

# The Labor Effects of Judicial Bias in Bankruptcy

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## Abstract

We exploit the random assignment of cases across courts in the state of São Paulo in Brazil to study the effect of judicial bias on labor market outcomes. Employees assigned to courts that favor firm continuation are more likely to stay with their employer, but they earn, on average, lower wages after bankruptcy. The effect is concentrated in periods of economic expansion. We explore several potential mechanisms that can drive this result, including risk aversion, adjustment costs, non-wage amenities and information frictions. The evidence suggests that imperfect information about outside options in the local labor market can rationalize this result.

**Keywords:** Brazil, Wages, Information frictions, Financial Distress.

**JEL Classification:** G33, G20, K10

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# I INTRODUCTION

Bankruptcy institutions play an important role in the reallocation of production factors of distressed firms and have broader implications for economic growth and aggregate productivity. The objective of a well-functioning bankruptcy system is to prevent the exit of viable firms and the inefficient continuation of non-viable ones, while facilitating the reallocation of resources from distressed firms to more productive ones. However, numerous frictions tend to characterize the reallocative efficiency of the bankruptcy process, especially in developing countries. Courts are often congested, judges lack the specialized knowledge necessary to deal with complex cases, and – in some instances – are subject to political influence. One friction that, in the context of developing countries, has received less attention in the literature is judicial bias in the interpretation of the law. In particular, judges may favor the continuation of a non-viable firm – even if doing so means deviating from the actual wording of the law – to protect workers’ jobs. Although this type of bias in bankruptcy is considered widespread, direct empirical evidence on how it affects workers’ labor market outcomes is scarce.<sup>1</sup>

In this paper, we study the effect of judicial bias in bankruptcy on the labor market outcomes of workers of distressed firms. We focus on Brazil, which provides a well-suited setting for a number of reasons. First, despite the Brazilian judicial system generally being considered pro-debtor (Arida, Bacha, and Lara-Resende, 2005), the data collected for this paper show large variation in the degree of judicial bias across courts dealing with bankruptcy cases. Second, this setting allows us to combine detailed information on judicial decisions in bankruptcy cases with a comprehensive employer-employee dataset in which we can follow all formal workers over time and across employers. Third, bankruptcy cases in the state of São Paulo – the largest and more industrialized state in Brazil – are randomly assigned across courts within a judicial district. We exploit this feature of the setting in our identification strategy, to ensure the degree of judicial bias workers face is plausibly orthogonal to their initial characteristics.

We start by constructing a measure of judicial bias using a new dataset covering the universe of bankruptcy cases filed in the state of São Paulo between 2005 and 2017. For each case, we analyze the text of all decisions taken by the judges in charge of the case and classify them as “pro” or “against” continuation, depending on whether they facilitate or hinder the continuation of an insolvent firm. Pro-continuation decisions include, for example, the denial of certain creditor requests to seize assets, the extension of the time available for managers to present a reorganization plan, or the denial of a request to

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<sup>1</sup>Blazy, Chopard, Fimayer, and Guigou (2011) show that in French bankruptcy courts, “social considerations prevail in the arbitration,” with the preservation of employment being a key consideration. In the US, reorganization under Chapter 11 is viewed as favoring debtors and the continuation of the firm (Franks, Nyborg, and Torous, 1996; Skeel, 2001). Pro-continuation bias is evident also outside of bankruptcy. For example, Cahuc, Carcillo, and Patault (2019) analyze the impact of pro-continuation bias in labor courts in France.

convert a reorganization into a liquidation. We aggregate these decisions to create a measure of pro-continuation at the court level.

The main identification challenge we face is the potential correlation between pro-continuation and other characteristics of a given region or the firms operating in it. For example, regions with more pro-continuation courts could also be characterized by poorly functioning local labor markets. In this case, differences in workers' outcomes after bankruptcy could be driven by differences in the characteristics of the local labor market that workers face, rather than being the effect of judicial bias. To deal with these challenges, we rely on the fact that – as discussed above – bankruptcy cases in the state of São Paulo are randomly assigned across courts within a judicial district. Exploiting this feature, our identification strategy compares the labor market outcomes of workers whose firms file for bankruptcy in the same judicial district and year, and whose cases are assigned to courts with different degrees of pro-continuation.<sup>2</sup>

We start by verifying that pro-continuation bias indeed affects bankruptcy outcomes. We document that high pro-continuation courts tend to facilitate the continuation of insolvent firms, by either rejecting liquidation requests at a higher rate or converting reorganization cases into liquidations at a lower rate. Crucially for our purposes, high and low pro-continuation courts receive cases with comparable characteristics – for example, insolvent firms are the same size and represent the same share of reorganization versus liquidation filings – and have similar levels of court congestion.

Next, we focus on the effect of pro-continuation bias on employee-employer relationships. The first key result of the paper is that employees of insolvent firms whose cases are assigned to high pro-continuation courts are more likely to stay with the same employer in the post-bankruptcy period. How does continuation with the same employer affect workers' labor market outcomes? In a perfectly competitive labor market where workers are paid their marginal product, higher continuation with the same employer should not affect workers' wages, as long as workers' productivity is unchanged. Frictions in the labor market can generate deviations from this benchmark. For example, workers might earn wages that are higher than the competitive benchmark in imperfectly competitive labor markets (Lamadon, Mogstad, and Setzler, 2019) or when workers are entrenched with the current employer (Berk, Stanton, and Zechner, 2010). In these cases, continuation positively affects worker's wages because it prevents a contract termination that make wages converge to their market level. On the other hand, workers might earn wages that are below their competitive benchmark if search costs are substantial or when workers are imperfectly informed about their outside options. Indeed, recent evidence shows that workers' beliefs about their outside options are often incorrect, leading them to underes-

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<sup>2</sup>In this sense, our identification strategy follows a large literature using random assignment of corporate and personal bankruptcy cases across judges within US courts (Chang and Schoar, 2013; Bernstein, Colonnelli, and Iverson, 2019; Dobbie and Song, 2015; Dobbie, Goldsmith-Pinkham, and Yang, 2017), which was inspired by Kling (2006).

timate what they could earn with other employers (Jäger, Roth, Roussille, and Schoefer, 2022). In this case, we expect pro-continuation bias to have a negative effect on workers' wages.

We find that being assigned to high pro-continuation courts has a negative effect on average workers' wages and earnings after bankruptcy. Specifically, workers of firms facing high pro-continuation courts experience 4.5% lower annual labor earnings in the post-bankruptcy period relative to those facing low pro-continuation courts within the same judicial district. The effect is primarily explained by lower average wages.

These results raise the question of why employees remain with the same employer when – according to our estimates – they could, on average, earn more by searching for a new job. We discuss and empirically test potential mechanisms that can rationalize this result. As discussed above, a potential explanation is that workers of bankrupt firms are imperfectly informed about their outside options and thus earn wages that are below their competitive benchmark in the labor market (Jäger et al., 2022). Underestimating outside options could be particularly costly for workers employed by poorly performing firms. To test this mechanism, we propose two proxies for access to information. First, we build on Porcher (2020) and use differences in internet diffusion across Brazilian municipalities. Second, we construct an individual-level measure of access to information based on the employment trajectories of former coworkers. This measure of “coworker network” builds on Caldwell and Harmon (2019) and relies on the idea that workers often learn about their outside options through their network of former colleagues. The evidence shows that in areas with lower internet diffusion, workers assigned to high pro-continuation courts experience a larger decline in wages. On the other hand, high internet diffusion strongly mitigates these effects. Similarly, we find that larger coworker networks help absorb the negative impact of pro-continuation on post-bankruptcy wages. Although both internet diffusion and coworker networks are imperfect measures of workers' access to information about their outside options, the findings are consistent with information frictions in local labor markets being an important driver of the negative effect of pro-continuation bias in bankruptcy on workers' wages.

We also discuss and empirically test two additional mechanisms. First, risk-averse workers might prefer to stay with the current employer than face an uncertain outcome in the labor market, even when the market wage for a worker with her characteristics is above the current wage. We find no significant evidence of an increase in future income volatility or a higher risk of extreme decline in earnings for workers in low pro-continuation courts. Another potential explanation is that the negative effect of pro-continuation on wages reflects adjustment costs associated with job change. Adjustment costs include those associated with geographical relocation, changes in the sector of employment or occupation, or changes in non-wage amenities offered by employers. Consistently with their higher probability of staying with the current employer, we find that workers in high

pro-continuation courts are less likely to change municipalities after bankruptcy. Although this effect is quantitatively small, it suggests that accepting lower wages might be in part explained by saving on adjustment costs due to relocation. We find instead no difference in workers' probability of changing sectors or occupations in the post-bankruptcy period. We also explore the role of workplace amenities. To do so, we rely on proxies proposed in the labor economics literature, which exploit job-to-job transitions to capture revealed preferences of workers over different employers (Sorkin, 2018; Bagger and Lentz, 2019; Lagaras, 2020). We find no significant differences in changes in workplace amenities for workers assigned to high versus low pro-continuation courts, which suggests that the documented effects on labor market outcomes are unlikely to reflect differential changes in amenities across employers in the post-bankruptcy period.

We perform several robustness tests. We present empirical evidence to corroborate the random assignment of cases within judicial districts. We show that no significant differences exist in terms of worker, firm, and case characteristics across high versus low pro-continuation courts within a given judicial district and year of filing. We also show that our results are robust to using alternative measures of pro-continuation and excluding the judicial district of the city of São Paulo, which includes two courts specialized in bankruptcy cases.

Finally, we show that our results are not explained by workers differentially leaving the sample in cases assigned to courts with different degrees of pro-continuation bias. First, we show that pro-continuation bias has no significant effect on the probability of remaining in-sample in the post-bankruptcy period. Second, we extend our analysis of the impact of pro-continuation bias on wages and earnings by estimating an alternative specification in which we include workers who exit the sample and assign them the average informal wage in their municipality. Our main results are robust to this alternative specification: during periods of economic expansion (the majority of our sample) pro-continuation bias has a negative and significant effect on wages and labor earnings. On the other hand, we find that, during recessions, being assigned to a high pro-continuation court can help workers to remain employed, and allows them to absorb about one quarter of the negative effect of bankruptcy on their earnings. This finding suggests that the availability of outside options in the local labor market can shape the impact of judicial bias on workers' wages and earnings.

### *Related Literature*

Our paper is related to three main streams of the literature. First, it contributes to the literature on distress resolution, and more specifically on the effect of financial distress on employees.<sup>3</sup> Baghai, Silva, Thell, and Vig (2020) use Swedish administrative data to

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<sup>3</sup>A related literature examines the effect of financial distress and bankruptcy on firm-level employment. Hotchkiss (1995) shows firms downsize in terms of employment after Chapter 11 bankruptcy, Falato and Liang (2016) document employment cuts following loan-covenant violations, and Agrawal and Matsa

document that financially distressed firms tend to lose their most skilled employees before filing for bankruptcy, although they do not examine the effect on employee wages. Babina (2019) focuses on entry to entrepreneurship for employees of distressed firms.

Closest to our paper is recent work by Graham, Kim, Li, and Qiu (2021), who study the costs of bankruptcy for employees in the US. The authors document that bankruptcy is associated with large employee costs, with employee annual earnings decreasing by about 10% relative to pre-bankruptcy earnings. Our paper makes two contributions with respect to Graham et al. (2021). First, we provide novel evidence on the effects of bankruptcy on employees in an important emerging economy such as Brazil, which differs from the US both in terms of labor market characteristics and bankruptcy institutions.<sup>4</sup> Second, our focus is on the role of judicial bias in affecting labor market outcomes. Although the average earnings losses that we document in the Brazilian setting are similar in magnitude to those documented in the US, we show that the cost of bankruptcy differs depending on the degree of judicial bias, and it is significantly larger for employees assigned to pro-continuation courts. The findings of the two papers differ regarding the effect of continuation with the bankrupt firm: Graham et al. (2021) document that, on average, employees who stay with financially distressed firms fare better than those who leave, whereas we find that during economic expansions, staying might actually be detrimental for workers' wages.<sup>5</sup> A potential explanation for this difference is that the Brazilian labor market is characterized by larger information frictions than the US market. In particular, we find that the negative effect of pro-continuation is mostly driven by workers that are plausibly less informed about their outside options and thus earn wages that are below their competitive benchmark in the labor market.

Our paper is also related to the literature on the influence of judges' individual characteristics on the bankruptcy process. From a theoretical perspective, Posner (2005) and Gennaioli and Shleifer (2008) examine how judicial policy preferences affect judges' biases. In the growing empirical literature, Bris, Welch, and Zhu (2006) examine bankruptcies in Arizona and New York from 1995 to 2001 and find evidence that the particular judges drawn to handle a case differ in terms of the fractions they pay out to creditors, the length of the proceedings, and how they adhere to absolute priority. Bernstein et al. (2019) ex-

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(2013) find employment decreases by approximately 27% after bond defaults. Relatedly, Caggese, Cuñat, and Metzger (2019) show financial constraints distort firms' firing decisions, and Brown and Matsa (2016) find that an increase in an employer's distress results in fewer and lower-quality job applicants.

<sup>4</sup>For example, similarly to most developing countries but unlike the US, liquidations are the predominant type of bankruptcy resolution in Brazil.

<sup>5</sup>An important caveat in comparing the findings of the two papers is that we use different identification strategies. Our estimates are obtained by comparing workers assigned to high pro-continuation courts relative to workers in low pro-continuation courts. On the other hand, the estimates in Graham et al. (2021) compare workers in bankrupt firms with workers in non-bankrupt firms with similar characteristics. Note also that the larger loss for leavers documented in Graham et al. (2021) seems to be driven by workers who leave the firm and have to change both county of residence and industry, whereas workers who leave the firm but find occupations in the same industry and county seem to fare at least as well as stayers also in the US setting.

exploit judge heterogeneity in the propensity to convert reorganization (Chapter 11) filings to liquidations (Chapter 7) to examine the effect of liquidation and reorganization on the utilization of assets of distressed firms. Iverson, Madsen, Wang, and Xu (2020) use large corporate Chapter 11 filings in the US and document that judge experience affects the time spent in bankruptcy, the likelihood of reorganization and refiling, and creditor recovery rates. Canayaz and Gustafson (2021) show that liberal judges facilitate business turnover. Chang and Schoar (2013) use judge fixed effects to create a measure of pro-debtor friendliness and estimate its impact on bankrupt firms. Specifically, they show pro-debtor judges lead to worse firm outcomes in terms of firm survival, sales, and employment growth. Finally, Antill (2021) proposes a new structural model to estimate the efficiency of different forms of bankruptcy resolution in terms of creditors' recovery rate, and finds evidence consistent with excessive liquidation using data from the US. Our paper differs from the existing work, because it is the first to examine the impact of judicial bias in the application of the bankruptcy law on labor market outcomes at the employee level.

Finally, our paper contributes to the literature that explores the impact of institutional frictions in bankruptcy, with a particular emphasis on the experience of developing countries. The existing literature studies the financial and real effects of a lack of judicial specialization (Visaria, 2009), court efficiency (Fonseca and Van Doornik, Fonseca and Van Doornik; Rodano, Serrano-Velarde, and Tarantino, 2016; Iverson, 2018; Ponticelli and Alencar, 2016), and political influence (Li and Ponticelli, 2020). Our paper contributes to this literature by introducing a measure of pro-continuation judicial bias and studying how it affects bankruptcy resolution and labor market outcomes.

The rest of the paper is organized as follows. In section II, we present the institutional background. Section III describes the data and introduces a new measure of pro-continuation bias used in the empirical analysis. Section IV contains the empirical analysis. In this section, we discuss a simple conceptual framework to guide the empirical analysis, we lay out the identification strategy, we present the main effects of pro-continuation bias on labor market outcomes, and we discuss a set of potential mechanisms that can rationalize the key results. Section VI concludes.

## II INSTITUTIONAL BACKGROUND

In this section, we provide background information on two aspects of our institutional setting: (i) the degree of judicial bias characterizing the Brazilian judicial system as evidenced by survey data, and (ii) how the Brazilian bankruptcy system operates, including both its legal framework and rules regarding the assignment of cases to courts.

## II.A JUDICIAL BIAS IN BRAZIL

Arida et al. (2005) argue that, potentially due to its pervasive income inequality, Brazilian society is traditionally characterized by a diffused anti-creditor bias, especially when contrasted with the positive view of the debtor, who is often described as a job creator whose financial distress is more the product of unfortunate circumstances than of misguided managerial decisions. Numerous surveys show this bias is deeply rooted in the judicial system. Lamounier and De Souza (2002) conducted an opinion survey of approximately 500 Brazilian workers in the executive, legislative, and judicial branches of government. The survey results show that 61% of the members of the judiciary agreed with the statement that a “judge has to perform a social function, and the quest for social justice justifies decisions in breach of contracts,” whereas only 7% of them declared that “contracts must be enforced independently of their social effects.”<sup>6</sup> By contrast, the majority of respondents of the same survey who were not part of the judiciary said they were in favor of contract enforcement being independent from social justice.

In a similar survey presented in Pinheiro (2003), approximately 700 judges answered the same question. The results show 73.1% of judges were *more* in agreement with the statement that social justice justifies decisions in breach of contracts than with the statement that contracts should always be enforced.<sup>7</sup> The latter survey also shows the social justice view of the judiciary is broadly shared between both young and old judges (with a higher percentage among younger judges) and tends to be stronger *outside* of the richest and more industrialized states of São Paulo, Rio de Janeiro, Federal District, and Rio Grande do Sul. Because the data used in our paper focus on judicial decisions in São Paulo, our setting can be considered a lower bound of the judicial bias present in the Brazilian context.

## II.B THE BRAZILIAN BANKRUPTCY SYSTEM

### II.B.1 *Legal Framework*

After the introduction of the 2005 reform, the Brazilian bankruptcy law shares important similarities with the US Bankruptcy Code by allowing for two types of in-court formal proceedings for insolvent firms, namely, judicial reorganization (“Recuperação Judicial”) and liquidation (“Falência”).

Liquidations are predominantly involuntary proceedings initiated by one of the firm’s creditors, although a debtor that experiences both financial and economic distress has the opportunity to voluntarily request the commencement of formal liquidation proceedings. The procedure is analogous to Chapter 7 of the US Bankruptcy Code. Once a petition for involuntary bankruptcy is filed with the court, the debtor has the opportunity to submit

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<sup>6</sup>Statistics from Lamounier and De Souza (2002) are reported in Arida et al. (2005), Table 8.2, p. 271.

<sup>7</sup>See Table 25, question 8 of the survey, Pinheiro (2003).



a defense and/or file for an in-court restructuring within 15 days. If the liquidation case is not dismissed and the court accepts the request, a court-appointed trustee replaces the management, and the debtor's assets are sold through public auctions, sealed bids, or public proclamations, based on guidance from the judicial trustee. The proceeds are used to repay the existing liabilities pursuant to the statutory absolute priority order: (i) labor-related claims (capped at 150 minimum wages per employee), (ii) secured credits, (iii) tax liabilities, and (iv) unsecured claims.

By contrast, reorganizations are initiated only voluntarily by the debtor, and the underlying procedures are largely similar to the ones followed in Chapter 11 of the US Bankruptcy Code. The reorganization process is a court-supervised procedure that was formally introduced in Brazil as part of the 2005 Bankruptcy Law Reform in an attempt to modernize and replace the previously inefficient and rarely used reorganization-like process ("Concordata") that basically only postponed debt repayment with no renegotiation between parties. The purpose of the judicial reorganization process is to enable economically viable (albeit financially distressed) firms to effectively restructure and overcome insolvency to preserve production, employment, and the interests of creditors.<sup>8</sup> The stages and the time frame of the reorganization procedure are shown in Appendix Figure A1.

Following the filing of the reorganization request, the court decides its eligibility based on a set of statutory requirements. In most cases, the decision is primarily based on whether the firm has attached the required documentation to the petition, including current and previous financial statements and a complete list of creditors. An assessment of economic viability is done in a later stage with the participation of creditors. If the request is accepted, the firm is granted an automatic stay on its assets, and creditors are prevented from pursuing their claims or repossessing any collateral for a period of 180 days.<sup>9</sup> In addition, the court appoints a trustee to oversee the proceedings and monitor the debtors' activities.

Within the first 60 days, the debtor is expected to present a reorganization plan containing (i) a strategy<sup>10</sup> for the recovery of the firm, (ii) estimates of the firm's long-term economic and financial prospects under the proposed terms, and (iii) an independent appraisal report with the estimated value of the firm's existing assets. Claims with voting rights and subject to automatic stay are grouped together according to their types: labor

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<sup>8</sup>Article 47 of the Brazilian Bankruptcy Law No. 11.101/2005

<sup>9</sup>Brazilian law allows some exceptions to automatic stay during reorganization. For example, claims originated from lease contracts, chattel mortgages, and accounts receivable lines of credit are not subject to automatic stay. However, during the first 180 days of the automatic stay, creditors holding these types of claims cannot sell "productive capital goods" (e.g., production plants, machinery, or vehicles) that are deemed essential to the firm's recovery.

<sup>10</sup>The proposed strategies involve a mix of debt renegotiation, asset divestitures, workforce downsizing, and any attempt to obtain additional funding.

claims, secured credits, unsecured credits, and claims from small businesses.<sup>11</sup> Debt-renegotiation offers cannot discriminate between creditors in the same class.<sup>12</sup>

After the reorganization plan is submitted, each creditor has 30 days to raise objections. If no objections are raised, the plan is considered approved. Otherwise, the court schedules a meeting that includes creditors with voting rights to vote on the proposed plan. If the plan is rejected by creditors that hold more than 50% of the total value of claims in any given class of claims, the firm is liquidated. If the plan is approved, reorganization starts and the firm begins implementing the proposed restructuring plan.<sup>13</sup>

During the next two years, the firm is expected to adhere to the reorganization plan, and creditors must approve any major change that deviates from the initial proposed plan. At the end of this two-year period, if everything has gone according to plan, the court declares the end of the reorganization period and the firm is considered to have recovered from insolvency. Otherwise, if at any point in this period, the firm is considered to have failed to follow the reorganization plan, the court orders the conversion of its reorganization into a liquidation.

### *II.B.2 Assignment of Cases to District Courts*

Bankruptcy cases are adjudicated in local courts. Any liquidation or reorganization request has to be filed in the judicial district that has jurisdiction over the location of a firm's primary establishment, which is predominantly where the firm's headquarters are located. This restriction limits the ability of the debtor to engage in forum shopping by filing the petition in jurisdictions perceived as consisting of pro-debtor courts. The same restriction applies to any creditor that considers filing a liquidation request.

Bankruptcy requests are collected by a central office in the debtor's judicial district ("Distribuidor Central"), which in turn randomly assigns cases to a district court within the judicial district. The random-assignment process of judicial cases ("Distribuição Por Sorteio") is established in the internal procedures of the justice department of the state of São Paulo. Judicial districts vary with regard to how many courts have jurisdiction over bankruptcy cases. For instance, whereas a case filed in the judicial district of Santos will be assigned to one of 12 general civil courts, bankruptcies filed in Serrana are automatically assigned to its one and only district court.<sup>14</sup>

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<sup>11</sup>Creditors whose claims are not subject to automatic stay do not vote on the reorganization plan but are allowed to veto the sale of any collateral supporting their claims.

<sup>12</sup>The law makes an exception for trade creditors that keep supplying the firm during its reorganization.

<sup>13</sup>The court can still allow the firm to continue with its reorganization even though the plan has been voted down. The plan, however, must have been approved by (i) creditors in attendance representing at least half of the total value of claims in all classes, (ii) half of the classes with creditors in attendance, and (iii) more than a third of creditors in the classes in which it was rejected.

<sup>14</sup>See Figure II, where each dot represents a court in the judicial district in the state of São Paulo.

### III DATA

We use two primary data sources in the empirical analysis. The first is a dataset covering all bankruptcy filings in the state of São Paulo between 2005 and 2017. For the second, we use matched employer-employee records that consist of nearly the universe of formal employment in Brazil from the *Relação Anual de Informações Sociais (RAIS)* from the Brazilian Ministry of Labor (MTE).

#### III.A BANKRUPTCY DATA

We collected information on bankruptcy requests from the electronic records of the *Tribunal de Justiça de São Paulo (TJSP)*, which include detailed information on court decisions related to judicial cases filed and adjudicated in the state of São Paulo. We collected information on the type of bankruptcy petition, the identity of the debtor, the intermediate decisions, and the outcome for 6,678 bankruptcy requests filed between 2005 and 2017.

Specifically, the electronic records contain detailed case-level information that includes the filing date, the type of bankruptcy request (liquidation or reorganization), the judicial district and the court to which the case was assigned, the name of the judge responsible for the case, and the names of the claimant and the defendant. Additionally, we collected information on any intermediate court decisions, including the decision date and the decision outcome (e.g., decision to approve the reorganization or to convert the reorganization to liquidation). We follow decision updates to the bankruptcy cases from the time they are filed up to March 2020.

#### III.B A MEASURE OF “PRO-CONTINUATION” BIAS IN BANKRUPTCY

In this section, we propose a new measure capturing the degree of pro-continuation bias of courts dealing with bankruptcy cases based on the data described above. The objective of this measure is to capture the tendency of bankruptcy judges to issue decisions that favor the continuation of financially distressed firms.

To construct the measure of pro-continuation bias, we rely on the text of intermediate judicial decisions in bankruptcy cases filed in the state of São Paulo. In particular, we collected the text of all decisions made by bankruptcy courts until March 2020 regarding reorganization and liquidation cases filed between 2005 and 2017.<sup>15</sup> Bankruptcy judges

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<sup>15</sup>Especially in the course of the reorganization process, in several instances, a court is called to make a decision. For example, in the early stages, courts decide whether to grant bankruptcy protection, rule on the right of particular secured creditors to seize collateral, decide whether trade creditors are allowed to discontinue supply during the stay period, and determine if the 180-day stay period should be extended. In the later stages, the court rules on any creditors’ objections to the proposed plan, decides whether to uphold the outcomes of creditors’ votes, determines whether any particular actions taken by the debtor’s management merit their removal, and concludes whether the reorganization should be resolved or should

typically have some discretion when making these intermediate decisions, even when the article of the law on a specific issue is very clear. This freedom leads to instances in which two judges ruling on the same issue and referring to the same article of the law in their decision make different rulings.<sup>16</sup>

One example of a legal provision for which courts exercise discretion is Article 49 of the Brazilian bankruptcy law. This article explicitly excludes from the automatic stay specific types of secured claims, including claims originated from lease contracts, chattel mortgages, and accounts-receivable lines of credit. However, judges can deviate from the wording of this provision by considering the collateral of these secured loans a “productive capital good” (e.g., production plants, machinery, or vehicles) that the court deems essential to the firm’s recovery and that therefore cannot be sold by creditors. In these instances, judges often cite Article 47 of the bankruptcy law, which states that a reorganization has the general objective of “maintaining jobs and creditors interests while promoting the preservation of the firm, its social function while stimulating economic activity.” Thus, when ruling against creditors seizing the collateral they are entitled to by law, courts routinely refer to this general objective and argue that limiting bankruptcy protection would harm the firm’s chances of survival and generate job losses.

Our methodology proceeds in two steps. First, we analyze the text of all decisions and identify mentions of specific legal provisions or articles of the bankruptcy law and the civil code that judges can use to exercise their discretion either in favor of or against the continuation of the firm. Second, for each mention of one of these articles, we read the ruling and classify it as being either pro or against continuation of the insolvent firm. In the example above, for each mention of Article 49 by a judge in a reorganization case, we read the decision and classify it as “pro-continuation” when the judge denies the creditors’ request to seize the assets given as collateral, and as “against-continuation” when the request is accepted. In Table A1 of the Appendix, we provide a detailed description of the legal provisions we searched for and the criteria we used when categorizing the decisions. We also report some illustrative examples of decisions categorized as pro-versus against-continuation for each article.

Finally, we aggregate decisions at the court level by assigning a value of 1 to pro-continuation decisions and a value of -1 to against-continuation ones, and then normalize the outcome by the total number of decisions of the judges of that court, including decisions that cannot be categorized as either, which we define as “neutral.” Our pro-continuation measure for court  $c$  of judicial district  $j$  is therefore computed as

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be turned into a liquidation.

<sup>16</sup>This relative flexibility in interpreting the law was in part granted by design by lawmakers to allow judges to decide based on the specifics of each case while adhering to the general spirit of the law. However, at least to some degree, this flexibility has traditionally allowed judges to make choices more aligned with their preferences and beliefs.

$$\text{Pro-continuation}_{cj} = \frac{1}{N_{cj}} \sum_t D_{cjt},$$

in which  $N_{cj}$  is the number of total decisions of court  $c$  in judicial district  $j$  in our sample and  $D_{cjt}$  is the sum of decisions pro- versus against- continuation. We aggregate decisions as the court level because that is the level of randomization that we are going to exploit in the empirical analysis. Note that mobility of judges is limited across courts in our sample, with 84% of judges only observed in one court during the period under study.

Figure I plots the distribution of the pro-continuation measure, whereas Panel A of Table I reports summary statistics of the pro-continuation measure for the 636 courts that handled bankruptcy cases during the period under study. The pro-continuation-bias measure has a mean of 0.12 and a median of 0.15, indicating the average court in the state of São Paulo is relatively pro-continuation. Figure II shows the geographical variation in pro-continuation bias both across and within judicial districts. The upper part of the figure reports a map of the state of São Paulo, with the level of pro-continuation bias in each judicial district calculated as the weighted-average of pro-continuation bias across the courts in the district.<sup>17</sup> In the lower part of Figure II, we report the list of judicial districts in our sample. Each dot next to the judicial districts' names represents a court, with the color of the dot indicating the court's level of pro-continuation bias (above vs. below the median in our sample). As shown, substantial variation of the pro-continuation-bias measure exists within districts, and we exploit this variation for the empirical analysis in section IV.B.

[Insert Figure I and II Here]

Next, in panel B of Table I, we document how our measure of pro-continuation bias correlates with other observable court characteristics, including measures of court efficiency and incidences of different bankruptcy outcomes. As shown, we find no significant differences between high- and low-pro-continuation courts in terms of efficiency as measured by the backlog of pending cases or the average length of reorganization cases.<sup>18</sup> However, important differences exist in other judicial outcomes at the court level. In particular, high-pro-continuation courts are more likely to dismiss a liquidation request by a creditor, and less likely to convert a reorganization case into a liquidation. We investigate the relationship between pro-continuation bias and case outcomes more formally and exploit the random assignment of cases across courts in section IV.B.

[Insert Table I Here]

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<sup>17</sup>The weights correspond to the share of bankruptcy cases filed in each court.

<sup>18</sup>We can compute an accurate measure of duration for reorganization cases, whereas the closure of liquidation cases is often not reported in our data.

### III.C WORKER-LEVEL DATA

Information on linked employer-employee relationships is obtained from RAIS, a longitudinal administrative dataset of the Brazilian Ministry of Labor compiled annually from information provided by all formally registered public or private firms and includes comprehensive information on labor contracts. The objective of the RAIS dataset is to administer and monitor access to unemployment insurance and payment of benefits to eligible employees; therefore, firms have strong incentives to provide comprehensive and accurate information in MTE. In addition, control mechanisms are in place to ensure mandatory compliance with the requirements of RAIS. Based on estimates of the MTE, RAIS includes over 95% of formally employed individuals in Brazil. We obtained access to RAIS for the period from 1985 to 2018.

The unit of observation in RAIS is a job entry that is identified by an employee-level identifier (CPF) and an establishment-level identifier (CNPJ), and enables us to track individuals over time and across firms. The firm name has been used to identify firms filing for a bankruptcy request, using information on the debtor's name extracted from the TJSP. In addition, RAIS includes information regarding the start and end date of the specific job entry, occupation type, wage level, and demographic characteristics. RAIS also contains information on the terminations of labor contracts, which allows us to identify exits from the labor force because of retirement or death. The occupation type is coded according to the *Classificação Brasileira de Ocupações* (CBO). At the establishment-level, RAIS contains information on the geographical location of the establishment, and the sector in which the specific establishment operates. At the individual level, available demographic characteristics include gender, age, race, and education level.

Because our employer-employee dataset ends in 2018, for our empirical analysis, we focus on bankruptcy requests filed between June 2005 (after the bankruptcy law reform of 2005 was introduced) and December 2013, so that employee-level information is available for five years before and at least five years after the bankruptcy request.

We begin with 4,297 bankruptcy requests from June 2005 to 2013 and use debtor names as reported in TJSP to determine their firm-level identifiers. Specifically, for liquidations initiated by one of the creditors, we rely on the name of the defendant, whereas for reorganizations (that are always initiated by the debtor), the relevant entity is identified using the name of the claimant. Based on this information, we were able to collect the firm identification number (or CNPJ) for 2,939 – approximately 70% – of the bankruptcy filings, including 2,067 liquidation and 872 reorganization requests.

Finally, we match bankrupt firms with the employer-employee dataset. Out of the 2,939 bankruptcy requests, we exclude cases in which the debtor has no employment information reported in RAIS in the year before the bankruptcy request. Additionally, to identify firms that are economically active, we only include bankrupt firms with at least

five employees in RAIS one year before the bankruptcy request. As a result, our final sample includes 1,042 bankruptcy requests.

Table II provides summary statistics for firms and employees in our sample. All statistics refer to the year prior to the bankruptcy filing. The average firm in our sample has 96 employees and a wage bill of about 2.5 million BRL, and approximately 11% of its labor force is composed of workers who have at least completed high school (what we define in this paper as high-skill workers). As shown in Panel B, more than half of the firms in our sample are in the manufacturing sector (53%), followed by the retail sector (29%). Panel C shows that in the year before bankruptcy, the average worker in our sample was 35 years old, had worked at the firm for around four years, and had 11 years of education. Our analysis focuses on firms that file for bankruptcy in the State of São Paulo. In Appendix Table A2, we use RAIS data to compare firms and workers in our sample with two additional groups: firms and workers located in São Paulo that did not file for bankruptcy, and the population of firms and workers in the rest of Brazil.<sup>19</sup> Several interesting differences emerge. As shown, firms filing for bankruptcy in the state of São Paulo are significantly larger in size (96 vs. 13-15 workers) and more concentrated in the manufacturing sector (53% vs. 12%) and construction sector (5% vs. 3%) than non-bankrupt firms in São Paulo and all firms in the rest of the country. These differences are consistent with the fact that formal bankruptcy tends to be used the most by relatively larger firms with more tangible assets, as documented also in existing work on bankruptcy in other emerging economies (Li and Ponticelli, 2020). Note these differences do not invalidate our empirical analysis, which relies on variation across comparable firms filing for bankruptcy within the same judicial district.

[Insert Table II Here]

## IV EMPIRICAL ANALYSIS

The empirical analysis is organized as follows. First, in section IV.A, we present an identification strategy to estimate the effects of judicial bias in bankruptcy on the labor market outcomes of bankrupt firms' employees. In section IV.B, we verify the impact of the pro-continuation-bias measure on case outcomes. Next, in section IV.C, we study the effect of judicial bias on firm continuation and on workers' continuation with the firm filing for bankruptcy. Workers whose firms are assigned to pro-continuation judges are significantly more likely to remain employed with bankrupt firms in the post-bankruptcy period. To shed light on the impact of higher continuation with the same employer on workers' labor market outcomes, we first present a conceptual framework based on existing

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<sup>19</sup>Among firms outside of the State of São Paulo, we do not have information on which ones filed for bankruptcy in the period under study. This lack of information prevents us from comparing firms filing for bankruptcy in this state relative to the rest of the country.

literature in section IV.D and then present the main empirical results in section IV.E. We conclude by discussing and presenting evidence on potential mechanisms in section IV.F.

#### IV.A IDENTIFICATION STRATEGY

In this section, we describe the identification strategy to estimate the causal effect of pro-continuation bias on the labor market outcomes of workers of financially distressed firms. The main challenge we face is that the degree of pro-continuation bias of courts in a given region might be correlated with other characteristics of that region and of the firms that operate in it. For example, if regions with courts with higher pro-continuation bias are also characterized by poorly functioning local labor markets, differences in workers' outcomes after bankruptcy could be driven by differences in the type of job opportunities that workers face. Even within judicial districts, selection could exist between firms and courts. For example, relatively less productive firms might decide to file for bankruptcy in courts with a more pro-continuation reputation, because doing so might lead to a higher probability of continuation. Note also that, in the presence of selection, court decisions favoring a certain party might not reflect a form of judicial bias, but rather the different nature of the cases that different judges face.

To deal with this challenge, we rely on a key characteristic of the institutional setting, namely, the fact that bankruptcy cases in the state of São Paulo are randomly assigned across courts within a judicial district. This fact insures that, on average, judges in different courts within the same district face cases with similar characteristics. Thus, their propensity to rule in favor of one party or another should capture judges' interpretation of the law rather than differences in the type of cases they face. Exploiting variation across cases filed within the same judicial district insures that firms cannot choose which court will handle their case and that the degree of judicial bias they face is plausibly orthogonal to their initial characteristics. Our identification strategy follows a large literature using random assignment of bankruptcy cases across judges within US bankruptcy courts to study the effects of reorganization on firm-level outcomes and asset reallocation (Chang and Schoar, 2013; Bernstein et al., 2019) or the effects of bankruptcy protection in consumer bankruptcy on individual-level outcomes (Dobbie and Song, 2015; Dobbie et al., 2017).<sup>20</sup>

We estimate a difference-in-differences specification that uses the year of bankruptcy filing as a source of time variation and the degree of pro-continuation bias of the court assigned to each case within a district as a source of cross-sectional variation. We restrict our focus to judicial districts that have multiple courts with at least one classified as high

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<sup>20</sup>For a seminal contribution to this approach, see Kling (2006), who uses random assignment of cases to judges with different leniency to study the effects of incarceration length on labor market outcomes. This approach is also used in Doyle Jr (2007) to study the long-run effects of foster care, and by Galasso and Schankerman (2015) to study the effect of patent invalidation on future innovation.



and one classified as low pro-continuation.<sup>21</sup> Our main specification at the employee level is as follows:

$$Y_{icjk,t} = \alpha_i + \alpha_t + \alpha_{jk} + \beta_1 Post_k + \beta_2 Post_k \times 1(HighBias)_{cj} + \beta X'_{icjk,t} + \varepsilon_{icjk,t}, \quad (1)$$

where  $Y_{icjk,t}$  is an outcome observed in calendar year  $t$  for an individual  $i$  whose employers' case was allocated to court  $c$  in judicial district  $j$  in bankruptcy year  $k$ . Individuals are assigned to bankrupt firms based on their employment in the year before the bankruptcy case was filed. Our main coefficient of interest is  $\beta_2$ , which captures the effect of being assigned to a high pro-continuation court relative to a low pro-continuation court on workers' outcomes in the post-bankruptcy period. The specification in equation (1) also includes individual fixed effects ( $\alpha_i$ ), calendar-year fixed effects ( $\alpha_t$ ), and judicial district interacted with bankruptcy-year fixed effects ( $\alpha_{jk}$ ). Thus, the relevant variation identifying the  $\beta_2$  coefficient derives from differences across workers whose employers file for bankruptcy in the same judicial district and year, but whose cases are randomly assigned to courts with different levels of pro-continuation bias. To account for correlation in the error term across workers at the level of randomization, we double-cluster standard errors at the judicial-district and bankruptcy-year level (Abadie, Athey, Imbens, and Wooldridge, 2017) in all specifications.

In Table III, we formally verify whether workers whose employer is assigned to a high versus a low pro-continuation court differ in terms of observable characteristics. The results reported in column (1) show that workers' characteristics – including years of education, gender, age, tenure, and wage level – do not predict the judicial bias of the assigned court. This specification includes judicial district interacted with bankruptcy-year fixed effects. Thus, the small and non-significant coefficients on workers' characteristics are consistent with random assignment of cases across courts within a district. Column (2) shows that workers whose employers are assigned to courts with different levels of pro-continuation bias exhibit similar pre-existing trends in wage growth in the five years before bankruptcy filings. Finally, in column (3), we include both worker characteristics and pre-existing wage growth in a single regression. The magnitudes of all estimated coefficients are small, and none of them are statistically significant at standard levels. In the empirical analysis, we augment equation (1) with (time-varying) individual characteristics and show that coefficient estimates are stable in magnitude when we add these controls.<sup>22</sup>

<sup>21</sup>Out of the 218 judicial districts in our sample, 127 have multiple courts and 91 have a single court in charge of bankruptcy cases. Out of the 127 districts with multiple courts, 86 districts encompass courts with high and low degrees of judicial bias. Note that these 86 districts tend to be the largest in our sample both in terms of judicial decisions observed (85.6%) and in terms of bankruptcy cases they deal with (87.9%).

<sup>22</sup>Specifically,  $X'_{icjk,t}$  in equation (1) includes the following time-varying worker characteristics: Years

In column (4), we show that firm size does not predict whether the firm will face a high- or low-pro-continuation court, which further supports the random assignment of cases to courts within judicial districts. Finally, column (5) shows that the share of liquidation filings over total filings is similar between high- and low-pro-continuation courts, which confirms that the type of bankruptcy case filed does not predict what type of court the case is assigned to.

[Insert Table III Here]

#### IV.B CASE OUTCOMES

We start by studying the effect of pro-continuation bias on bankruptcy resolution. As documented in section III.B, courts with high pro-continuation bias tend to be less inclined to subsequently liquidate a firm in reorganization or to approve a liquidation request by creditors. We formally examine this relationship by estimating the following specification:

$$Y_{bcjk} = \alpha_{jk} + \delta \times 1(\text{HighBias})_{cj} + \varepsilon_{bcjk}, \quad (2)$$

where  $Y_{bcjd}$  is a case-level outcome for case  $b$  filed in court  $c$  of judicial district  $j$  in year  $k$ . The coefficient of interest is  $\delta$ , which captures the impact of a high level of pro-continuation bias on bankruptcy resolution.

Table A3 in the Appendix reports the results using two measures of pro-continuation bias at the court level: a continuous leave-one-out court-level measure, and an indicator variable equal to 1 for courts with a pro-continuation-bias above the median, and 0 otherwise. As shown in column (1), we find that reorganization requests allocated to high pro-continuation courts are 9.1 percentage points less likely to be converted into liquidations. Next, we focus on case length, as measured by the logarithm of the number of days between the filing of the reorganization request and resolution of the case. Cases assigned to courts with high pro-continuation bias have, on average, a similar duration to those assigned to low pro-continuation courts. That is, courts with different bias levels do not seem to differ in terms of their efficiency (within a judicial district). Finally, we focus on liquidation cases. We document that liquidation requests filed in pro-continuation courts are more likely to be dismissed. Specifically, the coefficient estimate in column (6) suggests the incidence of a dismissal of a liquidation request is 30 percentage points higher in high pro-continuation courts.

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of Experience (defined as Age - Years of Education - 4), Years of Experience  $\times$  Years of Education, and Years of Experience  $\times$  Female indicator. Note the Education and Gender variables are not included in the estimation, because they are constant at the individual level and thus absorbed by the worker fixed effects.

#### IV.C FIRMS' AND WORKERS' CONTINUATION

In this section, we study how judicial bias affects the probability that a firm continues in operation after bankruptcy and that current employees stay with the firm filing for bankruptcy. Before presenting regression results, we discuss a set of stylized facts that emerge from the raw data. We start in Figure III by focusing on all firms that file for bankruptcy in our sample and following them from the year before the filing to the five years after the filing. The figure reports the share of firms still in operation at the end of each year, splitting the sample into firms that are assigned to low versus high pro-continuation courts. A firm is considered to be in operation if it reports positive employment in RAIS at the end of the year.

The key stylized fact emerging from this figure is that ex-ante comparable firms continue in operation at different rates depending on which type of court they are assigned to in the bankruptcy year. The share of continuing firms is higher in high pro-continuation courts than in low pro-continuation courts in all years. By the end of the year in which they file for bankruptcy, 85% of firms assigned to high pro-continuation courts are still in operation versus 79% in low pro-continuation courts, a difference of 6 percentage points. This difference is persistent over time. Five years after the bankruptcy filing, the share of continuing firms in high pro-continuation courts is still about 10 percentage points higher than in low pro-continuation courts (43% vs. 32%).

[Insert Figure III Here]

Next, we test more formally the effect of judicial bias on the probability of firm continuation by estimating a firm-level version of equation (1). The results are reported in column (1) of Table IV, where the outcome variable is a dummy equal to 1 for firms that report positive employment in RAIS at the end of the year, and 0 otherwise. The estimates show that firms whose bankruptcy case is assigned to high pro-continuation courts are more likely to remain in operation over the five-year post-bankruptcy period. The magnitude of the coefficient estimates indicates that the effects are economically large, with firms in high pro-continuation courts having a 7-percentage-points-higher probability of continuation in the five-year period after the bankruptcy filing.

Next, we examine the effect of pro-continuation bias on workers' continuation with the bankrupt firm. As in the case of firms, we start by describing the raw data. In Figure IV, we focus on workers employed in bankrupt firms in the year before the bankruptcy filing, and then follow their employment trajectory in the year of bankruptcy and in the five years after bankruptcy. In each year, we separate workers into three categories: those employed in the firm filing for bankruptcy (stayers), those employed in other formal firms (leavers), and those who exit our sample (out-of-sample). The latter category includes three types of workers that we cannot distinguish in our data: those who become unemployed, those

who switch to self-employment, and those who switch to informal labor. We exclude from the out-of-sample category workers who become older than 65 years of age, who, we consider retirees.

For each year, Figure IV reports the share of workers in each of these three categories and divides the sample into employees of firms that are assigned to low versus high pro-continuation courts. Notice that, by construction, all workers are in the category of stayers in the year before the firm files for bankruptcy, independently from the court to which they will be assigned.

Two important stylized facts emerge from the raw data. First, substantial exit from the sample occurs, in correspondence with bankruptcy filings. Around one third of workers employed in bankrupt firms leave the sample in the bankruptcy year. Second, the difference in the probability of staying with the bankrupt firm depending on the bias of the assigned court is stark. The share of stayers in the bankruptcy year is around 46% for employees assigned to high pro-continuation courts, and is 40% in low pro-continuation courts. Note this difference remains large – 6 percentage points – until the second year after bankruptcy, despite an overall decline in the share of stayers in both types of courts. The two stylized facts described above imply the share of leavers – workers who leave bankrupt firms and find employment elsewhere within the formal labor market – is higher in low pro-continuation courts.

Overall, Figure IV sums up the main stylized facts of the paper on worker continuation. Workers randomly assigned to high pro-continuation courts are more likely to stay with bankrupt firms than ex-ante comparable workers who are instead assigned to low pro-continuation courts. Combined with the evidence at the firm level presented above, this indicates that workers in firms that are allowed to continue operating under high pro-continuation courts – but would not have been under low pro-continuation courts – are more likely to continue in their current jobs. In the next section, we study the impact of this continuation on labor market outcomes.

[Insert Figure IV Here]

Before moving to labor market outcomes, we test more formally the effect of pro-continuation bias on the probability of staying employed with the bankrupt firm using a worker-level version of equation (2). The results are reported in columns (2) and (3) of Table IV. We find that employees assigned to high pro-continuation courts are significantly more likely to stay with the same employer in the post-bankruptcy period at different horizons. The probability of staying in the post-bankruptcy period in the first 3 years is, on average, 7.1 percentage points larger than for comparable employees assigned to low pro-continuation courts. The probability of staying with the same employer is still 3.1 percentage points larger and statistically significant when we focus on the five years horizon after bankruptcy. Note the average probability of staying with the same employer

in the post-bankruptcy period among workers in low pro-continuation courts is 18.5%. Thus, our findings imply that workers assigned to high pro-continuation courts have a 38% higher probability of staying with their current employer in the medium run (3 years) and still a 16.7% higher probability of staying with their current employer in the long run (5 years) relative to those assigned to low pro-continuation courts.

[Insert Table IV Here]

#### IV.D LABOR MARKET OUTCOMES: CONCEPTUAL FRAMEWORK

To guide the analysis of the effects of judicial bias favoring workers' continuation with the same employer on labor market outcomes, we start by discussing a simple conceptual framework based on the existing literature.

In perfectly competitive labor markets, workers of a given quality are paid their competitive wage  $w^*$ , which equals their marginal product. Thus, as long as a worker's productivity is unchanged, an exogenous shock to their probability of continuation with the same employer will not generate a differential change in wages. Under this null hypothesis, pro-continuation bias should have *no effect* on workers' wages.

Frictions in the labor market can generate deviations from this benchmark, which have been studied in the existing literature. Wages might be set higher than the competitive benchmark ( $w > w^*$ ), for example, in imperfectly competitive labor markets where workers earn rents from an employment relationship (Lamadon et al., 2019), or when workers are entrenched with the current employer (Berk et al., 2010). In this scenario, being assigned to a pro-continuation court should have a positive impact on worker's wages, because it prevents a contract termination that makes wages converge to their market level.

Other frictions can generate deviations of wages below their competitive benchmark ( $w < w^*$ ), which would be the case, for example, in the presence of substantial search costs or when workers are imperfectly informed about their outside options in the labor market. Recent evidence shows that workers tend to anchor their beliefs about outside options on their current employer's wage, and that these beliefs are often incorrect, leading them to underestimate their outside options. In particular, Jäger et al. (2022) match a representative survey on workers' beliefs about their outside options with administrative employer-employee data from Germany, and document that between 10% and 17% of employment relationships in their data would not be viable if workers had accurate beliefs about outside options. Imperfect knowledge about outside options might be particularly costly for workers of financially distressed firms that pay lower wages due to their poor performance.<sup>23</sup> By remaining employed with the same firms, uninformed workers

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<sup>23</sup>A large literature in labor economics has documented a strong connection between firm performance and wages paid to its employees. See Card, Cardoso, Heining, and Kline (2018) for a review. In fact,

will underestimate their outside options and earn lower wages than they would have by searching for other employment. In this scenario, we expect pro-continuation bias to have a negative effect on workers' wages.

In the next sections, we first test empirically the effect of pro-continuation bias on employees' labor market outcomes (section IV.E), and then discuss this conceptual framework and provide more direct evidence on potential mechanisms in light of the results (section IV.F).

#### IV.E LABOR MARKET OUTCOMES: RESULTS

We begin by studying the impact of pro-continuation bias on workers' average wages. Average wages at the worker level are computed as the logarithm of the average monthly payments to workers. Payments include labor compensation, bonuses, tips, commissions, allowances for commuting costs, and contributions to social security, pension plans, health care, and unemployment insurance.<sup>24</sup>

The main results from estimating equation (1) are reported in Table V. The estimated coefficient on the interaction term ( $\beta_2$ ) captures the difference in the change in average wages after bankruptcy between employees facing high vs low pro-continuation courts. We find a negative estimated coefficient on the interaction term, indicating that employees assigned to high pro-continuation courts earn, on average, lower wages in the post-bankruptcy period. The magnitude of the estimate in column (1) indicates that average wages of workers assigned to high pro-continuation courts are approximately 3% lower than those of workers assigned to low pro-continuation courts. Given the random assignment of cases across courts within a judicial district, these estimates can be interpreted as the causal effect of our measure of pro-continuation bias on workers' wages. In column (2), we augment the specification with the set of worker time-varying characteristics described in section IV.A. As shown, the magnitude of the coefficient is stable when we include these additional controls. In Figure V(a), we explore the timing of this effect. We find that the relative losses in wages from facing a high-pro-continuation court begin during the year of the bankruptcy filing, and persist over the next five-year horizon.

[Insert Table V and Figure V Here]

These results, when combined with the findings reported in Table IV, suggest that employees who remain employed with the same bankrupt firm because they are assigned to a pro-continuation court earn, on average, lower wages than counterfactual employees

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Jäger et al. (2022) document that the share of workers underestimating their outside option is higher among those employed in less productive firms.

<sup>24</sup>These payments do not include private benefits offered by firms (e.g., private retirement plans, private healthcare plans or life insurance plans), which are not observable in our data. We return to this point in section IV.F, in which we investigate the role of workplace amenities using two proxies proposed by the labor literature.

who leave the firm because they were assigned to a low pro-continuation court. Next, we study the impact of pro-continuation bias on total earnings and months employed.

We measure total labor earnings as the logarithm of an individual's aggregate annual earnings across all employers, computed by multiplying average wages by the number of months with each employer. We report the results on earnings in column (3) of Table V. The estimated coefficients indicate that, overall, bankruptcy is very costly for employees of bankrupt firms. The coefficient on the *Post* indicator variable ( $\beta_1$ ) indicates that, on average, workers whose employers are assigned to low pro-continuation courts experience an 8% decline in annual earnings after bankruptcy. The estimated coefficient on the interaction term ( $\beta_2$ ) shows that pro-continuation bias amplifies the negative effect of bankruptcy on labor earnings. The magnitude of the estimated coefficient on the interaction term indicates that the decline in earnings for workers of firms assigned to high pro-continuation courts is 4.6% larger than the one experienced by workers of firms assigned to low pro-continuation courts.

Finally, in column (4) of Table V, we study the effect of pro-continuation bias on the number of months employed. We define months employed as the logarithm of the total number of months in which a worker is formally employed according to RAIS, independently from whether the employer is the firm filing for bankruptcy or another firm. We find that, on average, workers facing high pro-continuation courts experience a relative decline in the number of employment months in the post-bankruptcy period. The dynamic effects reported in Figure V(c) show that this perhaps surprising result is driven by a relative drop in the probability of employment in the second year after bankruptcy filing. Note that companies that file for reorganization have two years to complete their reorganization plan. At the end of the two years, the creditors can request the liquidation of the firm if they consider the plan unsuccessful. In this sense, a potential interpretation of this pattern is that reorganization cases allocated to high pro-continuation courts are more likely to be approved but then to be unsuccessful, and workers who have spent two additional years in financially distressed firms have more difficulty finding a job than those who searched in the bankruptcy year.

#### IV.F MECHANISM

In the previous section, we documented that workers of firms assigned to high pro-continuation courts are more likely to remain employed with firms filing for bankruptcy and earn, on average, lower wages and earnings in the post-bankruptcy period. These results raise the question of why employees assigned to high pro-continuation courts decide to stay with the current employer when they could potentially earn more by moving to other firms. As discussed in section IV.D, a potential explanation is that workers of bankrupt firms are imperfectly informed about their outside options and thus earn wages that are below their competitive benchmark in the labor market (Jäger et al., 2022).

In this section, we test this potential explanation by exploiting variation in access to information across workers in our sample. We also discuss and empirically test alternative potential mechanisms that can rationalize the findings. For example, workers searching for a new job might be exposed to higher income volatility. Thus, a risk-averse worker would prefer to stay with the current employer than face an uncertain outcome in the labor market, even when the market wage for a worker with her characteristics is above the current wage. Another potential explanation is that the wage gap we document captures adjustment costs associated with job change. These adjustment costs could be driven by the need for geographical relocation, changes in the sector of employment or occupation, or changes in workplace amenities offered by employers not directly captured in our data (Rosen, 1986).

We start by exploring the role of information. To this end, we test the extent to which the impact of pro-continuation bias on wages depends on the degree of access to information about the local labor market that is available to workers. We use two proxies for access to information. First, we use a measure of internet diffusion in the municipality where workers are located. Data on the number of internet connections in a given municipality are sourced from ANATEL, the Brazilian government agency for telecommunications. We construct a municipality-level measure of internet connections per capita at the yearly level following Porcher (2020). One potential concern is that internet diffusion might be correlated with other labor market characteristics. Indeed, as shown in Appendix Table A4, internet connections per capita at the municipality level are positively correlated with income per capita, population, literacy rate, and the share of local employment in services and manufacturing. On the other hand, municipalities with higher internet diffusion tend to have a lower unemployment rate and a lower share of local employment in agriculture.<sup>25</sup> Thus, in our analysis of the information mechanism, we include the set of observable characteristics reported in Table A4 interacted with linear time trends in all specifications.

Second, we construct an individual-level measure of access to information about outside options based on the employment trajectories of former coworkers. This measure is based on the coworker-network measure proposed in Caldwell and Harmon (2019), and relies on the argument that workers often learn about their outside options through their network of former colleagues. To construct this measure, we rely on RAIS data, which allows us to observe all the workers who overlapped with the workers in our sample during the five years before the bankruptcy filing. Among past coworkers, we focus on those who left the firm voluntarily and found another formal job in Brazil. To identify voluntary separations, we rely on the RAIS question reporting the motive of separation for each em-

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<sup>25</sup>Table A4 reports the correlation between the average level of internet connections per capita in a municipality between 2007 and 2017 and municipality observable characteristics as sourced from the Brazilian Population Census of 2000.



ployment spell.<sup>26</sup> We define our measure of access to information via coworker network as the share of workers with whom each employee shared some of their employment spell within the firm during the previous five years and who voluntarily left the firm. Because the networks of coworkers might vary depending on the type of worker within the firm, we also construct measures of such networks that only focus on former coworkers who had similar occupations within the firm.

The results on the role of information using these two proxies are presented in Table VI. We start by estimating equation (1) separately for areas with low versus high internet diffusion, defined using the median level of internet connections per capita. We find that the negative effect of pro-continuation bias on workers' wages is concentrated in areas with lower internet diffusion. In these areas, workers of firms assigned to high pro-continuation courts have 4.8% lower average wages than workers in low pro-continuation courts in the post-bankruptcy period. The magnitude of this effect declines to 4% and remains statistically significant when controlling for municipality characteristics correlated with internet diffusion (column (2)). Columns (3) and (4) show that this difference approaches zero and is not statistically significant in areas with high internet access.

Next, in columns (5) to (7), we exploit variation in access to information at the individual level based on coworker networks. We use three definitions of coworkers: the first includes all those who spent time in the same firm as the employees in our sample, and the second and third definitions focus on employees who spent time in the same firm and had similar occupations.<sup>27</sup> Two main results emerge from this analysis. First, workers with a larger network of past coworkers earn, on average, higher wages after bankruptcy than those with a smaller network. Second, the triple-interaction coefficient is positive and significant, indicating that among workers assigned to high pro-continuation courts, those with larger coworker networks earn higher wages on average. The magnitude of the estimated effect in column (5) implies that workers with a one-standard-deviation-larger network (0.07) absorb about one-third of the negative impact of pro-continuation on their post-bankruptcy wages. As shown in columns (6) and (7), we find qualitatively similar effects when we use alternative definitions of coworkers that rely on firm-occupation specific networks. Overall, the results presented in Table VI are only suggestive of an information mechanism, because both internet diffusion and coworker networks are imperfect measures of workers' access to information about their outside options. However, the findings

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<sup>26</sup>To avoid the risk that some separations might be only formally "voluntary," whereas they are de facto imposed on workers by the firm for legal reasons, we exclude from voluntary separations those in which the worker does not re-enter the formal labor market within six months or when the average wage in the new job is lower than the average wage in the previous job.

<sup>27</sup>In column (6), we use workers in the same occupation group. The classification of occupations CBO2002 used by the Brazilian Ministry of Labor contains 10 occupation groups, which are identified by the first digit of the occupation code. Examples of these large groups are managers, professionals, mid-level technicians, and administrative workers. In column (7), we use workers in the same occupation subgroup. The CBO2002 classification contains 48 occupation sub-groups.

are consistent with information frictions in local labor markets being an important driver of the negative impact of pro-continuation bias in bankruptcy on workers' wages.

In the remainder of this section, we explore alternative mechanisms that are also consistent with our findings. We start by testing whether workers in firms assigned to courts with different pro-continuation bias face significant differences in their labor-income volatility after bankruptcy. The results are reported in panel A of Table VII. In columns (1) and (2), the outcome variable is the change in labor income volatility – as measured by the coefficient of variation of log yearly labor earnings – between the pre-bankruptcy and the post-bankruptcy period for each worker. Note that in column (2), we include in the calculation of labor-income volatility the years in which workers are not formally employed according to RAIS, and assign to those workers the average annual informal labor income in their municipality and year according to the PNAD survey. As shown, we find no significant evidence of higher future income volatility for workers in low pro-continuation courts, irrespective of how we treat workers exiting RAIS. In columns (3) and (4), the outcome variable is an indicator equal to 1 if the change in the worker's earnings between the pre- and the post-bankruptcy period is in the bottom 10th percentile of the distribution, and 0 otherwise. This outcome is meant to capture the differential impact of pro-continuation bias on the probability that workers experience extreme declines in their labor income after bankruptcy. As shown, we find no significant differences when we look at changes between the pre-bankruptcy year and the post-bankruptcy year, and between the pre-bankruptcy year and the two years after bankruptcy. Taken together, these results indicate that risk aversion is unlikely to be an important driver of the wage differences documented in the previous section.

[Insert Table VII Here]

Next, in Panel B of Table VII, we test whether workers in firms assigned to high pro-continuation courts face higher adjustments costs. Although we do not have information on the monetary value of adjustment costs, we can observe in the data whether employees assigned to high pro-continuation courts are more likely to change the geographical location in which they work, to change their occupation, or to change the industry in which they are employed. In columns (1) and (2), the outcome variable is an indicator equal to 1 if the worker moves to a different region (municipality or micro-region, respectively) after bankruptcy, and 0 otherwise. Consistent with a higher probability of staying with the current employer, we find that workers of firms assigned to high pro-continuation courts are about 4 percentage points less likely to work for firms located in different municipalities, whereas we find a similar but not precisely estimated coefficient on changes in microregions.<sup>28</sup> This result indicates that pro-continuation bias decreases the probability

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<sup>28</sup>Microregions are a geographical unit of statistical analysis used by the Brazilian Institute of Geography and Statistics (IBGE) that combines one or more economically integrated municipalities with similar production and geographic characteristics.

of facing a longer commute or relocation costs, although the magnitude of the coefficient is small relative to the amount of relocation observed among formal workers in the state of São Paulo during the period under study.<sup>29</sup> On the other hand, as shown in columns (3) and (4), we find no differences in the probability of changing occupations or sectors in the post-bankruptcy period for workers assigned to courts with high pro-continuation bias.

An important caveat in the analysis of adjustment costs is that our measures do not take into account non-wage compensation. For example, workers might be willing to accept below-market wages due to non-wage amenities offered by the current employer.<sup>30</sup> Similar to papers in the literature, we do not observe workplace amenities directly in the data. However, the labor economics literature proposes proxies for non-wage components of a firm compensation that rely on workers' transitions across firms observed in employer-employee datasets (Sorkin, 2018; Bagger and Lentz, 2019). Following Lagaras (2020), we construct two measures of employees' preferences over different firms, which we use as proxies for workplace amenities: the PageRank index proposed by Sorkin (2018) and the poaching rank proposed by Bagger and Lentz (2019). The PageRank index is constructed using the network of labor flows across firms to quantify the relative value of employment in a firm. A firm's poaching rank depends on the share of newly hired employees who are directly recruited ("poached") from other firms without experiencing an unemployment spell.<sup>31</sup> The rationale behind these measures is that job-to-job transitions across firms capture revealed preferences of workers over two firms. Firms that are better able to directly attract employees from other firms can only do so by offering higher wages or better non-wage amenities.

In Panel C of Table VII we estimate equation (1) using as outcome variables the proxies of workplace amenities of the employer of each worker. We construct the PageRank and poaching indexes using labor flows observed over the whole period under study, so that these are time invariant measures at the employer level. Thus, this specification relies on variation driven by workers that change employer after bankruptcy. The results show no significant differences in changes in workplace amenities for workers assigned to high vs low pro-continuation courts. This implies that the differences in wages and earnings documented above are unlikely to reflect differential changes in amenities across employers in the post bankruptcy period.

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<sup>29</sup>Note São Paulo is a densely populated state where municipalities tend to be relatively small geographical units – with an average size of 385 square km versus 1530 square km for the average municipality in Brazil. This is reflected in the high mobility of workers across employers located in different municipalities: about half of the workers in our sample change their municipality of employment at least once in the post-bankruptcy period.

<sup>30</sup>In fact, survey responses in Jäger et al. (2022) suggests that non-wage amenities are an important reason keeping workers from accepting higher-paid jobs.

<sup>31</sup>We can identify these direct transitions thanks to the fact that RAIS captures the exact start and end date of each labor contract.

## V ADDITIONAL RESULTS AND ROBUSTNESS TESTS

### V.A IN-SAMPLE PROBABILITY AND ECONOMIC CYCLES

One potential concern with the main results reported in Table V is that we can only observe labor market outcomes for those workers who are observed in the formal labor market both in the pre- and the post-bankruptcy periods. Thus, differential exit from the sample between workers assigned to high versus low pro-continuation courts might affect the composition of workers observed, and thus our results. To investigate this, we create a balanced panel of worker-year observations including out-of-sample worker-year observations and study the effect of judicial bias on the probability of remaining in sample, as defined by a dummy equal to 1 for workers who are observed in RAIS in a given year.

The results are reported in Table A5. As shown in column (1), we find that pro-continuation bias does not predict being in sample after bankruptcy. Employees of insolvent firms whose cases are assigned to a high pro-continuation court are 1.7 percentage points more likely to remain in-sample in the post period, but this effect is not statistically different from zero. This result is, *prima facie*, surprising because it indicates that employees whose firms are more likely to continue are not significantly more likely to remain formally employed in the post-bankruptcy period. To better understand this pattern, we split our sample into bankruptcies that occurred during recessions versus boom periods, defined as years with negative versus positive GDP growth at the local level.<sup>32</sup> The results in columns (2) and (3) show that being assigned to a pro-continuation court indeed has a positive, large, and significant effect on the probability of remaining in-sample during recessions, whereas this difference becomes a precisely estimated zero during boom periods, which constitute 93% of the observations.

Table A5 documents that the timing of bankruptcy in terms of economic cycle is important in determining workers' probability of remaining employed. Thus, we re-estimate equation (1) for our main outcomes on a balanced panel of workers and split the sample between booms vs recessions. Although we do not observe the labor market outcomes of individuals leaving the sample, we can assign to out-of-sample workers the average wage observed in the informal labor market in their municipality and year as reported in the Brazilian National Household Sample Survey (PNAD). The results are reported in Panel A of Appendix Table A6. As shown, when focusing on boom periods, the findings on the effect of pro-continuation bias on average wages, earnings, and months employed are robust to including out-of-sample workers in the estimation.<sup>33</sup> Indeed, when we include such workers, the magnitude of the estimated coefficients on the post-bankruptcy dummy

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<sup>32</sup>Data on GDP growth at municipality level are sourced from the IBGE dataset, *Produto Interno Bruto dos Municípios*, which is publicly available at [www.ibge.gov.br/](http://www.ibge.gov.br/).

<sup>33</sup>Because we have no information on months employed for out-of-sample workers, we assign a 0 to this outcome whenever a worker drops from the RAIS sample. Informal labor earnings are computed as average informal wages multiplied by 12.

increases in absolute value. The reason is that workers who were formally employed in the pre-bankruptcy period and exit from the sample after bankruptcy are assigned their estimated informal wage, which tends to be substantially lower than the formal one. On the other hand, we find that assigning informal wages to out-of-sample workers results in large and positive effects of pro-continuation bias during recessions. This finding is expected given the results in Table A5. Indeed, the magnitude of the estimated effects indicates that workers assigned to high pro-continuation courts are able to absorb about one quarter of the negative effect of bankruptcy on earnings relative to those assigned to low pro-continuation courts.

Finally, in Panel B of Table A6, we replicate the results of Table V splitting in-sample workers between those whose employer's bankruptcy occurred in a boom vs a recession. As shown, we find that the negative impact of continuation bias on average wages is entirely driven by boom periods – the majority of our sample. This result is consistent with the effect of judicial bias on workers' wages depending on the availability of outside options in the local labor market.

## V.B ALTERNATIVE MEASURES OF JUDICIAL BIAS

We start this section by presenting a set of robustness tests on the measure of pro-continuation bias described in section III.B. A potential concern with our measure is that judges who tend to deviate from the letter of the law might also have other characteristics that ultimately affect worker-level outcomes. For example, pro-continuation deviations might capture poor decision-making or erratic behavior of judges rather than (or in addition to) their personal bias in favor of one of the parties. Note this concern mostly applies to situations in which the law provides a specific rule on a given aspect of bankruptcy resolution, such as rules stipulating which assets are excluded from automatic stay (Art.49), or how much time managers have to present a reorganization plan (Art.6). Because in these cases the law provides a specific rule designed to protect creditors, distinguishing between a judge who deviates because of her beliefs and a judge who deviates because of erratic decision-making is hard. The reason is that in both of these cases, the judge will appear to be pro-continuation, because this direction is the only one she can deviate from the law provision. On the other hand, three other provisions that we use to construct our measure of pro-continuation bias are less subject to this concern. These are instances in which creditors make a request to the judge – namely, a request to reorganize the firm, to remove managers, or to liquidate the firm – and the judge has to rule on the request based on her understanding of the case. In these situations, the law does not prescribe a specific decision. Thus, an erratic behavior does not necessarily translate into pro-continuation bias, because an erratic judge can take either a pro-continuation decision or a pro-creditor decision.

To address this potential concern, we construct a measure of pro-continuation bias

that alternatively does not use judicial decisions based on Art.49 and Art.6. That is, we focus on a measure that does not use deviations from specific prescriptions of the law, but instead captures variation in the result of decisions made by the judge when presented with reorganization requests, liquidation requests, and requests to remove management. In column (1) of Table A7, we replicate the main results on workers' earnings and show that they are robust to the use of this alternative measure of pro-continuation bias.

Another potential concern related to our measure of judicial bias is its correlation with the degree of specialization in bankruptcy across different courts. In our sample, this issue is limited to two courts in the judicial district of the city of São Paulo that are specialized in bankruptcy cases. All other courts in our sample are instead civil courts that also handle bankruptcy cases. Because the district of the city of São Paulo processes many cases, showing that our results are not driven by variation in the degree of specialization is important. Thus, in column (2) of Table A7, we replicate our main results on workers' earnings, excluding all workers of firms that filed for bankruptcy in the judicial district of the city of São Paulo. As shown, our results are robust to this sample restriction.

[Insert Table A7 Here]

## VI CONCLUDING REMARKS

Bankruptcy institutions play an important role in the reallocation of production factors of financially distressed firms and have broader implications for economic growth and aggregate productivity. An important friction that has received less attention in the context of developing countries is judicial bias in the interpretation of the law. In particular, judges may disproportionately consider the adverse effects of liquidating a firm on employees and delay the liquidation of insolvent firms, even if doing so means deviating from the actual wording of the law.

In this paper, we used detailed hand-collected information on the universe of bankruptcy cases filed in the state of São Paulo between 2005 and 2017 to understand how pro-continuation bias affects bankruptcy resolution and employees' labor market outcomes. Exploiting the random assignment of bankruptcy cases across courts within a judicial district, we document that courts with higher pro-continuation bias tend to facilitate the continuation of insolvent firms and of firm-employee relationships. What is the effect of higher continuation on employees' earnings? Our findings indicate that workers of firms facing high-pro-continuation courts experience 4.5% lower annual labor earnings in the post-bankruptcy period than workers of firms facing low-pro-continuation courts within the same judicial district. Lower earnings are driven by relatively lower wages rather than by variation in employment status.

Two important caveats should be kept in mind in interpreting our results. First, our analysis indicates that the negative effect of pro-continuation bias on workers' earnings

is not present during recessions, when outside options in the labor market are plausibly scarcer and continuation with the same employer actually helps preserve workers' earnings. Second, the evidence suggests that imperfect information about outside options in the labor market might be an important driver of the negative impact of continuation with the same employer on workers' earnings. Policies that foster the diffusion of information about labor market compensation among workers might be particularly important in developing economies and for workers whose employer is undergoing bankruptcy proceedings.

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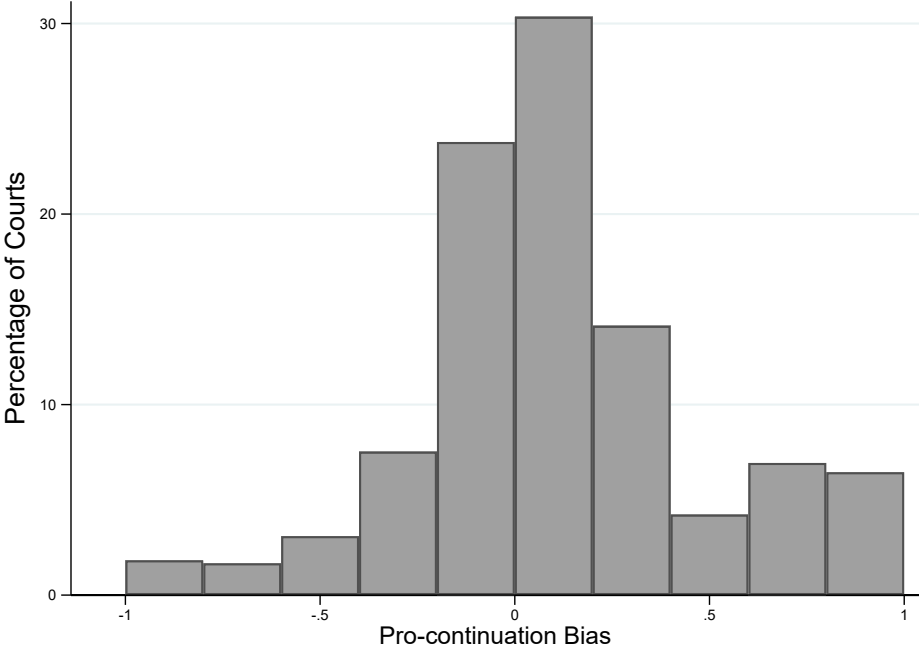


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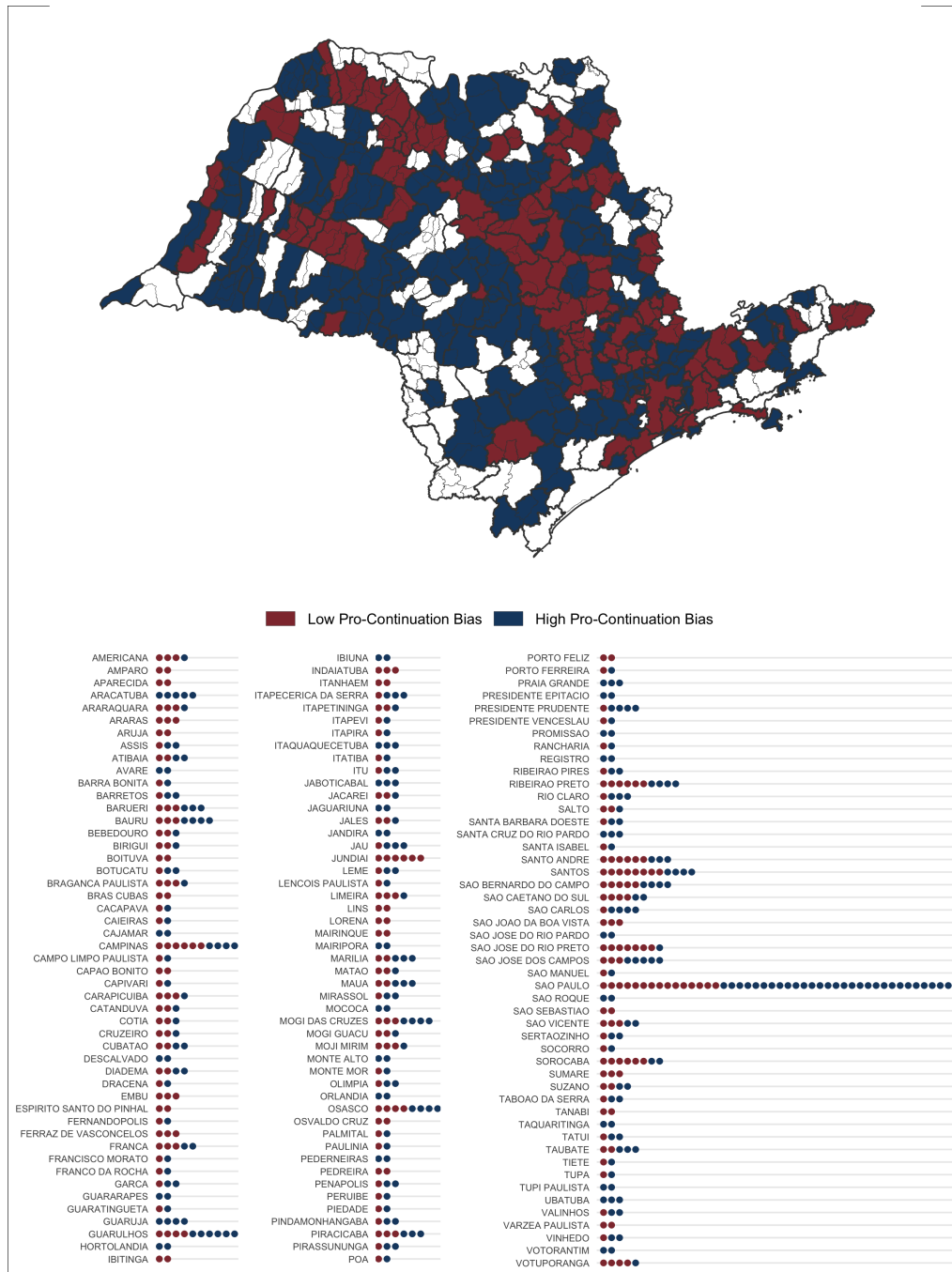
FIGURES

FIGURE I: PRO-CONTINUATION-BIAS MEASURE



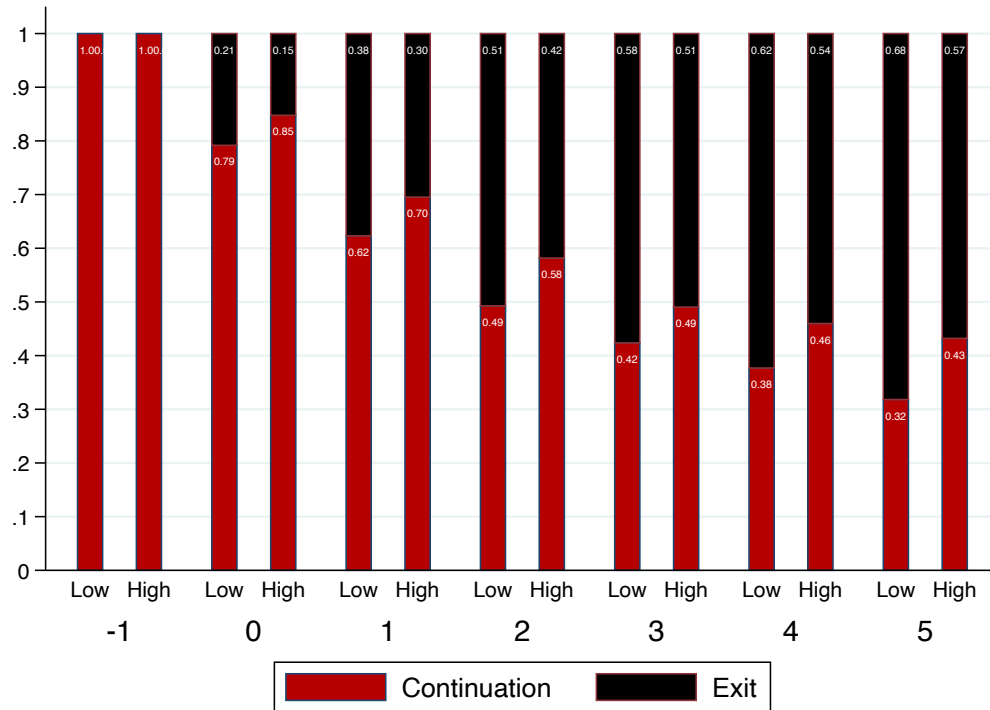
Notes: The figure reports the percentage of courts by different bins of pro-continuation bias.

FIGURE II: PRO-CONTINUATION BIAS BY JUDICIAL DISTRICT



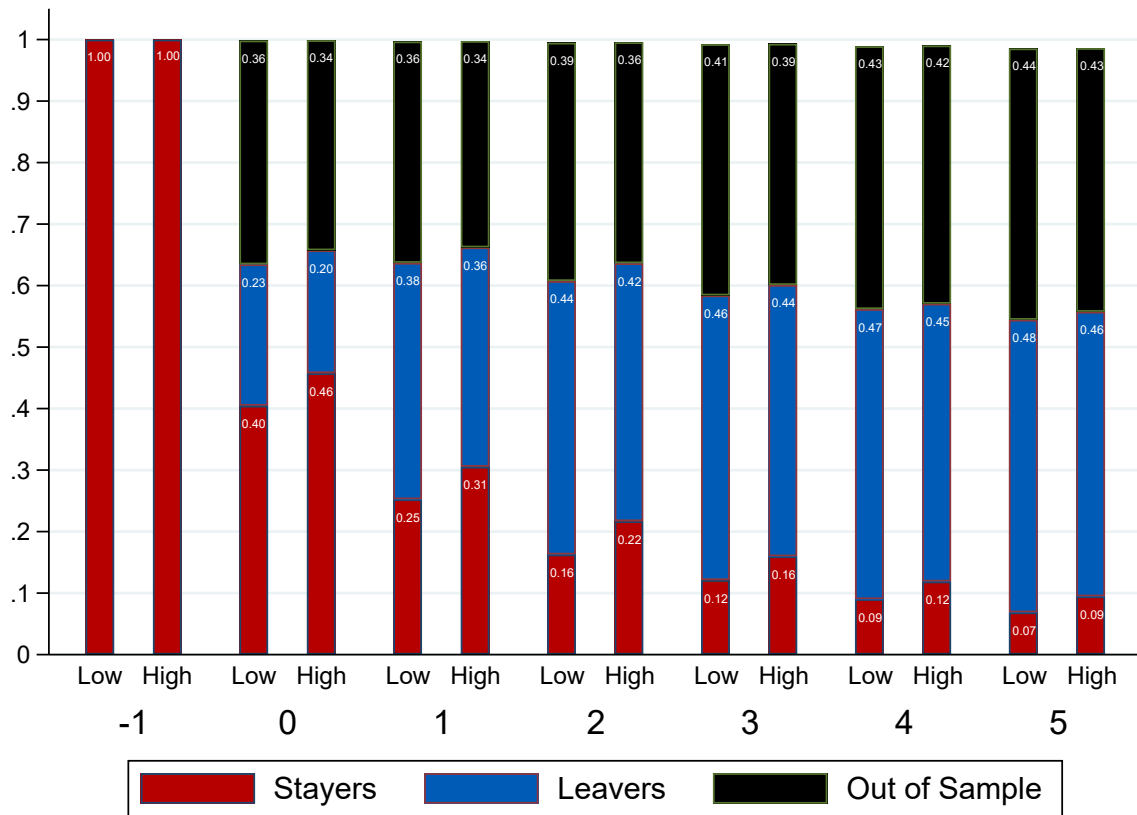
**Notes:** The upper part of the figure reports a map showing the geographical distribution of our measure of pro-continuation-bias across judicial districts in the state of São Paulo. The lower part of the figure reports the number of courts in each judicial district (each court represented by a dot), with the measure of pro-continuation bias associated with each court. The blue color represents high-pro-continuation judicial districts (upper figure), or courts (lower figure). We classify as high-pro-continuation courts those with pro-continuation above the median across courts. The pro-continuation-bias level of each district is calculated as the weighted average of the bias of its courts, where the weights are the number of bankruptcy cases. We classify as high-pro-continuation districts those with pro-continuation above the median across districts.

FIGURE III: CONTINUATION OF FIRMS FILING FOR BANKRUPTCY



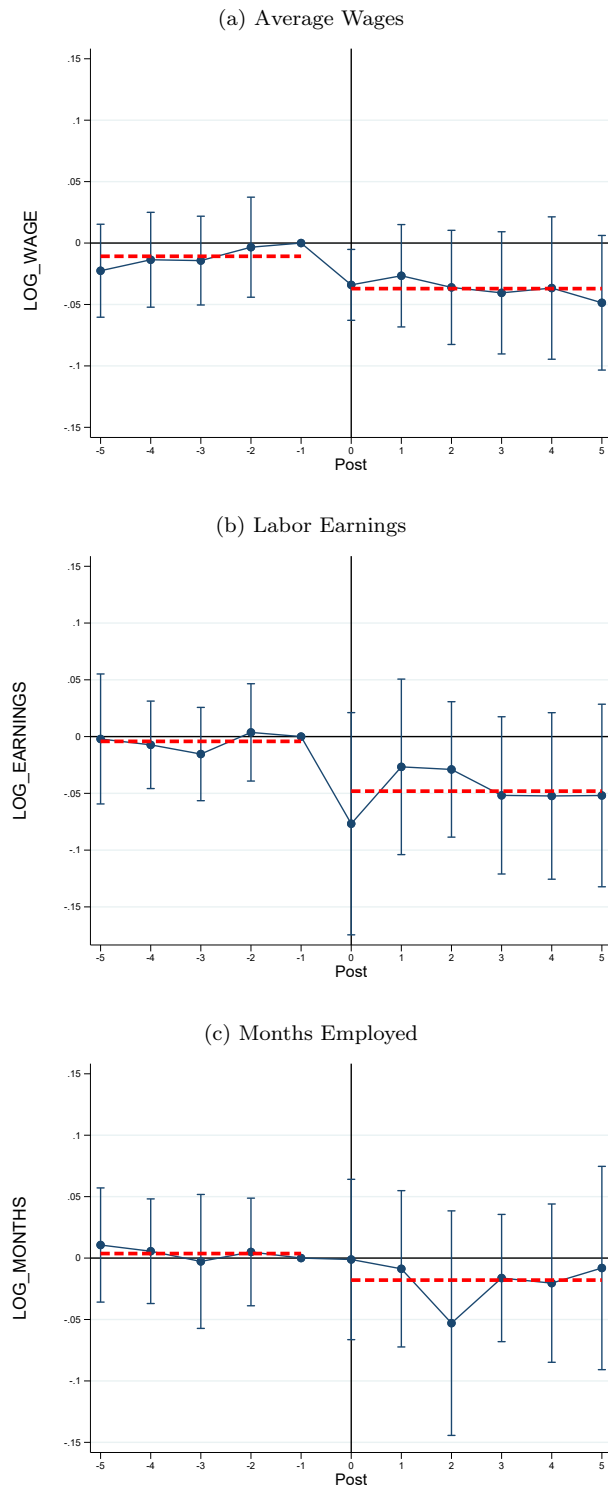
**Notes:** The figure reports the share of firms that are in operation vs exit between the year before the bankruptcy filing and the five years after the bankruptcy filing. All firms are in operation in the year before bankruptcy. We report shares separately for firms assigned to high vs low pro-continuation courts.

FIGURE IV: CONTINUATION OF EMPLOYEES OF BANKRUPT FIRMS  
BALANCED SAMPLE



**Notes:** The figure reports the employment trajectory of employees observed in financially distressed firms in the year before bankruptcy. We divide these employees in three groups: those that work in firms filing for bankruptcy (stayers), those that work for other firms in the formal labor market (leavers), those that exit the RAIS sample (out of sample). Workers that become older than 65 are considered retirees and not included in the calculation of the shares of the three groups. We focus on the period between the year before the bankruptcy filing and the five years after the bankruptcy filing. By construction, all workers in our sample are considered “stayers” in the year before the bankruptcy filing.

FIGURE V: DYNAMIC EFFECTS ON LABOR MARKET OUTCOMES



**Notes:** The figure reports the dynamic effects of pro-continuation bias on wages, earnings, and months employed in the five-year window around the bankruptcy filing. The figure plots the  $\beta_2$  estimates from a dynamic version of equation (1) along with 90% confidence intervals.

## TABLES

TABLE I: PRO-CONTINUATION BIAS AND COURT CHARACTERISTICS

Panel A: Pro-continuation Bias Measure				
Variables	Median	Mean	SD	N
Pro-Continuation Bias	0.15	0.12	0.39	636
Panel B: Court Characteristics				
Variables	High Pro-continuation Courts		Low Pro-continuation Courts	
	Mean	SD	Mean	SD
Pro-continuation Bias	0.52	0.28	-0.09	0.25
Log Backlog of Cases in 2009	8.27	0.70	8.31	0.65
Share of Liquidation Cases Dismissed	0.75	0.43	0.46	0.50
Share of Reorganization Cases Dismissed	0.18	0.38	0.25	0.43
Share of Reorganizations Converted to Liquidations	0.26	0.44	0.31	0.46
Days to Resolution in Reorganizations	1,747	1,035	1,685	989

**Notes:** The table reports descriptive statistics related to the pro-continuation-bias measure. Panel A provides descriptive statistics for the pro-continuation-bias measure. Panel B reports court-level descriptive statistics based on the level of pro-continuation bias.



TABLE II: SUMMARY STATISTICS

Panel A: Characteristics of Bankrupt Firms at $t = -1$			
Variables	Median	Mean	SD
Number of Employees	32	96	178
Total Wage Bill (R\$)	547,536	2,409,154	6,065,327
Log Employment	3.47	3.58	1.37
Log Total Wage Bill	13.21	13.31	1.67
High-Skilled Share	0.065	0.109	0.147
Number of Firms	1,042		
Panel B: Bankrupt Firms by Sector			
Sector	Number of Firms	Percentage Share	
Agriculture/Mining	2	0.00	
Manufacturing	547	0.53	
Construction	54	0.05	
Retail	306	0.29	
Other services	79	0.08	
Transportation/Utilities/Communications	54	0.05	
Panel C: Characteristics of Workers in Bankrupt Firms at $t = -1$			
Variables	Median	Mean	SD
Years of Education	12	10.73	2.95
Female	0	0.26	0.44
Age	33	34.85	10.56
Tenure (in Months)	25	46.32	56.70
Log(Wage)	7.37	7.43	0.67
Number of Workers	99,537		

**Notes:** Panel A reports summary statistics on observable characteristics of firms in our sample in the year prior to the bankruptcy event. Panel B reports the number and percentage of firms by sector for firms in our sample. Panel C reports summary statistics on observable characteristics of employees in our sample in the year prior to the bankruptcy event.

TABLE III: ASSIGNMENT TO HIGH PRO-CONTINUATION COURTS  
BALANCE TEST FOR WORKER, FIRM, AND CASE CHARACTERISTICS

Outcome	1(High Bias)				
	(1)	(2)	(3)	(4)	(5)
Years of Education	-0.001 (0.001)		-0.000 (0.001)		
Female	-0.022 (0.017)		-0.021 (0.017)		
Log Age	-0.001 (0.012)		0.001 (0.012)		
Log Tenure	-0.002 (0.002)		-0.002 (0.002)		
Log Wage at t = -1	0.012 (0.017)		0.004 (0.012)		
$\Delta$ Log Earnings (-5,-1)		0.003 (0.004)	0.003 (0.004)		
Firm Size at t = -1				0.003 (0.012)	
Liquidation Share					0.018 (0.052)
Judicial District $\times$ Bankruptcy Year FE	✓	✓	✓	✓	✓
R <sup>2</sup>	0.82	0.83	0.83	0.49	0.53
Observations	99,515	59,735	59,725	1,042	2,961

**Notes:** The outcome variable in all specifications is a dummy variable that is equal to one for courts with a pro-continuation-bias measure greater than the median value, and zero otherwise. Column (1) focuses on employee characteristics, including years of education, tenure, gender, age, and wage in the year prior to the bankruptcy request; column (2) shows pre-trends in log earnings; column (3) considers simultaneously the observable employee and pre-trend characteristics. Column (4) focuses on the case-level sample and considers the effect of firm size. Column (5) uses a court-level panel and examines selection in the type of bankruptcy. All specifications include Judicial District  $\times$  Bankruptcy Year fixed effects. The sample includes employees of bankrupt firms in the year prior to the filing. Standard errors are clustered at the judicial-district and bankruptcy-year level.

Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

TABLE IV: THE EFFECT OF JUDICIAL BIAS ON FIRM AND WORKER CONTINUATION

	1(Firm Continuation)	1(Employee Stay)	
	(1)	[0,3] (2)	[0,5] (3)
Post	-0.175*** (0.022)		
Post × 1(High Bias)	0.074* (0.038)		
1(High Bias)		0.071** (0.022)	0.030** (0.010)
Observations	5,149	99,533	99,533
R <sup>2</sup>	0.342	0.190	0.154
Year FE	✓	×	×
Firm FE	✓	×	×
Judicial District × Bankruptcy Year FE	✓	✓	✓
Worker Controls	×	✓	✓

**Notes:** The table reports the effects of pro-continuation bias on firm continuation and employee continuation with the same employer. In column (1), the dependent variable is an indicator equal to one in the year firms report non-zero employment in RAIS, and 0 otherwise. In columns (2) and (3), the dependent variable is an indicator variable that is equal to one for employees who are still employed in the distressed firm at the end of year 3 and 5 after bankruptcy, and zero otherwise. *Post* is an indicator variable equal to one for the five-year period after the bankruptcy request, and zero for the five-year period prior. In column (1),  $1(HighBias)$  is an indicator function equal to one for firms assigned to high pro-continuation courts, and zero for firms assigned to low pro-continuation courts. In columns (2) and (3),  $1(HighBias)$  is an indicator function equal to one for workers who in the year prior to bankruptcy were employed in firms assigned to high pro-continuation courts, and zero for employees of firms assigned to low pro-continuation courts. Standard errors are clustered at the judicial-district and bankruptcy-year level.

Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

TABLE V: EFFECT OF JUDICIAL BIAS ON LABOR MARKET OUTCOMES

	Log(Wage)		Log(Earnings)	Log(Months)
	(1)	(2)	(3)	(4)
Post	-0.036*** (0.009)	-0.036*** (0.009)	-0.080** (0.025)	-0.159*** (0.022)
Post × 1(High Bias)	-0.031** (0.012)	-0.029** (0.012)	-0.046** (0.018)	-0.021** (0.008)
Observations	733,545	733,545	733,545	733,545
R <sup>2</sup>	0.905	0.905	0.800	0.246
Year FE	✓	✓	✓	✓
Worker FE	✓	✓	✓	✓
Judicial District × Bankruptcy Year FE	✓	✓	✓	✓
Worker Controls	×	✓	✓	✓

**Notes:** The table reports estimates for equation (1). The outcome variable is the log of employee average wage in columns (1) to (2), the log of total labor earnings in column (3), and the log of employment months in columns (4). *Post* is an indicator variable equal to one for the five-year period after the bankruptcy request, and zero for the five-year period prior. *1(HighBias)* is an indicator function equal to one for workers who in the year prior to bankruptcy were employed in firms assigned to high pro-continuation courts, and equal to zero for employees of firms assigned to low pro-continuation courts. Standard errors are clustered at the judicial-district and bankruptcy-year level.

Significance levels: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

TABLE VI: INFORMATION MECHANISM

	Log(Wage)						
	Internet Diffusion				Coworker Definition		
	Low	Low	High	High	All	Occupation Group	Occupation Subgroup
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Post	-0.037*** (0.011)	-0.041*** (0.012)	-0.032* (0.014)	-0.033** (0.013)	-0.129*** (0.020)	-0.136*** (0.021)	-0.141*** (0.018)
Post $\times$ 1(High Bias)	-0.048** (0.017)	-0.040** (0.014)	-0.005 (0.029)	-0.002 (0.025)	-0.051* (0.024)	-0.044** (0.019)	-0.041** (0.017)
Post $\times$ Coworker Network					0.062*** (0.013)	0.067*** (0.014)	0.070*** (0.014)
Post $\times$ 1(High Bias) $\times$ Coworker Network					0.248* (0.121)	0.145* (0.065)	0.130*** (0.036)
Observations	385,445	385,445	348,100	348,100	732,957	723,242	709,702
R <sup>2</sup>	0.908	0.909	0.900	0.901	0.906	0.906	0.906
Year FE	✓	✓	✓	✓	✓	✓	✓
Worker FE	✓	✓	✓	✓	✓	✓	✓
JD $\times$ Bankruptcy Year FE	✓	✓	✓	✓	✓	✓	✓
JD Characteristics $\times$ Trend	×	✓	×	✓	✓	✓	✓

**Notes:** The outcome variable is the log of average employee wages in all columns. Columns (1) to (4) report estimates of Equation (1) for areas with high internet diffusion and areas with low internet diffusion. We construct a municipality-level measure of internet connections per capita at the yearly level following Porcher (2020). Areas with low versus high internet diffusion are defined using the median level of internet connections per capita. *Post* is an indicator variable equal to one for the five-year period after the bankruptcy request, and zero for the five-year period prior to the bankruptcy. *1(HighBias)* is an indicator function equal to one for workers who in the year prior to bankruptcy were employed in firms assigned to high pro-continuation courts, and zero for employees of firms assigned to low pro-continuation courts. *Network* is a worker-level measure capturing the share of a worker colleagues that voluntarily moved to other companies in the five years before the bankruptcy filing. We define colleagues as all other workers in the same firm in column (5), all workers in the same firm and one-digit occupation in column (6), and all workers in the same firm and two-digit occupation in column (7). We define a move to another company as voluntary based on the reason for separation reported in RAIS and the wage gap between the old and new job. Standard errors are clustered at judicial-district and bankruptcy-year level. Significance levels: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

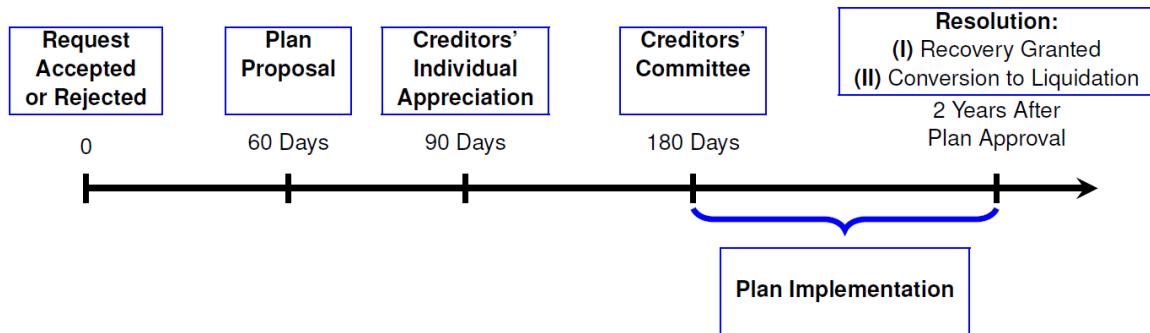
TABLE VII: ADDITIONAL MECHANISMS:  
RISK AVERSION, ADJUSTMENT COSTS, WORKPLACE AMENITIES

Panel A: Risk Aversion				
Outcomes:	$\Delta CV$ of Log Earnings		P10 $\{0,1\}$ of $\Delta \text{Log}(\text{Earnings})$	
	Without Informality (1)	With Informality (2)	$[-1, 0]$ (3)	$[-1, 2]$ (4)
1(High Bias)	-0.003 (0.003)	0.002 (0.003)	0.001 (0.016)	-0.005 (0.019)
R <sup>2</sup>	0.09	0.08	0.10	0.10
Observations	73,039	99,133	99,537	99,537
JD $\times$ Bankruptcy Year FE	✓	✓	✓	✓
Worker Controls	✓	✓	✓	✓
Panel B: Adjustment Costs				
Outcomes:	Municipality Change (1)	Microregion Change (2)	Occupation Change (3)	Industry Change (4)
1(High Bias)	-0.043*** (0.003)	-0.039 (0.026)	0.002 (0.011)	-0.016 (0.020)
R <sup>2</sup>	0.15	0.16	0.12	0.23
Observations	88,591	88,591	88,587	88,591
JD $\times$ Bankruptcy Year FE	✓	✓	✓	✓
Worker Controls	✓	✓	✓	✓
Panel C: Workplace Amenities				
	PageRank		Poaching Index	
	(1)	(2)	(3)	(4)
Post	0.003 (0.004)	0.003 (0.005)	-0.002 (0.006)	-0.002 (0.006)
Post $\times$ 1(High Bias)	0.000 (0.008)	-0.000 (0.009)	0.009 (0.006)	0.008 (0.006)
Observations	618,279	618,279	659,053	659,053
R <sup>2</sup>	0.702	0.702	0.673	0.674
Year FE	✓	✓	✓	✓
Worker FE	✓	✓	✓	✓
JD $\times$ Bankruptcy Year FE	✓	✓	✓	✓
Worker Controls	×	✓	×	✓

**Notes:** Panel A tests whether workers in firms assigned to high pro-continuation courts face higher income volatility. In columns (1) and (2), the dependent variable is the coefficient of variation of log earnings. In columns (3) and (4), the dependent variable is an indicator equal to one if the change in the worker's earnings over different time windows is in the lower 10th percentile, and zero otherwise. Panel B tests whether workers in firms assigned to high pro-continuation courts face a higher probability of geographical relocation or changes in occupation or sector of occupation. Panel C tests whether workers in firms assigned to high pro-continuation courts experience differential changes in workplace amenities as captured by the PageRank and Poaching Index described in section IV.F. Standard errors are clustered at the judicial-district and bankruptcy-year level. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

# APPENDIX

FIGURE A1: REORGANIZATION IN BRAZIL



**Notes:** The figure reports the different stages and the timeline of the reorganization process in Brazil.

TABLE A1: PROVISIONS USED TO CONSTRUCT PRO-CONTINUATION BIAS MEASURE

Article	Provision	Pro-continuation Decision
Art. 49, Par. 3	Certain Secured Claims Excluded from Automatic Stay	Not Excluded
Art. 6, Par. 3	Non-extendable 180 Days for Reorganization Plan	Extended
Art. 73, 61	Request to Convert Reorganization into Liquidation	Denied
Art. 64	Creditors Request Managers Removal	Denied
	Liquidation Request by Creditors	Denied

**Notes:** The table lists the five bankruptcy provisions – and relevant articles of the Brazilian bankruptcy code – used to construct our measure of pro-continuation bias at the court level.

TABLE A2: COMPARING IN-SAMPLE FIRMS AND EMPLOYEES WITH POPULATION OUTSIDE STATE OF SÃO PAULO

Panel A: Firm-Level Characteristics					
Variables	Bankrupt Firms in São Paulo	Non-Bankrupt Firms in São Paulo	Difference	Population (Excluding São Paulo)	Difference
	Mean	Mean		Mean	
Number of Employees	96	15	81***	13	83***
Total Wage Bill (R\$)	2,409,154	144,501	2,264,663***	103,642	2,305,523***
Log Employment	3.58	1.25	2.33***	1.15	2.43***
Log Total Wage Bill	13.31	9.59	3.72***	9.22	4.09***
High-Skilled Share	0.109	0.100	0.009**	0.080	0.029***
Number of Firms	1,042	1,343,652		3,649,058	
Panel B: Sectoral Composition					
Variables	Bankrupt Firms in São Paulo	Non-Bankrupt Firms in São Paulo	Difference	Population (Excluding São Paulo)	Difference
	Mean	Mean		Mean	
Agriculture/Mining	0.00	0.06	-0.06***	0.10	-0.10***
Manufacturing	0.53	0.12	0.40***	0.12	0.40***
Construction	0.05	0.03	0.02***	0.03	0.02***
Retail	0.29	0.41	-0.11***	0.40	-0.11***
Other Services	0.08	0.34	-0.26***	0.30	-0.23***
Transportation/Utilities/Communications	0.05	0.04	0.01	0.04	0.01**
Panel C: Employee-Level Characteristics					
Variables	Bankrupt Firms in São Paulo	Non-Bankrupt Firms in São Paulo	Difference	Population (Excluding São Paulo)	Difference
	Mean	Mean		Mean	
Years of Education	10.73	11.28	-0.54***	10.83	-0.10***
Female	0.26	0.38	-0.12***	0.38	-0.12***
Age	34.85	34.93	0.08	35.10	-0.25***
Tenure (in Months)	46.32	52.76	-6.44***	55.11	-8.79***
Log(Wage)	7.43	6.49	0.95***	6.23	1.21***
Number of Employees	99,537	20,515,413		48,137,803	

**Notes:** The table reports descriptive statistics. In Panel A, the table reports descriptive statistics for treated firms in the year prior to the bankruptcy event, the population of firms in São Paulo that have never filed for bankruptcy, and the population of firms outside São Paulo. In Panel B, the table reports the sectoral distribution of treated firms, the population of firms in São Paulo that have never filed for bankruptcy, and the population of firms outside São Paulo. In Panel C, the table reports descriptive statistics for treated employees in the year prior to the bankruptcy event, employees in São Paulo that were never employed by a firm that filed for bankruptcy in São Paulo, and the population of employees outside São Paulo.

Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .



TABLE A3: THE EFFECT OF PRO-CONTINUATION BIAS ON CASE OUTCOMES

	Reorganizations				Liquidations	
	Turned to Liquidation		Log Days to Resolution		Liquidation Dismissed	
	(1)	(2)	(3)	(4)	(5)	(6)
Pro-continuation Bias	-0.148*** (0.058)		-0.088 (0.133)		0.110* (0.060)	
1(High Bias)		-0.091* (0.048)		-0.041 (0.096)		0.303*** (0.024)
Judicial District × Bankruptcy Year FE	✓	✓	✓	✓	✓	✓
R <sup>2</sup>	0.07	0.07	0.35	0.36	0.10	0.13
Observations	1,710	1,715	699	702	4,864	4,963

**Notes:** The table reports the relation between pro-continuation bias and the type of bankruptcy resolution. It provides estimates from equation (2). In columns (1) and (2), the dependent variable is an indicator variable equal to one for reorganization cases that were converted to liquidation, and zero otherwise. In columns (3) and (4), the dependent variable is the log of days each reorganization case took to be resolved. In columns (5) and (6), the dependent variable is an indicator equal to one if a liquidation case is dismissed, and zero otherwise. *Pro – continuation Bias* is a continuous leave-one-out court-level pro-continuation measure, and *1(HighBias)* is an indicator function equal to one for courts with a pro-continuation-bias above the median, and zero otherwise. Standard errors clustered at the judicial-district and bankruptcy-year level are reported in parentheses. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

TABLE A4: CORRELATION OF INTERNET DIFFUSION WITH MUNICIPALITY CHARACTERISTICS

	Log Income	Log Population	Literacy	Unemployment	Employment Share		
	per Capita (1)	(2)	Rate (3)	Rate (4)	Manufacturing (5)	Services (6)	Agriculture (7)
Correlation with Internet Diffusion	0.111*** (0.008)	0.017*** (0.002)	0.567*** (0.051)	-0.464*** (0.071)	0.169*** (0.029)	0.148*** (0.029)	-0.235*** (0.021)
Observations	295	295	295	295	295	295	295
R <sup>2</sup>	0.493	0.207	0.321	0.104	0.091	0.077	0.256

**Notes:** The table reports the estimated coefficients of a set of regressions in which the outcome variable is internet connections per capita at the municipality level and the explanatory variable is the municipality characteristic reported in each column. The time period is 2007 to 2017. The source for the municipality characteristics is the Brazilian Population Census of 2000. Robust standard errors are in parentheses. Significance levels: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

TABLE A5: EFFECT OF JUDICIAL BIAS ON  
IN-SAMPLE PROBABILITY

	1(In-Sample)		
	All Periods (1)	Booms (2)	Recessions (3)
Post	-0.207*** (0.009)	-0.206*** (0.010)	-0.245*** (0.036)
Post $\times$ 1(High Bias)	0.017 (0.010)	0.007 (0.014)	0.145*** (0.033)
Observations	692,552	646,385	46,167
R <sup>2</sup>	0.555	0.555	0.566
Year FE	✓	✓	✓
Worker FE	✓	✓	✓
Judicial District $\times$ Bankruptcy Year FE	✓	✓	✓

**Notes:** The table reports the effects of pro-continuation bias on the probability that a worker remains in-sample. For this, we use a balanced panel of worker-year observations that include years in which workers drop from the RAIS sample. The dependent variable is an indicator variable equal to one for employees who are in the RAIS sample at the end of the year (independently from the employer), and zero otherwise. *Post* is an indicator variable equal to one for the five-year period after the bankruptcy request, and zero for the five-year period prior. *1(HighBias)* is an indicator function equal to one for workers who in the year prior to bankruptcy were employed in firms assigned to high pro-continuation courts, and zero for employees of firms assigned to low pro-continuation courts. Recessions (booms) are years with negative (positive) GDP growth at the judicial-district level. Standard errors are clustered at the judicial-district and bankruptcy-year level.

Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

TABLE A6: EFFECT OF JUDICIAL BIAS ON LABOR MARKET OUTCOMES  
ECONOMIC CYCLES

Panel A: Balanced Panel						
	Log(Wage)		Log(Earnings)		Log(1+Months)	
	Boom (1)	Recession (2)	Boom (3)	Recession (4)	Boom (5)	Recession (6)
Post	-0.356*** (0.029)	-0.468*** (0.062)	-0.308*** (0.032)	-0.589*** (0.095)	-0.736*** (0.049)	-0.964*** (0.174)
Post × 1(High Bias)	-0.056* (0.027)	0.187*** (0.040)	-0.059* (0.029)	0.146*** (0.034)	-0.066 (0.036)	0.148* (0.070)
Observations	1,013,803	72,665	1,013,803	72,665	1,013,803	72,665
R <sup>2</sup>	0.529	0.522	0.526	0.507	0.329	0.343
Year FE	✓	✓	✓	✓	✓	✓
Worker FE	✓	✓	✓	✓	✓	✓
Judicial District × Bankruptcy Year FE	✓	✓	✓	✓	✓	✓
Worker Controls	✓	✓	✓	✓	✓	✓
Panel B: In-Sample Panel						
	Log(Wage)		Log(Earnings)		Log(1+Months)	
	Boom (1)	Recession (2)	Boom (3)	Recession (4)	Boom (5)	Recession (6)
Post	-0.033** (0.012)	-0.084*** (0.014)	-0.065** (0.027)	-0.325** (0.101)	-0.146*** (0.020)	-0.383*** (0.072)
Post × 1(High Bias)	-0.035** (0.013)	0.048 (0.038)	-0.047** (0.020)	0.018 (0.034)	-0.015 (0.015)	-0.034 (0.058)
Observations	682,217	51,328	682,217	51,328	682,217	51,328
R <sup>2</sup>	0.906	0.897	0.803	0.762	0.247	0.251
Year FE	✓	✓	✓	✓	✓	✓
Worker FE	✓	✓	✓	✓	✓	✓
Judicial District × Bankruptcy Year FE	✓	✓	✓	✓	✓	✓
Worker Controls	✓	✓	✓	✓	✓	✓

**Notes:** The table replicates the results in Table V for recessions and booms. Panel A uses a balanced panel of worker-year observations that include years in which workers drop from the RAIS sample, whereas Panel B focuses only on the in-sample panel. The outcome variable is the log of employee average wage in columns (1) and (2). Workers who drop from the RAIS sample are assigned the average wage observed in the informal labor market in their municipality and year as reported in the Brazilian National Household Sample Survey (PNAD). The outcome variable is the log of total labor earnings in columns (3) and (4). Informal labor earnings are computed as average informal wages multiplied by 12. The outcome variable is the log of employment months in columns (5) and (6). Because we have no information on months employed for out-of-sample workers, we assign a zero to this outcome whenever a worker drops from the RAIS sample. *Post* is an indicator variable equal to one for the five-year period after the bankruptcy request, and zero for the five-year period prior. *1(HighBias)* is an indicator function equal to one for workers who in the year prior to bankruptcy were employed in firms assigned to high pro-continuation courts, and zero for employees of firms assigned to low pro-continuation courts. Recessions (booms) are years with negative (positive) GDP growth at the judicial district level. Standard errors clustered at the judicial-district and bankruptcy-year level are reported in parentheses. Significance levels: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

TABLE A7: ROBUSTNESS TO ALTERNATIVE MEASURES OF PRO-CONTINUATION BIAS

	Log(Earnings)	
	Alternative Measures of Pro-continuation Bias:	
	Excl: Art.49 & Art.6 (1)	Excl: São Paulo (2)
Post	-0.079*** (0.021)	-0.065** (0.027)
Post × 1(High Bias)	-0.041* (0.018)	-0.058* (0.026)
Observations	711,206	582,563
R <sup>2</sup>	0.806	0.798
Worker Controls	✓	✓
Year FE	✓	✓
Worker FE	✓	✓
Judicial District × Bankruptcy Year FE	✓	✓

**Notes:** The table replicates the earnings results reported in Table V using alternative measures of pro-continuation bias described in section V.B. In column (1), the measure of pro-continuation bias does not use judicial decisions based on Art. 49 and Art. 6. In column (2), we exclude all workers of firms that filed for bankruptcy in the judicial district of the city of São Paulo. Standard errors clustered at the judicial-district and bankruptcy-year level are reported in parentheses. Significance levels: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .