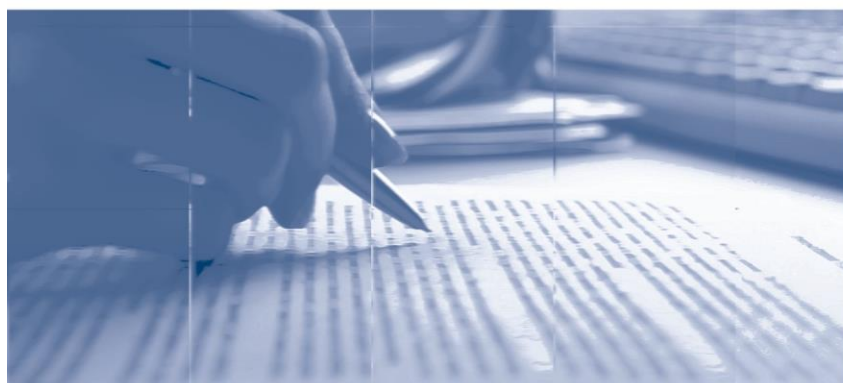


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Collateral after the Brazilian Creditor Rights Reform*

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Abstract

The Working Papers should not be reported as representing the views of the Banco Central do Brasil. The views expressed in the papers are those of the author(s) and do not necessarily reflect those of the Banco Central do Brasil.

We investigate how the strengthening of creditor rights affected corporate debt structure, collateral liquidity, and collateralization rate following the 2005 bankruptcy law in Brazil. Using a large dataset from the Brazilian credit registry, we find that secured debt usage increased 13 percentage points after the reform, together with a reinforcement in the use of more liquid collateral agreements. We document that the law had a varying effect across groups of borrowers with different amounts of collateral pledged before the reform. Firms previously pledging amounts of collateral in excess of the value of the loan could access credit with a much lower collateralization rate after the introduction of the law. However, the collateralization rate significantly increased for firms with lower-pledge levels, imposing an extra cost on them. We show that a multiple banking set-up may give such borrowers an option out of overcollateralization, as foreign-owned banks demanded substantially less collateral compared with domestic-owned banks after the reform. These results are robust after controlling for a wide variety of possibilities.

Keywords: creditor rights, collateral, security interests, secured debt, collateralization rate, foreign banks.

JEL Classification: D23, G18, G21, G28, G33, H81.

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1 – Introduction

On one hand, “one of the key channels through which financial development operates is by lowering the demand for collateral” (Liberti and Mian, 2010). On the other hand, protecting creditor rights, which is also linked with financial development, is documented as increasing secured debt use (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1998; Levine, 1998, and 1999; Djankov, McLiesh, and Shleifer, 2007). In the light of these seemingly opposing views, we explore the role of collateral following the reforms in creditor rights sealed by the Brazilian bankruptcy law in 2005.

The reforms brought by the bankruptcy law (Law 11,101/2005) significantly strengthened the rights of secured creditors by giving them a higher priority when it comes to accessing the assets of the bankrupt firm. The law also exempted certain specific classes of collateral from reorganization and liquidation proceedings. Thus, it allowed banks to bypass the lengthy judicial process for seizing and liquidating the collateralized assets of the defaulting firm. Exploiting the bankruptcy law in a quasi-natural experiment, we investigate its effect on corporate debt structure; on the use of collateral agreements with different liquidity levels; and on the amount of collateral pledged by a firm in order to access new credit.

We have the right setting and the appropriate data for testing the effects of the Brazilian creditor rights reform. We use a panel data sample from the Brazilian credit registry, which consists of quarterly credit data for more than 790.000 firms from 2004:Q1 to 2005:Q4, where firms must be observed in the pre- and post-period. Overall, there are more than 5.2 million firm–time observations. The data allows us to identify banks, firms, loans, and collateral information over time. The unique quasi-natural experiment combined with the comprehensive dataset enables us to address the econometric identification challenges.

Besides identification issues, any attempt to examine the link between the strengthening of creditor rights and collateral potentially suffers from omitted variables. We use a set of fixed effects (firm, time/firm–time and bank fixed effects) when defined as appropriate. We also include a set of time-varying firm, bank and firm-bank level controls, depending on the regressions. Since the residuals may be correlated across different dimensions of the data, we base ourselves on Bertrand, Duflo and Mullainathan (2004), in order to cluster standard errors at the appropriate level.

More than 80% of the total loan amount granted in Brazil was classified as unsecured credit in 2004¹. We find that *Secured debt* increased by an estimate of 13 percentage points after the reform. This goes in line with La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), Levine (1999), Djankov, McLiesh, and Shleifer (2007), who document higher secured creditor rights with an increase in secured debt. Results are robust when we control for time-varying firm characteristics. We test the robustness of our findings for sample periods of five and six quarters after the change in the law. The results suggest that a larger sample after the changed law also captures the change in collateral pledge.

Following the increase in *Secured debt*, we document that the law increased the use of all types of security interests. By providing lenders with a higher priority in the distribution of credit claims, the reform allowed a broader class of assets to be pledged. Specifically, we find evidence that the law had a higher effect on the use of more liquid collateral agreements. We distinguish three groups of collateral agreements, depending on the ease with which the lender could repossess and sell the assets. Collateral with the least level of liquidity includes agreements in which the lender has only indirect possession on pledges of fixed assets. Indirect possession requires the bank to obtain court approval to repossess and sell the asset. In the case of firm liquidation, assets under this category are automatically set as part of the pool of assets in the bankruptcy petition and the bank can no longer exercise its rights. We find that the use of *Collateral with indirect possession* increased by one percentage point after the reform.

A more liquid agreement for using fixed assets as collateral is achieved by transferring the direct possession of the asset to the lender. This form of agreement is the fiduciary lien. The new law exempted creditors that have taken collateral in the form of fiduciary lien from the bankruptcy procedure that would affect all other secured and unsecured debt. However, the law also restricted the repossession of assets considered as core-assets². In this case, the judge would still need to set the appropriate time in order to ensure the recovery of the firm before the bank can repossess and sell the assets. We find that the use of *Collateral with direct possession* increased by four percentage points after the reform.

1 According to Erel (2011), the fraction of loans not collateralized in US was 25% in a sample of loan from the Survey of Term of Business Lending for the time period from 1987 to 2003.

² Core assets are essential property of a business without which a business would dissolve, since the company cannot carry on with its profit-making activities. The judge is the one that determines whether an asset is a core-asset depending on the type of business. Examples could include vehicles, equipment, machinery, industrial plants, land, etc.

The evidence we find is a significant increase on the use of *Highly liquid collateral*. This type includes credit claims under fiduciary cession agreement of credit rights and rights over banking accounts (*e.g.* checks, fixed income investments, shares, debentures, deposits, and promissory notes). Because of the fiduciary feature, the bank has direct possession of credit claims under *Highly liquid collateral*. Hence, this category represents a “put option” for banks, which can be exercised when the borrower defaults on a loan. Moreover, the bank will not need to integrate the bankruptcy pool of creditors. We find that the use of *Collateral with direct possession* increased by eight percentage points after the reform.

Using a subsample of loans with information on *Collateralization rate* – the amount of collateral pledged divided by loan amount – we document that the *Collateralization rate* is very heterogeneous among firms in Brazil³. Additionally, banks tend to fully or over-collateralize their credit positions. We show that a reform that strengthens secured creditor’s rights has a mixed effect on borrowers, depending on their previous level of collateral pledged. Collateral pledge significantly decreases for those borrowers who previously had to pledge amounts in excess of the value of the loan, and it significantly increased for those borrowers with a lower level of collateral pledged before the reform. We test the robustness of our prediction on a placebo, and confirm that the law had a standardization effect on banks’ lending policy.

Strengthening creditor rights reduces borrowing costs and thus relaxes financial constraints, but it can also impose an extra cost on borrowers (Vig, 2013). We show that firms negatively affected by the reform might be able to undo the extra burden of having to pledge more collateral. We find evidence that borrowers in a multiple banking setup could at least mitigate the effect of the reform by contracting with foreign-owned banks. Our findings are based on a powerful identification within borrowers in order to disentangle the bank’s demand for security interests from the firm’s supply of collateralizable assets. Using a differences-in-differences methodology in an analogous manner as in Khwaja and Mian (2008), we test the demand of foreign banks for collateral in a sample of firms that could be harmed by the changes brought by the creditor rights reform.

Next, we test the demand of foreign banks for *Secured credit* in the whole sample of firms with multiple bank relationships. Both tests confirm that foreign banks demanded less collateral from their borrowers than domestic banks did after the reform. We consider a

³ We find that the effect of the law concerning the demand for collateral was homogeneous across groups of firms with different levels of default risk.

number of robustness tests and alternative explanations that may fully or partially account for the results reported. As we already exclude loans involving resources other than the bank's, we focus on controlling for portfolio reallocations and borrower-induced choice of multiple lenders. In all settings, results continue to hold, suggesting that the main findings are not driven by any of the raised possibilities. Results are robust to different event windows.

To our knowledge, this is the first paper in the literature that empirically tests the effect of the strengthening of creditor rights on collateral pledge at both the macro-level (*i.e.* focusing on corporate debt structure) as well as at the micro-level (*i.e.* analyzing the collateralization rate of new loans). We also provide the first paper in the literature that documents the effect of a creditor rights reform on collateral agreements with different liquidity levels. Besides Beck, Ioannidou and Schafer (2012), this is the only paper that properly disentangle a firm's supply of collateralizable assets from bank's demand for its security interests. With a sample of firms with multiple banking relationships, we are able to examine the demand of competing banks for collateral. Although the role of foreign banks is controversial because they might displace local lending, thereby tightening a firm's overall access to credit (Bruno and Hauswald, 2014), our paper documents foreign banks as catalysts for financial development.

The rest of the paper is organized as follows. The following section examines the related literature in the field and sets our predictions. Section 3 discusses the reforms brought by the Brazilian bankruptcy law. Section 4 presents the dataset and the main descriptive statistics. Section 5 documents our empirical analysis, including the model we propose to overcome the current challenges, our main findings, as well as a battery of robustness tests. Finally, Section 6 concludes with the main messages of the paper.

2 – Literature review

Credit rationing originates from the presence of informational asymmetries. Since collateral is expected to have a mitigating effect on informational asymmetries, collateral may solve the credit-rationing problem (Steijvers and Voordeckers, 2009). One category of theoretical models considers collateral as a screening device, which reduces the *adverse selection* problem. In this case, collateral has a signaling role, where the willingness of the firm to pledge security interests positively influences the quality of the loan, as perceived by

the bank (Bester, 1985, 1987). From this stream of literature, it is concluded that, in equilibrium, low-risk borrowers would pledge more collateral than high-risk borrowers.

Another category of theoretical models considers collateral as an incentive device, reducing the *moral hazard* problem (Boot *et al.* 1991; Boot and Thakor, 1994). Collateral can be a means of preventing high-risk firms switching from a lower to a higher risk project, or from making less effort to develop the project, given the possibility of losing the collateral pledged. Their theories predict the opposite, namely, high-risk borrowers would pledge more collateral than low-risk borrowers.

Strengthening creditor rights reduces borrowing costs and thus relaxes financial constraints. The economic justification for stronger creditor rights is that the space for debt contracts can be expanded between the borrower and the lender (Vig, 2013). The reduction in the cost of borrowing may come from the *moral hazard* channel since stronger creditor rights mitigate borrower's misbehavior. However, the lower cost of borrowing incentivizes firms to signal themselves by pledging more collateral. Thus, high-risk firms and low-risk firms would pledge more collateral after a creditor rights reform. This goes in line with La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), Levine (1999), Djankov, McLiesh, and Shleifer (2007), who document higher secured creditor rights with an increase in secured debt.

This leads us to our first prediction.

Prediction 1. A reform that strengthens secured creditor rights would cause secured debt to increase

Few studies explicitly make the distinction among different types of collateral. Chan and Kanatas (1985) distinguish between inside collateral (belonging to the business) and outside collateral (personal guarantees). The difference between these two types is the higher implicit value of personal collateral as a discipline device. The likelihood that the borrower will feel personal loss is higher when granting personal collateral. Liberti and Mian (2010) make a distinction between firm-specific (firm inventory/machinery, equipment, and account receivables) and non-firm-specific assets (land and Real State, bonds and shares). The authors find that there is a strong tendency for the composition of collateral assets to shift from firm specific to non-firm specific assets when loan risk increases. One of the reasons might be that the value of firm-specific assets diverts more between the lender and the borrower, compared with non-firm specific assets.

Vig (2013) distinguishes assets used as collateral according to their tangibility (fixed assets). Vig (2013) shows that strengthening secured creditor rights increases secured debt capacity and lowers the cost of borrowing, but it also exposes firms to the threat of being prematurely liquidated. Here we see a substitution effect, where a standard secured debt contract may lead to inefficient liquidations when firms value continuation. For this reason, firms that value continuation will have a higher implicit value for core assets (more associated with fixed assets) compared with non-core assets (more associated with liquid assets).

Ceteris paribus, firms will prefer to pledge non-core assets, given the threat of being prematurely liquidated. On the other hand, if banks can mitigate moral hazard by using any asset as collateral, they will prefer to demand liquid assets, in order to recover as smoothly as possible any loss from debtor default. If non-core assets are liquid assets with a market value accepted by both parties (no implicit value), the use of such assets would constitute a Pareto improvement, as it makes none of the parties worse off. Firms would be able to access credit pledging collateral with assets that do not compromise its profit-making activities, and banks could mitigate moral hazard with assets easy to repossess and sell at market value. This brings us to our second prediction.

Prediction 2. Better protection of creditor rights increases the demand for collateralizable assets, in particular for the more liquid types of security interests.

The empirical work seems to confirm that collateral plays a disciplinary role in the behavior of borrowers (Berger and Udell, 1995; Brick and Palia, 2007), thus solving the *moral hazard* problem. In contrast, Lehmann and Neuberger (2001) and Jimenez *et al.* (2006) suggest a signaling value of collateral, which would solve the *adverse selection* problem. Nevertheless, Cressy and Toivanen (2001) find no significant relationship between risk and the pledging of collateral. One explanation for the inconsistency of these empirical researches might be the endogeneity issue of collateral and risk, since borrowers who provide more guarantees receive a better rating (Steijvers and Voordeckers, 2009).

Strengthening creditor rights reduces borrowing costs and thus relaxes financial constraints, but it can also impose an extra cost on certain borrowers (Vig, 2013). In analyzing the effect of a reform in creditor rights, instead of distinguishing borrowers by their

risk⁴, given the endogeneity problems, firms could be differentiated according to the amount of collateral pledged before the reform. A firm can pledge a certain level of collateral (high or low) in a disciplinary and in a signaling role. Such an approach would aim at comparing the level of collateral pledged by the same firm, before and after a reform, and would allow for both *moral hazard* and *adverse selection* problems to coexist.

If banks value collateral more, they may standardize a level of collateral. This can create an extra cost that would be enforced on those firms that had a lower level of collateral pledged before the reform. Borrowers who were signaling with lower levels of collateral will incur an extra cost to signal their quality to the bank, while borrowers who were pledging lower levels of collateral as a disciplinary measure will bear an extra cost simply to comply with their original agreement.

This leads us to our third prediction.

Prediction 3. A reform that strengthens secured creditor rights has a mixed effect on borrowers, depending on their previous level of collateral pledged. Collateral pledge would decrease for those borrowers who previously had to pledge collateral that exceeded the value of the loan (firms that are better off); and it would increase for those borrowers with a lower level of pledged collateral before the reform (firms possibly worse off and then facing additional cost).

The truth is that firms are not eager to pledge collateral. First, there is the risk of losing the collateral pledged in the case of default. Second, firms incur other costs, such as making additional reports to financial institutions, or agreeing on more restrictive asset usage (Coco, 2000). Third, the entrepreneur incurs a loss of welfare due to restrictions on selling the asset. Forth, pledging collateral limits the firms' ability to obtain future loans from other lenders. In this last drawback, the lending bank is put in a position of power (Steijvers and Voordeckers, 2009).

Banks can also ask for more collateral than necessary, in an effort to build a 'quasi-monopoly' position with each borrower. This strategy works as a barrier-to-entry for other

⁴ Following the literature that analyses collateral pledge for firms with different risk levels, we tested predictions (1) and (3) by differentiating groups of firms with opposing default risk probabilities. In one sample we select *Low-risk firms*, which have an average rating equal or above the 75th percentile among all lenders before 2005:Q1 and zero otherwise. In the other sample, we select *High-risk firms*, which have an average rating equal or below the 25th percentile among all lenders before 2005:Q1 and zero otherwise. By running our specifications for *Low-risk firms* and *High-risk firms*, we find that the impact of the law was homogeneous between these two groups of firms. We also differentiate *Low-risk firms* and *High-risk firms* by the median of the average rating of the firm with all lenders before 2005:Q1, but results continue to hold.

banks (Lehmann and Neuberger, 2001). For firms with multiple bank relationships that feel threatened by a reform in creditor rights (*e.g.* the main bank demands a higher amount/degree of collateral in order to extract rents), one alternative in order to maintain the balance between credit supply and the demand for collateral might be found within their own multiple banking setup.

Bank ownership is one dimension that might differentiate a bank with regard to its lending techniques and loan pricing models. Using a sample of Bolivian firms that borrow from domestic and foreign banks, Beck, Ioannidou and Schafer (2012) show that foreign banks grant loans with lower interest rates and shorter maturity and are more likely to demand collateral than domestic banks. According to the authors, foreign banks have a more transaction-based lending technique, basing their prices on credit ratings and collateral pledges. Domestic banks have a more relationship-based lending technique, pricing according to length, depth and breadth of the relationship with the borrower.

This brings us to prediction 4.

Prediction 4: For firms that value multiple relationships and could be made worse off by a strengthening of creditor rights, domestically-owned banks could be a strategic alternative to circumvent the extra cost imposed by the higher demand for collateral.

3 – Creditor rights reform

3.1 – Pre-reform

The old legislation regulating the Brazilian bankruptcy procedures, prescribing both reorganization and liquidation, was ineffective in maintaining the value of a firm's assets and protecting creditors' rights in liquidation.

Concerning the reorganization process (the old term is *concordata*), creditors and debtor should be unanimous in the decisions regarding the restructuring procedures. In most cases, there were serious issues of collective enforcement problems arising from coordination failures. Additionally, creditors could not remove the debtor manager from office, which would not incentivize creditors to provide additional financing to potentially viable firms. The old law only postponed debt payments and with time, a firm's restructuring plans would be turned into a bankruptcy liquidation.

Liquidation procedures were typically lengthy and costly. On average, resolving an insolvency case would take up to 10 years, mainly because of procedural inefficiency and lack of transparency. Figure 1 illustrates this dimension of inefficiency, comparing Brazil with seven other groups of countries⁵. The figure shows that the average time to close a business in Brazil was more than twice the average for Latin America (Araujo *et al.*, 2012). As a result, assets would often be devalued over the course of the procedures.

The government attempted to improve creditor rights in 2004⁶, allowing banks to repossess and sell assets under fiduciary lien⁷. In particular, we highlight the fiduciary cession agreement of credit rights and rights over banking accounts (defined in our paper as *Highly liquid collateral*), and fiduciary assignments on equipment, vehicles, real estate, and other asset claims (*Collateral with direct possession*). However, due to political uncertainty, the banking system was skeptical about the implementation of the law. There was considerable uncertainty about the ability of the court system to operationalize the law and whether assets under fiduciary lien agreements would be part of the pool of assets of the bankruptcy petition.

Moreover, due to successor liability, which implied that in liquidation the debts of a firm were passed on to the new equity holders, firm assets were more likely to be sold piecemeal than jointly. This further reduced the proceeds from the liquidation. Furthermore, the bankruptcy priority rule was very punitive to secured creditors⁸. The old law specified the following order: first, labor claims; second, tax claims; third, secured creditors' claims; and finally unsecured creditors' claims and trade debts.

The inefficiencies that characterized the former bankruptcy procedures lead to significantly lower secured credit recovery values. The average recovery rate – expressed in cents per claim dollar that creditors are able to recover from an insolvent firm – was 0.2 cents

⁵ Groups of countries include the Organization for Economic Cooperation and Development (OECD), Latin America and the Caribbean (LAC), the Middle East and North Africa (MENA), Europe and Central Asia (ECA), East Asia and the Pacific (EAP), South Asia (SAS), and Sub-Saharan Africa (SSA).

⁶ Law 10.931 enacted in August 2, 2004.

⁷ Under the fiduciary lien, the direct and indirect possession of the asset stays with the lender, and repossession could take place without the need of judicial court procedures (Araujo *et al.*, 2014).

⁸ The seminal paper by La Porta *et al.* (1998), titled “Law and Finance” ranked Brazil low in terms of creditor rights. Using an index that varies from zero to four, with higher scores, higher creditor rights, Brazil attained the score of one. The index is formed by “adding one when (1) the country imposes restrictions, such as creditors' consent or minimum dividends to file for reorganization; (2) secured creditors are able to gain possession of their security once the reorganization petition has been approved (no automatic stay); (3) secured creditors are ranked first in the distribution of the proceeds that result from the disposition of the assets of a bankrupt firm; and (4) the debtor does not retain the administration of its property pending the resolution of the reorganization” (La Porta *et al.*, 1998).

on the dollar in Brazil before the new bankruptcy law (World Bank, 2005). Since this fact was known to creditors *ex-ante*, collateral was undervalued. Banks would either supply unsecured credit, substituting collateral by higher interest rates and lower maturity, or would supply secured credit, by demanding collateral in excess of the loan's value.

3.2 – Post-reform

The new bankruptcy law (Law 11,101) was published in February 2005 and came into force in June of the same year. It was inspired by chapters 7 and 11 of the US bankruptcy code. It sealed the creditor rights reform that started in 2004 and increased the chance of viable businesses being restructured.

The new law introduced a new reorganization procedure where the firm could enter into an extrajudicial reorganization, an out-of-court process close to the “pre-packaged bankruptcy” under the US code. A reorganization plan can be approved by the majority of creditors (60% of each class or group of creditors), instead of the need for the unanimous decision of all players involved. It is also possible for the firm to enter into a judicial reorganization, based on the US chapter 11, where creditors may remove the debtor manager from office and demand the appointment of new managers by the court. In order to give creditors incentives to provide additional financing for the reorganization of businesses, post-petition credits have priority over the assets in the debtor's pre-petition estate.

In the worst-case scenario, where the firm's restructuring plan does not receive enough support from the creditors, a judicial reorganization is turned into a bankruptcy liquidation. With the new law, legislators aimed to foster the distress market and removed successor liability. Thus, claims remain as liabilities of the debtor and are no longer passed to the purchasers. This increases the value of distressed firms when sold in full or by business units (Ponticelli, 2014).

In case of a bankruptcy procedure, secured creditors are now given a higher priority. The new law still prioritizes labor claims, but now it sets limits on the amount to be paid to labor debt, with the introduction of a cap of 150 times the monthly minimum wage⁹. Additionally, tax authorities lost their priority in relation to secured credit claims up to the limit of the encumbered amounts. The higher priority accorded to secured creditors increased their protection in exercising their creditor rights.

⁹ In 2005, the monthly minimum wage was R\$300, which corresponds approximately at the time to US\$100.

The law had a clear rule for assets under fiduciary lien. Both fiduciary cession agreement of credit rights and rights over banking accounts (defined in our paper as *Highly liquid collateral*), as well as fiduciary assignments on equipment, vehicles, real estate, and other asset claims (*Collateral with direct possession*) would be excluded from the pool of assets under the bankruptcy petition. In other words, the law exempted from the bankruptcy procedure that would affect all other secured and unsecured debt creditors that had taken collateral in the form of fiduciary lien. This was a novel provision of the law, which gave banks an extra incentive to use these types of guarantees. However, the law restricted the repossession of assets considered as core-assets¹⁰ under *Collateral with direct possession*. In this case, the judge would need to set an appropriate time to allow the recovery of the firm, before the bank could repossess and sell the assets.

With the changes brought by the new bankruptcy law, banks could increase their recovery rate in the case of financial distress, and could evaluate *ex-ante* their likely recovery on each loan. Figure 2 illustrates the increase in the recovery rate after 2005, reaching 12 percent at the end of that year¹¹. In addition, the average time to close a business in Brazil has fallen from 10 to 4 years, reducing the depreciation of assets. The significant boost in the rights of secured creditors affected the use of collateral in the country. Banks increased their demand for secured credit, especially for more liquid types of collateral, and decreased the variation in collateral pledged by firms.

4 – Data and descriptive statistics

The primary database employed in this study is the credit registry from the Central Bank of Brazil, which contains specific information on bank–firm credit relationships. The dataset covers the period from 2004:Q1 to 2005:Q4, where we are able to follow loans, firms, and banks over time. Loans that each borrower has with banks operating in Brazil are registered above a threshold of 5,000 Brazilian Real (around 2,500 USD in December 2012). Data is available at quarterly frequency and is of very high quality since the total outstanding loan amount at the credit registry must match the bank’s quarterly accounting figures for

¹⁰ Core assets are essential property of a business without which a business would dissolve, since the company cannot carry on with its profit-making activities. The judge is the one that determines whether an asset is a core-asset depending on the type of business. Examples could include vehicles, equipment, machinery, industrial plants, land, etc.

¹¹ The average of Latin American and OECD countries remained stable (29% and 67%, respectively) (Araujo *et al.*, 2012)

credit loan. Central Bank ensures the quality of the data, and intermediaries use the credit registry as a screening and monitoring device for borrowers.

In addition, we use collateral information on financial contracts also extracted from the credit registry. The benefit of a credit registry is that it allows creditors' claims in secured assets to be easily verifiable by third parties. Secured assets need to be registered with a notary and, in most cases, cannot be pledged for different loan contracts. Banks are asked to send information on whether the loan is secured or unsecured at each quarter. In the case that a loan is secured, we have information on both the type of the security and its market value.

Some drawbacks of the collateral database include the presence of a few gaps for banks that did not send all the quarterly collateral files. Moreover, banks might register just part of their secured portfolio in specific quarters. And furthermore, the information on the market value of the assets pledged by the banks as collateral is not always reliable. In order to mitigate these issues we perform several tests to detect absence of collateral information. Gaps on collateral information are seldom and more prominent in smaller institutions¹². We employ a strategy where we consider a loan as secured if the loan is registered in the credit register as "secured" in any quarter of the whole dataset¹³. Finally, in order to study the amount of collateral pledged by the firm, we consider a sample of secured loans, where we keep just the first observation of each loan contract.

We also obtained from Central Bank consolidated and unconsolidated balance sheet data with quarterly frequency of all the banks operating in Brazil. In addition, we have bank ownership and conglomerate information. After several checkups to ensure that the data is of high quality, we merge these different datasets using the public bank identification number.

We keep all non-financial and private firms with outstanding credit in the credit registry. We exclude firms that do not appear throughout the sample period that goes from 2004:Q1 until 2005:Q4. The sample of banks includes commercial banks and multiple banks with a commercial portfolio¹⁴. Furthermore, banks should appear in the pre- and in the post-periods. This partially controls for mergers and acquisitions among banks. We further control for M&A and rebalancing of the bank's loan portfolio, since we can track whether each loan was initiated by the bank itself, or whether there is a new relationship with the acquirer bank.

¹² Results are robust to dropping such institutions.

¹³ Results are robust to considering loans secured only at the quarter we merge the loan files with the collateral files.

¹⁴ The Brazilian Development Bank (BNDES) is excluded from the sample given its particular objectives and operational differences, especially in its cost of funding and its long-term assets.

Table 1 shows the definitions of the variables used in testing each of the predictions.

– Insert Table 1 here –

4.1 – Sample and variables for Prediction 1

We select a sample of firms with outstanding loan amount before and after the reform of creditor rights. We keep firm observations if the firm appears in the pre-period for at least three out of the four possible quarters. The same applies for the post-period. Therefore, we keep the firm if there is a 75% minimum appearance throughout the sample period. Results are robust to the loosening of such restriction.

Loan amounts are aggregated at firm and quarter level. In this setting, we have 5,252,939 firm–time observations for 796,582 firms. The dependent variable is *Secured debt*, defined as the ratio of outstanding debt amount guaranteed by any type of collateral from borrower i in quarter t . Table 2 – Panel A shows the summary statistics of *Secured debt* and all other variables used to test prediction 1. A firm’s debt structure was composed on average of 17% of secured debt before the law. After the law, the ratio of secured debt increased to 27% (0.10 in the “Diff” column of Table 2 – Panel A). This is an economic and statistically significant change, as we can observe from the p-value of the T-test column.

– Insert Table 2 here –

From the overall sample, one can notice that the average firm debt was around USD 17.000. Additionally, most of the firms had just one bank relationship. The participation of overdraft loans was around 40%, factoring 13%, term loans 9%, and leasing and export loans around 0.1%. The omitted category is regular loan. From the standard deviation measures, one can notice that there is extreme variability in the firm variables. Such firm differences can be correlated with the pledge of collateral, so we formally control for these variables in the regressions analysis. It is important to recall that systematic differences across firms are controlled in the regressions by firm fixed effects.

Figure 3 shows the dynamics of secured debt in the eight quarters of our analysis. At a first glance, the creditor rights reforms that started in August 2004 with the Fiduciary law and were sealed in February 2005 with the Bankruptcy law have increased the use of secured debt. It may be the case that collateral law matters more for credit market development than bankruptcy law (Haselmann, Pistor and Vig, 2008). Although the figure shows a high increase of secured debt by the third quarter of 2004, for the purpose of this paper we do not take a position on which law had a greater effect on the supply and demand for collateral. We rather analyze the complementary effect of both laws in the usage of collateral.

– Insert Figure 3 here –

4.2 – Sample and variables for Prediction 2

The same sample selected for prediction 1 is used to test prediction 2. The three dependent variables in this setting are:

- *Highly liquid collateral*, defined as the ratio of outstanding debt amount guaranteed by highly liquid collateral. Security interests in this category include checks, fixed income investments, shares, debentures, deposits, promissory notes, and other credit claims under fiduciary cession agreement of credit rights and rights over banking accounts;
- *Collateral with direct possession*, defined as the ratio of outstanding debt amount guaranteed by collateral with the direct and the indirect possession of the lender. Security interests in this category include fiduciary assignments on equipment, vehicles, real estate, and other asset claims;
- *Collateral with indirect possession*, defined as the ratio of outstanding debt amount guaranteed by collateral with the indirect possession of the lender. Security interests in this category include pledge on equipment, vehicles, real estate, mortgages of real properties and other asset claims.

From Table 2 – Panel B we can see that a firm’s debt structure before the change in the law was composed, on average, by 8% of debt secured by *Highly liquid collateral*, 7% of debt secured by *Collateral with direct possession*, and 1% of debt secured by *Collateral with indirect possession*. After the law was introduced, debt secured by *Highly liquid collateral*

increased to 14%, *Collateral with direct possession* increased to 10%, and debt secured by *Collateral with indirect possession* increased to 2%. Figure 4 shows the dynamics of secured debt guaranteed by different types of collateral in the 8 quarters of our analysis.

– Insert Figure 4 here –

4.3 – Sample and variables for Prediction 3

In order to test prediction 3, we select a sample of firms with secured loans before and after the reform in creditor rights. Since the information on the market value of the assets pledged by the banks as collateral is not always reliable, we consider only the first observation of each loan. Collateral value must be greater than zero, as we aim to test the intensive margin effect of the amount of collateral pledged by the same firm, before and after the reform. A loan is defined as a single firm–bank relationship. If a firm takes out several loans from the same bank at a given quarter, we aggregate all loans for this firm–bank pair. Additionally, each loan must have information on the following: loan amount, maturity, interest rate, credit rating, and type. The controls for loan type are the percentages of loans that are classified as overdraft, factoring, term loans, leasing, and export loans (Schnabl, 2012). The omitted category is regular loan.

We differentiate firms depending on the amount of collateral they pledged before the reform¹⁵. We define the two groups of borrowers according to their previous *Collateralization rate* compared with the sample median *Collateralization rate* before the reform. The median *Collateralization rate* before the reform is one. *Low-pledge firms* are defined using a dummy variable that takes the value one if firm *Collateralization rate* before the law is equal or below one, and zero otherwise. *High-pledge firms* are defined using a dummy variable that takes the value one if firm *Collateralization rate* before the law is above one, and zero otherwise.

Table 3 shows the summary statistics of *Collateralization rate* and all other variables of both groups of firms used to test prediction 3. We can notice that the mean *Collateralization rate* for *Low-pledge firms* before the reform was 0.95. After the reform, the rate increased to

¹⁵ A firm can pledge a certain level of collateral (high or low) in a disciplinary and in a signaling role. As our approach aims at comparing the level of collateral pledged by the same firm, before and after a reform, it allows for both *moral hazard* and *adverse selection* problems to coexist.

1.09. *High-pledge firms*, on the contrary, had an extremely high *Collateralization rate* of 8.52 before the reform. This rate came down to 5.85 after the reform.

– Insert Table 3 here –

Figure 5 shows the Kernel density estimate for *Collateralization rate* before and after the reform. For the purpose of a better visualization of the difference in distributions, we winsorize *Collateralization rate* at 95%. One can notice that the collateral pledged after the reform had a clear tendency to be concentrated. We confirm the non-equality of the distributions of *Collateralization rate* before and after the reform using the two-sample Kolmogorov-Smirnov test for equality of distribution functions. We interpret this as a first indication that the law had a standardization effect on the amount expected to be pledged by firms in order for a bank to grant a new loan.

– Insert Figure 5 here –

4.4 – Sample and variables for Prediction 4

In order to test for prediction 4, we first use a subsample used to test prediction 3. Specifically we focus on *Low-pledge firms* since they that might have an extra cost in pledging more collateral after the reform. Specifically, we investigate the impact on the intensive margin on the same firm, at the same point in time, for foreign banks versus domestic banks. First, in a sample of *Low-pledge firms*, we test whether the demand of foreign banks for collateral increased more compared with domestic banks after the changes brought by the creditor rights reform. Next, in the whole sample of firms with multiple bank relationship, we test whether the demand of foreign banks for *Secured credit* increased more compared with domestic banks after the reform.

In the analyses for *Collateralization rate*, we track 7,795 loans. Table 4 – Panel A shows descriptive statistics of *Collateralization rate* and all other variables for each group of banks, according to their ownership. Before the reform, the *Collateralization rate* was 0.98 for foreign banks, 0.89 for government banks and 0.78 for private domestic banks. After the

reform, *Collateralization rate* increased to 1.01 for foreign banks, 1.13 for government banks and 1.22 with private domestic banks.

– Insert Table 4 here –

However, the validity of the identification strategy depends on a similar trend in the pre-period of the variable *Collateralization rate* from foreign banks and other banks, conditional on all controls. The requirement for a similar trend only applies to how much foreign banks, private domestic banks, and government banks depart from their time-invariant component in the pre- and post-period. Data do not allow us to run ex-ante placebo tests.

Figure 6 shows the *Collateralization rate* by bank ownership for *Low-pledge firms*. We can note that the change in the law had a greater effect on those with relationships with domestic banks. Before the law reform, collateral pledge with domestic banks was lower than that for foreign and government-owned banks, but after the law reform, this situation turned in the opposite direction, with domestic banks demanding higher levels of collateral compared with foreign banks. It is interesting to note that for *Low-pledge firms* the lending policy of foreign banks remained constant after the reform. In any case, we document the preference of banks to fully or over-collateralize their credit positions after the reform.

– Insert Figure 6 here –

In the analyses for *Secured credit*, we track 5,252,939 loans. Table 4 – Panel B shows descriptive statistics of *Secured credit* and all other variables for each group of banks, depending on their ownership. Before the reform, the *Secured credit* was 0.29 for foreign banks, 0.14 for government banks and 0.33 with private domestic banks. After the reform, *Secured credit* increased to 0.35 for foreign banks, 0.24 for government banks and 0.51 for private domestic banks. Figure 7 shows the level of *Secured credit* by bank ownership. Again, domestic banks detach from foreign banks after the creditor rights reform.

– Insert Figure 7 here –

The differences in the means of *Collateralization rate* of government banks compared with foreign or with private domestic banks are statistically significant. The same applies to the means of *Secured credit*. The difference in means of relationship controls and bank balance sheet variables among foreign, private domestic, and government banks is statistically significant. For this reason, the need to include them as controls in the regression analysis.

It is possible that both subsamples used to test prediction 4 are not representative of the population intended to be analyzed. As we select firms with multiple banking relationships, these firms are expected to be larger firms. As we do not know the public identity of the firm, their location, nor their industry, it is difficult for us to give an account of the importance and the direction of the selection bias. To the extent that medium and large firms represent almost 65% of the Brazilian GDP in 2004¹⁶, and that the non-exclusivity in banking relationship is the most controversial in the literature, the selection bias may actually be beneficial for our analysis. These are the situations where the firm may have a choice in deciding which bank to contract to, which is exactly what we want to capture in terms of collateral pledge.

5 – Empirical analysis

In this section, we empirically analyze the theoretical predictions laid out in Section 2. However, identifying a causal effect on collateral in the change to creditor rights poses important challenges.

First, there is a lack of a common identification system for loans, their guarantees, and borrowers, making the matching of large samples difficult. We overcome this difficulty thanks to the richness of the dataset that allows us to identify banks, firms, loans, and collateral information over time. Given also the several loan characteristics the dataset possesses, we are able to observe the dynamics of each loan, whether it is secured or not, and the type of security interests pledged by the banks, among several other variables. Given the size of the overall sample, inferences are robust enough to enlighten our knowledge regarding collateral pledge.

¹⁶ Estimates are from the Brazilian Institute of Geography and Statistics (IBGE).

Second, any attempt to examine the link between the strengthening of creditor rights and collateral potentially suffers from omitted variables. We use a set of fixed effects (firm, time, firm–time, and bank fixed effects) when appropriate. Each of the fixed effects enables us to control for a dimension of unobserved heterogeneity that affects the dynamics of the collateral pledged. Moreover, we include time-varying firm, bank, and firm-bank level controls, depending on the regressions. These controls enable one to check the robustness of the findings, in particular whether the inclusion of other covariates reduces the estimated impact of the reform in the baseline model. Last, but not least, since the residuals may be correlated across different dimensions of the data, we base ourselves on Bertrand, Duflo and Mullainathan (2004), in order to cluster standard errors at the appropriate level.

Table 5 is the one that best captures the main identification strategies. We collapse the data into a single data point (based on averages) both before and after the reform. This results in two data points per unit of observation, one data point for the pre-reform regime and one point for the post-reform regime. This time-collapsing of the data ensures that the standard errors are robust to Bertrand, Duflo and Mullainathan (2004) critique¹⁷.

– Insert Table 5 here –

In Panel A, we report the before-after results for the variable *Secured debt*. As can be seen, *Secured debt* increased 9 percentage points after the reform. In Panel B, the dependent variables are *Highly liquid collateral*, *Collateral with direct possession*, and *Collateral with indirect possession*. As we can see, all classes of collateral agreements increased, in particular, *Highly liquid collateral* with 6 percentages points. In Panel C, we report the opposite before–after results of the variable *Collateralization rate* for *Low-Pledge firms* and *High-Pledge firms*. In Panel D, we show that *Collateralization rate* for *Low-Pledge firms* after the reform changed less for foreign banks, with minus 14 percentage points in comparison to domestic banks (Government and private domestic banks). In Panel E, we show that *Secured credit* for firms with multiple banking relationships after the reform changed less for foreign banks, with minus 9 percentage points, than for domestic banks.

¹⁷ The Bertrand, Duflo and Mullainathan (2004) critique relates to serial correlation – the tendency for one observation to be correlated with those that have gone before – especially in differences-in-differences models. The simplest and most widely applied approach is simply to time-collapse the data. We believe that our number of bank clusters (>50 banks) does not cause biased standard errors or misleading estimates.

5.1 – Effect of the reform on corporate debt structure

We begin with prediction 1, which states that a reform that strengthens secured creditor rights would cause secured debt to increase. The dependent variable is *Secured debt*_{*i,t*}, defined as the ratio of outstanding debt amount guaranteed by any type of collateral of borrower *i* in quarter *t*.

We then estimate the following regression:

$$\text{Secured debt}_{i,t} = \alpha_i + \alpha_t + \beta_1 \text{Post}_t + \gamma_1 X_{i,t} + \gamma_2 Y_{i,t} + \varepsilon_{i,t} \quad (1)$$

where *Post* is a dummy variable that takes the value one from 2005:Q1 to 2005:Q4 and zero otherwise. The sample period starts in 2004:Q1 and ends in 2005:Q4. We include firm and time fixed effects, respectively α_i , and α_t , controlling for unobserved heterogeneity at each of both dimensions. $\varepsilon_{i,t}$ is an idiosyncratic error term. Since the residuals may be correlated across firms and across time, we cluster standard errors at the firm–time level. Vector $X_{i,t}$ controls for a set of observable characteristics of firm *i* at time *t*, including the size of the debt, the number of lenders, and the weighted average rating. Vector $Y_{i,t}$ controls for loan type as percentages of loans that are classified as overdraft, factoring, term loans, leasing and export loans (Schnabl, 2012). The omitted category is regular loan. In order to check whether the inclusion of covariates reduces the impact estimated for the reform in the baseline model, we also show estimates of equation (1) without vector $X_{i,t}$ and without vector $Y_{i,t}$.

Table 6 provides the main results of the baseline model, where we regress *Secured debt* on the reform of creditor rights. Columns (1) to (3) show the effect of the dummy *Post* on *Secured debt* in the period from 2004:Q1 to 2005:Q4. In column (1), we present the results of equation (1) suggesting that the reform had a strong effect on collateral pledge. The estimate of *Post* is positive, statistically significant and economically meaningful. The reform increased *Secured debt* by an estimate of 14 percentage points. Here, we include firm and time fixed effects, but do not control for time-varying firm characteristics.

– Insert Table 6 here –

Results are also robust when we control for time-varying firm characteristics, as one can observe in column (2). Even when we control for loan type characteristics, results remain statistically and economically significant. The reform increased *Secured debt* by an estimate of 13 percentage points. Regarding our firm controls, the higher the debt size the higher *Secured debt* will be, with an estimate of four to six percentage points – columns (2) and (3), respectively. However, an additional lender is estimated to have a negative effect of around three to four percentage points in *Secured debt*, whereas a change to a higher category in the credit rating scale has a negative effect of one percentage point. Concerning the type of loans, there is considerable heterogeneity on the estimated effect, relative to regular loans, on *Secured debt*. Term loans appear to be the most significant type of loan to positively influence *Secured debt*, with an estimate of 32 percentage points – column (3).

We consider a number of robustness tests and alternative explanations that may fully or partially account for the results reported in Table 6. One argument could be that the sample period of four quarters in the pre-period and four other quarters in the post-period is not appropriate to understanding the long-run effect of reform. To address this concern, we test equation (1) for sample periods of five and of six quarters after the law changed. The results suggest that a larger sample after the change also captures the change in collateral pledge.

Another argument, as discussed by Haselmann, Pistor and Vig (2008), is that collateral law may matter more for credit market development than bankruptcy law. In our case, there are two laws in place. The Fiduciary law of August 2004 and the Bankruptcy law of February 2005 that we consider as having a complementary effect. To address the concern that the effect of the first reform is the main cause of the increase in *Secured debt*, we test equation (1) where the reform takes place in 2004:Q3, with two quarters in the pre-period and two quarters in the post-period. Results suggest that this might be the case. Moreover, the exact content of the Bankruptcy law could hardly be anticipated before its publication, because of conflict of interest between the fiscal authority and the banking sector on the priority of credit claims and the several passages through the congress and the senate (Ponticelli, 2014).

5.2 – Effect of the reform on collateral type

In the case that a loan is secured, banks are asked to send information on what type of the security interest is being used as collateral. We group collateral agreements in three categories of liquidity, depending on the degree to which the assets can be possessed and

sold. We define *Highly liquid collateral*, as the ratio of outstanding debt amount guaranteed by highly liquid collateral. Security interests in this category include checks, fixed income investments, shares and debentures, deposits, promissory notes, and other credit claims under fiduciary cession agreement of credit rights and rights over banking accounts.

The second most liquid category of collateral agreements is *Collateral with direct possession*, defined as the ratio of outstanding debt amount guaranteed by collateral under the direct and the indirect possession of the lender. Security interests in this category include fiduciary assignments on equipment, vehicles, real estate, and other asset claims. The least liquid type of collateral agreements includes *Collateral with indirect possession*, defined as the ratio of outstanding debt amount guaranteed by collateral under the indirect possession of the lender. Security interests in this category include pledge on equipment, vehicles, real estate, mortgages of real properties, and other asset claims.

As discussed in the Section 3, the law had a clear rule for assets under fiduciary lien. Assets under *Highly liquid collateral* and under *Collateral with direct possession* would be excluded from the pool of assets under the bankruptcy petition. This gave banks an extra incentive to use these types of guarantees, in special of *Highly liquid collateral*, because of the absence of repossession restrictions in case of firm liquidation. We run equation (1) for these three different dependent variables. All the controls are kept the same for prediction 2.

Table 7 decomposes the impact of the Brazilian creditor rights reform on secured debt, depending on the lender's ability to repossess and sell the collateralizable assets. The dependent variable is *Highly liquid collateral* in columns (1) to (3); *Collateral with direct possession* in columns (4) to (6); and *Collateral with indirect possession* in columns (7) to (9). The reform increased the use of *Highly liquid collateral* by an estimate of eight percentage points. Columns (4) to (6) shows that the reform increased the use of *Collateral with direct possession* by an estimate of four percentage points. The last three columns of Table 7 show that the reform increased the use of *Collateral with indirect possession* by an estimate of one percentage point.

– Insert Table 7 here –

The differences in estimates between each combination of the results in columns (3), (6) and (9) are statistically significant. The law had an effect on the use of security interests, in particular on more liquid collateral agreements.

5.3 – Effect of the reform on collateralization rate

Prediction 3 states that a reform that strengthens a secured creditor’s rights has a mixed effect on borrowers, depending on their previous level of pledged collateral. Collateral pledge would decrease for those borrowers who previously had to pledge extremely large amounts of collateral (firms better off); and it would increase for those borrowers with a lower level of pledged collateral before the reform (firms possibly worse off then having an extra cost after the reform).

As banks value collateral more, they may standardize the level of collateral demanded. This can create an extra cost that would be enforced on firms that had a lower level of collateral pledged before the reform. Borrowers who were signaling with lower levels of collateral will have an extra cost in signaling their quality to the bank, and those borrowers who were pledging lower levels of collateral as a disciplinary measure will incur an extra cost simply to comply with their original agreement.

The dependent variable is *Collateralization rate* $_{i,b,t}$ which is the value of the collateral to contract amount, winsorized on 98%/2% level of borrower i in quarter t . As discussed in Section 4, we define the two groups of firms according to their previous *Collateralization rate*. *Low-pledge firms* are firms who, before the reform, pledged, on average, an amount of collateral equal to or below the loan amount they received. *High-pledge firms*, on the other hand, are firms who, before the reform, pledged amounts of collateral that exceeded the loan amounts they received.

The most saturated specification for *Low-pledge firms* and for *High-pledge firms* is:

$$Collateralization\ rate_{i,b,t} = \alpha_{i,t} + \alpha_b + \beta_1 Post_t + \gamma_1 W_{i,b,t} + \gamma_2 Z_{i,b,t} + \varepsilon_{i,b,t} \quad (2)$$

where *Post* is a dummy variable that takes the value one from 2005:Q1 to 2005:Q4 and zero otherwise. The sample period starts in 2004:Q1 and ends in 2005:Q4. We also include firm–time and bank fixed effects, respectively $\alpha_{i,t}$ and α_b , controlling for unobserved time-varying

heterogeneity at firm level and unobserved time-invariant bank heterogeneity. $\varepsilon_{i,b,t}$ is an idiosyncratic error term. Since the residuals may be correlated across banks and across time, we cluster standard errors at the bank level.

Vector $W_{i,b,t}$ controls for a set of observable characteristics of firm i with bank b at time t , including the loan amount, loan maturity, loan spread, and loan rating. Vector $Z_{i,b,t}$ controls for loan type as percentages of loans that are classified as overdraft, factoring, term loans, leasing, and export loans (Schnabl, 2012). The omitted category is regular loan. In order to check whether the inclusion of covariates reduces the impact estimated for the reform, we also show estimates of equation (2) without vector $W_{i,b,t}$ and without vector $Z_{i,b,t}$.

By using vectors $W_{i,b,t}$ and $Z_{i,b,t}$, instead of assuming that collateral is exogenous, our approach endogenizes for collateral using the jointness of several loan characteristics. Thus, we recognize that lenders do not consider each contractual agreement as an isolated debt contract feature. Instead, banks may simultaneously consider the whole contract features they can rely on. Brick and Palia (2007), and Cressy and Toivanen (2001) also consider this possibility. Our paper adds to this literature by applying firm and bank fixed effects, as we use a panel sample where we can trace the new loans of the same bank–firm combination over time. Therefore, we recognize important interrelated debt contract features including intrinsic characteristics of the relationship of the borrower with the lender.

Table 8 shows the impact of the Brazilian creditor rights reform on *Collateralization rate*. Specifications (1) to (3) account for *Low-pledge firms – Collateralization rate* equal or below one in the pre-period ($Post=0$). In column (1), the estimate of $Post_t$ is positive, statistically significant and economically meaningful, showing that the change to the law increased the demand for collateral of *Low-pledge firms* by 17 percentage points. Here, we include bank, and firm–time fixed effects, but do not control for time-varying bank–firm characteristics. Results are also robust when we control for time-varying bank–firm characteristics, as one can observe in column (2). A conservative estimate of the effect of the law on *Collateralization rate* for *Low-pledge firms* is an increase of 12 percentage points, as it can be found in column (3), after we add controls for the type of loans.

– Insert Table 8 here –

Specifications (4) to (6) account for *High-pledge firms – Collateralization rate* above one in the pre-period ($Post=0$). For these firms, we document an opposite effect of the law reform that seems to have significantly decreased the *Collateralization rate* for firms that had been pledging amounts of collateral that exceeded the value of their loans. In column (4) the estimate of $Post_t$ is negative, decreasing the demand for collateral of *High-pledge firms* by 40 percentage points. By adding time-varying bank–firm characteristics – column (5) – and type of loans – column (6), one can observe that the estimate of the law becomes more conservative, with an estimate of 36 and 25 percentage points, respectively.

In order to test whether the results are biased because of the econometric design (*e.g.* focusing on the tails of the distribution before and after the law reform), we test prediction 3 in a placebo using a sample before the reform. The sample period goes from 2004:Q1 to 2004:Q4, where $Post$ is a dummy variable that takes the value one from 2004:Q3 to 2004:Q4, and zero otherwise. Although one can argue that there is a natural tendency of the data to move to the median of the sample from one period to the next, we do not find evidence in this direction. The economic significance of the estimates we find in Table 8 is strong and reinforce the effect of the strengthening of creditor rights on a bank’s lending policy standardization.

Following the literature that analyses collateral pledge for firms with different risk levels, we tested predictions 1 and 3 by differentiating groups of firms with opposing default risk probabilities. We expected to find a heterogeneous effect of the change in the law on the different groups of firms, but we did not find evidence in this direction. Formally, we selected *Low-risk firms* that before 2005:Q1 had an average rating above the 75th percentile among all lenders. In the other sample, we selected *High-risk firms*, which before 2005:Q1 had an average rating equal to or below the 25th percentile among all lenders. By running specifications (1) and (2) for *Low-risk firms* and *High-risk firms*, we found that the estimates of $Post$ are not economically and statistically significant between these two groups of firms. Results are similar when we test whether the estimates of $Post$ for both groups of firms are different when setting *Low-risk firms* and *High-risk firms* by the median of the average rating of the firm with all lenders before 2005:Q1.

5.4 – Effect of bank ownership on collateral pledge

We begin testing prediction 4 by focusing on *Collateralization rate* $_{i,b,t}$ for *Low-pledge firms*. It may be the case that these firms in particular feel themselves in a worse off situation, given the extra cost in having to pledge more collateral after the reforms. Here we ask the question whether a certain bank-ownership type could be a strategic alternative to circumvent the extra cost imposed by the higher demand of collateral.

One challenge is the simultaneous nature of the bank and the firm behavior regarding securities interests. We completely capture any change in the supply of collateralizable assets at the firm level by using firm–time fixed effects controls, $\alpha_{i,t}$. This comes at the cost that one needs to constrain one’s analysis to those firms with multiple bank relationships at the same time. In our case, we constrain our analysis to firms having a relationship with one foreign and one domestic bank (private domestic or public) in the pre- and post-period. We follow the intuition that domestic banks have an informational advantage over foreign banks, and in case of a legal change, foreign-owned banks would respond more strongly than domestic banks (Buch, 2003; Haselmann, Pistor and Vig, 2009). The most saturated specification is:

$$\text{Collateralization rate}_{i,b,t} = \alpha_{i,t} + \alpha_b + \beta_1 \text{Foreign}_b * \text{Post}_t + \gamma_1 W_{i,b,t} + \gamma_2 Z_{i,b,t} + \gamma_3 B_{b,t} + \varepsilon_{i,b,t} \quad (3)$$

where vector $W_{i,b,t}$ and vector $Z_{i,b,t}$ continue being defined as in equation (2) and vector $B_{b,t}$ controls for a set of observable characteristics of bank b at time t , including size of the bank, ratio of credit assets, equity to total assets, and return over assets (Roa). Therefore, we are able to control for further bank and bank–firm specific determinants of collateral pledge not captured by the specified fixed effects. In order to check whether the inclusion of other bank and bank–firm covariates reduces the impact estimated in the baseline model, we also show estimates of equation (3) without vector $B_{b,t}$ and without vectors $W_{i,b,t}$ and $Z_{i,b,t}$. Last, but not least, since the residuals may be correlated across banks and across time (Bertrand, Duflo and Mullainathan, 2004), we cluster standard errors at the bank level.

Given the market share of Brazilian government banks and their countercyclical behavior at given moments (IMF, 2012; Coleman and Feler, 2014), one hypothesis is that

government banks behave in a more detached way, compared with private domestic banks. Therefore, we also estimate the following:

$$\begin{aligned} \text{Collateralization rate}_{i,b,t} = & \alpha_{i,t} + \alpha_b + \beta_1 \text{Foreign}_b * \text{Post}_t + \beta_2 \text{Government}_b * \\ & \text{Post}_t + \gamma_1 W_{i,b,t} + \gamma_2 Z_{i,b,t} + \gamma_3 B_{b,t} + \varepsilon_{i,b,t} \end{aligned} \quad (4)$$

The coefficient of interest continues to be β_1 . In a difference-in-differences approach, β_1 captures the change in the demand for collateral, from the pre-treatment to the post-treatment period, for the treatment group (foreign banks) relative to the control group (private domestic and government banks in equation (3) and private domestic banks in equation (4)). A positive coefficient β_1 would imply, all else equal, that foreign banks increased their demand for collateral compared with other banks. The numerical estimate of β_1 captures the difference in the change of the demand for collateral between the pre- and the post-period induced by moving from the control group to the treatment group.

The sample period is 2004:Q1 until 2005:Q4 (quarterly data). The quarter we split the sample is 2005:Q1, which takes into account the date the new bankruptcy law was published (February 2005). Therefore, we have four quarters before the exogenous event and four quarters after it. Nonetheless, we also formally test the models for a sample period of five and six quarters after the change in the law and the results do not change. The same applies when we test for the possibility that the enforcement of the law in June 2005 is the start of the post-period.

This is a powerful identification within borrowers which is used to disentangle the bank's demand for security interests from the firm's supply of collateralizable assets. The within-firm comparison fully absorbs firm-specific changes in the supply of collateralizable assets, enabling us to defend that the estimated difference in *Collateralization rate* can be attributed to differences in a bank's demand for collateral. In order to reduce the risk that there is borrower-induced choice of multiple borrowers (*i.e.* borrowers who borrow from a historically weak domestic bank try to compensate with a stronger foreign bank), we keep firm-bank relationship if it appears in the pre-period for at least three out of the four possible quarters. The same applies for the post period. Therefore, we keep the bank-firm relationship if there is a 75% minimum appearance throughout the sample period. Results are robust to the loosening of such restriction.

In a summary, we identify the impact of the bankruptcy law on the demand for collateral by comparing the pre- and the post-patterns of *Collateralization rate* applied to the same firm by two or more banks, where the firm must have a relationship with one foreign and with another bank (private domestic or public). By using bank and firm–time fixed effects, bank and bank–firm level controls, the estimated difference in *Collateralization rate* can be plausibly attributed to differences in bank behavior, depending on their ownership.

Table 9 provides the first results of prediction 4. Columns (1) to (3) show the effect of the dummy *Foreign* interacted with *Post* on the demand for collateral. In column (1), we present the results of equation (3). The estimate of $Foreign_b * Post_t$ is negative, statistically significant and economically meaningful, showing that foreign banks demanded less collateral after the law when compared with domestic banks operating in the country. Here, we include bank, and firm–time fixed effects, but do not control for time-varying bank or bank–firm characteristics. Column (2) focuses on this comparison between foreign banks and domestic banks and estimates are increased from 15 percentage points in column (1) to 23 in column (2). In column (3), we include time-varying bank controls and results remain statistically and economically significant.

– Insert Table 9 here –

In columns (4) to (6), we include the estimates of $Government_b * Post_t$ and we still observe the more “passive” behavior of foreign banks in the post period compared now to the private domestic banks. Column (6) in Table 9 presents the preferred estimation providing an unbiased estimate of the demand of foreign banks for collateral. *Ceteris paribus*, the demand of foreign banks for security interests decreased by 24 percentage points compared with private domestic banks after the reform. Because specification (6) includes saturated fixed effects, and time-varying bank and bank–firm controls, it is unlikely that the results are driven by unobservable time-varying differences in borrower demand and quality. Neither are results driven by time-invariant bank heterogeneity, time-varying differences in bank’s structure, behavior or risk appetite; nor by time-varying differences in bank–firm relationship.

We run equations (3) and (4) on the full sample of 80,035 loan observations for *Low-pledge firms* and results continue to hold. The same applies when we test equations (3) and

(4) for the full sample of 160,067 loans, including both *Low-pledge firms* and *High-pledge firms*. Another exercise we performed was to test whether the reform had a heterogeneous effect on the demand for different types of collateral by banks with different ownership. Using the dependent variables used to test prediction 2, we include the interaction of *Post* with *Foreign* and *Post* with *Government*. Results do not show statistically significant differences on the use of collateral agreements, with different liquidity levels across banks with different ownership.

We then test whether the reform that strengthens secured creditor rights causes secured credit to increase in a heterogeneous way, depending on bank ownership. To do this, we use the dependent variable *Secured debt*_{*i,b,t*}, defined as the ratio of outstanding credit amount guaranteed by any type of collateral of borrower *i* with bank *b* in quarter *t*. We formally estimate the following regression:

$$Secured\ credit_{i,b,t} = \alpha_{i,t} + \alpha_b + \beta_1 Foreign_b * Post_t + \gamma_1 X_{i,b,t} + \gamma_2 Y_{i,b,t} + \gamma_3 B_{b,t} + \varepsilon_{i,b,t} \quad (5)$$

where vector $X_{i,b,t}$ and vector $Y_{i,b,t}$ maintain the same definition as in equation (1), but now as firm-bank-quarter level, and vector $B_{b,t}$ controls for a set of observable characteristics of bank *b* at time *t*, including size of the bank, ratio of credit assets, equity to total assets and Roa. Given the presence of government banks, we also estimate the following:

$$Secured\ credit_{i,b,t} = \alpha_{i,t} + \alpha_b + \beta_1 Foreign_b * Post_t + \beta_2 Government_b * Post_t + \gamma_1 X_{i,b,t} + \gamma_2 Y_{i,b,t} + \gamma_3 B_{b,t} + \varepsilon_{i,b,t} \quad (6)$$

Table 10 provides the main results of specifications (5) and (6). Columns (1) to (3) show the effect of the dummy *Foreign* interacted with *Post* on the demand for *Secured credit*. The estimate of 7 percentage points for $Foreign_b * Post_t$ is strong evidence that foreign banks demanded less collateral after the law reform when compared with domestic banks. In columns (4) to (6), we include the estimates of $Government_b * Post_t$, presenting our preferred estimations, which provide an unbiased estimate of the demand of foreign banks for *Secured*

credit. Ceteris paribus, the demand of foreign banks for *Secured credit* decreased by 10 percentage points compared with private domestic banks after the reform.

– Insert Table 10 here –

Results may be driven by portfolio re-allocations, including the partial or full divestment of credit portfolios by smaller and weaker banks to bigger and stronger institutions. As we are able to observe whether loans were acquired but not initiated by the bank itself, we are able to control for mergers and acquisitions among banks, including rebalancing of the bank's loan portfolio. Results are robust to credit portfolio movements among banks. According to Central Bank's financial stability reports, the major acquisition of a foreign bank was the purchase of the private-domestic bank Banespa by the Spanish bank Santander in June 2004. We do not find evidence that the estimates for foreign banks are driven by the activity of these two banks.

Another possible concern regarding the results is that there might be a borrower-induced choice of multiple borrowers (*i.e.* borrowers who borrow from a historically weak domestic bank, try to compensate with a stronger foreign bank). In order to reduce this possibility, we keep firm–bank relationship if it appears in the pre-period for at least three out of the four possible quarters. The same applies for the post-period. However, in order to test it in a stricter sense, we account for firms with three or more bank relationships, where the firm must have a relationship with one foreign, with a private domestic bank, and with a public bank in the pre- and post-period. Even in such a setting, results continue to hold, suggesting that the main findings are not driven by the possibility of borrower-induced choice of multiple lenders.

Another possible issue is that there may be problems associated with using ratios as dependent variables in regressions, which may lead to incorrect or misleading inferences (Kronmal, 1993). In our case, the coefficients of *Foreign* and *Government* should be seen as measuring the joint effect of varying the secured loan amount and the total loan amount at the same time, on the same borrower, in comparison with private domestic banks. *Collateralization rate* and *Secured credit* in this case are the proxies we use to measure the demand for collateral. Therefore, we focus the analysis on a level variable, more specifically on the supply of credit instead of the demand for collateral. To this aim, we create the

dependent variable *Total lending*, which is the natural logarithm of total loan amount of borrower i at bank b in quarter t . We find that the law had a homogeneous effect on lending from groups of banks with different ownership. Total credit is estimated to have increased 17% after the reform.

Results suggest that a firm's financial decisions about the allocation of security interests among creditors is strongly affected by the bank's demand for those securities. In a possible strategy to mitigate risk by increasing the liquidation value of debt contracts, after the change to the law private domestic banks tended towards retaining more collateral. Foreign banks remained as an alternative for firms that wanted to maintain part of their debt structure as unsecured.

6 – Concluding remarks

Lowering the collateral cost of capital may foster financial development. However, empowering creditors to enforce their right on collateralized assets is documented as increasing the demand for collateral. In this paper, we exploit the Brazilian bankruptcy law in a quasi-natural experiment, and investigate its effects on three aspects of collateral. Namely, we focus on corporate debt structure (macro-level), on the use of collateral agreements with different liquidity levels, and on the amount of collateral pledged in order for a firm to access new credit (micro-level).

We find that *Secured debt* increased by an estimate of 13 percentage points after the reform. Moreover, we document that the law increased the use of all types of security interests. In particular, we find evidence that the law had a bigger effect on the use of more liquid collateral agreements. Banks demand more liquid collateral because it may represent a “put option” for them, which can be exercised when the borrower defaults on a loan, with no need for the bank to integrate the bankruptcy pool of creditors. We also show that a reform that strengthens secured creditor rights has a mixed effect on borrowers, depending on their previous level of collateral pledged. Collateral pledge significantly decreases for those borrowers who previously had to pledge collateral in excess of the value of the loan, and it significantly increased for those borrowers with a lower level of collateral pledged before the reform.

We show that firms negatively affected by the reform might be able to lighten the extra burden of having to pledge more collateral. We find evidence that borrowers in a multiple

banking setup could at least mitigate the effect of the reform by contracting with foreign-owned banks. Our findings are based on a careful classification of borrowers in order to disentangle the bank's demand for security interests from the firm's supply of collateralizable assets. Although the role of foreign banks is controversial (Bruno and Hauswald, 2014), our paper documents foreign banks as promoters of financial development.

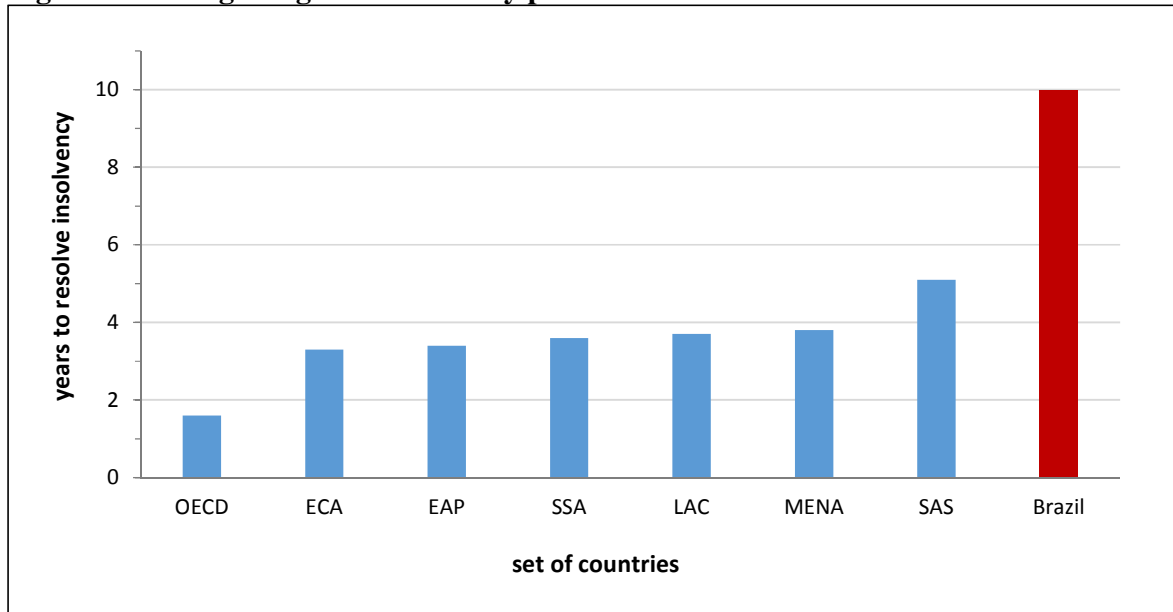
References

- Acharya, V., K. John, and R. Sundaram (2011) “Cross-country variations in capital structure: The role of bankruptcy codes”, *Journal of Financial Intermediation* 20: 25-54.
- Acharya, V., and K. Subramanian (2009) “Bankruptcy codes and innovation”, *Review of Financial Studies* 22: 4949-4988.
- Aghion, P., O. Hart, and J. Moore (1992) “The economics of bankruptcy reform”, *Journal of Law, Economics and Organization* 8: 523-546.
- Alderson, M., and B. Betker (1995) “Liquidation costs and capital structure”, *Journal of Financial Economics* 39: 45-69.
- Araujo, A., R. Ferreira, and B. Funchal (2012) “The Brazilian Bankruptcy Law Experience”, *Journal of Corporate Finance* 18: 994-1004.
- Beck, T., A. Demirgüç-Kunt, and R. Levine (2004) “Law and firms’ access to finance”, *American Law and Economics Review* 7: 211-252.
- Beck, T., V. Ioannidou, and L. Schäfer (2012) “Foreigners vs. natives: Bank lending technologies and loan pricing”. European Banking Center Discussion Paper, 2012-014.
- Bekaert, G., C. Harvey, and C. Lundblad (2005) “Does financial liberalization spur economic growth?”, *Journal of Financial Economics* 77, 3-55.
- Berger, A., and G. Udell (1995) “Relationship lending and lines of credit in small firm Finance”. *Journal of Business* 68: 351-381.
- Bertrand M., E. Duflo, and S. Mullainathan (2004) “How Much Should We Trust Differences-in-Differences Estimates?”, *Quarterly Journal of Economics* 119: 249-275.
- Bester, H. (1985) “Screening vs. rationing in credit markets with imperfect information”, *American Economic Review* 75: 850-855.
- Bester, H. (1987) “The role of collateral in credit markets with imperfect information”, *European Economic Review* 31: 887-899.
- Bolton, P., and D. Scharfstein (1990) “A Theory of Predation Based on Agency Problems in Financial Contracting”, *American Economic Review* 80: 93-106.
- Bolton, P., and D. Scharfstein (1996) “Optimal Debt Structure and the Number of Creditors”, *Journal of Political Economy* 104: 1-25.
- Boot, A., and A. Thakor (1994) “Moral hazard and secured lending in an infinitely repeated credit market game”. *International Economic Review* 35: 899-920.
- Boot, A., A. Thakor, and G. Udell (1991) “Secured lending and default risk: Equilibrium analysis, policy implications and empirical results”, *Economic Journal* 101: 458-472.
- Brick, I., and Palia, D. (2007) “Evidence of jointness in the terms of relationship lending”, *Journal of Financial Intermediation* 16: 452-476.
- Bruno, V., and R. Hauswald (2014) “The Real Effect of Foreign Banks”, *Review of Finance* 18: 1683-1716.
- Central Bank of Brazil, Financial Stability Reports, various years.
- Cerqueiro, G., S. Ongena, and K. Roszbach (2014) “Collateralization, Bank Loan Rates and Monitoring”, *Journal of Finance*, Forthcoming.

- Chan, Y., and G. Kanatas (1985) “Asymmetric valuation and the role of collateral in loan agreements” *Journal of Money, Credit and Banking* 17: 84-95.
- Claessens, S., A. Demirgüç-Kunt, and H. Huizinga (2001) “How Does Foreign Entry Affect Domestic Banking Markets?”, *Journal of Banking and Finance* 25: 891-911.
- Coco, G. (2000) “On the use of collateral”, *Journal of Economic Surveys* 14: 191-214.
- Coleman, N., and L. Feler (2014) “Bank Ownership, Lending, and Local Economic Performance during the 2008-2010 Financial Crisis”, *International Finance Discussion Papers* No. 1099.
- Cressy, R., and O. Toivanen (2001) “Is there adverse selection in the credit market?”, *Venture Capital* 3: 215–238.
- Davydenko, S., and J. Franks (2008) “Do bankruptcy codes matter? A study of defaults in France, Germany, and the U.K.”, *Journal of Finance* 63: 565-608.
- Detragiache, E., P. Garella and L. Guiso (2000) “Multiple versus Single Banking Relationships: Theory and Evidence”, *Journal of Finance* 55: 1133-1161.
- Diamond, D. (1984) “Financial Intermediation and Delegated Monitoring”, *Review of Economic Studies* 51: 393-414.
- Djankov, S., C. McLiesh, and A. Shleifer (2007) “Private credit in 129 countries”, *Journal of Financial Economics* 84: 299-329.
- Erel, I. (2011) “The Effect of Bank Mergers on Loan Prices: Evidence from the United States”, *Review of Financial Studies* 24: 1068-1101.
- Giannetti, M. (2003) “Do better institutions mitigate agency problems? Evidence from corporate finance choices”, *Journal of Financial and Quantitative Analysis* 38: 185-212.
- Giannetti, M., and S. Ongena (2007), “Financial Integration and Entrepreneurial Activity: Evidence from Foreign Bank Entry in Emerging Markets”, *Review of Finance* 13: 181-223.
- Giannetti, M., and S. Ongena (2012) “Lending by Example: Direct and Indirect Effects of Foreign Banks in Emerging Markets”, *Journal of International Economics* 86: 167-180.
- Hart, O., and J. Moore (1994) “A Theory of Debt Based on the Inalienability of Human Capital”, *Quarterly Journal of Economics* 109: 841-79.
- Haselmann, R., K. Pistor and Vig, V. (2009) “How Law Affects Lending”, *Journal of Financial Studies* 23: 549-580.
- IMF (2012) “Brazil: Financial System Stability Assessment”, International Monetary Fund, Country Report No. 12/206.
- Jimenez, G., V. Salas, and J. Saurina (2006) “Determinants of collateral”, *Journal of Financial Economics* 81: 255-282.
- Jiménez, G., S. Ongena, J. Peydró, and J. Saurina (2012) “Credit Supply and Monetary Policy: Identifying the Bank Balance-Sheet Channel with Loan Applications”, *American Economic Review* 102: 2301-26.
- Khwaja, A., and A. Mian (2008) “Tracing the Impact of Bank Liquidity Shocks: Evidence from an Emerging Market”, *American Economic Review* 98: 1413-1442.
- Kronmal, R. (1993) “Spurious Correlation and the Fallacy of the Ratio Standard Revisited”, *Journal of the Royal Statistical Society* 156: 379-392.

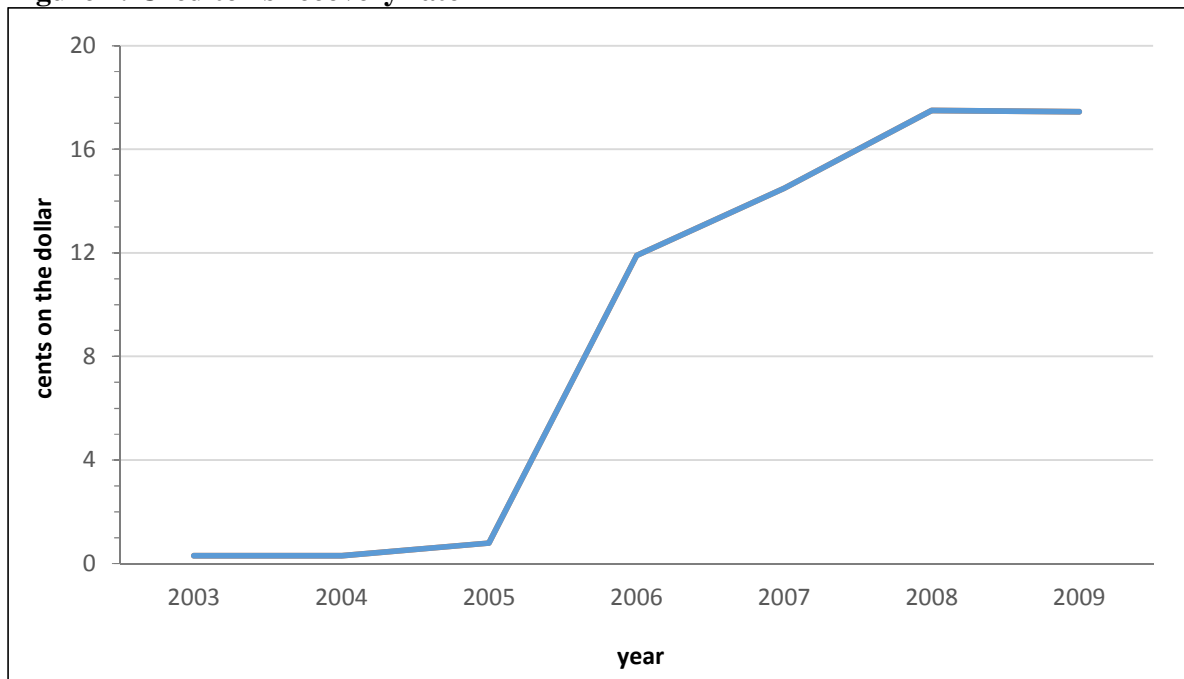
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny (1998) “Law and Finance”, *Journal of Political Economy* 106: 1113-1155.
- Lehmann, E. and D. Neuberger (2001) “Do lending relationships matter? Evidence from bank survey data in Germany”, *Journal of Economic Behavior and Organization* 45: 339-359.
- Levine, R. (1998) “The Legal Environment, Banks, and Long-Run Economic Growth”, *Journal of Money, Credit and Banking* 30: 596-613.
- Levine, R. (1999) “Law, Finance, and Economic Growth”, *Journal of Financial Intermediation* 8: 8-35.
- Liberti, J., and A. Mian (2010) “Collateral Spread and Financial Development”, *Journal of Finance* 65: 147-177.
- Mian, A. (2006) “Distance Constraints: The Limits of Foreign Lending in Poor Economies”, *Journal of Finance* 61: 1465-1505.
- Petersen, M. (2009) “Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches”, *Review of Financial Studies* 22: 435-480.
- Ponticelli, J. (2014) “Court Enforcement and Firm Productivity: Evidence from a Bankruptcy Reform in Brazil”, Chicago Booth Research Paper No. 14-08.
- Popov, A., and van Horen, N. (2013) “The Impact of Sovereign Debt Exposure on Bank Lending: Evidence from the European Debt Crisis”, *De Nederlandsche Bank Working Paper* No. 382.
- Qian, J., and P. Strahan (2007) “How law and institutions shape financial contracts: The case of bank loans”, *Journal of Finance* 62: 2803-2834.
- Rauh, J., and A. Sufi (2010) “Capital structure and debt structure”, *Review of Financial Studies* 23: 4242-4280.
- Schnabl, P. (2012) “The International Transmission of Bank Liquidity Shocks: Evidence from an Emerging Market”, *Journal of Finance* 67: 897-932.
- Shleifer, A., and R. Vishny (1992) “Liquidation values and debt capacity: A market equilibrium approach”, *Journal of Finance* 47: 1343-1366.
- Smith, C., and J. Warner (1979) “On financial contracting: An analysis of bond covenants”, *Journal of Financial Economics* 7: 117-161.
- Steijvers, T., and W. Voordeckers (2009) “Collateral and credit rationing: a review of recent empirical studies as a guide for future research”, *Journal of Economic Surveys*, 23: 924-946.
- Stulz, R., and H. Johnson (1985) “An analysis of secured debt”, *Journal of Financial Economics* 14: 501-521.
- Vig, V. (2013), “Access to Collateral and Corporate Debt Structure: Evidence from a Natural Experiment”, *Journal of Finance* 68: 881-928.
- World Bank (2005) “World Development Report: A Better Investment Climate for Everyone”, The World Bank: Washington DC.

Figure 1: Average length of insolvency procedures



Source: Araujo, Ferreira, and Funchal (2012)

Figure 2: Creditor's recovery rate



Source: Araujo, Ferreira, and Funchal (2012)

Table 1
Variables definitions

The table presents the definition of variables used in the paper for each prediction. We use credit registry data, bank ownership data, and quarterly accounting information provided by the Central Bank of Brazil.

Variable name	Definition
Panel A: Variables for prediction 1 – aggregated at firm level (borrower i in quarter t), unless otherwise specified	
Secured debt	Ratio of outstanding debt amount guaranteed by any type of collateral
Post	Dummy variable that takes the value one from 2005:Q1 to 2005:Q4, and zero otherwise
Debt amount	Log of outstanding debt amount, adjusted by official inflation index, winsorized on 98%/2% level
Number of lenders	Number of active lenders
Overall rating	Weighted credit rating, which varies from 10 (lowest risk) to 2 (highest risk).
Overdraft	Ratio of amount that is classified as overdraft
Factoring	Ratio of amount that is classified as factoring
Term loans	Ratio of amount that is classified as term loans
Leasing	Ratio of amount that is classified as leasing
Export loan	Ratio of amount that is classified as export loans
Panel B: Variables for prediction 2 – aggregated at firm level (borrower i in quarter t)	
Highly liquid collateral	Ratio of outstanding debt amount guaranteed by claims under fiduciary cession agreement of credit rights and rights over banking accounts
Collateral with direct possession	Ratio of outstanding debt amount guaranteed by collateral with the direct and the indirect possession of the lender.
Collateral with indirect possession	Ratio of outstanding debt amount guaranteed by collateral with the indirect possession of the lender.
Panel C: Variables for prediction 3 – aggregated at loan level¹⁸ (bank b with borrower i in quarter t)	
Collateralization rate	Ratio of the value of the collateral to contract amount, winsorized on 98%/2% level
Loan amount	Log of contract amount, adjusted by official inflation index, winsorized on 98%/2% level
Loan maturity	Maturity of contract in number of days, winsorized on 98%/2% level
Loan spread	Annual spread of loan contract (Interest rate – Selic target rate), winsorized on 98%/2% level
Loan rating	Rating assigned by the bank to the loan contract, which varies from 10 (lowest risk) to 2 (highest risk).
Panel D: Variables for prediction 4 – aggregated at bank-firm level (bank b with borrower i in quarter t), unless otherwise specified	
Foreign	Dummy variable that takes the value one if ownership control of bank in Brazil is from a foreign country, and zero otherwise
Government	Dummy variable that takes the value one if bank is public, and zero otherwise
Low-pledge firms	Dummy variable that takes the value one if firm <i>Collateralization rate</i> before the law is equal or below the sample median <i>Collateralization rate</i> , and zero otherwise
High-pledge firms	Dummy variable that takes the value one if firm <i>Collateralization rate</i> before the law is above the sample median <i>Collateralization rate</i> , and zero otherwise
Secured credit	Ratio of outstanding credit amount guaranteed by any type of collateral
Credit amount	Log of outstanding credit amount, adjusted by official inflation index, winsorized on 98%/2% level
Bank rating	Weighted credit rating, which varies from 10 (lowest risk) to 2 (highest risk).
Oldest	Dummy variable that takes the value of one if bank b is the oldest bank of borrower i , and zero otherwise
Size	Log of total assets of the bank, adjusted by official inflation index, winsorized on 98%/2% level
Credit assets	Ratio of credit assets to total assets, winsorized on 98%/2% level
Equity	Ratio of equity to total assets, winsorized on 98%/2% level
Roa	Quarterly return over assets * 100, winsorized on 98%/2% level

¹⁸ A loan is defined as a single firm–bank relationship, where we only consider the first observation of each contract.

Table 2
Descriptive statistics for prediction 1 and 2

This table presents descriptive statistics of the variables used in the paper for prediction 1 and 2. The t-test is used to test whether the mean of the pre-period (Post=0) is the same as the mean of the post-period (Post=1).

Variable name	N	Overall sample					Before	Mean		T-test (p-value)
		Mean	Median	St. dev.	Min	Max		Diff.		
Panel A: Variables for prediction 1										
Secured debt	5,252,939	0.22	0.00	0.34	0.00	1.00	0.17	0.10	0.00	
Post	5,252,939	0.51	1	0.50	0	1				
Debt amount	5,252,939	10.46	10.30	1.52	6.95	14.28	10.43	0.06	0.00	
Number of lenders	5,252,939	1.61	1	1.11	1	27	1.58	0.06	0.00	
Overall rating	5,252,939	8.07	8.5	1.77	2.00	10.00	8.27	-0.40	0.00	
Overdraft	5,252,939	0.40	0.30	0.38	0.00	1.00	0.39	0.02	0.00	
Factoring	5,252,939	0.13	0.00	0.25	0.00	1.00	0.13	-0.01	0.00	
Term loans	5,252,939	0.09	0.00	0.23	0.00	1.00	0.09	0.00	0.00	
Leasing	5,252,939	0.00	0.00	0.04	0.00	1.00	0.00	0.00	0.00	
Export loan	5,252,939	0.00	0.00	0.04	0.00	1.00	0.00	-0.00	0.00	
Panel B: Variables for prediction 2										
Highly liquid collateral	5,252,939	0.11	0.00	0.25	0.00	1.00	0.08	0.06	0.00	
Collateral with direct possession	5,252,939	0.09	0.00	0.23	0.00	1.00	0.07	0.03	0.00	
Collateral with indirect possession	5,252,939	0.01	0.00	0.05	0.00	0.32	0.01	0.01	0.00	

Figure 3: Secured debt

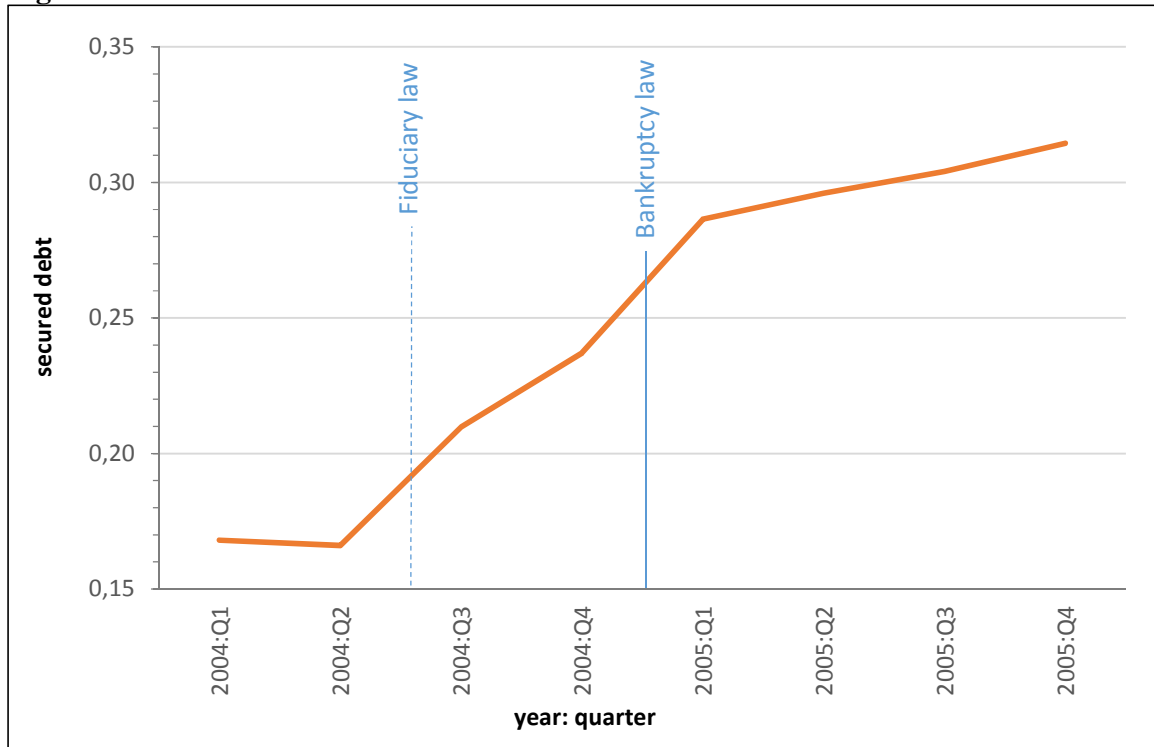


Figure 4: Type of collateral

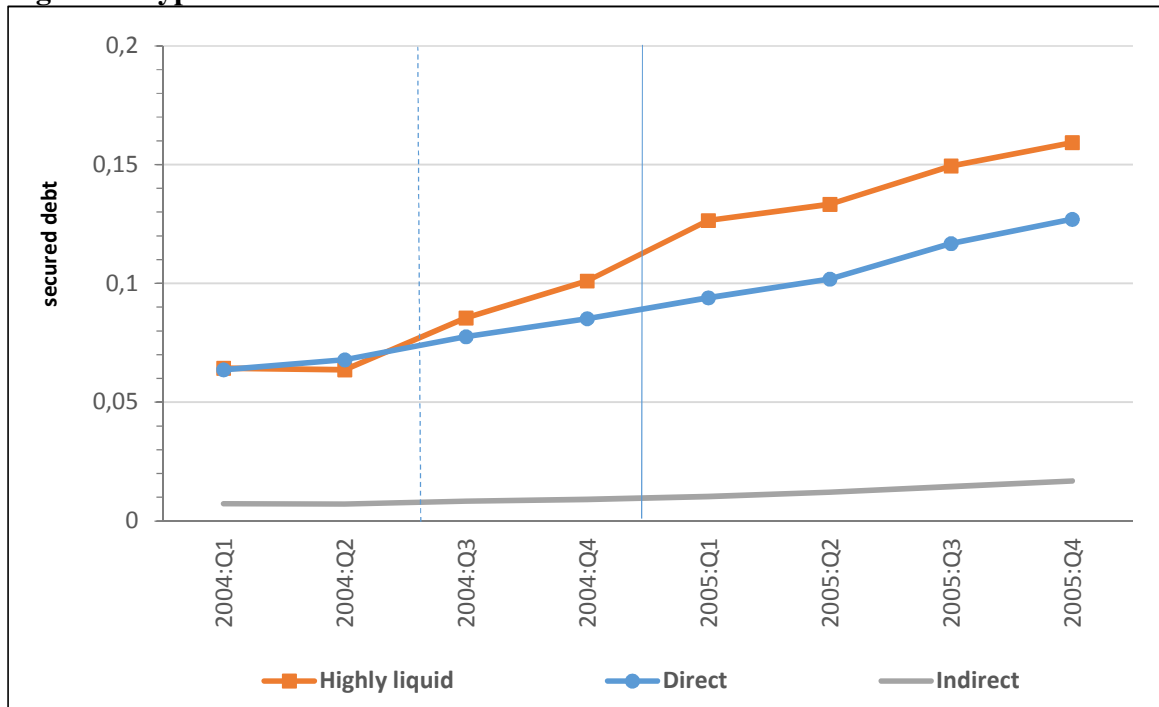


Table 3
Descriptive statistics for prediction 3

This table presents the variables used for prediction 3 for both groups of firms (*low-pledge firms* and *high-pledge firms*). We show the mean before the reform and the additional difference after the reform. The t-test is used to test whether the mean of the pre-period (Post=0) is the same as the mean of the post-period (Post=1).

Variable name	<i>Low-pledge firms</i>			<i>High-pledge firms</i>		
	Before	Diff.	T-Test (p-value)	Before	Diff.	T-Test (p-value)
Collateralization rate	0.95	0.14	0.00	8.25	-2.41	0.00
Loan amount	10.57	0.13	0.00	10.79	0.13	0.00
Loan maturity	147.18	6.53	0.00	162.35	25.10	0.00
Loan spread	25.76	-5.10	0.00	35.72	-10.60	0.00
Loan rating	8.20	-0.04	0.00	8.17	-0.04	0.00
Overdraft	0.17	-0.09	0.00	0.41	-0.23	0.00
Factoring	0.04	0.05	0.00	0.11	0.13	0.00
Term loans	0.14	-0.03	0.00	0.06	0.00	0.72
Leasing	-	-	-	0.00	0.00	0.32
Export loan	0.00	-0.00	0.90	0.00	-0.00	0.51
N. of observations			80,035			80,032

Figure 5: Distribution of Collateralization rate before and after the reform

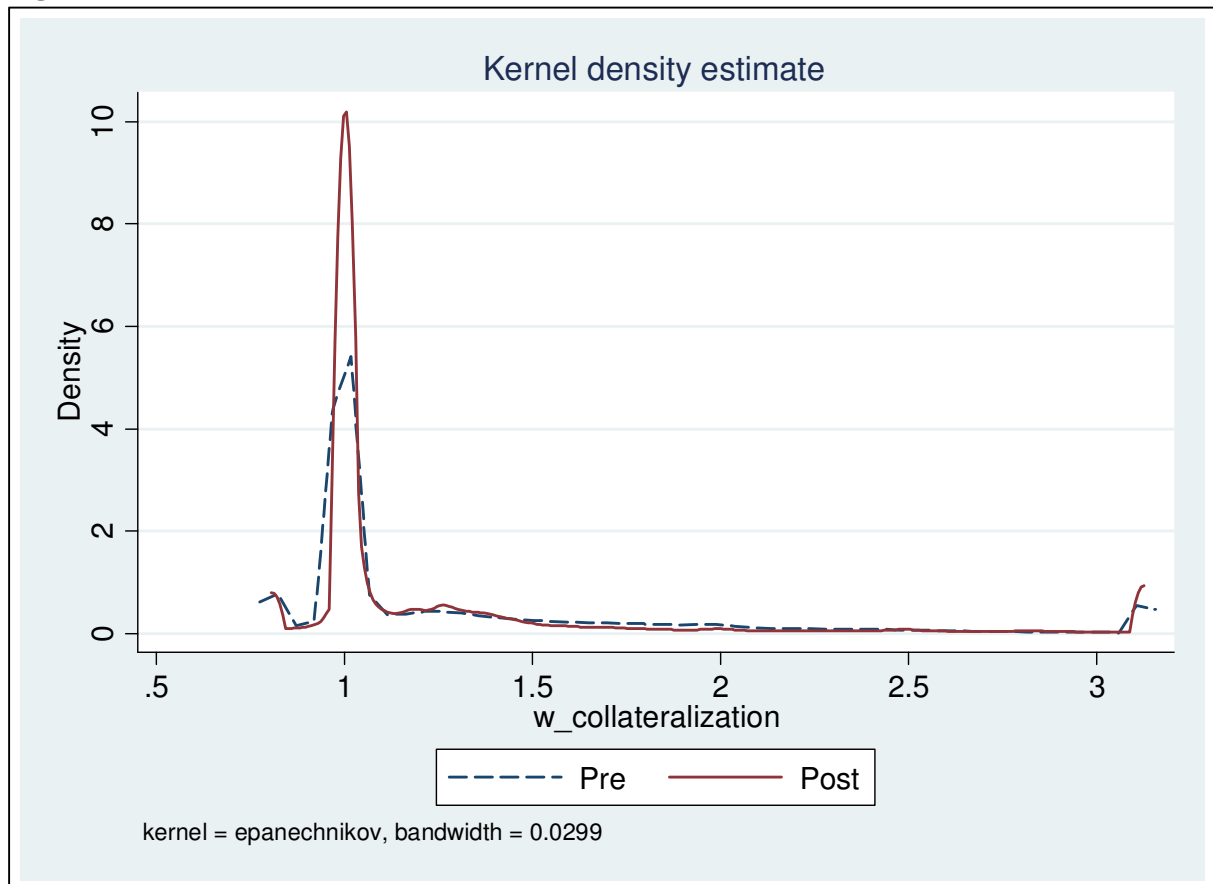


Table 4
Descriptive statistics

This table presents the variables used for prediction 4 for each group of banks. We show the mean before the reform and the additional difference after the reform. The t-test is used to test whether the mean of the pre-period (Post=0) is the same as the mean of the post-period (Post=1).

Variable name	<i>Foreign banks</i>			<i>Government banks</i>			<i>Domestic banks</i>		
	Before	Diff.	T-Test (p-value)	Before	Diff.	T-test (p-value)	Before	Diff.	T-Test (p-value)
Panel A: Collateralization rate for banks									
Collateralization rate	0.98	0.03	0.00	0.89	0.24	0.00	0.78	0.44	0.00
Loan amount	11.21	0.08	0.05	10.26	-0.10	0.15	11.21	0.10	0.05
Loan maturity	150.00	-12.08	0.07	208.00	16.70	0.14	80.09	122.66	0.00
Loan spread	19.14	-0.75	0.03	28.09	0.12	0.86	49.18	-23.51	0.00
Loan rating	8.22	-0.03	0.25	7.19	0.08	0.31	8.04	0.29	0.00
Size	24.49	0.02	0.47	24.45	0.01	0.58	24.67	0.54	0.00
Credit assets	0.33	0.02	0.00	0.14	0.02	0.00	0.33	-0.01	0.00
Equity	0.15	-0.02	0.00	0.07	-0.00	0.11	0.11	0.00	0.42
Roa	0.11	0.12	0.00	0.19	0.27	0.00	0.36	0.18	0.00
Overdraft	0.09	-0.02	0.00	0.13	-0.07	0.00	0.80	-0.60	0.00
Factoring	0.13	-0.03	0.00	0.01	-0.01	0.48	0.03	0.37	0.00
Term loans	0.13	-0.04	0.00	0.01	0.00	0.36	0.02	0.04	0.00
Leasing	-	-	-	-	-	-	-	-	-
Export loan	0.00	-0.00	0.19	0.00	-0.00	0.61	0.00	0.00	0.30
N. of observations			4,341			674			2,780
Panel B: Secured credit for banks									
Secured credit	0.29	0.06	0.00	0.14	0.10	0.00	0.33	0.18	0.00
Credit amount	11.42	0.06	0.00	11.19	-0.01	0.03	11.54	0.11	0.00
Bank rating	8.67	-0.58	0.00	8.24	-0.52	0.00	8.54	-0.70	0.00
Oldest	0.29	0.01	0.00	0.32	-0.00	0.05	0.32	0.01	0.00
Size	24.43	0.18	0.00	25.94	0.03	0.00	25.12	0.15	0.00
Credit assets	0.30	0.02	0.00	0.26	0.03	0.00	0.30	0.01	0.00
Equity	0.12	-0.01	0.00	0.06	0.01	0.00	0.10	0.00	0.08
Roa	0.29	0.06	0.00	0.24	0.10	0.00	0.37	0.00	0.00
Overdraft	0.41	-0.06	0.00	0.34	0.04	0.00	0.47	-0.03	0.00
Factoring	0.11	-0.05	0.00	0.28	-0.02	0.00	0.19	-0.04	0.00
Term loans	0.11	-0.01	0.00	0.01	0.01	0.00	0.11	-0.01	0.00
Leasing	0.01	-0.00	0.53	0.00	-0.00	0.14	0.00	0.00	0.00
Export loan	0.02	-0.00	0.00	0.02	-0.00	0.33	0.02	-0.00	0.00
N. of observations			452,623			295,758			401,037

Figure 6: Collateralization rate by bank ownership for Low-pledge firms

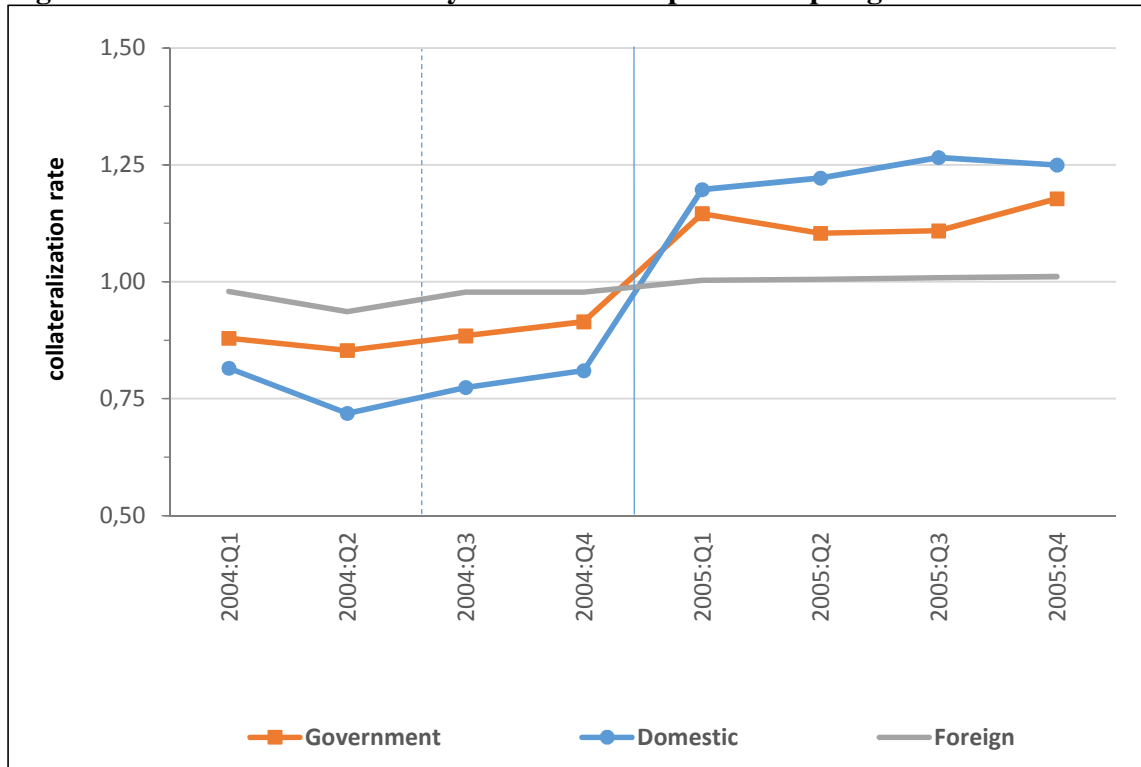


Figure 7: Secured credit by bank type

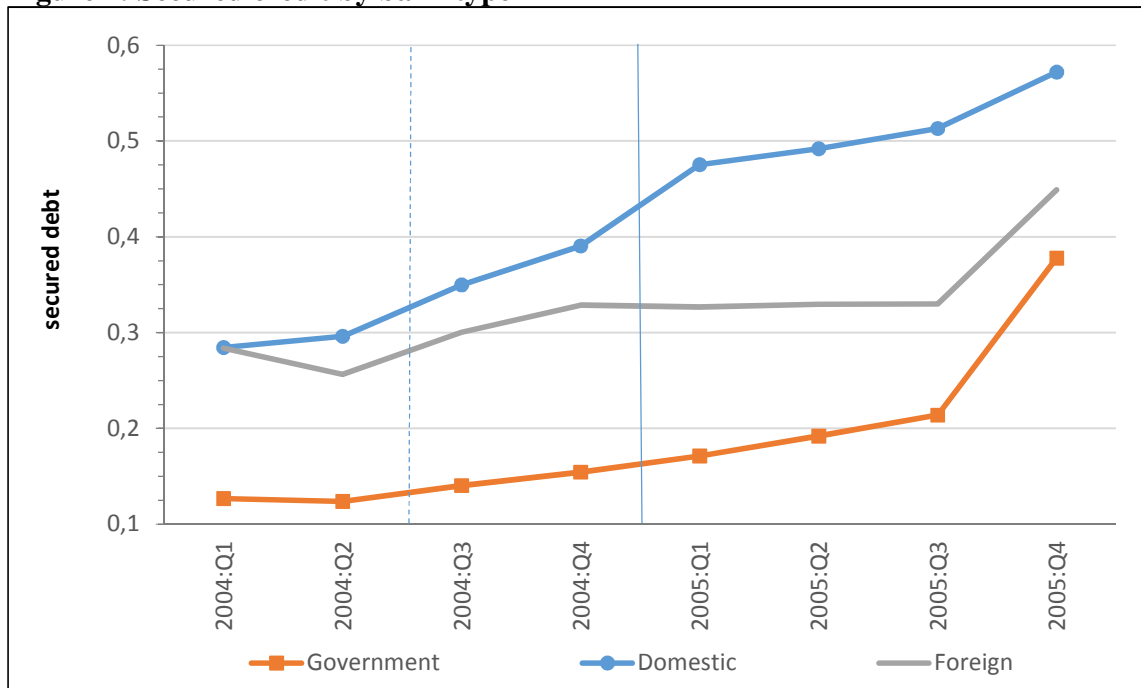


Table 5
Empirical Strategy

This table introduces the basic empirical strategy for each of the predictions. Before refers to quarters from 2004:Q1 to 2004:Q4 and after refers to quarters from 2005:Q1 to 2005: Q4. We next collapse the data into a single data point (based on averages) both before and after. This results in two data points per unit of observation, one data point for the pre-reform regime and one point for the post-reform regime. Standard errors are reported in parentheses. ***, **, * imply significance at 99% level, 95% level, and 90% level, respectively. The data spans the years of 2004 and 2005.

	Before	After	Difference	N
Panel A: Prediction 1 (Unit of observation: Firm)				
Secured debt	0.1663 (0.0003)	0.2586 (0.0004)	0.0923*** (0.0005)	1,593,032
Panel B: Prediction 2 (Unit of observation: Firm)				
Highly liquid collateral	0.0758 (0.0002)	0.1330 (0.0003)	0.0572*** (0.0004)	1,593,032
Collateral with direct possession	0.0733 (0.0002)	0.1027 (0.0003)	0.0294*** (0.0003)	1,593,032
Collateral with indirect possession	0.0075 (0.0000)	0.0121 (0.0000)	0.0046*** (0.0001)	1,593,032
Panel C: Prediction 3 (Unit of observation: Firm-bank)				
Collateralization rate for Low-Pledge firms	0.9692 (0.0005)	1.0852 (0.0020)	0.1160*** (0.0020)	42,724
Collateralization rate for High-Pledge firms	1.6448 (0.0041)	1.5636 (0.0047)	-0.0812*** (0.0063)	45,232
Panel D: Prediction 4 Collateralization rate for Low-Pledge firms (Unit of observation: Firm-bank)				
Foreign banks	1.0066 (0.0024)	1.0360 (0.0050)	0.0291*** (0.0055)	2,026
Government banks	1.1925 (0.0097)	1.3124 (0.0173)	0.1200*** (0.0198)	444
Private-domestic banks	1.1349 (0.0097)	1.3207 (0.0134)	0.1858*** (0.0165)	1,532
Difference (Foreign-Domestic)			-0.1419*** (0.0137)	
Panel E: Prediction 4 Secured credit for all firms with multiple banking relationships (Unit of observation: Firm-bank)				
Foreign banks	0.2909 (0.0014)	0.3438 (0.0014)	0.0529*** (0.0020)	122,134
Government banks	0.1362 (0.0012)	0.2257 (0.0015)	0.0895*** (0.0019)	78,280
Private-domestic banks	0.3317 (0.0016)	0.5108 (0.0017)	0.1791*** (0.0023)	105,700
Difference (Foreign – Domestic)			-0.0919*** (0.0013)	

Table 6**Effect of the reform on corporate debt structure**

This table shows the impact of the Brazilian creditor rights reform on *Secured debt*. The sample period starts in 2004:Q1 and ends in 2005:Q4. *Post* is a dummy variable that takes the value one from 2005:Q1 to 2005:Q4 and zero otherwise. Specifications (1) to (3) account for all firms, where the firm must be present in the pre and in post sample period. All regressions include firm and time fixed effects. All regressions are estimated using OLS. All regressions include a constant and standard errors are clustered on firmXtime level. Standard errors appear in parentheses and ***, **, * correspond to one, five and ten percent level of significance.

	(1)	(2)	(3)
Post	0.1434*** (0.0004)	0.1332*** (0.0004)	0.1294*** (0.0004)
<i>Firm controls</i>			
Debt size		0.0428*** (0.0002)	0.0593*** (0.0002)
Number of lenders		-0.0321*** (0.0002)	-0.0493*** (0.0002)
Firm rating		-0.0117*** (0.0001)	-0.0092*** (0.0001)
<i>Type of loans</i>			
Overdraft			0.0343*** (0.0005)
Factoring			-0.2109*** (0.0007)
Term loans			0.3187*** (0.0012)
Leasing			-0.0572*** (0.0055)
Export loan			-0.2036*** (0.0072)
<i>Fixed effects</i>			
Time	Yes	Yes	Yes
Firm	Yes	Yes	Yes
Observations	5,252,939	5,252,939	5,252,939
R-squared	0.08	0.10	0.16

Table 7

Effect of the reform on collateral type

This table decomposes the impact of the Brazilian creditor rights reform on secured debt, depending on the lender's ability to repossess and sell the collateralizable assets. The dependent variable is *Highly liquid collateral* in column (1) to (3); *Collateral with direct possession* in columns (4) to (6), and; *Collateral with indirect possession* in column (7) to (9). The sample period starts in 2004:Q1 and ends in 2005:Q4. *Post* is a dummy variable that takes the value one from 2005:Q1 to 2005:Q4, and zero otherwise. Specifications (1) to (9) account for all firms, where the firm must be present in the pre- and post- sample period. All regressions include firm and time fixed effects. All regressions are estimated using OLS. All regressions include a constant and standard errors are clustered on firmXtime level. Standard errors appear in parentheses and ***, **, * correspond to one, five and ten percent level of significance.

	<i>Highly liquid collateral</i>			<i>Collateral with direct possession</i>			<i>Collateral with indirect possession</i>		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Post	0.0871*** (0.0003)	0.0845*** (0.0003)	0.0830*** (0.0003)	0.0468*** (0.0002)	0.0410*** (0.0002)	0.0389*** (0.0002)	0.0075*** (0.0001)	0.0062*** (0.0001)	0.0061*** (0.0001)
<i>Firm controls</i>									
Debt size		0.0203*** (0.0001)	0.0351*** (0.0002)		0.0178*** (0.0001)	0.0174*** (0.0001)		0.0028*** (0.0000)	0.0038*** (0.0000)
Number of lenders		-0.0235*** (0.0002)	-0.0307*** (0.0002)		-0.0084*** (0.0002)	-0.0170*** (0.0002)		0.0012*** (0.0000)	0.0006*** (0.0000)
Firm rating		-0.0039*** (0.0001)	-0.0015*** (0.0001)		-0.0062*** (0.0001)	-0.0065*** (0.0001)		-0.0010*** (0.0000)	-0.0008*** (0.0000)
<i>Type of loans</i>									
Overdraft			0.0266*** (0.0004)			0.0051*** (0.0003)			0.0019*** (0.0001)
Factoring			-0.1276*** (0.0006)			-0.0595*** (0.0004)			-0.0096*** (0.0001)
Term loans			-0.1192*** (0.0007)			0.4337*** (0.0010)			-0.0021*** (0.0001)
Leasing			-0.0947*** (0.0034)			0.0432*** (0.0045)			-0.0020** (0.0009)
Export loan			-0.1426*** (0.0058)			-0.0428*** (0.0039)			-0.0153*** (0.0012)
<i>Fixed effects</i>									
Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,252,939	5,252,939	5,252,939	5,252,939	5,252,939	5,252,939	5,252,939	5,252,939	5,252,939
R-squared	0.05	0.06	0.08	0.02	0.03	0.19	0.01	0.02	0.02

Table 8
Effect of the reform on collateralization rate

This table shows the impact of the Brazilian creditor rights reform on *Collateralization rate*. The sample period starts in 2004:Q1 and ends in 2005:Q4. *Post* is a dummy variable that takes the value one from 2005:Q1 to 2005:Q4, and zero otherwise. Specifications (1) to (3) account for *Low-pledge firms* defined by firm *Collateralization rate* equal or below the sample median in the pre-period (*Post*=0). Specifications (4) to (6) account for *High-pledge firms* defined by firm *Collateralization rate* above the sample median in the pre-period (*Post*=0). Specification (1) to (6) accounts for loans, where the relationship of the firm and the bank must be present in the pre- and post-sample period. All regressions include bank and firm-by-time fixed effects. All regressions are estimated using OLS. All regressions include a constant, and standard errors are clustered on bank level. Standard errors appear in parentheses and ***, **, * correspond to one, five and ten percent level of significance.

	<i>Low-pledge firms</i>			<i>High-pledge firms</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Post</i>	0.1673*** (0.0103)	0.1405*** (0.0107)	0.1222*** (0.0105)	-0.4045*** (0.0586)	-0.3579*** (0.0673)	-0.2472*** (0.0670)
<i>Relationship controls</i>						
Loan amount		-0.0992*** (0.0170)	-0.1069*** (0.0188)		-0.5716*** (0.0353)	-0.5552*** (0.0350)
Loan maturity		0.0002*** (0.0000)	0.0003*** (0.0000)		0.0010*** (0.0001)	0.0016*** (0.0001)
Loan spread		-0.0064*** (0.0002)	-0.0075*** (0.0007)		-0.0012* (0.0007)	-0.0062*** (0.0009)
Loan rating		0.0031 (0.0053)	0.0305*** (0.0056)		0.3279*** (0.0286)	0.2946*** (0.0286)
<i>Type of loans</i>						
Overdraft			-0.0801 (0.0599)			0.9807*** (0.0648)
Factoring			-0.3488*** (0.0332)			0.7462*** (0.1459)
Term loans			-0.1832*** (0.0390)			-0.2824*** (0.0825)
Leasing			0.0000 (.)			-1.4818*** (0.2800)
Export loan			-0.1434*** (0.0488)			0.0697 (0.6241)
<i>Fixed effects</i>						
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Firm-by-time	Yes	Yes	Yes	Yes	Yes	Yes
Observations	80,035	80,035	80,035	80,032	80,032	80,032
R-squared	0.01	0.02	0.03	0.88	0.88	0.88

Table 9

Effect of bank ownership on collateralization rate for *Low-pledge firms*

This table shows the impact of foreign ownership on *Collateralization rate* for firms with a *Collateralization rate* before the law reform equal or below the sample median. The sample period starts in 2004:Q1 and ends in 2005:Q4. *Post* is a dummy variable that takes the value one from 2005:Q1 to 2005:Q4, and zero otherwise. Specifications (1) to (6) account for firms with two or more bank relationships, where the firm must have a relationship with a foreign and with another bank (private domestic or public) in the pre- and post- period. All regressions include bank and firm-by-time fixed effects. All regressions are estimated using OLS. All regressions include a constant and standard errors are clustered on bank level. Standard errors appear in parentheses and ***, **, * correspond to one, five and ten percent level of significance.

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign * Post	-0.1521** (0.0668)	-0.2339*** (0.0405)	-0.1969*** (0.0348)	-0.1529* (0.0874)	-0.2685*** (0.0504)	-0.2380*** (0.0318)
Government * Post				-0.0039 (0.0922)	-0.1169** (0.0543)	-0.1297*** (0.0427)
<i>Relationship controls</i>						
Loan amount		-0.0354*** (0.0072)	-0.0339*** (0.0074)		-0.0355*** (0.0071)	-0.0341*** (0.0073)
Loan maturity		0.0002*** (0.0000)	0.0002*** (0.0000)		0.0002*** (0.0000)	0.0002*** (0.0000)
Loan spread		-0.0016** (0.0006)	-0.0015*** (0.0005)		-0.0015** (0.0006)	-0.0014*** (0.0005)
Loan rating		0.0105 (0.0093)	0.0119 (0.0099)		0.0102 (0.0095)	0.0110 (0.0099)
<i>Type of loans</i>						
Overdraft		0.0242 (0.0381)	0.0337 (0.0367)		0.0338 (0.0340)	0.0435 (0.0343)
Factoring		-0.3829*** (0.0477)	-0.3612*** (0.0367)		-0.3895*** (0.0499)	-0.3674*** (0.0381)
Term loans		-0.0502 (0.0307)	-0.0423 (0.0270)		-0.0490 (0.0307)	-0.0403 (0.0273)
Export loan		-0.0419 (0.0839)	-0.0814 (0.1004)		-0.0479 (0.0845)	-0.0875 (0.1002)
<i>Bank controls</i>						
Size			-0.4334* (0.2291)			-0.4804** (0.2297)
Credit assets			-0.6265 (0.5599)			-0.5413 (0.5357)
Equity			0.7104 (0.5017)			0.4190 (0.5879)
Roa			-0.0760*** (0.0126)			-0.0721*** (0.0128)
<i>Fixed effects</i>						
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Firm-by-time	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,795	7,795	7,795	7,795	7,795	7,795
R-squared	0.29	0.34	0.35	0.29	0.34	0.35

Table 10

Effect of bank ownership on secured credit

This table shows the impact of foreign ownership on *Secured credit*. The sample period starts in 2004:Q1 and ends in 2005:Q4. *Post* is a dummy variable that takes the value one from 2005:Q1 to 2005:Q4, and zero otherwise. Specifications (1) to (6) account for firms with two or more bank relationships, where the firm must have a relationship with a foreign and with another bank (private domestic or public) in the pre- and post-period. All regressions include bank and firm-by-time fixed effects. All regressions are estimated using OLS. All regressions include a constant and standard errors are clustered on bank level. Standard errors appear in parentheses and ***, **, * correspond to one, five and ten percent level of significance.

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign * Post	-0.0747** (0.0369)	-0.0834** (0.0368)	-0.0733** (0.0344)	-0.1132** (0.0511)	-0.1172** (0.0512)	-0.1038** (0.0488)
Government * Post				-0.0890* (0.0529)	-0.0786 (0.0521)	-0.0719 (0.0506)
<i>Relationship controls</i>						
Credit amount		0.0661*** (0.0057)	0.0664*** (0.0056)		0.0658*** (0.0057)	0.0662*** (0.0056)
Bank rating		-0.0041 (0.0040)	-0.0039 (0.0040)		-0.0037 (0.0041)	-0.0036 (0.0040)
Oldest		0.0025 (0.0037)	0.0023 (0.0037)		0.0024 (0.0037)	0.0024 (0.0037)
<i>Type of loans</i>						
Overdraft		0.0041 (0.0277)	0.0061 (0.0271)		0.0070 (0.0274)	0.0083 (0.0269)
Factoring		-0.3709*** (0.0428)	-0.3691*** (0.0423)		-0.3683*** (0.0427)	-0.3669*** (0.0422)
Term loans		0.2721*** (0.0747)	0.2735*** (0.0744)		0.2746*** (0.0742)	0.2752*** (0.0740)
Leasing		-0.1506* (0.0856)	-0.1516* (0.0864)		-0.1499* (0.0856)	-0.1506* (0.0862)
Export loan		-0.2785*** (0.0515)	-0.2773*** (0.0511)		-0.2759*** (0.0504)	-0.2753*** (0.0502)
<i>Bank controls</i>						
Size			0.0515 (0.0569)			0.0260 (0.0562)
Credit assets			-0.5356** (0.2189)			-0.4070** (0.1818)
Equity			1.3449*** (0.3488)			1.1742*** (0.3723)
Roa			0.0205			0.0227
<i>Fixed effects</i>						
Bank	Yes	Yes	Yes	Yes	Yes	Yes
Firm-by-time	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,149,418	1,149,418	1,149,418	1,149,418	1,149,418	1,149,418
R-squared	0.23	0.32	0.32	0.24	0.32	0.32