π_{us}	Expected profits for G-type firms with unsecured debt
$\Delta = \Pi_s - \Pi_{us}$	Expected profit differential for G-type firms

The objective function of the G-type borrower is given by:³⁴

$$\max_{\{R_1, R_2, \beta_c, \{us, s\}\}} b + \theta \cdot (C_H + b - R) + (1 - \theta) \cdot \beta_c \cdot b$$

subject to the lender participation constraint:

$$\theta \cdot R + (1 - \theta) \cdot [\beta_c \cdot C_L + (1 - \beta_c) \cdot L] \geq F$$

Here, $\beta_c \in \{0, 1\}$ denotes the probability of continuation. Note that refinancing is always obtainable at fair market terms if short-term debt is used (competitive capital markets).

Proof of Lemma 1

If $C_L > L_s$, then secured debt is preferred by the G-type entrepreneur.

Secured Debt as Optimal Contract

It can easily be verified that, in the absence of a liquidation threat ($C_L > L_s$), G-Type firm's expected profits with unsecured and secured debt are, respectively:

$$\Pi_{us} = \theta C_H + (1 - \theta) C_L - \frac{F - (1 - \nu) L_{us}}{\nu} + 2b$$

$$\Pi_s = \theta C_H + (1 - \theta) C_L - \frac{F - (1 - \nu) L_s}{\nu} + 2b$$

$$\Delta = \left(\frac{1 - \nu}{\nu}\right)(L_s - L_{us}) > 0 \text{ and } \frac{\delta \Delta}{\delta L_s} > 0$$

Proof of Lemma 2

If $C_L < L_s + \delta$ and collateral is "lumpy", then there exists \hat{b} such that if $b > \hat{b}$, firms prefer unsecured debt to secured debt.

In the presence of a liquidation threat ($C_L < L_s + \delta$, where δ reflects the increase in liquidation values as a result of strengthened secured creditor rights), G-Type firm's expected profits with unsecured and secured debt are, respectively:

$$\Pi_{us} = \theta C_H + (1 - \theta) C_L - \frac{F - (1 - \nu) L_{us}}{\nu} + 2b$$

$$\Pi_s = \theta C_H - \frac{F}{\nu} + \left(\frac{1}{\nu} - \theta\right)(L_s + \delta) + (1 + \theta)b$$

$$\Delta = \frac{1}{\nu}(L_s + \delta - L_{us}) + L_{us} - \theta(L_s + \delta) - (1 - \theta)C_L - (1 - \theta)b$$

$$\text{Let } \Delta = 0, \text{ then } \hat{b} = \frac{\frac{1}{\nu}(L_s + \delta - L_{us}) + L_{us} - \theta(L_s + \delta)}{1 - \theta} - C_L.$$

³⁴B-types will always try to imitate the G-types as they will otherwise not receive any funding.

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 = Item 6 - Accumulated Depreciation	Derived from CMIE
Item 17	Specific Assets (SA) = Item 2 + Item 5	Derived from CMIE
Item 18	Non Specific Assets (NSA)=Item 3 + Item 8 + Item 9	Derived from CMIE
Item 19	Tangibility = $\frac{\text{Plant and Machinery} + \text{Other Fixed Assets}}{\text{Total Assets}}$	Derived from CMIE
Item 20	Tangibility ₂ = $\frac{\text{Specific Assets}}{\text{Specific Assets} + \text{Non Specific Assets}}$	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	8	40
2	Agricultural Products	161	817
3	Minerals products	82	389
4	Vegetable oils	124	570
5	Processed Food and Tobacco	245	1252
6	Textiles	550	3000
7	Leather	37	188
8	Wood Products	18	121
9	Paper	138	734
10	Chemicals (includes drugs and pharmaceuticals)	570	3186
11	Plastics	276	1544
12	Cement (includes abrasives)	172	958
13	Iron and Steel	423	2183
14	Engines and Material handling equipment	162	913
15	Wires and Cables	168	932
16	Consumer electronics	280	1404
17	Automobiles and Ancillaries	189	1169
18	Misc items	35	195
19	Construction	130	712
20	Power generation	21	104
21	Services	591	2847
22	Diversified	43	275
	Total	4423	23533

Table III
Descriptive Statistics

Variables	All Firms	Listed Firms	Unlisted Firms
Debt/Assets	0.345	0.351	0.336
	[0.182]	[0.178]	[0.189]
	23533	13427	10106
Secured Debt/Assets	0.279	0.293	0.259
	[0.175]	[0.174]	[0.176]
	23533	13427	10106
Long-term Debt/Assets	0.210	0.220	0.197
	[0.166]	[0.162]	[0.17]
	23533	13427	10106
Secured Debt/Debt	0.787	0.808	0.758
	[0.241]	[0.218]	[0.267]
	23533	13427	10106
Short-term Debt/Debt	0.436	0.419	0.459
	[0.295]	[0.281]	[0.312]
	23533	13427	10106
Log(Assets)	3.755	4.089	3.311
	[1.542]	[1.553]	[1.409]
	23533	13427	10106
Total Assets	197.622	276.381	92.981
	[1075.03]	[1391.25]	[316.883]
	23533	13427	10106
Log(EBIT)	1.237	1.577	0.785
	[1.832]	[1.858]	[1.695]
	20006	11403	8603
Log(Sales)	3.525	3.780	3.181
	[1.811]	[1.819]	[1.741]
	23226	13331	9895
EBIT/Assets	0.104	0.101	0.107
	[0.121]	[0.109]	[0.135]
	23533	13427	10106

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 with maturity of less than 3 years. Assets refer to the book value of assets and are reported in 10 million Indian Rupees (1 US Dollar is approximately 45 Indian Rupees). EBIT is defined as earnings before interest and taxes. Sample period is from 1997-2004. Source: CMIE (publishes detailed financial information on large Indian firms).

Table IV
Descriptive Statistics (Pre and Post Legal Change)

Variables	Mean		Median		Observations
	Before	Difference	Before	Difference	
Debt/Assets	0.353*** (0.001)	-0.023*** (0.003)	0.352*** (0.002)	-0.028*** (0.003)	23533
Secured Debt/Assets	0.289*** (0.001)	-0.032*** (0.002)	0.276*** (0.002)	-0.038*** (0.003)	23533
Short-term Debt/Assets	0.133*** (0.001)	0.004** (0.001)	0.118*** (0.001)	0.000 (0.002)	23533
Long-term Debt/Assets	0.219*** (0.001)	-0.027*** (0.002)	0.195*** (0.002)	-0.032*** (0.003)	23533
Secured Debt/Debt	0.799*** (0.002)	-0.037*** (0.003)	0.878*** (0.002)	-0.031*** (0.004)	23533
Short-term Debt/Debt	0.424*** (0.002)	0.037*** (0.004)	0.386*** (0.003)	0.047*** (0.005)	23533
Interest Exp/Op Income	0.450*** (0.148)	-0.235 (0.252)	0.434*** (0.008)	-0.155*** (0.014)	23285
Interest Exp/Assets	0.047*** 0.000	-0.013*** 0.000	0.045*** 0.000	-0.014*** 0.000	23533
Interest Exp/Sales	0.143*** (0.021)	0.034 (0.036)	0.049*** 0.000	-0.018*** (0.001)	23226

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

Table V
Descriptive Statistics

	Low Tangibility			Medium Tangibility			High Tangibility		
	Before	Difference	Observations	Before	Difference	Observations	Before	Difference	Observations
Debt/Assets	0.281*** (0.002)	0.003 (0.004)	8112	0.362*** (0.002)	-0.022*** (0.004)	7719	0.416*** (0.002)	-0.042*** (0.004)	7702
Secured Debt/Assets	0.219*** (0.002)	-0.001 (0.004)	8112	0.298*** (0.002)	-0.032*** (0.004)	7719	0.351*** (0.002)	-0.057*** (0.004)	7702
Secured Debt/Debt	0.771*** (0.004)	-0.019*** (0.006)	8112	0.809*** (0.003)	-0.037*** (0.005)	7719	0.817*** (0.003)	-0.053*** (0.005)	7702
Long-term Debt/Assets	0.143*** (0.002)	-0.002 (0.003)	8112	0.219*** (0.002)	-0.025*** (0.004)	7719	0.296*** (0.002)	-0.045*** (0.004)	7702
Short-term Debt/Assets	0.137*** (0.002)	0.005* (0.003)	8112	0.143*** (0.001)	0.002 (0.002)	7719	0.137*** (0.002)	0.005* (0.003)	8112
Short-term Debt/Debt	0.523*** (0.005)	0.012 (0.008)	8112	0.425*** (0.004)	0.040*** (0.006)	7719	0.323*** (0.003)	0.047*** (0.006)	7702
Log(Assets)	3.487*** (0.021)	0.324*** (0.035)	8112	3.662*** (0.021)	0.289*** (0.036)	7719	3.819*** (0.022)	0.274*** (0.039)	7702
EBIT/Assets	0.078*** (0.002)	-0.014*** (0.003)	8112	0.077*** (0.001)	-0.007*** (0.002)	7719	0.066*** (0.002)	0.010*** (0.003)	7702
Log(EBIT)	0.872*** (0.027)	0.175*** (0.046)	6993	1.260*** (0.027)	0.169*** (0.046)	6630	1.379*** (0.028)	0.311*** (0.048)	6383
Log(Sales)	3.207*** (0.026)	0.307*** (0.044)	7941	3.475*** (0.024)	0.410*** (0.041)	7650	3.495*** (0.025)	0.484*** (0.044)	7635
Interest Exp/Assets	0.036*** (0.000)	-0.008*** (0.001)	8112	0.049*** (0.000)	-0.012*** (0.001)	7719	0.057*** (0.000)	-0.018*** (0.001)	7702
Interest Exp/Op Income	0.408* (0.216)	-0.367 (0.358)	7965	0.537* (0.285)	-0.222 (0.493)	7653	0.405 (0.264)	-0.091 (0.458)	7667

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

Table VI
Empirical Strategy

Panel A: Secured Debt to Assets				
	Before	After	Difference	No. of observations
High Tangibility	0.331 (0.002)	0.277 (0.004)	-0.054*** (0.004)	7661
Low Tangibility	0.240 (0.002)	0.230 (0.003)	-0.010** (0.004)	8052
		Difference	-0.044*** (0.006)	
Panel B: Secured Debt to Assets				
High Tangibility	0.331 (0.003)	0.358 (0.004)	0.027*** (0.005)	7661
Low Tangibility	0.241 (0.004)	0.367 (0.006)	0.126*** (0.007)	8052
		Difference	-0.099*** (0.009)	
Panel C: Secured Debt to Debt				
High Tangibility	0.807 (0.003)	0.757 (0.005)	-0.050*** (0.006)	7661
Low Tangibility	0.785 (0.004)	0.757 (0.005)	-0.028*** (0.006)	8052
		Difference	-0.021*** (0.008)	

Notes: This tables introduces the basic empirical strategy. We divide firms (by industry) into three bins based on a measure of tangibility, where tangibility is defined as net fixed assets to total assets. We designate the top 33% firms (based on the measure of pre-treatment tangibility) as “High Tangibility” firms and the bottom 33% as the “Low Tangibility” group. The “High Tangibility” group is the treated group while firms belonging to the “Low Tangibility” group form the control group. After refers to the period 2002-2004 and Before refers to years prior to that. We next collapse the data into single data points (based on averages) both before and after. This results in two data points per firm, one data point for the pre-SARFAESI regime and one data point for the post-SARFAESI regime. In Panel A, we report the before-after results for the variable secured debt divided by assets. In Panel B, numerator is secured debt as before but the denominator is the pre-SARFAESI average asset value. In Panel C, the variable of interest is the ratio secured debt to total debt. Standard errors are reported in parentheses. ***, ** and * implies significance at the 99 percent level, 95 percent level, and 90 percent levels respectively. The database is provided by CMIE which publishes financials of large corporations in India. The data spans years 1997-2004. Standard errors are reported in parentheses.

Table VII
Effect of SARFAESI Law on Secured Debt

Variables	Secured Debt/Assets				Secured Debt/Debt			
	1	2	3	4	5	6	7	8
AFTER*HIGH TANG DUM	-0.052*** (0.010)	-0.051*** (0.009)	-0.048*** (0.009)	-0.048*** (0.009)	-0.032*** (0.008)	-0.033*** (0.008)	-0.026*** (0.008)	-0.028*** (0.009)
EBIT/Assets		-0.128*** (0.022)	-0.128*** (0.023)	-0.100*** (0.028)		-0.032* (0.019)	-0.032* (0.019)	-0.023 (0.023)
Log(Sales)		-0.002 (0.003)	-0.001 (0.003)	0.000 (0.003)		0.017*** (0.003)	0.018*** (0.003)	0.015*** (0.004)
Tobin's Q adjusted		0.015*** (0.004)	0.016*** (0.003)	0.018*** (0.003)		0.006 (0.004)	0.008* (0.004)	0.009* (0.005)
AFTER*EBIT/Assets				-0.055* (0.028)				-0.014 (0.025)
AFTER*Log(Sales)				0.000 (0.001)				0.007*** (0.002)
AFTER*Tobin's Q adjusted				-0.007 (0.005)				-0.004 (0.007)
Number of Firms	2983	2948	2948	2948	2983	2948	2948	2948
Observations	15814	15310	15310	15310	15814	15310	15310	15310
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	No	Yes	Yes	No	No	Yes	Yes
Adj. R-squared	0.779	0.786	0.788	0.788	0.643	0.644	0.644	0.644

Double-clustered standard errors in parentheses (clustering done at firm and year level)

* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} \cdot 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. The dependent variable is secured debt to assets in columns 1-4 and secured debt to debt in columns 5-8. Here, i indexes firms, t indexes time, and j indexes industries; 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 firm belongs to the treated group and 0 if it belongs to the control group. We divide firms into three bins based on this measure of pre-treatment (average of tangibility before 2001) tangibility values. We define tangibility as net fixed assets to total assets. We designate the top 33% firms (based on the measure of pre-treatment tangibility) as "High Tangibility" firms and the bottom 33% as the "Low Tangibility" group. The "High Tangibility" group is the treated group while firms belonging to the "Low Tangibility" group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, and 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 and Bank Balance)/Assets		
	1	2	3	4	5	6
AFTER*HIGH TANG DUM	-0.046*** (0.009)	-0.044*** (0.009)	-0.041*** (0.009)	-0.057*** (0.011)	-0.053*** (0.010)	-0.049*** (0.010)
EBIT/Assets		-0.133*** (0.023)	-0.133*** (0.023)		-0.165*** (0.028)	-0.163*** (0.029)
Log(Sales)		-0.007** (0.003)	-0.006* (0.003)		-0.009** (0.004)	-0.008** (0.004)
Tobin's Q adjusted		0.012*** (0.003)	0.013*** (0.003)		0.009** (0.004)	0.012*** (0.004)
Number of Firms	2983	2948	2948	2983	2948	2948
Observations	15814	15310	15310	15814	15310	15310
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Effects	No	No	Yes	No	No	Yes
Adj. R-squared	0.780	0.786	0.788	0.775	0.782	0.783

Double-clustered standard errors in parentheses (clustering done at firm and year level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} \cdot 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. Leverage, as defined by debt to total assets, is the dependent variable. Debt is defined in two different ways. In Columns 1-3, we define debt as the sum of short-term and long-term debt. In Columns 4-6, we define debt as sum of short-term debt+long-term debt-cash. 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 firm belongs to the treated group and 0 if it belongs to the control group. We divide firms into three bins based on this measure of tangibility where tangibility is defined as net fixed assets to total assets. We define the top 33% firms (based on the measure of tangibility) as “High Tangibility” firms and the bottom 33% as the “Low Tangibility” group. The “High Tangibility” is the treated group while firms belonging to the “Low Tangibility” group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, and size. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Table IX
Effect of SARFAESI Law on Debt Maturity

Variables	Short-term Debt/Assets			Long-term Debt/Assets			Short-term Debt/Debt		
	1	2	3	4	5	6	7	8	9
AFTER*HIGH TANG DUM	-0.005 (0.004)	-0.004 (0.003)	-0.001 (0.004)	-0.041*** (0.008)	-0.040*** (0.008)	-0.040*** (0.008)	0.038*** (0.010)	0.035*** (0.011)	0.044*** (0.012)
EBIT/Assets		-0.066*** (0.011)	-0.065*** (0.011)		-0.067*** (0.016)	-0.067*** (0.016)		-0.026 (0.018)	-0.024 (0.019)
Log(Sales)		0.005*** (0.002)	0.005*** (0.002)		-0.012*** (0.002)	-0.011*** (0.002)		0.016*** (0.003)	0.017*** (0.003)
Tobin's Q adjusted		0.001 (0.002)	0.001 (0.002)		0.010*** (0.002)	0.011*** (0.002)		-0.006 (0.004)	-0.006 (0.004)
Number of Firms	2983	2948	2948	2983	2948	2948	2983	2948	2948
Observations	15814	15310	15310	15814	15310	15310	15814	15310	15310
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
Adj. R-squared	0.718	0.721	0.722	0.793	0.795	0.796	0.700	0.701	0.701

Double-clustered standard errors in parentheses (clustering done at firm and year level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} \cdot 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. 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 firm belongs to the treated group and 0 if it belongs to the control group. We divide firms into three bins based on this measure of tangibility where tangibility is defined as net fixed assets to total assets. We define the top 33% firms (based on the measure of tangibility) as “High Tangibility” firms and the bottom 33% as the “Low Tangibility” group. The “High Tangibility” is the treated group while firms belonging to the “Low Tangibility” group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, and size. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Table X
Effect of SARFAESI Law on Lending Relationships and Leases

Variables	Number of Banks			Leased Assets/Assets		
	1	2	3	4	5	6
AFTER*HIGH TANG DUM	-0.032 (0.074)	-0.044 (0.076)	-0.066 (0.085)	-0.004 (0.003)	-0.003 (0.002)	-0.006* (0.004)
EBIT/Assets		-0.623** (0.278)	-0.663** (0.282)		-0.002 (0.006)	-0.004 (0.005)
Log(Sales)		0.315*** (0.066)	0.315*** (0.071)		0.001 (0.001)	0 (0.001)
Tobin's Q adjusted		0.04 (0.043)	0.042 (0.040)		-0.002** (0.001)	-0.002** (0.001)
Number of Firms	1306	1297	1297	2983	2948	2948
Observations	6099	5942	5942	15814	15310	15310
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry*Year Fixed Effects	No	No	Yes	No	No	Yes
Adj. R-squared	0.906	0.908	0.908	0.663	0.675	0.676

Double-clustered standard errors in parentheses (clustering done at firm and year level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} \cdot 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. Here, i indexes firms, t indexes time, j indexes industries, y_{it} is the dependent variable of interest, α_i and γ_t are firm and year fixed effect respectively; $1_{(E=1)}$ is an indicator variable that takes on a value of 1 if year is 2002, 2003 or 2004 and 0 otherwise. $1_{(A=H)}$ is an indicator variable that takes on a value of 1 if the firm belongs to treated group and 0 if it belongs to the control group. We divide firms into three bins based on this measure of tangibility where tangibility is defined as net fixed assets to total assets. We define the top 33% firms (based on the measure of tangibility) as “High Tangibility” firms and the bottom 33% as the “Low Tangibility” group. The “High Tangibility” is the treated group while firms belonging to the “Low Tangibility” group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, and size. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Table XI
Effect of SARFAESI Law on Cash/Assets Ratios

Variables	Cash and Bank Balance/Assets		
	1	2	3
AFTER*HIGH TANG DUM	0.009*** (0.003)	0.007*** (0.002)	0.006*** (0.002)
EBIT/Assets		0.020*** (0.005)	0.018*** (0.005)
Log(Sales)		0.001 (0.001)	0.001 (0.001)
Tobin's Q adjusted		0.007*** (0.002)	0.006*** (0.002)
Number of Firms	2983	2948	2948
Observations	15814	15310	15310
Firm Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Industry*Year Fixed Effects	No	No	Yes
Adj. R-squared	0.005	0.013	0.024

Double-clustered standard errors in parentheses (clustering done at firm and year level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} \cdot 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. In Columns 1-3, the dependent variable is cash divided by assets and in Columns 4-6, the dependent variable is cash plus bank account balances divided by 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 firm belongs to the treated group and 0 if it belongs to the control group. We divide firms into three bins based on this measure of tangibility where tangibility is defined as net fixed assets to total assets. We define the top 33% firms (based on the measure of tangibility) as “High Tangibility” firms and the bottom 33% as the “Low Tangibility” group. The “High Tangibility” is the treated group while firms belonging to the “Low Tangibility” group form the control group. ε_{it} is the error term. X_{it} are some firm level control variables such as profitability, Tobin's Q, and size. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Table XII
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	0.003 (0.046)	0.001 (0.036)	0.036 (0.042)	0.020*** (0.007)	0.020*** (0.006)	0.021*** (0.006)	-0.156*** (0.038)	-0.162*** (0.040)	-0.159*** (0.040)
Log(Sales)		0.786*** (0.037)	0.777*** (0.038)		0.031*** (0.002)	0.030*** (0.002)		0.243*** (0.019)	0.238*** (0.019)
Tobin's Q adjusted		0.088*** (0.027)	0.079*** (0.028)		0.004 (0.005)	0.003 (0.005)		-0.022 (0.014)	-0.019 (0.014)
Number of Firms	2745	2730	2730	2983	2948	2948	2983	2948	2948
Observations	13376	13183	13183	15814	15310	15310	15814	15310	15310
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
Adj. R-squared	0.857	0.896	0.898	0.415	0.441	0.443	0.964	0.973	0.973

Double-clustered standard errors in parentheses (clustering done at firm and year level)
* significant at 10%; ** significant at 5%; *** significant at 1%

Notes: This table reports the regression results for the regression $y_{ijt} = \alpha_i + \gamma_t + \delta \cdot 1_{(E=1)} + \theta \cdot 1_{(A=H)} + \eta \cdot 1_{(E=1)} \cdot 1_{(A=H)} + \omega \cdot X_{ijt} + \varepsilon_{ijt}$. In Columns 1-3, the dependent variable is log of EBIT. In Columns 4-6, the dependent variable is profitability defined as EBIT divided by book value of assets and in columns 7-9 the dependent variable is given by log of book value of assets. Here, t indexes firms, 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 firm belongs to the treated group and 0 if it belongs to the control group. We divide firms into three bins based on this measure of tangibility where tangibility is defined as fixed assets to total assets. We define the top 33% firms (based on the measure of tangibility) as “High Tangibility” firms and the bottom 33% as the “Low Tangibility” group. The “High Tangibility” is the treated group while firms belonging to the “Low Tangibility” group form the control group. ε_{ijt} is the error term. X_{ijt} are some firm level control variables such as profitability, Tobin's Q, and size. The variable of interest is η which captures the DID effect. Source: CMIE database. Coverage: 1997-2004.

Figure 1. Net NPA Additions/Net Advances

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

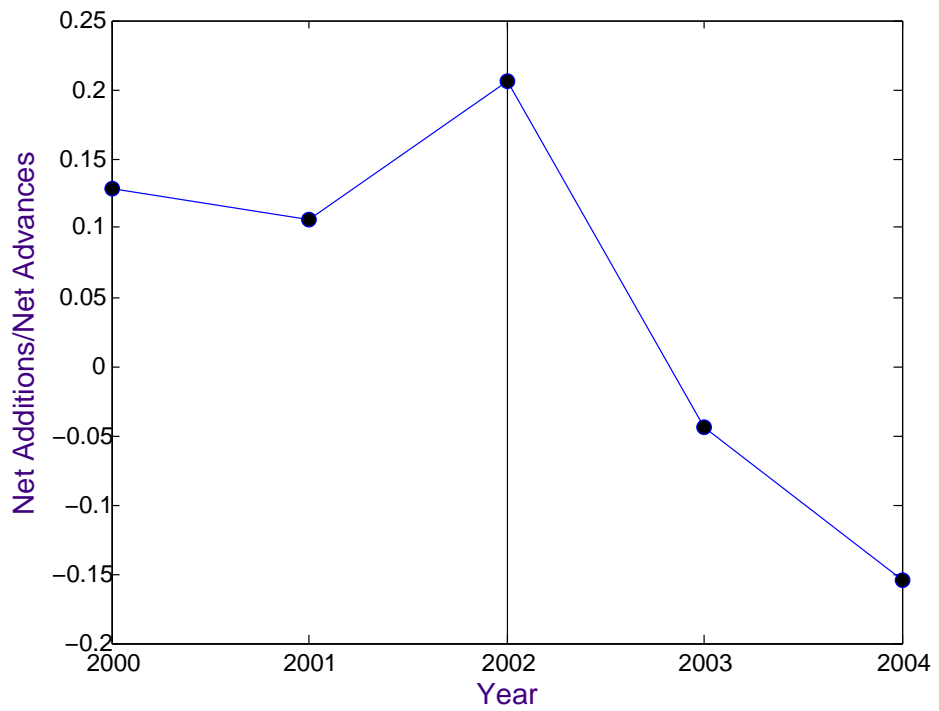


Figure 3. Extensive Form Representation

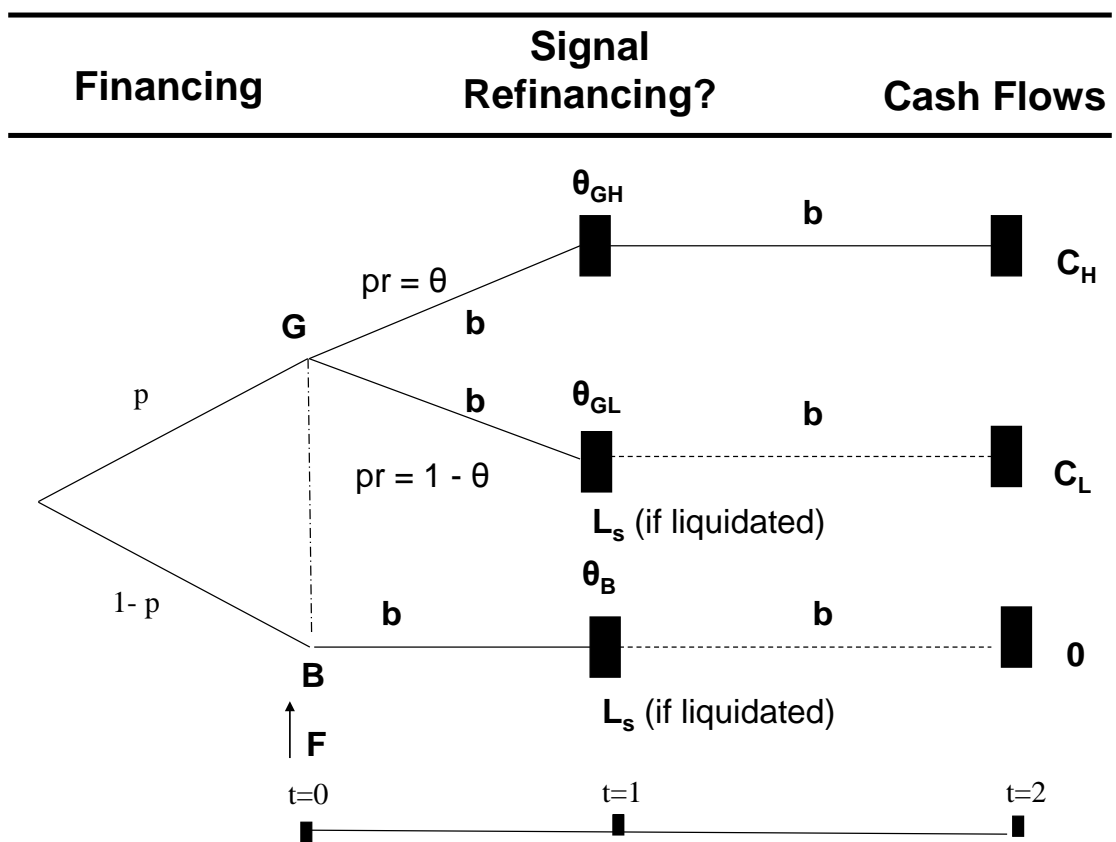
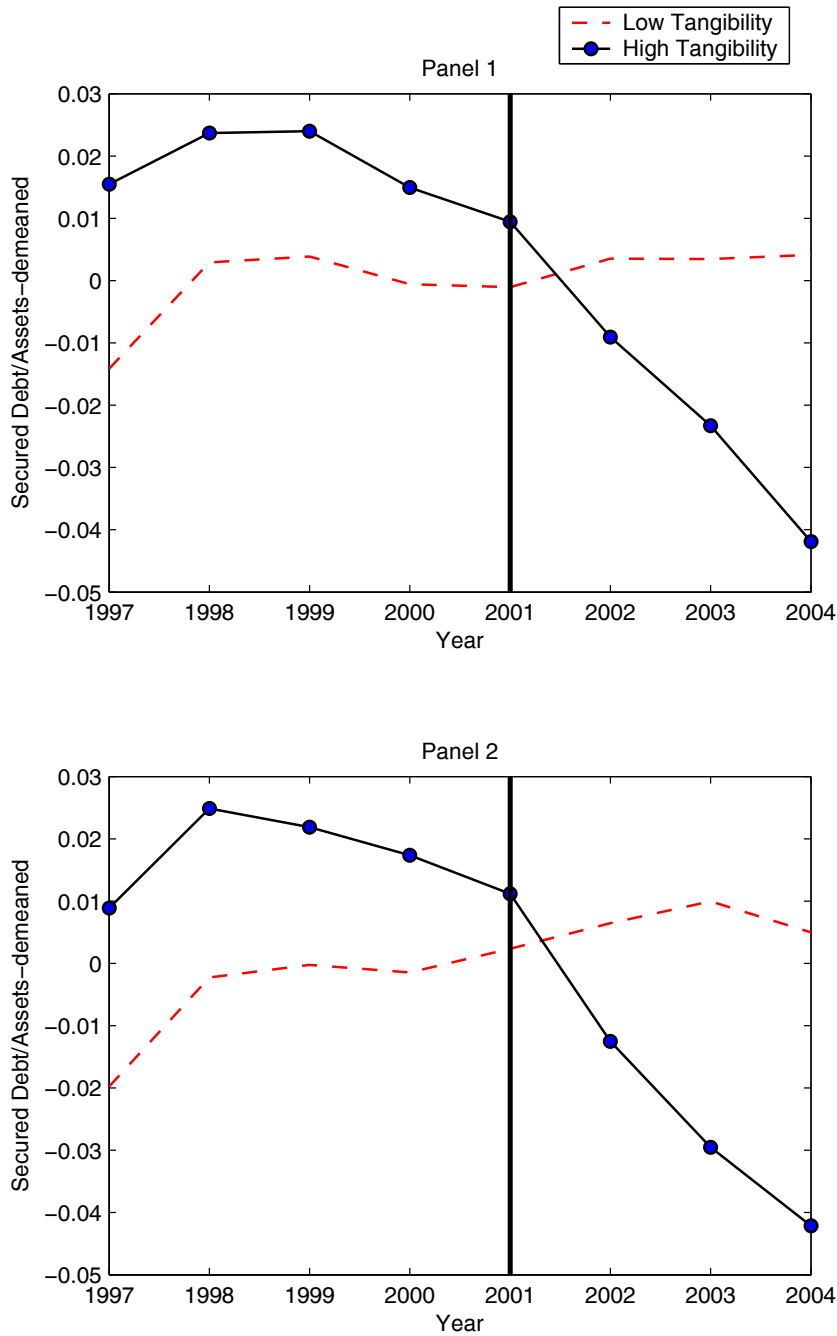
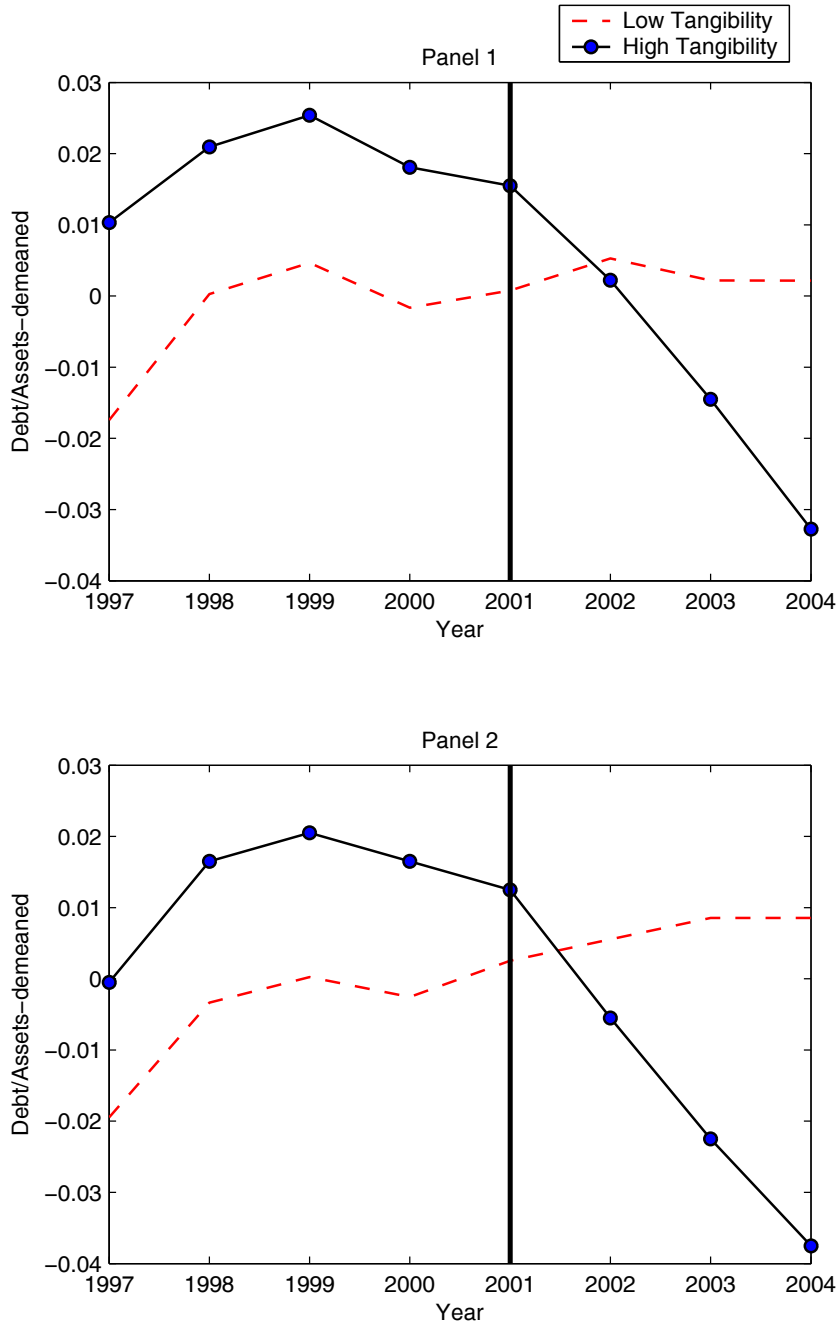


Figure 4. Secured Debt/Assets



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

Figure 5. Debt/Assets



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

Figure 6. Secured Debt/Assets

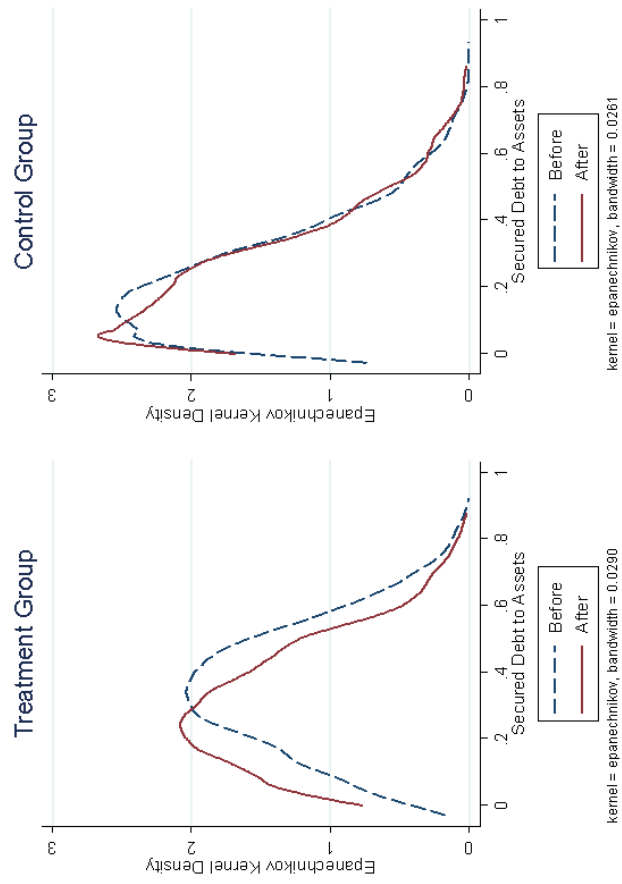


Figure 7. Debt/Assets

