CREDITOR VOTING AND TIME CONSTRAINTS IN REORGANIZATIONS

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Abstract

In this paper, we evaluate how creditors behave in corporate renegotiations, constructing a novel database containing 11,388 claim-level votes across 200 bankruptcy reorganization filings in Brazil. We document several patterns in the data and analyze the role played by an important constraint, the time available for negotiations, as proxied by the duration of the court process. Using random assignment of bankruptcy cases across judges with heterogeneous tendencies to delay proceedings, we find that each additional month of court delay increases the probability of approval from banks and accounts receivable owners by 0.05, or 6.3% relative to the average. This increases the probability of plan approval. Consistent with the notion of time constraints reducing the ability to reach many creditors, we show that these effects are driven by companies with high debt dispersion. Our main results suggest that reforms expediting bankruptcy cases could undesirably increase the number of liquidations.

Keywords: Distressed debt; Chapter 11; Corporate bankruptcy; Corporate reorganization

JEL codes: G32; G33; G38

1. Introduction

There is consensus among economists and finance practitioners that bankruptcy costs are a crucial factor affecting corporate capital structure (Gale and Gottardi (2015), Serfling (2016), Antill and Grenadier (2019)). Direct costs from bankruptcy proceedings can arise from transaction costs associated with negotiating disputes with creditors over reorganization plans (Warner (1977)). Despite the importance of these disputes, there is scant evidence on how creditors behave in renegotiations. For instance, how do different types of creditors vote? Which types of creditors demand more intense negotiations? How are creditors affected by negotiation frictions, such as time constraints? The lack of direct answers to these questions can be partially attributed to the unavailability of granular data describing the behavior of creditors and how they vote on reorganization plans.

In this paper, we analyze the effect of the time available for negotiations on creditors' voting behavior using the random assignment of bankruptcy cases among judges with heterogeneous tendencies to generate court delays. Using a novel database of votes in corporate bankruptcy reorganizations, we show that the time judges take to analyze a case is a persistent factor. Among the various steps during which judges can add time to the process, we find that the most relevant is the analysis of creditors' injunction requests after the release of the first version of the reorganization plan – highlighting that the tendency to increase case time is related to the ability to analyze many court requests.

We hand-collected claim-level votes in all corporate reorganizations filed in specialized bankruptcy courts in the Brazilian state of *São Paulo* between 2006 and 2017. After restricting the sample to filings that reached the reorganization plan voting stage, the final sample comprised 200 filings and 11,388 votes[1]. The choice of Brazilian reorganizations filed in specialized bankruptcy courts is motivated by three factors. First, the current Brazilian bankruptcy law, which took effect in 2005, was inspired by Chapter 11 of the US Bankruptcy Code. Among many similarities with Chapter 11, Brazilian bankruptcy law includes creditor approval as a requirement for the implementation of a reorganization plan. Second, Brazilian specialized bankruptcy courts are faster than nonspecialized courts and thus more likely to mimic the environment creditors face in

[1] We use only filings that were digitalized by the bankruptcy courts.

developed countries[2]. Third, creditor votes for reorganization plans are publicly accessible in Brazil[3]. Rather than relying on indirect measures, direct analysis of creditor' choices enables novel insight into bargaining over reorganization plans.

We start the analysis by documenting that a substantial fraction of reorganization plans reach only the bare minimum number of votes needed for approval, 50% in each debt class. This discontinuity in the distribution of approval votes suggests that a large group of successful reorganizations are the result of direct, one-on-one negotiations with creditors, with debtors discontinuing interactions with additional creditors once they obtain the necessary number of votes for approval. We illustrate this point with a simple rational expectations model that describes creditors' votes. In the model, a debtor chooses the optimal number of creditors to interact with, while creditors choose to either accept or reject the plan. Consecutive simulations of this model produce a fraction of approval votes with a mass of filings in the 50% bin, similar to that observed in the data.

Given the importance of direct negotiations, it is natural to ask which types of creditors are more likely to switch votes as a result of successful negotiations. We categorize creditors into four groups: workers, receivable owners, commercial banks, and active investors – which consist mainly of hedge funds and factoring companies[4]. We find that in most filings, workers and active investors unanimously approve the plan. Banks and receivable owners, on the other hand, show greater vote dispersion: in most cases, there is vote disagreement within each of these groups. This difference suggests that banks and receivable owners might be the groups for which one-on-one negotiations are more relevant to gain approval of a reorganization plan, an insight that will receive further corroboration with the next results.

What explains the difference in voting across different filings? Firm fundamentals may play an important role, but the discontinuity in the vote density at the 50% threshold suggests that frictions may prevent debtors from negotiating effectively with creditors. One possible friction is time constraints. Distressed firms with dispersed debt might have to engage in lengthy negotiations over the terms of the reorganization plan with a large number of creditors. The importance of this

[2] According to Waisberg et al. (2019), specialized bankruptcy courts in São Paulo state take, on average, 407 days to vote on a reorganization petition, similar to the average of 490 days found by Goyal, Madsen and Wang (2020) in the US.
[3] It is accessible to registered lawyers. We hired a Brazilian lawyer to assist me with data collection for this research.
[4] Factoring, or invoice discounting, is a financial operation in which a business sells its accounts receivable at a discount to a factoring company.

issue was recognized by policymakers when defining the guidelines for corporate reorganizations. Chapter 11 in the US provides a possible remedy in the form of an automatic stay, a period during which collection activities and foreclosures are suspended (11 US Code § 362). Several other countries, including Brazil, also contemplate a version of the stay period. However, the official stay period, which can be as short as one month, may be insufficient for interactions with many creditors.

In the empirical strategy, we instrumentalize court duration (from filing to voting) using the average duration of filings that were assigned to the same judge in the same year, leaving the current filing out of the average. This variable is usually called the "leave-out mean" instrument in the random judge assignment literature introduced by Kling (2006). We corroborate the randomness of the selection of judges by regressing the leave-out mean duration on several pre-bankruptcy firm characteristics, with most coefficients being close to zero.

We show that one additional month of court duration increases the probability of a random creditor approving the reorganization plan by 0.01. However, when focusing only on banks and receivable owners, which are more likely to be pivotal in the approval of the plan, this number rises to 0.05, which represents a 6% increase relative to the sample average. This, in turn, increases the probability of plan approval by 0.04, which represents a 4% increase relative to the sample average. Overall, the results are consistent with the notion that time is a key friction in renegotiations.

Next, we address several potential endogeneities that could be driving this result. One concern is that a judge might create obstacles for certain debtors to reach the voting stage, and the propensity to do so might be correlated with the propensity to increase the duration of the court process. For instance, rigorous judges might be more likely to dismiss reorganization filings of highly distressed firms and might also be more likely to lengthen the court process for careful consideration. If that is the case, creditors would be more likely to approve reorganization plans when there is more delay simply because of debtor selection. To address this concern, we collected data on all reorganization petitions that did not reach the voting stage in the sample period. The majority (64%) were dismissed by the judge because the petition did not meet the basic legal requirements. Motivated by this finding, for each judge, we calculate the fraction of reorganization petitions dismissed. Then, we run the baseline IV regressions while controlling for this judge

dismissal rate, obtaining similar results. This indicates that results are not driven by heterogeneous propensities to dismiss reorganization filings.

Another endogeneity issue is the potential correlation of judges' characteristics with the propensity to delay the court process if these characteristics could affect the outcome of the reorganization plan through alternative channels. As documented by Araujo et al. (2021) using a similar sample of filings, courts in Brazil have strong idiosyncratic pro-debtor or pro-creditor tendencies. These tendencies might also be relevant at the judge level and could be correlated with judges' propensities to delay a given process. We address this issue by calculating a judge-level pro-creditor score in the spirit of Araujo et al. (2021) through textual analysis of court decisions. The main results remain unchanged after the inclusion of this pro-creditor score in the baseline IV regression.

Next, we investigate the mechanisms underlying the findings. As previously discussed, the groups of creditors that are more likely to change their decisions when more time is available are banks and receivable owners. A striking feature of the accounts receivable class is its wide dispersion: among all types of creditors, it has the highest number of claims. According to Ivashina, Iverson and Smith (2016), high debt dispersion reduces the probability of a successful reorganization. Therefore, one of the reasons why time is important when dealing with accounts receivable could be its dispersion across many creditors. We directly test the more general notion that the amount of time available for negotiation is more important for dispersed debt structures by sorting the sample of filings according to the Herfindahl–Hirschman index calculated for the debt shares of each filing. We find that the duration of the court process influences the outcome of reorganization plan voting only for filings with high debt dispersion. This result provides additional economic meaning for the findings of Ivashina, Iverson and Smith (2016): debt concentration is important because it reduces the time necessary for interactions with creditors. If concentration is too low, the available time might be insufficient to reach agreement on terms or to alleviate information asymmetries to convince creditors.

In exploring how creditors vote and how they react to renegotiation constraints, this paper contributes to the literature analyzing bankruptcy frictions and their costs. Using a structural estimation approach, Dou et al. (2021) show that information asymmetries reduce out-of-court restructuring and increase the duration of in-court restructuring cases. We complement their findings by exploring how creditors' decisions are affected by an exogenous restriction on the time

available to alleviate information asymmetries. Consistent with their results, we find that such time constraints would increase the number of firms that are liquidated. Another bankruptcy friction is presented by Antill (2021), who shows that US judges generally have a bias toward liquidating firms seeking reorganization, even when reorganization would be preferable to creditors. We add to his result by showing that judges might create adverse outcomes for creditors not only when they unilaterally liquidate a debtor but also when they prematurely request creditors' votes.

This paper also contributes to the literature analyzing the effects of bankruptcy case duration. Alencar and Ponticelli (2016) show that congested courts in Brazil are associated with longer bankruptcy cases and lower access to finance for local firms. Iverson (2018) shows that congested courts liquidate fewer small firms and more large firms. Iverson et al. (2020) show that inexperienced judges take more time when analyzing cases and are associated with lower recovery rates and lower debtor emergence from reorganization. Li and Ponticelli (2020) show that the introduction of specialized bankruptcy courts reduces case duration and increases firm entry locally. In this vein, we contribute by showing the "bright side" of higher court duration in bankruptcy cases when analyzing its impact on a novel variable: creditor votes on reorganization plans. Courts that take longer to review a case leave more time for debtors to negotiate and to alleviate information asymmetries[5].

The effect of bankruptcy duration is also addressed by Iverson, Madsen and Xu (2020). They show that more experienced judges reduce case duration and increase the likelihood that a company will emerge from the reorganization. At first glance, this result might seem inconsistent with the main finding of this paper, but this is not the case. As noted by Bernstein, Colonnelli and Iverson (2019), a large fraction of Chapter 11 cases in the US are converted to Chapter 7 before a plan can be voted on by creditors. Therefore, emerging from reorganization reflects, in part, how judges perceive petitions to liquidate the debtor. This paper, on the other hand, focuses only on creditors' votes.

In analyzing the effect of the interaction between debt concentration and court duration, this paper contributes to the literature on the connection between capital structure and financial distress. Gilson, John and Lang (1990) show that debt concentration in large banks correlates with successful emergence from reorganization. Perhaps most closely related to this paper is Ivashina,

[5] More generally, this paper contributes to the literature analyzing the effects of the bankruptcy judges and of the design of bankruptcy systems. See Bernstein, Colonnelli, and Iverson (2019), Bernstein et al. (2019), Goyal, Madsen, Wang (2020), and Araujo et al. (2021).

Iverson, and Smith (2016). They show that claim ownership dispersion reduces the probability of liquidation but do not explore the mechanisms driving this result. We provide evidence that ownership dispersion increases the time required for debtors to reach all creditors. Therefore, when the amount of time required exceeds the amount of time available, the company is liquidated.

The remainder of the paper is organized as follows. Section 2 describes the design of the bankruptcy system in Brazil. Section 3 summarizes the data and basic patterns of creditor votes. Section 4 presents the empirical strategy and evidence of random judge assignment. Section 5 presents the impact of court duration on creditors' votes. Section 6 addresses several possible endogeneity issues. Section 7 analyzes the role played by debt dispersion. Section 8 concludes the paper.

2. Brazilian Bankruptcy System

The current Brazilian bankruptcy law took effect in 2015. Based on the US bankruptcy code, Brazilian law emphasizes the firm's preservation, the protection of workers, and the rights of creditors. From 1945 to 2005, Brazil had an inefficient bankruptcy law, wich did not allow the practical restructuring of firms in financial distress.

To be entitled to file for court reorganization, the company needs to fulfill legal requirements under bankruptcy law 11,105/2005 (later amended in 2020 by law 14,112/2020). The process begins with the formal request to the judiciary for court reorganization, in which a judge can be randomly assigned to supervise the process, depending on the court's rules and the number of judges. This judge will monitor all stages of the proceedings until the restructuring or bankruptcy decision concludes.

Designated judges are responsible for actively participating in the steps of the court reorganization procedures to guarantee compliance with the principles, legal requirements, and execution of the plan. For each case, the judges select a claim administrator to oversee the firm's reorganization activities, preventing actions that could harm creditors.

The first stage of the Brazilian reorganization process is postulatory and includes the request for court reorganization by the debtor. After providing the requirements for the reorganization proposal, the judge concludes the first phase by granting the reorganization request. After receiving judicial authorization to move forward, the debtor must present a reorganization plan in court within sixty days after the application is granted. The judge grants approval for court

reorganization to proceed under the terms outlined in article 58 for verifying the legality of the process and the debtor's reorganization plan. When a creditor disagrees with the plan's conditions, all classes of creditors must meet in an assembly to vote on the plan.

The institution of a general meeting of creditors (AGC) is stablished based on the list of creditors with voting rights in the judicial recovery process. As a result, the second stage of the process is deliberative. It begins with deferring the request from the previous phase until the judge decides to ratify the plan that was approved at a meeting of creditors or declare bankruptcy if the plan is rejected at that meeting. The law divides creditors into four groups, namely, labor, secured, unsecured, and micro business.

The different classes of creditors can either approve or reject the reorganization plan in court. Debtors must obtain the consent of all four categories of creditors for approval of the reorganization plan. Most secured and unsecured creditors must accept the reorganization plan, and at least half of the total debt value for each class must be represented. Labor and micro business approvals require a majority of the creditors' votes. Tax creditors and creditors holding loans supported by the fiduciary alienation of assets are not parties to the reorganization. In addition, labor claims are limited to 150 times the monthly minimum wage for each worker. Additional claims from workers are classified as unsecured debt.

Unlike the United States, Brazil has no procedure for converting court reorganization into bankruptcy. Hence, judges can liquidate debtors in rare instances, such as (i) failure to submit a reorganization plan within the deadline established by law and (ii) company sales of firm assets large enough to substantially harm creditors who are not represented at the general meeting of creditors.

3. Data

The corporate reorganization documents in Brazil provide information about the votes of each creditor at the general meeting of creditors. For the purpose of this study, we hand-collected a database of votes regarding the corporate reorganization plan from creditors with individual claims. We obtained the data from three documents used in the reorganization process: the reorganization plan, the minutes from the general meetings, and descriptions of the amount of money to be recovered by each creditor. Below, we provide detailed information about the dataset.

3.1 Database Construction

We start the construction of the database by collecting metadata from all 565 digitalized corporate reorganization proceedings filed in the state of *São Paulo* from 2006 to 2017, including only claims that reached the voting stage. Next, we restrict the sample to cases filed in specialized bankruptcy courts, totaling 289 cases. The sample restriction to specialized courts is for two reasons. First, specialized courts are faster than nonspecialized ones and thus more likely to mimic the environment faced by debtors and creditors in developed economies. Second, the distribution of bankruptcy cases among judges is random in specialized courts, while the distribution rules can vary in nonspecialized courts.

Next, we apply two additional data filters. First, we remove the cases for which votes were lost or never registered by the court, as votes are the variable of interest in this paper. Second, we restrict the data to filings for which the leave-out-mean instrument (mentioned in the introduction and to be defined more precisely in the next section) can be defined. Therefore, we drop claims overseen by judges who did not oversee any other case in the same year.

The final sample includes 200 filings. We manually collect data from three different attachments in each case: (i) the reorganization plan, (ii) the description of the claim structure, and (iii) the minutes of the general meeting of creditors. The data contain the date when the reorganization petition was filed, the bankruptcy court that received the petition, the name of the judge who received the case, the name and fee of the claim administrator designated by the judge, and company characteristics such as the number of creditors, amount of debt, firm age, liquidation value of assets and income statement information for the three years prior to the reorganization petition. We further enrich the database by collecting debtors' labor information from RAIS, a firm-worker linked database managed by the Brazilian Ministry of Labor.

3.2 Filing-level Statistics

Table 1 reports the basic summary statistics of our sample. According to Panel A, the number of filings increases substantially from 2006 to 2013, from 2 to 29 filings. The number of filings declines slightly thereafter, coinciding with a period of economic slowdown in Brazil.

[Table 1]

A unique feature of the Brazilian bankruptcy system is that different companies can be reorganized in the same court process if they are different divisions of the same conglomerate. According to Panel B of Table 1, the 200 filings in the sample covered 497 firms, totaling an average of 2.49 firms per filing. In Figure 1, we plot the empirical cumulative distribution of the number of firms across filings. Approximately 70% of filings include a single company, but several filings include a large number of companies, with the largest filing representing an economic group with 64 companies[6]. The decision to reorganize more than one company in the same process belongs to the debtor but must be approved by the judge responsible for the case. All these requests were approved in the sample.

[Figure 1]

The bankruptcy cases in the sample cover a universe of 11,388 claims and 10,478 unique creditors, according to Panel B of Table 1, highlighting the debt dispersion in corporate reorganizations. These cases were analyzed by 7 different judges located in 2 specialized bankruptcy courts. Each judge must appoint a claim administrator to oversee the activities of the firm during the bankruptcy process and to protect the rights of the creditors. Claim administrators are usually law, accounting or auditing firms. They are responsible, for example, for ensuring that company assets are not improperly sold and that the company keeps the business active[7]. According to Panel B of Table 1, there are 54 unique claim administrators in the sample.

One can gain some insights into the profile of companies through Panel C of Table 1, which reports pre-bankruptcy firm characteristics[8]. The average firm is 27 years old and owes approximately R$100 million ($60 million) in debt[9]. The liquidation value of its assets is R$18 million ($11 million), which is enough to pay only 18% of its total debt[10]. This indicates that if the firm is economically viable, it is in the interest of creditors to learn about it and to let the firm

[6] This was the reorganization petition for *Viver Incorporadora e Construtora*, a developer and building company.
[7] Having an active business is a legal requirement for reorganization eligibility.
[8] We aggregate different companies represented in the same filing into a single observation.
[9] In this article, we use the conversion rate of 1.6736 reais for each dollar, which corresponds to the midpoint rate of the sample.
[10] In most of the cases in our sample, the judge requested an expert assessment of the firm's liquidation value.

survive, given the low possible recovery rate under liquidation[11]. Approximately half of the firms have negative net income and negative return on assets (ROA), but the distribution is highly asymmetric: the bottom 10% ROA is -35%, while the top 10% ROA is 15%. Furthermore, the average firm has 411 workers, indicating a potential social cost if the company is liquidated.

According to Panel D of Table 1, the average filing takes 17 months to reach the voting stage, which is very similar to the average of 16 months found by Goyal, Madsen and Wang (2020) in the US. This shows that creditors in specialized courts face an environment similar to that of creditors in developed countries, which is one of the reasons for considering only specialized courts in this study. The approval rate is 88%, which is higher than the rates of emergence from reorganization found by works analyzing the US (see Iverson (2018)). This is in part due to the high rates of conversion of Chapter 11 petitions into Chapter 7 cases by judges. Indeed, according to Bernstein, Colonnelli and Iverson (2019), a substantial fraction of reorganization filings (Chapter 11) in the US are converted to liquidation (Chapter 7) before the voting stage.

3.3 Claim Ownership

Although the final sample contains information on 200 filings, the analysis is based on the variation of 11,388 claim-level votes, as described in Table 2, which contains aggregate statistics. The type of nonlabor claims with the largest number of total creditors is accounts receivable. The average filing has five bank claims and one active investor claim, where the active investor group mainly consists of nonbank financial institutions such as hedge funds and factoring companies[12]. These averages are informative, but there is wide variation in the claim structure across cases, so examining the entire distribution is also helpful. Figure 2 plots the distribution of the percentages of claims owned by each type of creditor across filings.

[Table 2]

[Figure 2]

[11] The real recovery rate would be lower than 18%, as several transaction costs would have to be paid.
[12] Factoring is a transaction in which a firm sells its accounts receivable to a third party.

Several important conclusions can be drawn. First, workers and active investors are groups that usually do not own a large fraction of claims, either in numeric terms or in value terms. Second, banks own a considerable amount of the value of claims in a large number of filings. Third, receivable owners own a considerable share of the number of claims in a large number of filings. Given that the approval of the plan requires 50% approval in numeric terms and as a fraction of the value of the claims, one can conclude that banks and receivable owners are the groups with the greatest importance in the voting process.

3.4 Creditors' Votes

To understand the behavior of voters across plans, we calculate the fraction of approval votes across the groups of claims as defined by law: workers, secured, unsecured, and micro firms. Then, we calculate the fraction of the value of the claims owned by creditors that approved the plan in the secured and unsecured classes. We take the minimum of these fractions and define it as the total fraction of approval votes. In mathematical terms, for each filing *i*, the fraction of approval votes is defined as:

$$FracVotes_i = \min\left\{\frac{NA_{i,worker}}{N_{i,worker}}, \frac{NA_{i,secured}}{N_{i,secured}}, \frac{NA_{i,unsecured}}{N_{i,unsecured}}, \frac{NA_{i,micro}}{N_{i,micro}}, \frac{VA_{i,secured}}{V_{i,secured}}, \frac{VA_{i,unsecured}}{V_{i,unsecured}}\right\}, \quad (1)$$

where, for each claim group $g \in \{worker, secured, unsecured, micro\ firms\}$, $N_{i,g}$ denotes the number of claims owned by group g, $NA_{i,g}$ denotes the number of claims owned by creditors of group g voting to approve the plan, $V_{i,g}$ denotes the total value of claims owned by creditors of group g, and $VA_{i,g}$ denotes the total value of claims owned by creditors in group g and voting to approve the plan. As mentioned above, Brazilian bankruptcy law requires each fraction in the definition of $FracVotes_i$ to be larger than or equal to 0.50, which happens if and only if $FracVotes_i \geq .50$. Therefore, $FracVotes_i$ is the metric that debtors should track to approve the reorganization plan.

Figure 3 plots the distribution of $FracVotes_i$ across the 200 filings in the sample, showing a striking mass of filings in the 50% bin. This pattern is consistent with one-on-one interactions between debtors and creditors to either adjust the terms of the contract or to alleviate information asymmetries. Once the debtor obtains the necessary number of votes, there is no reason to seek new creditors. We formalize this idea with a stylized rational expectations model in appendix B. In the model, creditors observe a private signal about the random payoff they might receive if the company is reorganized and vote for the option with the highest expected value. The debtor knows the true reorganization payoff to creditors and can transmit this information to a given creditor at a cost. Finally, the debtor chooses the optimal number of creditors to interact with. As we show in Figure B1 in Appendix B, consecutive simulations of this model produce a fraction of approval votes with a similar mass of filings in the 50% bin.

[Figure 3]

3.5 Vote Heterogeneity

Given the importance of one-on-one negotiations, it is natural to ask what types of creditors debtors might prefer as targets. One would expect high vote dispersion in the preferred groups of creditors. Negotiations with creditors who always vote to reject the plan or who always vote to approve the plan may not be the optimal use of a debtor's time. Figure 4 depicts the boxplot of the fraction of approval votes for each of the categories of creditors across the 200 filings in the sample. It shows that the groups of workers and active investors vote to approve the plan unanimously in the vast majority of the cases. Banks and receivable owners, on the other hand, have a relevant degree of vote dispersion. This confirms the notion discussed above that banks and receivable owners are the most relevant creditors in renegotiations.

[Figure 4]

The literature on corporate reorganizations provides evidence that firm fundamentals are an important factor for the approval of reorganization plans. For instance, Jiang, Li and Wang (2012) show that hedge funds are more likely to help debtors emerge from reorganization if they

have promising future profitability. However, the evidence presented thus far in this paper suggests that not only fundamentals but also constraints on renegotiations might be a factor in the reorganization/liquidation outcome. Why can some debtors obtain exactly 50% of the votes of creditors, while others are liquidated with only a few votes less? In the remainder of this paper, we focus on the importance of the time available for negotiations.

4. Methodology

Debtors can engage in negotiations with creditors during the period from when the reorganization petition is filed to when the plan is voted on[13]. The time set for this interval may be longer, for instance, when creditors are represented by inexperienced lawyers, which might be more common for smaller cases. Therefore, when analyzing the effect of case duration on creditors' votes, one cannot simply use case duration as a left-hand variable. Indeed, this duration is endogenous to the characteristics of the filing, and it could be correlated with information asymmetries, case complexity, lawyer experience, and the degree of conflicting interests. As shown in Table 3, case duration is highly correlated with several pre-bankruptcy debtor characteristics. To facilitate interpretation, all variables on the right-hand side in this table are standardized. The variable that is most strongly correlated with duration is firm size, measured by log assets. A one-standard-deviation increase in firm size is associated with a case duration that is 1.3-months shorter. As previously noted, one possible interpretation is that creditors have more incentives to hire skilled lawyers for this type of case, which could expedite the case.

[Table 3]

4.1 Identification

To understand the impact of case duration (as a proxy for the time available for negotiations) on the behavior of creditors, we exploit the random assignment of reorganization cases across judges in specialized bankruptcy courts in *São Paulo* state. We follow the judge

[13] The reorganization plan can be amended even on the day of voting.

random assignment literature and use the leave-out mean duration, defined as the average duration of cases overseen by the same judge, excluding the current case. We take into account the fact that the judge's propensity to generate delay might change over time by calculating the leave-out mean duration using only cases filed in the same year. In mathematical terms, for each reorganization case *i* filed in year *t* and overseen by judge *j*, we define:

$$LeaveOutMean_{ijt} = \frac{\sum_{\tilde{\imath}\neq i,j,t} Duration_{\tilde{\imath}jt}}{\sum_{\tilde{\imath}\neq i,j,t} 1} \quad (2)$$

Table 4 reports the OLS coefficients of several univariate regressions using the leave-out mean duration defined by Equation (2) on the left-hand side and pre-bankruptcy debtor characteristics on the right-hand side. In contrast to the regressions based on the actual duration, most coefficients here are close to zero, and no coefficient is statistically significant at the 5% level. Only two coefficients are significant at the 10% level, log size and log number of workers. These two variables, however, are highly correlated[14]. Overall, this table supports the assumption that the leave-out mean duration is exogenous to several pre-bankruptcy debtor characteristics, which is a consequence of the random distribution of cases across judges. This, however, does not automatically imply that the leave-out mean duration is exogenous to creditors' votes. It is quite possible for judges to interfere with the way creditors vote in separate channels. In the next section, we present the main results of the paper, and thereafter, we run a battery of robustness checks to ensure that the results are not driven by alternative stories.

[Table 4]

4.2 Binary Dependent Variable Model

The economic model to be estimated is as follows. For each creditor *c*, let $Propensity_{ijct}$ denote the propensity of creditor *c* to approve the reorganization plan *i*. As before, *j* represents judges, and *t* represents time. Creditor *c* approves the plan if $Propensity_{ijct} \geq 0$ and rejects it otherwise. $Propensity_{ijct}$ could represent, for example, the expected NPV of reorganization minus the expected NPV of liquidation. Debtors can increase $Propensity_{ijct}$ by either amending

[14] The correlation between log size and the log number of workers is 0.7.

the reorganization plan or by alleviating information asymmetries at the cost of time. If $Duration_{ijt}$ denotes the duration of the judicial process, the economic model is:

$$Propensity_{ijct} = \beta Duration_{ijt} + \boldsymbol{x}_{ijct}^{\intercal}\boldsymbol{\gamma} + u_{\boldsymbol{ijct}}. \quad (3)$$

The econometrician, however, only observes whenever creditor *c* voted to approve the plan,

$$Approve_{ijct} = \begin{cases} 1 \; if \; Propensity_{ijct} \geq 0 \\ 0 \; if \; Propensity_{ijct} < 0 \end{cases} \quad (4)$$

According to Newey (1987), the causal coefficient β can be consistently estimated with maximum likelihood based on the instrument $LeaveOutMean_{ijt}$ if the instrument is exogenous to the error $u_{\boldsymbol{ijct}}$. The β coefficient itself does not have an obvious economic interpretation because it depends on the scale used, but the marginal effects can be calculated and are easy to interpret.

5. The Impact of Court Duration on Votes

5.1 First-stage Results

We start this section by showing the first-stage results. Formally, we regress court duration on the leave-out mean duration defined by Equation 2 and on a set of controls. We use the conservative approach of running the regression at the level of the filing instead of using the level of the creditor. In mathematical terms,

$$Duration_{ijt} = bLeaveOutMean_{ijt} + \boldsymbol{x}_{ijt}^{\intercal}\boldsymbol{a} + e_{\boldsymbol{ijt}}. \quad (5)$$

We estimate two versions of this model: one without controls and one including as controls a second-degree time polynomial and the following firm pre-bankruptcy characteristic: debt concentration (measured by the Herfindahl–Hirschman Index of the debt shares), ROA, and the natural logarithm of the following variables: number of creditors, total debt, total assets, and

number of workers[15]. For filings that involve more than one firm, we appropriately aggregate those variables. Finally, we also include a version of Equation (5) that replaces the leave-out mean duration with judge fixed effects.

Table 5 reports the first-stage results and shows that the coefficient of the leave-out mean duration is always significant at the 5% level. The coefficient in column 1 of .29 can be interpreted as follows: a judge with a one-month higher case duration in the current year will take, on average, 1/3 of a month more on the current case. Columns 3 and 4 report the results when the leave-out mean duration is replaced by judge fixed effects and show a large degree of dispersion across judges. Indeed, cases overseen by judge 7 are, on average, 6.5 months longer than cases overseen by judge 1 (omitted from the regression), which represents a 39% difference relative to the sample average duration of 16.7 months.

[Table 5]

In which part of the process are "slow" judges more likely to generate delays? To answer this question, we divide court duration into durations between 5 dates of the court process. The first date is when the debtor files the reorganization petition with the bankruptcy court. The second date is when the judge grants the request, and the case officially starts. The third date is when the debtor presents the initial reorganization plan (still to be voted on) to the judge. The fourth date is when the judge discloses the plan to the creditors. Finally, the fifth stage is the General Meeting of Creditors, when the plan is voted on. As shown in Table 6, judges with a high leave-out mean duration are associated with longer times in the last phase of the process, between the disclosure of the reorganization plan to creditors and the General Meeting of Creditors. This is the stage during which creditors dissatisfied with the plan can send petitions to the judge arguing about the legality of the process and for the liquidation of the debtor[16]. Responding to these petitions in a timely manner might require a certain degree of skills and experience.

[15] Time fixed effects are infeasible given the low number of observations in each year. Instead, we use the parametric approach of including a time polynomial. This polynomial is defined as $p(t) = m_2(t-2005)^2 + m_1(t-2005) + m_0$.

[16] Liquidation at this stage is rare, occurring in less than 4% of the reorganization petitions filled between 2006 and 2017.

[Table 6]

5.2 Main Results

We now proceed to estimate the effect of court duration on creditors' votes, as defined by the binary dependent variable model described by Equation (3). We add creditor-group fixed effects (workers, banks, receivables, and active investors) as additional controls in the claim-level regressions. To facilitate interpretation, we weighed the observations such that each of the four groups of creditors has the same total weight[17]. As shown in columns 1 and 2 in Table 7, the coefficient describing the impact of court duration is significant at the 10% level, and one additional month of court duration increases the probability of a random creditor approving the plan by 0.01. This number, however, may not reflect the change in creditor votes that truly matter for the approval of the reorganization plan. As discussed in the data section, banks and receivable owners tend to hold a large fraction of the total debt (in terms of both the number and value of claims). Furthermore, other creditors (workers and active investors) often unanimously approve the plan, so there may be less value in negotiating with them. With this motivation in mind, we run the same regression but include only banks and receivable owners. The results in columns 3 and 4 are significant at the 1% level, and the economic effect is much larger: now, an additional month of court time increases the probability of an approval vote by 0.05, as measured by the marginal effect in column 3.

[Table 7]

The results presented thus far are consistent with debtors using their scarce time to negotiate with creditors that are more likely to impact the outcome of the General Meeting of Creditors, where the reorganization plan is voted on. If that is the case, one would expect that the duration of the court process would affect the likelihood of plan approval. we test this hypothesis in columns 5 and 6, where we estimate the same binary outcome model using the approval of the

[17] This is done to avoid overweighting labor, which is has a large number of individual claims in the sample. Observations in the same group have the same weight.

reorganization plan as the dependent variable. The coefficient in column 5 is significant at the 5% level and implies that one additional month of court delay increases the probability of plan approval by 0.04. The results in column 6, with controls, are numerically similar but statistically insignificant due to the lack of power in a regression with only 200 observations and many control variables.

6. Robustness

Now, we address several possible endogeneities that could drive the results presented in the previous section.

6.1 Filing Selection

One possible issue is that we only use filings that reach the General Meeting of Creditors, where the plan is voted on. This can be problematic if companies fail to reach the voting stage because of judges' influence and if a judge's propensity to contribute to this failure is correlated with the duration of cases he oversees. For example, stricter judges could reject more reorganization petitions and also spend more time on their tasks. To understand the severity of this problem, we collected data on all 132 reorganization petitions filed in specialized courts between 2006 and 2017 that did not reach the voting stage. Table 8 reveals that the most common reason to fail to reach the voting stage, corresponding to 64% of the cases, is when the initial petition is dismissed by the judge because it does not satisfy the basic legal requirements[18]. The second most common reason occurs when the debtor withdraws the reorganization request, presumably because it reached an out-of-court settlement with creditors. All the other reasons are less frequent, each accounting for less than 10% of cases.

[Table 8]

[18] Legal requirements for the possibility of reorganization are defined in Article 48 of Law 11.101/05. It states that a firm can request reorganization if (i) it has operated for the last two years, (ii) it has not been reorganized in the past five years, and (iii) has not have been found guilty of a list of crimes.

The main concern suggested by Table 8 is of judges being more stringent in accepting initial reorganization petitions and of that being correlated with the judge's speed in performing his or her tasks. We solve this problem by directly controlling for this level of rigorousness in the baseline regression. Specifically, we compute the dismissal rate of each judge, defined as the fraction of petitions a given judge rejects. Columns (1) and (2) in Table 9 show that the inclusion of this control does not affect the main estimates.

[Table 9]

6.2 Judge's Biases

Another possible endogeneity issue is that biased judges could directly influence creditors. For instance, they could influence creditors' votes with their written decisions in the case files. According to Araujo et al. (2021), Brazilian bankruptcy judges are usually biased toward creditors or toward debtors – or, equivalently, biased toward creditors or toward workers. To understand whether this bias could be driving the results, we replicate their bias measure, which is based on textual analysis. For that purpose, we collected, for each judge in the sample, all written decisions to accept reorganization petitions. We then count the instances in which a given judge interpreted the articles of the bankruptcy law favoring creditors and subtract from that the instances in which he or she sided with debtors. Next, we normalize this number by dividing it by the total number of instances, resulting in a judge-level pro-creditor score between -1 (totally pro-debtor) and 1 (totally pro-creditor[19]). As shown in Table 9, the inclusion of this score as a control variable in the baseline regression does not affect the main result.

6.3 Influence of Claim Administrators

When overseeing a case, a judge has no direct contact with the debtor or creditors. The law establishes that this intermediation must be done by a claim administrator appointed by the judge. Claim administrators are individuals or companies (usually law, accounting, or audit companies)

[19] See Araujo et al. (2021) for a detailed explanation of the construction of this measure.

with several responsibilities. They must oversee the process, work at the company's headquarters to evaluate its performance, inform the court of any substantial changes in its activity, and appear in court to inform the judge of the procedural progress, among other functions.

It is not difficult to conceive of scenarios in which this design would be problematic for the identification. For instance, rigorous judges could appoint more skilled claim administrators that could find more problems with the debtor, changing creditors' beliefs about the profitability of the firm in the case of reorganization. We address this issue by including claim administrator fixed effects in the baseline regression. As shown in columns (5) and (6) in Table 9, this does not change the main finding that the votes of creditors, especially banks and receivable owners, are affected by the duration of the court process.

7. The Role of Debt Dispersion

Given the importance of accounts receivable, it is natural to ask whether the dispersion of this type of claim can make renegotiations more time consuming. Ivashina, Iverson and Smith (2016) show that high debt dispersion reduces the likelihood of emerging from reorganization. We hypothesize that filings with high debt dispersion are less likely to succeed because they require more time for interactions between creditors and debtors.

We measure debt concentration using the Herfindahl–Hirschman Index of the debt shares. As shown in Table 10, the duration of the process affects a creditor's vote only in the subsample of shares with a debt concentration below the median, i.e., the subsample of filings with high debt dispersion. This can be interpreted as evidence that time for negotiations is a binding friction only when there is a large degree of debt dispersion. When debt is concentrated, major creditors can be reached easily, and therefore time is not of great importance. Interestingly, we find that having more time in court decreases the likelihood of approval votes. One possibility is that, for this type of filing, the benefits of additional time are small, so that the possible costs of delay might be dominant. These costs might include no access to finance, loss of customers, loss of employees, asset depreciation, and so forth. These factors can make creditors' payoffs in the case of reorganization less favorable, which leads them to reject the reorganization plan.

[Table 10]

Columns 5 through 8 in Table 10 examine the effect of court duration on the approval of the reorganization plan and tell a similar story. The duration of the court case affects the likelihood of approval of the reorganization plan but only for plans with high debt dispersion. When debt dispersion is low, the effect is statistically insignificant and economically small.

8. Conclusion

This paper explores the interactions between debtors and creditors using a novel database with claim-level creditor votes in corporate reorganizations. To the best of my knowledge, this is the first work analyzing creditor votes and court delay in bankruptcy reorganizations.

We document several regularities in how creditors vote. First, a large number of reorganization plans are approved with the minimum number of required votes. we show, with a stylized model, that this pattern is consistent with one-on-one interactions between debtors and creditors, with debtors halting costly interactions with creditors once they obtain the necessary number of votes to approve the reorganization plan. Second, we show that the creditors most likely to be decisive in the voting process are banks and owners of receivables. This is the case for two reasons. First, other creditors almost never own a significant fraction of the claims. Second, other creditors almost always vote unanimously to approve the plan. Therefore, banks and accounts receivable owners are more likely to be targeted by debtors seeking the approval of a reorganization plan.

Moreover, we show that the time available for negotiation is a key factor for the votes of banks and receivable owners. One additional month of the court process increases the probability of an approval vote by 0.05. With more favorable votes from major creditors, the reorganization plan is also more likely to be approved: one additional month of the court process increases the probability of plan approval by 0.04. Finally, we show that this effect only exists for filings with a high degree of debt dispersion.

Although it is beyond the scope of this paper to consider policies that could improve interactions between creditors and debtors, we have some suggestions. Given that the time needed for renegotiations depends on debt dispersion, it would make sense to extend the automatic stay for debtors with a large number of creditors. More research is needed to understand the welfare implications of such a reform. However, if the spirit of the law is to provide time for negotiations, the results indicate that the length of time granted must account for debtors' capital structure.

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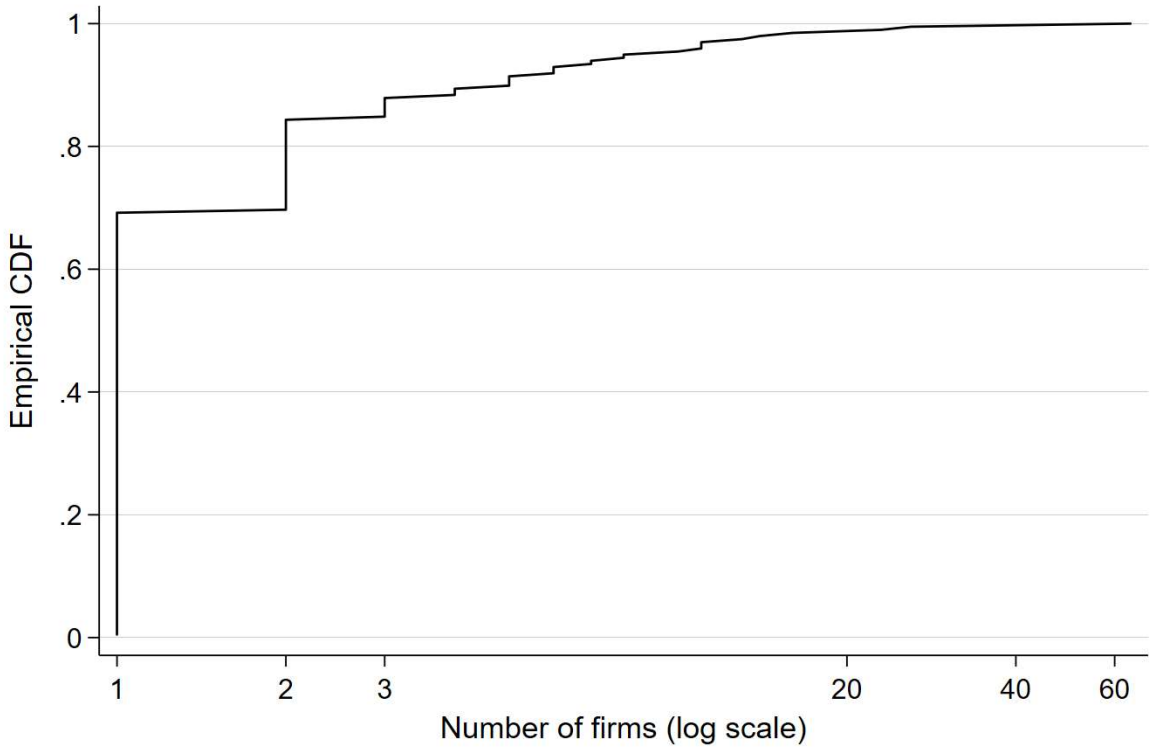

Figure 1: Cumulative Distribution of the Number of Firms in Each Filing

Plotted is the empirical cumulative distribution of the number of firms (identified by the CNPJ, a Brazilian company taxpayer identifier) in each reorganization filing in our sample. The x-axis represents the number of firms in the log scale.

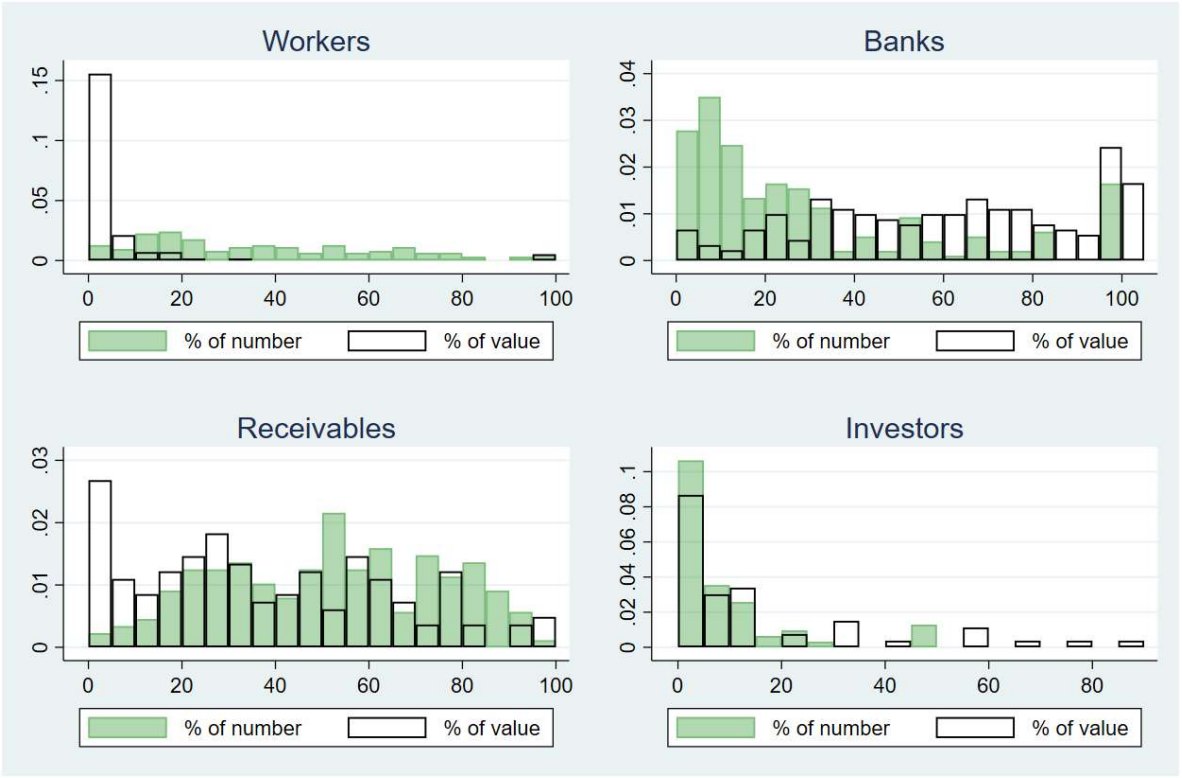

Figure 2: Distribution of Claim Ownership Across Reorganization Filings

Plotted is the distribution of the percentages of the claims (as a percentage of both the number and value of claims) owned by each type of creditor across the 200 filings in our sample. Distributions are plotted for each of the four types of creditors according to the following categorization: workers, banks, receivables, and (active) investors. The group of active investors consists mainly of factoring companies and hedge funds.

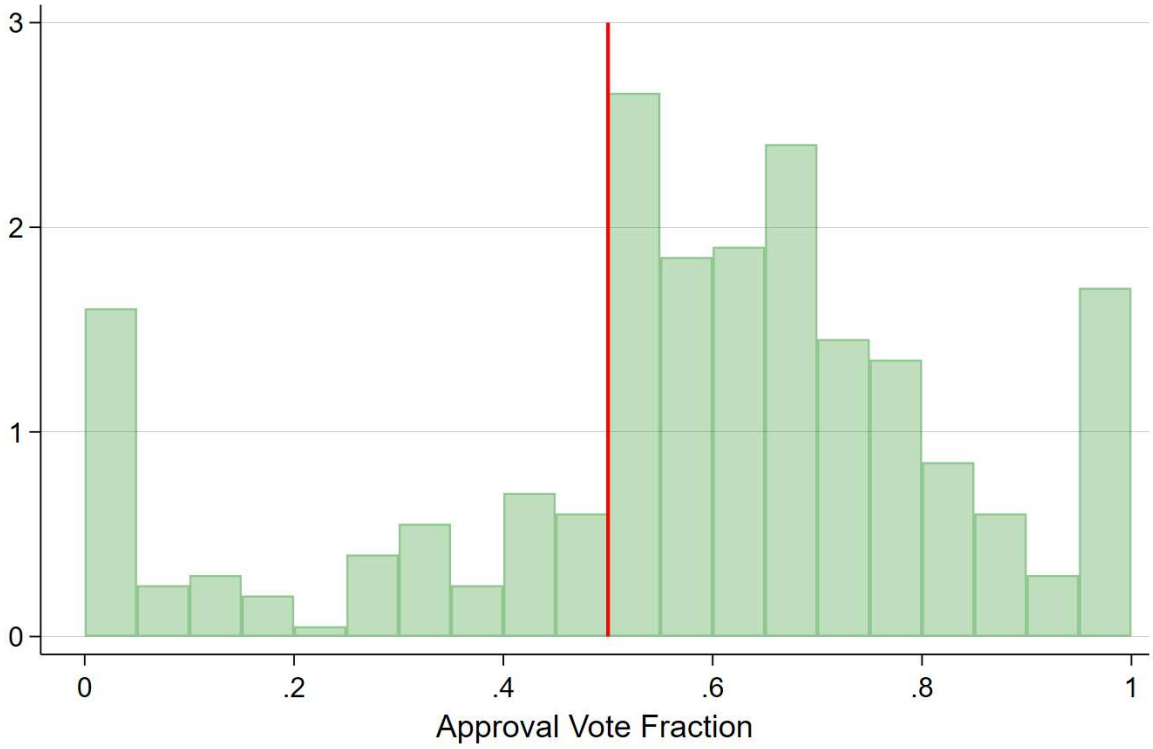

Figure 3: Fraction of Approval Votes Across Reorganization Plans

Plotted is the distribution of the fraction of approval votes across different reorganization plans. Brazilian bankruptcy law states that a reorganization plan is approved if and only if it receives more than 50% of approval votes in 4 different groups of creditors. Therefore, for each plan, we used the approval fraction in the group with the smallest approval fraction. This implies that plans on the right side of the 50% red line are approved, while plans on the left side of the red line are rejected.

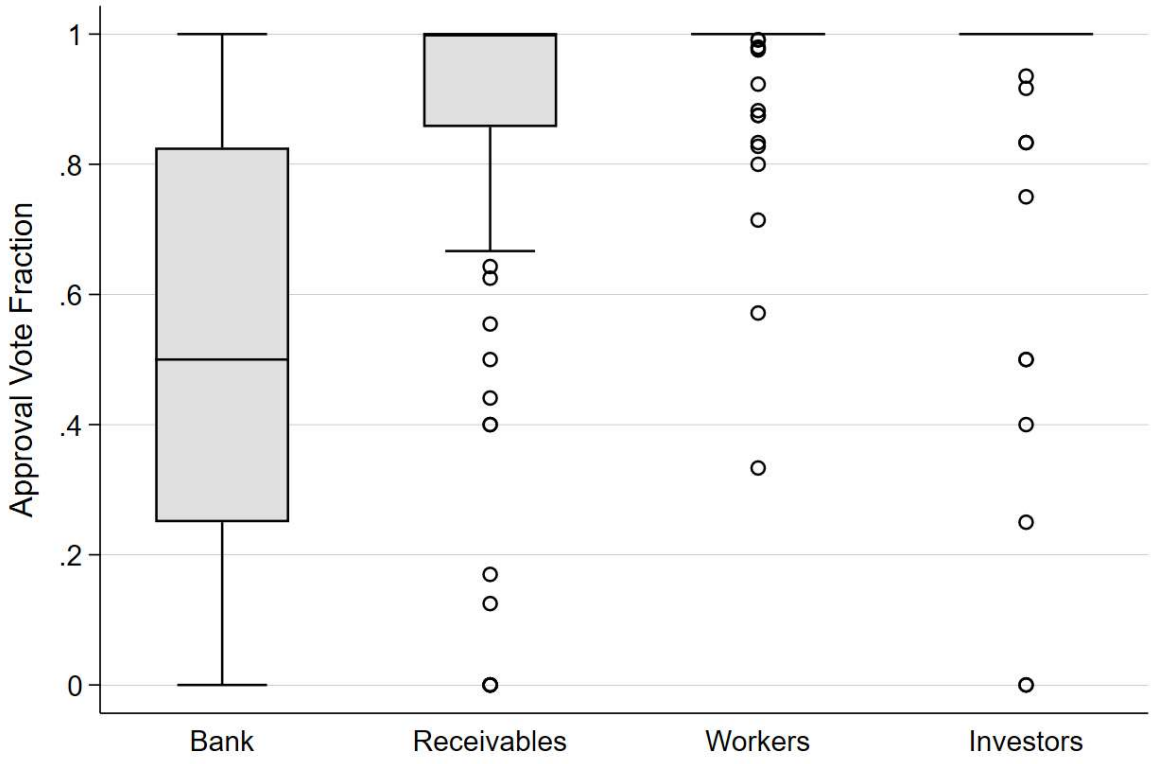

Figure 4: Distribution of Votes by Creditor Type

For each type of creditor, we present the boxplot of approval vote actions. The end points in the box represent the 25th and 75th percentiles. The endpoints of the lines represent the maximum and minimum excluding outliers. Circular dots represent outliers.

Table 1: Characteristics of Filings for Reorganization

This table reports the basic descriptive statistics of the data used in this paper. Panel A reports the annual breakdown of the number of filings. Panel B reports the total count of several filing and court characteristics. Panel C reports firm characteristics measured in the year prior to the reorganization. Debt Concentration is the Herfindahl–Hirschman index calculated using the debt shares of each creditor. Liquidation value of assets is an estimate of the market value of assets made by an expert hired by the court. Panel D reports outcome variables measured at the voting stage or after the voting stage.

Panel A: Count of Filings by Year

Filing Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
Obs.	2	6	15	12	7	18	26	29	19	26	22	18	200
%	1.00	3.00	7.50	6.00	3.50	9.00	13.00	14.50	9.50	13.00	11.00	9.00	100

Panel B: Filing and Court Characteristics

Characteristic	*Total Count*
Number of Firms Filing	497
Number of Filings	200
Number of Voting Creditors	10,478
Number of Claims	11,388
Number of Courts	2
Number of Judges	7
Number of Claim Administrators	54

Panel C: Pre-Bankruptcy Firm Characteristics

Variable	*N*	*mean*	*p50*	*sd.*	*p10*	*p25*	*p75*	*p90*
Number of Creditors	200	371	104	999	14	37	240	640
Number of Creditors (ex Labor)	200	235	79	676	12	30	161	371
Debt Concentration (Herfindahl–Hirschman)	200	0.27	0.21	0.21	0.07	0.13	0.36	0.55
Firm Age (Years)	200	26.95	22.00	18.27	7.00	14.00	37.50	54.50
Total Debt (R$1MM)	200	100.71	12.02	410.26	1.27	3.79	28.54	70.96
Liquidation Value of Assets (R$1MM)	148	17.54	1.56	59.74	0.07	0.41	10.56	34.09
Assets (R$1MM)	120	288.50	23.15	1,046.85	3.57	7.34	50.25	174.83
Net Income (R$1MM)	120	-60.34	-0.02	369.84	-27.33	-4.05	0.69	2.85
Return on Assets (ROA)	120	-0.11	-0.01	0.41	-0.35	-0.17	0.05	0.15
Number of Workers	200	411	53	1,816	0	2	151	372
Average Monthly Wage (R$1)	156	2,117	1,796	1,296	1,008	1,294	2,547	3,516

Panel D: Outcome Variables

Variable	*N*	*mean*	*p50*	*sd.*	*p10*	*p25*	*p75*	*p90*
Duration (Filing to plan voting, Months)	200	16.70	15.73	5.56	10.32	12.63	20.00	24.37
Approval of Reorganization Plan	200	0.88	1.00	0.33	0.00	1.00	1.00	1.00
Survives 2 years after approval	148	0.84	1.00	0.37	0.00	1.00	1.00	1.00
Survives 4 years after approval	137	0.58	1.00	0.50	0.00	0.00	1.00	1.00

Table 2: Distribution of Voting Claim Ownership

This table reports the distribution of claims according to creditor type and type of claim. we categorized creditors into four groups: labor, receivables, commercial banks, and (active) investors. Active investors consist of all claims that do not belong to the other groups and involves mainly hedge funds and factoring firms. We divided claims into three groups: all, secured, and unsecured. For each group, one can see the total number of claims and the total value of the claims.

	Creditor Type				
	Workers	Banks	Receivables	Investors	Total
All Types of Claims					
Number of claims	6,753	770	3,640	225	11,388
% of number of claims	59.30	6.76	31.96	1.98	100.00
Value of claims (bi)	0.26	3.55	1.53	4.49	9.84
% of value	2.64	36.12	15.55	45.70	100.00
Secured Claims					
Number of claims	-	72	42	16	130
% of number of claims	-	55.38	32.31	12.31	100.00
Value of claims (bi)	-	0.28	0.04	0.36	0.68
% of value	-	41.06	6.54	52.41	100.00
Unsecured Claims					
Number of claims	-	695	2,984	207	3,886
% of number of claims	-	17.88	76.79	5.33	100.00
Value of claims (bi)	-	3.27	1.44	4.14	8.85
% of value	-	36.94	16.27	46.78	100.00

Table 3: Covariates and Case Duration

This table reports the coefficients of univariate regressions using case duration on the left-hand side and several covariates on the right-hand side. Court duration is measured from filing to voting. HH index is the Herfindahl–Hirschman index calculated using the value of the claims in each filing. The liquidation value of assets is an estimate of an expert hired by the court. ROA is the return on assets. All right-hand-side variables are standardized.

	Dependent Variable: Duration (from filing to voting, months)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
HH Index	0.424 [0.391]									
Log # Creditors		-0.70** [0.337]								
Log # Creditors (Ex Labor)			-0.64* [0.350]							
Firm Age				-0.420 [0.413]						
Log Debt					-1.18*** [0.315]					
Log Liquidation Value Assets						-0.338 [0.463]				
Log Assets							-1.33*** [0.440]			
ROA								-0.040 [0.671]		
Log # Workers									-1.10*** [0.346]	
Average Wage										-0.80* [0.458]
Observations	200	200	200	200	200	148	120	120	200	156
R-squared	0.006	0.016	0.013	0.006	0.045	0.004	0.050	0.000	0.039	0.019

Table 4: Covariates and Leave-Out Mean Duration

This table reports the coefficients of univariate regressions using the case leave-out mean duration on the left-hand side and several covariates on the right-hand side. HH index is the Herfindahl–Hirschman index calculated using the value of the claims in each filing. The liquidation value of assets is an estimate of an expert hired by the court. ROA is the return on assets. All right-hand side variables are standardized.

	Dependent Variable: Leave-Out Mean Duration									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
HH Index	0.0997 [0.191]									
Log # Creditors		-0.290 [0.176]								
Log # Creditors (Ex Labor)			-0.222 [0.173]							
Firm Age				-0.104 [0.217]						
Log Debt					-0.0745 [0.179]					
Log Liquidation Value Assets						0.166 [0.207]				
Log Assets							-0.435* [0.226]			
ROA								-0.318 [0.305]		
Log # Workers									-0.317* [0.192]	
Average Wage										-0.308 [0.188]
Observations	200	200	200	200	200	148	120	120	200	156
R-squared	0.001	0.011	0.007	0.001	0.001	0.004	0.025	0.013	0.013	0.013

Table 5: First-stage Results

This table reports the results of the first-stage regressions. Regressions are defined at the filing level. The left-hand side variable is the reorganization case duration in months, measured from filing to voting. Judge's leave-out mean duration is the average duration of bankruptcy cases overseen by the same judge in the same year, excluding the current case from the average. We included the following firm pre-bankruptcy characteristics as controls: a second-degree time polynomial, debt concentration (measured by the Herfindahl–Hirschman index of the debt shares), return on assets (ROA), and the natural logarithm of the following variables: number of creditors, total debt, total assets, and number of workers. For filings that involve more than one firm, we appropriately aggregate those variables. Robust standard errors are in brackets. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	Dependent Variable: Duration (months)			
	(1)	(2)	(3)	(4)
Judge's Leave-Out Mean Duration	0.288**	0.273**		
	[0.127]	[0.130]		
Judge 2			1.004	-0.951
			[1.551]	[2.164]
Judge 3			1.461	0.776
			[1.205]	[1.416]
Judge 4			1.751	0.128
			[1.130]	[1.560]
Judge 5			3.082**	2.924**
			[1.525]	[1.481]
Judge 6			4.298***	5.162***
			[1.381]	[1.636]
Judge 7			6.510***	4.381*
			[1.924]	[2.309]
Filling Year Polynomial	No	Yes	No	Yes
Pre-Bankruptcy Controls	No	Yes	No	Yes
F-stat	5.106**	4.391**	3.117***	3.062***
p-value	0.0249	0.0375	0.0061	0.0070
Observations	200	200	200	200
R-squared	0.019	0.072	0.065	0.128

Table 6: Delay Breakdown

This table reports the estimates of the regressions using the breakdown of the case duration in the left-hand side. Regressions are defined at the filing level. The left-hand side variable is the duration of each step of the court process (in months). Judge's leave-out mean duration is the average duration of bankruptcy cases overseen by the same judge in the same year, excluding the current case from the average. We included the following firm pre-bankruptcy characteristics as controls: a second-degree time polynomial, debt concentration (measured by the Herfindahl–Hirschman index of the debt shares), return on assets (ROA), and the natural logarithm of the following variables: number of creditors, total debt, total assets, and number of workers. For filings that involve more than one firm, we appropriately aggregate those variables. Robust standard errors are in brackets. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	Dependent Variable							
	Reorganization filing to judge deferral		Judge deferral to plan presentation to judge		Plan presentation to judge to plan disclosure to creditors		From plan disclosure to creditors to plan voting	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Judge's Leave-Out Mean Duration	-0.0466 [0.0422]	-0.0510 [0.0414]	-0.0681 [0.0755]	-0.0531 [0.0639]	-0.003 [0.0330]	-0.00167 [0.0351]	0.366*** [0.136]	0.331** [0.140]
Filling Year Polynomial	No	Yes	No	Yes	No	Yes	No	Yes
Pre-Bankruptcy Controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	200	200	121	121	121	121	198	198
R-squared	0.005	0.101	0.018	0.079	0.000	0.038	0.035	0.075

Table 7: The Impact of Court Duration

This table reports the estimates of a binary dependent variable model, where court duration (from filing to voting) is a left-hand side variable assumed to be endogenous. Coefficients are estimated using the leave-out mean duration as an instrument in a maximum likelihood estimation approach. Regressions from columns 1 to 4 have the approval vote as the dependent variable, while regressions in columns 5 and 6 have the approval of the reorganization plan as the dependent variable. we included the following firm pre-bankruptcy characteristics as controls: a second-degree time polynomial, debt concentration (measured by the Herfindahl–Hirschman index of the debt shares), return on assets (ROA), and the natural logarithm of the following variables: number of creditors, total debt, total assets, and number of workers. For filings that involve more than one firm, we appropriately aggregate those variables. Robust standard errors are in brackets. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Dependent Variable:	Approval Vote	Approval Vote	Approval Vote, Banks and receivables Only	Approval Vote, Banks and receivables Only	Reorganization Approval	Reorganization Approval
	(1)	(2)	(3)	(4)	(5)	(6)
Duration (months)						
Coefficient	0.0927*	0.162*	0.152***	0.180***	0.115**	0.104
Standard Error	[0.0547]	[0.0848]	[0.0503]	[0.0582]	[0.0552]	[0.0741]
Marginal Effect	0.0111	0.0297	0.0524	0.0663	0.0358	0.0302
Filling Year Polynomial	No	Yes	No	Yes	No	Yes
Pre-Bankruptcy Firm Controls	No	Yes	No	Yes	No	Yes
Standard Error	Clustered, Filing Level	Clustered, Filing Level	Clustered, Filing Level	Clustered, Filing Level	Robust	Robust
Observation Level	Claim	Claim	Claim	Claim	Filing	Filing
Observations	11,388	11,388	4,410	4,410	200	200

Table 8: Reasons to Fail to Reach the Voting Stage

This table reports the reasons why the group of debtors that did not reach the voting stage failed to have their reorganization plan submitted or voted on. We collected the reasons for all petitions filed between 2006 and 2017. Only filings that were digitalized by the bankruptcy court are included.

Reason	*Total Count*	*Fraction*
Dismissal of initial petition by judge	84	63.64%
Reorganization petition withdrawn by debtor	18	13.64%
Inability to keep business running	13	9.85%
Failure to produce a reorganization plan	8	6.06%
Redistribution to another court	4	3.03%
Liquidation requested by debtor	4	3.03%
Liquidated in another legal proceeding	1	0.76%
Total	132	100.00%

Table 9: Robustness

This table reports the estimates of a binary dependent variable model, where court duration (from filing to voting) is a left-hand side variable assumed to be endogenous, controlling for several possible cofounding factors. Judges' dismissal rate is the fraction of initial petitions dismissed by the judge overseeing the current case. Judges' pro-creditor score is the number of instances a judge sides with creditors minus the number a judge sides with creditors, normalized by the total number of instances. Coefficients are estimated using the leave-out mean duration as an instrument in a maximum likelihood estimation approach. Regressions from columns 1 to 6 have the approval vote of banks and receivable owners as the dependent variable. We included the following firm pre-bankruptcy characteristics as controls: a second-degree time polynomial, debt concentration (measured by the Herfindahl–Hirschman index of the debt shares), return on assets (ROA), and the natural logarithm of the following variables: number of creditors, total debt, total assets, and number of workers. For filings that involve more than one firm, we appropriately aggregate those variables. Robust standard errors are in brackets. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

	Dependent Variable: Approval Vote (Banks and Receivables Only)					
	(1)	(2)	(3)	(4)	(5)	(6)
Duration (months)	0.178***	0.213***	0.162***	0.204***	0.172*	0.217*
	[0.0626]	[0.0403]	[0.0567]	[0.0419]	[0.100]	[0.121]
Judges' Dismissal Rate	0.889	1.152				
	[1.184]	[1.191]				
Judges' Pro-Creditor Score			0.0655	0.0422		
			[0.677]	[0.724]		
Filling Year Polynomial	No	Yes	No	Yes	No	Yes
Pre-Bankruptcy Controls	No	Yes	No	Yes	No	Yes
Claim Administrator Fes	No	No	No	No	Yes	Yes
Observations	4,410	4,410	4,388	4,388	4,343	4,343

Table 10: The Role of Debt Dispersion

This table reports the estimates of a binary dependent variable model, where court duration (from filing to voting) is a left-hand side variable assumed to be endogenous. Coefficients are estimated using the leave-out mean duration as an instrument in a maximum likelihood estimation approach. The sample in columns 1, 2, 5, and 6 uses filings with debt concentration (measured by the Herfindahl–Hirschman index of the debt shares) bellow the median, while that in columns 3, 4, 7, and 8 uses filings with debt concentration above the median. We included the following firm pre-bankruptcy characteristics as controls: a second-degree time polynomial, debt concentration (measured by the Herfindahl–Hirschman index of the debt shares), return on assets (ROA), and the natural logarithm of the following variables: number of creditors, total debt, total assets, and number of workers. For filings that involve more than one firm, we appropriately aggregate those variables. Robust standard errors are in brackets. *** denotes p<0.01, ** denotes p<0.05, and * denotes p<0.1.

Dependent Variable:	Approval Vote				Reorganization Approval			
Sample:	HH Index ≤ median		HH Index > median		HH Index ≤ median		HH Index > median	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Duration (months)	0.170***	0.213***	-0.161***	-0.0829	0.148***	0.180***	0.0521	-0.0167
	[0.00634]	[0.00544]	[0.0517]	[0.0566]	[0.0337]	[0.0214]	[0.128]	[0.142]
Filling Year Polynomial	No	Yes	No	Yes	No	Yes	No	Yes
Pre-Bankruptcy Firm Controls	No	Yes	No	Yes	No	Yes	No	Yes
Standard Error	Clustered, Reorganization Level		Robust		Clustered, Reorganization Level		Robust	
Observation Level	Claim		Filing		Claim		Filing	
Observations	3,376	3,376	1,034	1,034	100	100	100	100

Appendix A: Data

A.1 Collection of Court Filings

The first step in the construction of the database is finding the case numbers of all digitalized reorganization cases filed between 2006 and 2017 in specialized bankruptcy courts. This is done through manual searches of the Electronic Journal of Justice of São Paulo. After collecting all court numbers, we collected the PDF files containing the full filing and its attachments. We manually extracted all relevant information from the filings, including the full description of the capital structure and the full list of votes for the reorganization plan. Here, we restrict the sample to filings that (i) reached the voting stage and for which (ii) the judge overseeing the filing oversaw at least one other case in the same year so that the leave-out mean instrument can be calculated.

A.2 Additional Data Sources

We collected additional information from two other databases. Labor market outcomes, such as the number of employees and average wage, are collected from RAIS (*Relação Anual de Informações Sociais*), a database with information at the worker-employer level. We also collected additional administrative information (such as firm age and firm survival) from the Brazilian Federal Revenue System.

Table A1: Data Sources

This table reports the source of all variables used in this paper. RAIS is the *Relação Anual de Informações Sociais.* The Brazilian Federal Revenue System is the federal institution responsible for collecting income taxes in Brazil.

Variable	*Source*
Number of Creditors	Court Filing
Debt Concentration	Calculated from Court Filing
Firm Age	Brazilian Federal Revenue System
Total Debt	Court Filing
Liquidation Value of Assets	Court Filing
Assets	Court Filing
Net Income	Court Filing
Return on Assets (ROA)	Court Filing
Number of Workers	RAIS
Average Monthly Wage	RAIS
Case Duration	Court Filing
Creditor Vote	Court Filing
Approval of Reorganization Plan	Court Filing
Survives 2 years after approval	Brazilian Federal Revenue System
Survives 4 years after approval	Brazilian Federal Revenue System

Appendix B: A Model of Creditor Votes

Here, we discuss a simple reorganization model that can generate a distribution of votes similar to the empirical distribution described in the data section.

B.1 Model Layout

There are T periods, where T can be interpreted as the amount of time available for negotiations. There is one debtor and N creditors, where N is an even number. All agents are risk neutral and have a discount rate of 0. The reorganization plan is presented to creditors at $t = 0$, and creditors vote at $t = T$. The plan is approved if the number of approval votes is larger than or equal to $N/2$.

The payoff for each creditor in the case of reorganization is given by π, which follows an unconditional normal distribution with average π_0 and variance σ_π^2. Each creditor observes a private signal about the reorganization payoff, given by:

$$s_i = \pi + \varepsilon_i$$

where each ε_i is orthogonal to π and $\varepsilon_i \sim iidN(0, \sigma_\varepsilon^2)$.

The debtor receives a payoff normalized to 1 in the case of reorganization and of 0 in the case of liquidation. He or she observes the true value of π, denoted by π^*, and can convince a given creditor that $\pi = \pi^*$ at the monetary cost c and at the time cost of one period. Therefore, only one creditor can be convinced at a time. We assume that creditors are not aware that the debtor may be approaching them, so they do not update their beliefs if they have not been approached.

We make the simplifying assumption that debtors cannot change the reorganization plan. This is in effect shutting down the negotiation channel so that we can more parsimoniously focus on the information channel. Therefore, the debtor only chooses the number of creditors to approach, while creditors choose their votes.

B.2 Model Solution if $\pi < L$

In this case, the debtor would not approach any creditor. Indeed, approaching a creditor would imply paying a cost c and would make the creditor vote to reject the plan. Instead, the debtor does nothing and hopes for sufficiently optimistic signals so the plan can be approved.

In this scenario, since the creditor does not discover the true value of π, he or she uses his or her signal s_i to vote. The projection theorem implies that

$$E(\pi|s_i) = \left(\frac{\sigma_\varepsilon^2}{\sigma_\pi^2 + \sigma_\varepsilon^2}\right)\pi_0 + \left(\frac{\sigma_\pi^2}{\sigma_\pi^2 + \sigma_\varepsilon^2}\right)s_i$$

Therefore, a creditor would vote to approve the reorganization plan if, and only if,

$$s_i \geq L + \frac{\sigma_\varepsilon^2}{\sigma_\pi^2}(L - \pi_0)$$

From the perspective of the debtor, $s_i|\pi \sim N(\pi, \sigma_\varepsilon^2)$. Therefore, creditor i accepts the plan with probability

$$P\left[s_i \geq L + \frac{\sigma_\varepsilon^2}{\sigma_\pi^2}(L - \pi_0)\right] = P\left[\frac{s_i - \pi}{\sigma_\varepsilon^2} \geq \frac{L - \pi}{\sigma_\varepsilon^2} + \frac{L - \pi_0}{\sigma_\pi^2}\right] = \Phi\left(\frac{\pi - L}{\sigma_\varepsilon^2} + \frac{\pi_0 - L}{\sigma_\pi^2}\right)$$

where $\Phi(\cdot)$ represents the $N(0,1)$ cumulative distribution function. Let q denote the probability $\Phi\left(\frac{\pi - L}{\sigma_\varepsilon^2} + \frac{\pi_0 - L}{\sigma_\pi^2}\right)$. This probability will be useful for the next case, discussed below.

B.3 Model Solution if $\pi \geq L$

In this case, one need to find the optimal number of creditors M to be approached by the debtor. Let $V_i \in \{0,1\}$ denote the vote of creditor i if he or she was not approached by the debtor. To simplify notation, let $B_M = \sum_{i=M+1}^{N} V_i$. The debtor's maximization problem is:

$$\max_{M \leq T} P(M + B_M \geq N/2) - cM$$

Maximization can be achieved by analyzing all possible values of M between 0 and T and noting that the probability $P(B_M \geq N/2 - M)$ can be calculated using the cumulative distribution function of the binomial distribution.

B.4 Model Simulation

we simulate the model 10,000 times using the following parameters: $N = 100$, $\pi_0 = 0.75$, $L = 1.1$, $\sigma_\pi^2 = 1$, $\sigma_e^2 = 1.3$, and $c = 0.015$. As seen in Figure B1 below, the resulting distribution of the fraction of approval votes has a mass of positive votes above the 0.5 cutoff, replicating one of the main features of the empirical distribution of votes in Figure 3.

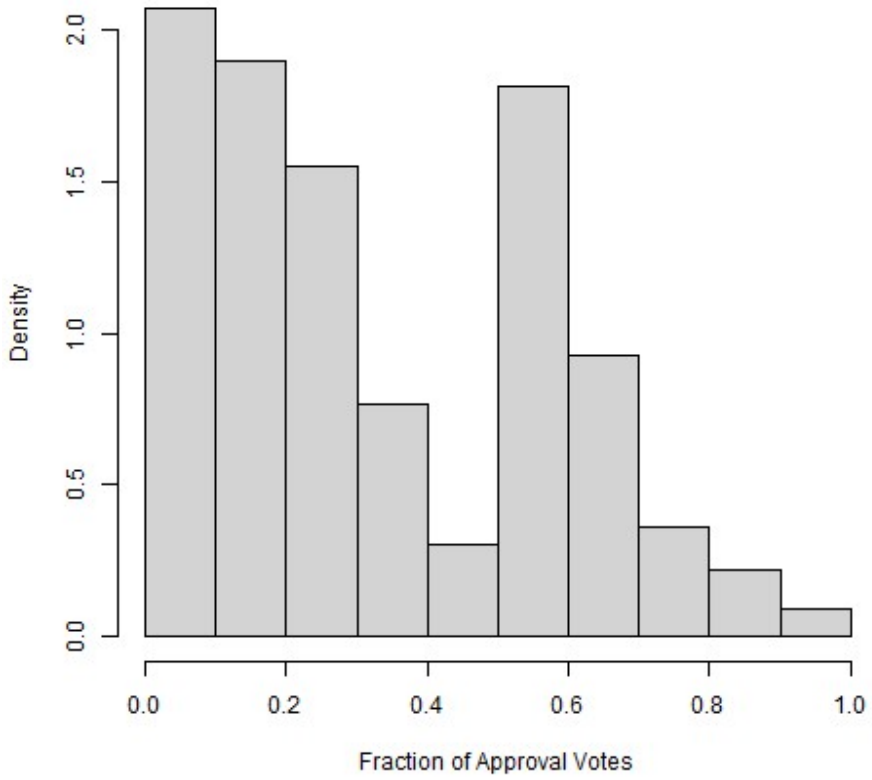

Figure B1: Simulated Fraction of Approval Votes

Plotted is the distribution of the fraction of approval votes across different reorganization plans simulated by the model described in Appendix B. The following parameters were used: $N = 100$, $\pi_0 = 0.75$, $L = 1.1$, $\sigma_\pi^2 = 1$, $\sigma_e^2 = 1.3$, and $c = 0.015$.