



The impact of union activities and employee terminations on labor lawsuits in Brazil


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Abstract

This study explores the influence of unions on labor lawsuits, and the impacts of involuntary dismissal *vis-à-vis* self-dismissal. We analyzed a database containing more than 18,000 observations from a financial institution in Brazil. Logistic regression models were then estimated using this data. The modeling was done using instrumental variables to address the endogeneity of unionization and the type of termination. Additionally, we present the models after performing matching to reduce potential selection bias in the sample. Control variables related to worker's personal information were included. Results show significant increases in the probability of filing lawsuits if the employee is unionized and is involuntarily dismissed. Finally, all control variables, except gender, are positively associated with a higher propensity to file a lawsuit. The results were satisfactory in terms of model fit, with accurate classification percentages greater than 73% (up to 75.1%) and ROC curve values ranging from 77.1% to 79.3%.

Keywords

Unions, Dismissal, Propensity to labor lawsuit, Logistic regression.

Impactos de sindicatos e demissões de empregados nos litígios trabalhistas no Brasil

Resumo

Este estudo explora a influência dos sindicatos nas ações trabalhistas e os impactos da demissão involuntária *vis-à-vis* o desligamento voluntário. Analisamos uma base de dados com mais de 18.000 observações de uma instituição financeira brasileira. Modelos de regressão logística foram estimados usando o banco de dados de uma instituição financeira. A modelagem foi feita utilizando variáveis instrumentais para lidar com a endogeneidade da sindicalização e do

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tipo de demissão. Também apresentamos os modelos após a realização de um pareamento para reduzir um possível viés de seleção relacionado à obtenção da amostra. Foram incluídas variáveis de controle relacionadas aos dados pessoais do trabalhador. Os resultados mostram aumentos significativos na probabilidade de processar se o empregado for sindicalizado e for demitido involuntariamente. Finalmente, variáveis de controle apresentaram-se positivamente associadas à maior propensão a processar, exceto gênero. Os resultados obtidos foram satisfatórios em termos de ajuste, com porcentagem de classificação acurada superior a 73% (até 75,1%) e valores obtidos da curva ROC variando de 77,1% a 79,3%.

Palavras-chave

Sindicatos, Demissão, Propensão à litigância trabalhista, Regressão logística.

JEL Classification

J51, K41, C5.

1. Introduction

Litigation in Brazilian Labor Courts is extremely high. According to an official report published by the National Council of Justice (CNJ), “Justiça em Números 2018”, more than 4.6 million cases were adjudicated in 2017, 4.3 million cases were filed in the Judiciary, and there was a backlog of over 5.5 million pending cases by December 31st of the same year.

A study coordinated by Sadek (2018) assessed the numbers of labor lawsuits of three large companies from different economic sectors (financial, agribusiness, and consumer goods) that operated concurrently in 3 countries: Chile, Argentina and Brazil. The companies were similar regarding relevance in the international market and size. Regardless of the sector in which they operated, all of the organizations faced the greatest number of labor claims in Brazil. Companies in the financial services sector faced 625 labor claims for every 1,000 Brazilian employees, 38 claims for every 1,000 Argentine employees, and fewer than 1 labor lawsuit for every 1,000 Chilean employees. This means that, in terms of volume of labor claims, companies in Brazil had 1,486 times more claims than in Argentina, and 30,561 times more proceedings than in Chile. In the realm of agribusiness companies, there was one labor claim for every 2.85 Brazilian employees, one legal action for every 8.97 employees in Argentina, and one claim for every 26.7 employees in Chile. Finally, consumer goods companies

in Brazil faced one labor claim for every 1.6 employees, compared to one claim for every 9.3 employees in Argentina and one claim for every 27.1 employees in Chile.

The first question when analyzing these numbers is: Why are there far fewer lawsuits in the mentioned countries compared to Brazil? One of the answers lies in the fact that these countries use extrajudicial methods such as conciliation and mediation, which aim to resolve conflicts in the administrative sphere before the opening of a lawsuit (PASTORE, 2017). Specifically, in such countries as the United States, conflicts are resolved during the term of the contract and do not escalate into judicial litigation - it is worth noting that labor matters are treated as common contractual issues, without a dedicated Labor Court. Another fact is that, in Brazil, employees have up to two years to file a labor lawsuit following a dismissal. In contrast, this period is considerably shorter in other countries: Six months in Portugal, Italy, and the United States (USA Government, 2018), three months in England, and only three weeks in Germany and Austria. The extended period in Brazil significantly increases the likelihood of litigation (PASTORE, 2017).

In the Brazilian context, are there any variables associated with the likelihood of litigation? If so, which ones? What is the role of labor unions, if any, in this process? The objective of this study is to investigate whether such factors as the influence of unions and the type of dismissal impact the probability of employees filing a labor lawsuit after leaving the company. Understanding this behavior is complex, and the empirical literature on the subject is scarce, almost nonexistent. Fraisse, Kramarz, and Prost (2015) conducted a similar study by investigating all French lawsuits initiated over an eight-year period (totaling 1.3 million cases), evaluating issues such as the percentage of cases where conciliation occurred between the parties, the percentage of cases won by workers, and the percentage of cases in which workers were legally represented, among others. Another study from the early 1980s (Hoyman and Stallworth, 1981) surveyed nearly 900 employees in an American state and found impacts of unionization on the levels of lawsuit filings. However, we have not found literature that uses econometric models to estimate the likelihood of initiating a labor lawsuit based on such characteristics as union membership or the type of dismissal (voluntary or involuntary). Therefore, one of the main contributions of this article is to estimate the impacts of unionization and the type of termination on an employee's likelihood of filing a labor lawsuit against his or her employer.

For this paper, we had access to data that is typically unavailable for academic purposes: The complete database of a large national financial institution. This dataset provided information on employees whose employment contracts were terminated between 2014 and 2015, either voluntarily or involuntarily, ensuring that all eligible labor lawsuits were filed by the time of the 2018 sample collection (as mandated by the Federal Constitution of 1988 and Brazilian Labor Laws, which require employees to file lawsuits against their employers within two years of dismissal). The dataset includes 18,104 employees and examines the likelihood of filing a labor lawsuit using explanatory variables such as union membership, type of termination, and various personal characteristics (age, gender, marital status, tenure, career movement, position, education, department type, and race). Modeling was conducted using logistic regression to estimate the probability of an employee filing a labor lawsuit. To account for the endogeneity of unionization and the type of termination, which depend on omitted variables from the model, we used instrumental variables: Whether the employee works in the state of São Paulo for unionization, and the time without career movement for the type of termination. Additionally, we present the results with propensity score matching to address a potential selection bias due to the non-random nature of the sample.

By analyzing the results obtained, we conclude that there are factors that are significantly associated with the likelihood of filing a labor lawsuit. A significant factor is the influence of unions, as unionized employees are more likely to file labor lawsuits. Another factor is the type of termination undertaken by the employee: Those who had their employment contracts terminated involuntarily (dismissed) were more prone to file a lawsuit, compared to those who voluntarily left the organization (resigned). Finally, in cases where there was a combined effect (unionization plus involuntary dismissal), the likelihood of litigation was even greater compared to situations involving isolated factors, especially when employees resigned voluntarily.

We start by making a disclaimer. By the end of 2017, a significant reform occurred in the Brazilian Labor Justice and labor laws. This paper is not aimed at measuring the impacts of that labor reform implemented in November 2017. Our goal here is different: to evaluate the impacts of personal variables, related to employees themselves (not institutional or environmental variables) on the propensity to file lawsuits after dismissals.

The paper is organized as follows: Section 2 briefly provides the context of Brazilian labor institutions. Next, Section 3 discusses the literature regarding the impacts of unions on labor relations, more specifically, on litigation. We also define our main theoretical hypotheses. Section 4 describes our methodology (database, general variables, statistical model, the instrumental variable used, and the model of propensity score matching). Section 5 presents and discusses the implications of our empirical results. Finally, Section 6 closes this paper with concluding remarks and reflections for further exercises.

2. Labor Institutions in Brazil

2.1. Historical Development and Principles.

Labor laws and labor justice were created in Brazil in the 1940s, within a context of intense transformations in the country: Industrialization, urbanization and foreign immigration were all taking place at the same time. Getúlio Vargas, the non-democratic president of the time, in order to gain control of the various urban groups, unified all previous labor laws under the *Consolidação das Leis Trabalhistas*, CLT (“Consolidation of Labor Laws”) which, according to some, represented a “combination of state paternalism and fascism, which was the essence [of the Vargas administration]” (Lopez, 1991). It guaranteed a wide range of labor rights and benefits, including some corporatist features, such as monopolist trade unions, which are financed by taxes levied on all formal employees.

Since then, CLT remains the main source of labor regulation in Brazil, besides a few clauses in the Federal Constitution of 1988, and other minor legislations. As a civil law country, judicial precedents are rare, and most of the time, not mandatory.

Brazilian labor laws and labor justice are based on the principle of employees’ vulnerability (“*hipossuficiência*”) (Yeung & Firpo, 2020). “This means labor conflicts are not solved as contractual conflicts by [courts]” (p. 3). One immediate implication of this principle is that, in the view of labor judges and many labor lawyers, the rationality assumed by economic analysis does not apply to labor relations. Coasean analyses of solving la-

bor conflicts by cooperative bargaining (through mediation or arbitration, for instance) are much more difficult to happen. This might explain the very high levels of judicial disputes, as we posed in the introduction of this paper. Although litigation is also high in other fields of the Brazilian Judiciary, labor issues are always the most disputed. “Justiça em Números” – the official report previously mentioned above – indicates, year after year, that the top-1 theme for judicial disputes in Brazilian courts is “labor dismissal/dismissal fees”: In 2017, judicial cases related to this topic comprised 5.8 million cases or 11.5% of all judicial cases in the country. In second place, there were conflicts on “breach of (commercial) contracts”, with only 1.9 million cases (CONSELHO NACIONAL DE JUSTIÇA, CNJ, 2018).

2.2. Rules of Unionization in Brazil

As mentioned above, legal institutions ruling labor relations in Brazil were created under non-democratic circumstances, in which the government tried to firmly control the nascent labor classes and organizations:

“Vargas created a ‘fake’ unionism, which included a monopoly of representation, i.e., only one union per professional category in a particular geographical region¹. Employees must pay compulsory union fees (deducted from their paychecks once a year)². In turn, unionism is funded by public resources³.

¹ Article 516 of the CLT: “The law shall not recognize more than one trade union representing the same economic or professional category ... in a given territorial base”. Item II of article 8 of the 1988 Federal Constitution addresses the same issue: “II - it is forbidden to create more than one union organization, at any level, representing a professional or economic category, in the same territorial base...” (free translation).

² Former article 579 (modified after the Labor Reform of 2017): “Art. 579 - The union contribution is mandatory for all those who participate in a certain economic or professional category, or in a liberal profession, in favor of the representative union of the same category ... The union fee will be paid once, annually, and consists of: a) the amount corresponding to the remuneration of one day’s work...” (free translation).

³ As stated in articles 586 and 588 of the CLT: “Art. 586. Union fees will be paid, in the months set forth in this Chapter, to Caixa Econômica Federal, Banco do Brasil SA (two national public banks), or national banking establishments that are part of the federal tax collection system, which, in accordance with instructions issued by the National Monetary Council, will transfer the amounts collected to Caixa Econômica Federal.

Art. 588. Caixa Econômica Federal shall maintain a checking account entitled “Union Fees Collection Deposits”, in the name of each of the benefiting trade union entities, and the Ministry of Labor shall be made aware of occurrences relevant to the administrative life of these entities.

§ ¹ Withdrawals from the current account referred to in this article shall be made by bank order or

Unsurprisingly, unions were mostly subordinated to the federal government” (Yeung and Firpo, 2020).

In Brazil, there is a “right to work” rule at any workplace: Unionization is never obligatory under any circumstances and there is no such a thing as firm-level union. This right is enshrined in the 1988 Federal Constitution:

Art. 8: Professional or union association is free, observing the following:

...

V - no one will be required to join a union, or remain a union member...” (free translation)

However, regardless of his or her unionization status, every worker in the country – unionized or not – was required to pay union fees. This only changed with the Labor Reform that occurred at the end of year 2017.

It is noteworthy to observe two important characteristics derived from this institutional setting. First, being a member of a trade union is a purely individual decision in Brazil, without economic motivations: There is no material gain, but also no material loss at any time – including during dismissal – in being unionized. Because of that, one might affirm that this decision might be motivated, instead, by an employee’s personal characteristics. Also, the decision to become a member of a union might be made anytime during an employee’s life and is not related to the situation or timing of dismissal (it happens before that). Second, unions do not actually need to worry about union membership; what they really care about is the number of resources they might get from the government, which in turn comes from the mandatory fees paid by all workers at their workplace. These characteristics are particularly important to bear in mind when discussing a worker’s decision to file a lawsuit against his or her employer.

For purposes of international comparison – even for literature review or application of theoretical models – other aspects distinguish Brazil from other countries in labor relations. While in Brazil most conflicts are

check with the joint signatures of the president and treasurer of the trade union entity.

§ ² Caixa Econômica Federal will send, monthly, to each trade union entity, an extract of the respective checking account, and, when requested, to the agencies of the Ministry of Labor.”

brought to a specialized Labor Court, largely due to the ease with which workers can access it (almost always with the benefits of Judicial Gratuity and exemption from paying court costs in cases of court loss⁴), in other countries, labor conflicts are understood as contractual conflicts, resolved during the term of the contract and do not take on the character of litigation. The contracts themselves or collective agreements signed with unions provide for internal procedures for exercising the “voice” to express dissatisfaction, minimizing the chances of going to court. Unlike Brazil, in the United States, for example, unions are organized at the company level, and union activity takes place within the organizational structure. Thus, there are “unionized companies” and “non-unionized companies” (unionization is not defined at the individual level). In contrast, due to the lack of worker representation in Brazilian companies, there is no official “voice” channel, leading to the recognition and resolution of nearly all conflicts through judicial litigation.⁵

Consequently, analyzing the role of unions in labor relations within companies—one of the focal points of our research—presents challenges when attempting to apply discussions from international literature to the Brazilian context. For instance, North American literature often compares unionized and non-unionized organizations, a distinction that is not relevant in Brazil. Similar discrepancies arise in studies from other countries. Thus, a significant portion of the foreign literature on unionism may not be directly applicable to the Brazilian scenario.

3. Literature Review

3.1. The Impact of Unions on Economic Variables.

Economists have long studied – theoretically and empirically – the effects of unionization on labor markets. The topic has been the subject of academic research not only by economists, but also by sociologists, political scientists and others since the beginning of the 20th century. Despite the decline of unionism worldwide in the past decades, the role of unions still deserves profound academic debates.

⁴ These two instruments were also amended by the 2017 Labor Reform.

⁵ We thank professor Hélio Zylberstajn (Department of Economics, University of São Paulo) for the input and information provided in this section.

Although traditional economic analysis affirms that there is a tradeoff between wages and employment (e.g. Farber, 1986), empirical results have not unanimously corroborated the existence of a demand curve for labor (Borjas, 1996). The effects of responsiveness to economic cycles are observed, though: During periods of economic expansion, unions can advise employers to raise wages in order to reduce excessive demand. On the other hand, when negative demand shocks occur, unions can support employers' efforts to decrease wage costs, with the aim of keeping jobs during the shock period (Shuntian and Chew, 2014).

Several other impacts of unions have been consistently verified by empirical work. First, unions raise the wages of unionized workers *vis-à-vis* nonunionized ones. Thus, unionization creates a quasi-monopoly in the labor market, where the wages for unionized workers tend to be higher (e.g., Freeman & Medoff, 1984; Card, 1996 among others; in Brazil, Menezes-Filho and Rodrigues, 2009). There is also evidence that unions lead to less dispersion of wages within the group (e.g., Freeman, 1980), but more in comparison to other groups (Arbache, 2008). Finally, it seems to be clear that unions tend to generate more extra wage benefits for their members, compared to nonunionized workers (Freeman, 1981; Campos and Moura, 2017). In Brazil, specifically, throughout history, some achievements in this regard are noteworthy: The meal ticket (*vale refeição*), transportation allowances (*vale transporte*), the 13th salary (*13o salário*), fixed work schedules and Profit and Results Sharing (*Participação em Lucros e Resultados - PLR*), among others, have all been the result of trade union efforts.

In terms of impacts of unions on business variables, Choi, Sohn, and Seo (2016) showed that unionized companies strategically maintain less liquidity to increase their bargaining power against unions. Bronars and Deere (1991) and Matsa (2010) demonstrated that companies with unions use their capital structure to shield their earnings from union demands. Chen, Kacperczyk, and Ortiz-Molina (2011) suggest that unions increase a company's capital costs, reducing its operational flexibility. Hilary (2006) and Chung et al. (2015) show that companies tend to present a high level of information asymmetry to preserve their bargaining power against unions, and Tong (2015) argues that unions affect the choice of corporate liquidity between companies and bank lines of credit. Again, we must emphasize, one must keep in mind the fact that the American model of unionism occurs at the company level, not at the individual worker level.

3.2. *The impacts of Union on Filing Lawsuits.*

For reasons already explained above, caution is needed when using foreign literature on the effects of unionism on labor relations. However, to the best of our knowledge, there are no Brazilian studies that empirically evaluate the impacts of unions on variables of labor relations in workplaces, specifically on the likelihood of litigation. In our view, this constitutes an important gap in the academic literature that should be addressed by national scholars as soon as possible. Due to this reason, we present a few contributions from the foreign literature.

A classic study by Hirschman (1970) associates labor litigation as a form of “voice” to express dissatisfaction of the worker in contrast to “exit,” that is, leaving the current job. According to this author, a dissatisfied worker will have three options: “1) to exercise ‘voice’ through a lawsuit; 2) to exercise ‘exit’ and perhaps (in the American case) not file a lawsuit; 3) to remain in the organization and perhaps feel victimized, but not file a lawsuit” (*apud* Hoyman and Stallworth, 1985, p. 63). On the other hand, Hoyman and Stallworth (1981 and 1985), employing a survey with 876 responses, show that the use of labor lawsuits as a ‘voice’ mechanism depends on some personal factors, one of them being union activity. More specifically:

“[T]hree factors emerge as the strongest predictors of whether an individual worker is likely to file a suit. These three factors are (1) the individual worker’s grievance activity; (2) the individual worker’s race; and (3) the degree of participation by the individual worker in the union” (HOYMAN AND STALLWORTH, 1981, p. 138, emphasis added).

Moreover, “[o]ne striking finding of this study is that those who are active in their union file lawsuits more frequently than those who are not” (HOYMAN AND STALLWORTH, 1985, p. 80).

The explanations for this finding are not unexpected. Several authors theorize that this occurrence is related to the role unions play as agents for workers and as disseminators of information on labor laws and rights to their unionized members. (Weil, 2004). Finally, “unions also offer individual workers assistance in the actual exercise of their rights” (*ibid*, p. 24).

In the United States, the structure of unionization precludes the coexistence of unionized and non-unionized workers within the same organization, as unionization is implemented at the company level rather than the individual level. Consequently, the limited foreign literature available has clear limitations in its applicability. For instance, it cannot reliably assess differences in the impact of unions on workers within the same organization who have had varying experiences, such as voluntary resignations versus dismissals by the employer. One objective of this study is to identify evidence of these different impacts.

3.3. Labor Protection and Labor Costs.

In Brazil, there are several findings that formal work is expensive to employers. Pastore (2007) evaluated that for each salary paid to a worker, the employer pays an additional one to the government, in the form of corporate social obligations such as Social Security, severance packages, advanced notices, vacation and observances, among others. In the same vein, the consultancy UHY International (2016) showed that Brazil has the highest employer-side tax burden of all countries; based on their calculations, the payroll tax burden amounts to 71% of the salary the employer pays. According to data from the same consultancy, in countries such as Portugal, China, Argentina and the United States, these costs are 29.9%, 42%, 26% and 8.8%, respectively - much lower compared to Brazil (pp. 4-5).

In the Americas, Brazil ranks in the top third for the highest unemployment indicators (11th out of 31 countries) (TRADING ECONOMICS, 2024). Among the G20 countries, Brazil ranks 3rd in unemployment, behind only South Africa and Turkey.

In the literature, the relationship between unemployment and labor market regulations has been widely studied, yet the results remain highly controversial. On one hand, the work of Botero et al. (2004) has become a cornerstone in advocating for labor market deregulation. Based on observations in 85 countries and categorizing nations according to their legal origins, the authors assert categorically that countries with heavier regulation of labor experience lower labor force participation and higher unemployment, particularly among young workers. Several studies have followed this line of reasoning, demonstrating similar outcomes across

virtually all regions of the world. For example, in India, Besley and Burgess (2004) showed that provinces implementing stricter labor regulations experienced reductions in production, employment, investment, and formal manufacturing productivity. Similarly, in Brazil, Ponczek and Ulyssea (2022) analyzed the effect of labor regulation enforcement on informality and non-employment, leveraging the significant regional variations within the country. Their findings indicate that regions with stricter enforcement observed “(i) substantially lower informality effects; (ii) much larger disemployment effects; (iii) lower reductions in formal employment; and (iv) greater reductions in the number of formal plants,” while regions with weaker enforcement exhibited the opposite effects (p. 388). However, the authors emphasize that these impacts are concentrated among low-skilled workers, and the long-term effects on welfare remain unclear in their analyses.

On the other hand, a substantial body of literature argues that the empirical effects of labor regulation on unemployment (and vice versa) are not as pronounced as suggested by the first group of studies. Sarkar’s (2013) study identifies four key findings: (i) there is no significant long-term relationship between employment protection regulations and total unemployment; (ii) there is no causal relationship between long-term unemployment and employment protection regulations; (iii) there is no clear evidence that labor regulations are to blame for youth unemployment; and (iv) there is a strong causal relationship between unemployment and GDP. It is worth noting that while some models indicate certain effects, these do not hold consistently. In the context of OECD countries, Baker et al. (2005), Howell et al. (2007), and Rubery (2011) are highly critical of the “orthodox view” that labor protective institutions are the primary causes of unemployment. They strongly caution against the applied use of such findings and underscore the need for a more nuanced approach to policy-making that considers the complexity of labor market dynamics and broader socio-economic factors.

To sum up, although it is hard to deny that there are high employment costs and unemployment rates in Brazil, the evidence presented by the literature underscores the complexity of the relationship between labor market regulations and unemployment.

3.4. *Labor Courts and Labor Laws in Brazil.*

There is evidence that labor courts in Brazil tend to grant substantial gains to lawsuits filed by workers against their employers. A study conducted by Salama, Carlotti, and Yeung (2018), analyzing approximately 130,000 pieces of data, from 2013 to 2016, from the Regional Labor Court of First Instance of the city of São Paulo and metropolitan area (TRT-2), revealed that in 88.5% of cases, employees had their requests granted, either partially or fully. On the other hand, employers have fully favorable court decisions in only 11.45% of the claims. In addition, in more than 77% of the cases it was possible to detect, expressly, the request for Judicial Gratuity (*Acesso Gratuito à Justiça*) - in which the plaintiff would be exempt from paying legal fees and, in many cases, attorney fees as well. Of the 77% requests for free legal assistance, 99.6% were granted. The results of this study indicate strong incentives for the worker to file labor lawsuits, due to the predictability of favorable court decisions and free legal assistance for plaintiffs.

Lastly, to conclude this section, it is important to emphasize that our efforts to find any references regarding the impact of the type of dismissal an employee experiences on the likelihood of subsequently filing a lawsuit have been unsuccessful. We can assert with reasonable confidence that this literature is virtually nonexistent.

3.5. *Hypotheses.*

This study explores the influence of unions on labor lawsuits. In addition, it tries to capture whether the relationship between unionization and filing a labor lawsuit is moderated by the occurrence of an involuntary dismissal.

In cases of involuntary worker dismissal and subsequent unemployment, the incentives for litigation are anticipated to be higher. These circumstances often lead to the justification of labor lawsuits based on the perceived “non-conformity” of the dismissal. This phenomenon elucidates why, consistently, the most prevalent topic discussed in Brazilian courts (across all branches, not solely labor courts) is “labor dismissal” (CONSELHO NACIONAL DE JUSTIÇA, 2024). Conversely, if a dismissed worker can swiftly reintegrate into the labor market, the need to resort to a Labor Court is obviated. Moreover, when a worker voluntarily exits a company, it is presumed that they possess an alternative income source or have

secured new employment, thereby reducing the incentives for litigation. Conversely, the presence of a union significantly facilitates the process of filing a labor lawsuit, providing technical, legal, and even emotional support. Consequently, the likelihood of an employee pursuing legal action against an employer is heightened.

Bearing this in mind, we have three hypotheses to be tested in this paper:

H1 - If the employee is unionized, there are greater chances of filing a labor lawsuit after his/her dismissal.

If an employee is unionized, he or she feels more supported to go against his/her employer. Moreover, it is a known fact that unions voluntarily provide support, typically offering information and assistance in filing lawsuits against former employers. This holds especially true in industries with strong unions and/or large companies, such as the banking sector in Brazil.

H2 - If the employee was (involuntarily) dismissed, there are greater chances of filing a labor lawsuit.

When employees are dismissed involuntarily, their propensity to sue is high, no matter what their unionization status is because the dismissal by the employer makes them emotionally at odds (exactly what is stated on the previous hypothesis). This typically prompts the dismissed employee to resort almost automatically to the courts.

H3- If the employee becomes unionized, the probability of filing a labor lawsuit increases both for dismissals and for resignations; however, this increase will be greater for individuals who resigned.

As just shown in the previous hypothesis, in cases of involuntary dismissals, the propensity to sue is high. This is not usually the case when an employee voluntarily resigns. Our hypothesis is that unionization may create stronger effects on these employees who, otherwise, would not file lawsuits: with the union's support, the ex-employee finds reasons to start a labor claim, even when he/she voluntarily resigned from the job. The union's effect here is comparatively stronger than in cases of involuntary dismissal, where the chances of filing a lawsuit are already high.

4. Methodology

4.1. Database and variables

We had exclusive access to a database covering information on employees who were dismissed from January 2014 to December 2015 in a large Brazilian financial institution. Given that in Brazil a former employee has up to two years to file a labor lawsuit, assessing this period ensures that everyone entitled to file a labor lawsuit at that institution had already done so by the time the sample was obtained in 2018.

The database has information on 18,104 employees who were (involuntarily) dismissed or who (voluntarily) resigned in 2014 and 2015.

Dependent variable

Variable of interest ("Process") is an indicator of whether the employee filed a labor lawsuit (value = 1) or not (value = 0).

Explanatory variables

"Unionized" – represents whether the employee was unionized during the period he or she worked at the company. We created a binary variable, in which 1 indicates that the employee was unionized, and 0 otherwise. Unionized employees are expected to have a higher probability of filing labor lawsuits, according to hypothesis 1 described above.

"Type of termination" – indicates whether there was a (involuntary) dismissal or a (voluntary) resignation. We created a binary variable, in which 1 represents dismissal, and 0 represents resignation. We expect that employees who were dismissed would have a greater chance of filing labor lawsuits, according to hypothesis 2.

Instrumental variables

"Region" – indicates the region of Brazil where the employee worked during the period he or she worked at the company. We created dummy variables to represent North, Northeast, Midwest and South, while Southeast is the reference. This variable is an instrument for Unionized.

“Time without career movement” (in years) - indicates how long ago the employee had a career movement within the organization – either merit-based promotion or merit-based department transfer. This variable is an instrument for Type of termination.

We employed some control variables related to employees’ personal characteristics:

- Age (in years)
- Gender (male or female)
- Marital status (single, married, or divorced)
- Time working at the company (in years)
- Position level at the company (“Operational Level”, “Junior Analyst”, “Analyst”, “Senior Analyst”, “Coordinator”, “Manager” or “General Manager”).
- Education level (“High School Diploma”, “Undergraduate Degree”, “Specialization” or a “Master’s / Doctorate Degree”)
- Department type (“Administrative” or “Sales Department”)
- Race (“White” or “Others”)

4.2. Statistical model

Our variable of interest has a binary (or dichotomous) characteristic; thus, we use the logit model to assess the chance of filing a labor lawsuit:

$$P_i = P(y_i = 1|x) = \frac{e^{\beta_0 + \sum_{j=1}^k \beta_j x_{ji}}}{1 + e^{\beta_0 + \sum_{j=1}^k \beta_j x_{ji}}} = \frac{1}{1 + e^{-(\beta_0 + \sum_{j=1}^k \beta_j x_{ji})}},$$

in which y is the dependent variable that indicates whether a lawsuit was filed by the i -th former employee and x represents the complete set of k explanatory and control variables.

We evaluate the fit of a logistic model by assessing the likelihood log measurements and the pseudo R^2 (MCFADDEN, 1974). If R^2 varies between 0.2 and 0.4, then the model is considered appropriate. In both measurements, the higher the value, the better adjusted the model is. Another indicator that evaluates the model's forecasting capacity is the Kolmogorov-Smirnov (KS) measurement, which corresponds to the maximum distance between the cumulative distribution of former employees who filed a labor lawsuit and the cumulative distribution of former employees who did not (CONOVER, 1999). To complement this analysis, the area under the ROC curve will be evaluated, since it indicates the predictive power of the model. The larger the area under the ROC curve, the better the model's ability to correctly classify and, thus, balance sensitivity and specificity (HOSMER AND LEMESHOW, 2000).

Four logistic regression models will be used to test the different hypotheses discussed above. The first model includes only "unionized" and control variables (Model 1); the second model includes the "type of termination" and control variables (Model 2); the third model includes all variables, and the interaction between "unionized" and "type of termination" (Model 3); finally, the last model includes the two explanatory variables - "unionized" and "type of termination" - and control variables (Model 4). Instead of the coefficient, the odds ratio is presented. Therefore, values equal to one indicate equality of chances for the groups, while values less than one mean a reduction in chances of filing lawsuits. Values greater than one indicate increases in the chances of filing a lawsuit. This facilitates the interpretation of the results, since the logistic model is nonlinear and the odds ratio indicates the variation in one group's chances of litigation in relation to the other.

4.3. Instrumental Variables

Due to the institutional settings governing labor laws in Brazil, the decision to unionize might be better explained by each employee's personal profile. This aligns with some previous literature, which emphasizes factors beyond economic ones - such as sociological, psychological and other personal factors - that affect individual decisions regarding unionization (e.g. VAN RIJ AND DAALDER, 1997).

The type of termination (involuntary or voluntary) also depends on individual employee characteristics, such as employment opportunities and career stage, which introduces endogeneity into the model. To address the endogeneity issue, we selected instrumental variables for unionized and type of termination.

For unionized, we used an instrumental variable composed by dummies variables indicating the region of Brazil where the employee worked during the period he or she worked at the company. According to Rodrigues (2015), unionization has been migrating over time from the southeastern region to other regions. In the Southeast region, which hosts most of the country's financial institutions, the unionization rate is lower compared to other regions. According to data from the financial institution we analyzed, about 40% of employees in the Southeast region are unionized, compared to about 66% in other Brazilian regions (North – 72%, Northeast – 67%, Midwest – 66%, South – 62%). We consider that working in different regions of Brazil influences the decision to unionize. At the same time, working in a specific region does not directly influence the decision to file a lawsuit. Thus, we argue that the region where the employee works can be used as an instrument for unionization.

As a robustness check, we also used the states as instrumental variables for unionization, and the results were similar to the use of the regions. These results are available upon request.

For the type of termination, we employed the instrumental variable time without career advancement, measuring the duration since the employee last experienced a merit-based promotion or department transfer within the organization. The time without a career movement influences the type of termination, as individuals who have gone longer without career movements are more likely to be involuntarily terminated. However, the time without a career movement does not directly influence the decision to file a lawsuit upon termination.

The validity of the instruments will be verified based on the statistical relevance of these variables in the reduced equation (first stage), while the exogeneity of the instruments will be validated through the Sargan test. Additionally, the Wu-Hausman test will be conducted to check for the existence of endogeneity. More details can be found in Wooldridge (2016).

4.4. *Propensity Score Matching (PSM)*

The comparison between individuals that are unionized and non-unionized is one of the contributions of this study. However, there is a selection bias if the analysis of the two groups of individuals is performed directly, and this can be attributed to the fact that the sample selection is not random, meaning that some members of the population are less likely to belong to one group than to another (HECKMAN, 1979).

One of the ways to eliminate (or reduce) the selection bias is to match the employees. That is, for each unionized employee (treatment group) we select a non-unionized employee with similar characteristics to construct the control group. This is done using the propensity score matching (PSM) procedure, which would lead to the two groups being randomly selected, thereby eliminating the selection bias (HECKMAN et al., 1998).

Then, for each unionized employee, we select the non-unionized one with the most similar probability to be in the treatment group (nearest neighbor method) and a pair is thus created.

The propensity score matching procedure is described as follows:

i. propensity score: We estimate a logit model to forecast the probability that an employee belongs to the treatment group (unionized), conditional on a set of observable and exogenous characteristics that may affect this decision. The control variables used for matching the employees are: age, gender, marital status, time working at the company, position, education level, department and race;

ii. matching algorithm: For each unionized employee, we select the non-unionized employee with the most similar probability of being in the treatment group (nearest neighbor method) and a pair is thus created. The selection of the non-unionized employee is done with replacement. As mentioned by Stuart (2010), matching with replacement can often decrease bias, and the author suggests that matching with replacement is preferred to matching without replacement, if the number of duplications is not too large (approximately 1% of the non-unionized employees entered twice in the matched sample);

iii. checking for balance: A t-test was used for comparing the means of all variables in the propensity score to determine whether the groups are statistically similar. We calculate two measures to evaluate the ma-

tching method, in line with Stuart (2010). The standardized difference of means of the propensity score of our sample is 0.018, close to zero and under 0.25 as desirable, and the ratio of the variances of the propensity score between the groups is 0.981, close to 1 as desirable and between 0.5 and 2 according to the criterion presented in Stuart (2010).

5. Results and Implications

5.1. General Results.

Table 1 presents descriptive statistics of the numerical variables, segmented by employees who filed and those who did not file a lawsuit. Student's t-tests were added to compare both means. There are differences in averages of age and time at the organization: Older workers who have been at the company for a longer time do file labor lawsuits more often. Based on the results of the means test, it seems that these variables are statistically associated with a higher probability of filing a labor lawsuit.

Table 1 - Descriptive statistics separating workers who have or have not filed a labor lawsuit.

Variable		Mean	SD	Minimum	Maximum	t-test	p-value
Age (in years)	Total	39	10	20	84		
	Did not file a lawsuit	36	9	20	84	-34.99***	< 0.001
	Filed a lawsuit	41	10	22	69		
Time in the organization (in years)	Total	10	10	0	54		
	Did not file a lawsuit	7	8	0	54	-28.25***	< 0.001
	Filed a lawsuit	12	10	0	45		

Note: p-value of the Student's t-test to compare the averages of the groups of employees who filed or did not file a labor lawsuit. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Descriptive statistics for categorical variables are summarized in Table 2. We performed Pearson's Chi-square test to assess the association between each variable with chances of filing a labor lawsuit.

Table 2 - Descriptive statistics of the categorical explanatory variables separated by filing or not filing a labor lawsuit and Pearson's Chi-square association test.

Unionized	Total	%	Did not file a lawsuit	Filed a lawsuit	% Filed a lawsuit	p-value
No	9,371	52%	4,700	4,671	50%	<0.001
Yes	8,733	48%	1,987	6,746	77%	
Type of termination						
Dismissed	13,501	75%	3,787	9,714	72%	<0.001
Resigned	4,603	25%	2,900	1,703	37%	
Position level						
Operational	4,515	25%	2,069	2,446	54%	<0.001
Junior analyst	6,769	37%	2,008	4,761	70%	
Analyst	1,641	9%	874	767	47%	
Senior analyst	2,666	15%	776	1,890	71%	
Coordinator	1,853	10%	528	1,325	72%	
Manager	534	3%	331	203	38%	
General manager	126	1%	101	25	20%	
Education level						
High school	1,986	11%	850	1,136	57%	<0.001
Higher Education	11,114	61%	3,997	7,117	64%	
Specialization	4,733	26%	1,652	3,081	65%	
Master's / Doctorate	271	1%	188	83	31%	
Race						
White	14,391	79%	5,381	9,010	63%	<0.001
Other	3,713	21%	1,306	2,407	65%	
Marital status						
Single	8,770	48%	3,940	4,830	55%	<0.001
Married	8,441	47%	2,525	5,916	70%	
Divorced	893	5%	222	671	75%	
Gender						
Female	9,910	55%	3,495	6,415	65%	<0.001
Male	8,194	45%	3,192	5,002	61%	
Type of department						
Sales	9,692	54%	2,366	7,326	76%	<0.001
Administrative	8,412	46%	4,321	4,091	49%	
Total general	18,104	100%	6,687	11,417	63%	

Note: Pearson's Chi-square association test between filed a lawsuit and did not file a lawsuit and each explanatory/control variable.

Unionized employees have a greater propensity (77%) to file labor lawsuits, compared to employees who are not unionized (50%). Approximately half of the sample is comprised of unionized employees, this rate is much higher than the national average (less than 10% in the year 2022, according to IBGE, the Brazilian Statistics Bureau⁶); however, this might reflect unionization levels

⁶ Available at: <https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/37913-taxa-de-sindicalizacao-cai-a-9-2-em-2022-menor-nivel-da-serie> (checked on Apr. 22nd, 2024).

among banking employees in the country⁷. The association between unionized employees and filing labor lawsuits is confirmed by the statistical test.

By analyzing the type of termination, we find that (involuntarily) dismissed employees are more likely (72%) to start a labor claim than employees who (voluntarily) resigned (37%), with a 95% confidence level. In this case, 75% of the sample is made up of employees who were dismissed.

We followed the same exercise with control variables and found that the positions of “junior”, “senior” and “coordinator” have higher propensities to start a lawsuit, of 70%, 71% and 72%, respectively; 86% of the sample is made up of non-management positions. Concerning educational levels, most of the sample is composed of employees with higher education (61%), and among those with higher education, 64% filed lawsuits. Among those who hold a master’s or doctorate degree, there are low levels of labor lawsuits (31%), but this category is very unrepresentative, comprising only 1% of the whole sample.

Most of the sample is made up of employees who declared themselves as being “white” (79%), and their litigation rate is equivalent to that of the sample average (63%). Employees who declared themselves to be of “other races” presented 65% of labor lawsuits. Married and divorced employees have higher propensities to start a labor claim, 70% and 75% respectively. Approximately half of the sample is comprised of married or divorced people. Additionally, the percentage of women who filed lawsuits, 65%, is slightly higher compared to that of men, 61%.

By assessing the department where employees worked, the sales department has the highest propensity to file a labor lawsuit (76%), compared to the administrative department, which presented 49% of litigation. Overall, 54% of the sample consists of employees who worked at sales departments.

Pearson’s chi-square test (p-value in the last column of Table 2) confirms the relationships between each control variable with chances of filing labor lawsuits, with a 95% confidence interval.

Table 3 shows the absolute value and percentage of employees who filed a labor lawsuit, categorized by union membership and type of termination. Unionized employees have a higher likelihood of filing labor claims, with

⁷ According to the Union of Employees in the Banking sector, unionization levels in this sector in 2019 is higher than 60%. Available at: <https://contrafcut.com.br/noticias/bancarios-dao-importancia-aos-seus-sindicatos/> (checked on Apr. 22nd, 2024).

79.73% of dismissed employees and 64.49% of resigned employees doing so. In addition, there is an interaction between unionization and dismissals, since there is a greater increase in the percentage of legal claims for employees who resigned when comparing unionized and non-unionized individuals (64.49% - 24.71%, an increase of approximately 40 percentage points) than for employees who were dismissed when comparing unionized and non-unionized individuals (79.73% - 62.76%, an increase of approximately 17 percentage points). Thus, there is evidence supporting the validity of our hypotheses, albeit in a descriptive and exploratory context.

Table 3 - Absolute number and percentage of employees who took legal action, segmented by unionization and type of employment contract termination.

Unionized	Type of termination	Filed a lawsuit	Total	% who filed a lawsuit
Yes	Dismissed	5,829	7,311	79.73
	Resigned	917	1,422	64.49
No	Dismissed	3,885	6,190	62.76
	Resigned	786	3,181	24.71

Results of regression models estimated using instrumental variables are shown in Table 4 (Panel A – First Stage and Panel B – Second Stage).

Table 4 - Results of the estimation of logistic regression models using instrumental variables to assess the hypotheses of interest and the quality adjustment measurements.

Panel A – First Stage

First Stage Variables	Unionized		Dismissed	
	Odds ratio	SE	Odds ratio	SE
North region	3.735 ***	0.532	1.384 **	0.212
Northeast region	2.333 ***	0.175	1.304 ***	0.116
Midwest region	1.331 ***	0.107	1.099	0.106
South region	1.691 ***	0.103	0.849 **	0.059
Time without movement	1.050	0.008	1.091 ***	0.014
Constant	0.394 ***	0.502	0.132 ***	0.201
Exogenous variables	Yes		Yes	
Pseudo - R ²	0.260		0.215	
Hosmer - Lemeshow (p-value)	< 0.001		< 0.001	
Correct classification	0.760		0.783	
Wu-Hausman test (p-value) - endogeneity	< 0.001		0.008	
Sargan test (p-value) - IV exogenous	0.561		0.486	

Notes: Robust standard errors (SE). *p<0.1, **p<0.05, ***p<0.01

Panel B – Second Stage

Second Stage		Model 1		Model 2		Model 3		Model 4	
Variables		Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE
Unionized	H1	6.955 ***	0.750			9.412 ***	1.030	7.368 ***	0.799
Dismissed	H2			1.707 ***	0.152	2.204 ***	0.192	1.894 ***	0.168
Unionized*Dismissed	H3					0.875 ***	0.005		
Age		1.047 ***	0.004	1.085 *	0.009	1.072 ***	0.008	1.088 ***	0.009
Time in the organization		1.061 ***	0.009	1.069 **	0.012	1.091 ***	0.013	1.086 ***	0.132
Married		1.163 ***	0.045	1.289 ***	0.049	1.154 ***	0.046	1.193 ***	0.046
Divorced		1.671 ***	0.155	1.305 ***	0.121	1.396 ***	0.131	1.493 ***	0.140
Woman		0.649 ***	0.027	0.964	0.034	0.586 ***	0.254	0.621 ***	0.026
Junior analyst		1.934 ***	0.091	1.539 ***	0.097	1.652 ***	0.097	1.930 ***	0.090
Analyst		1.884 ***	0.059	1.857 ***	0.062	1.759 ***	0.052	1.895 ***	0.052
Senior analyst		1.483 ***	0.074	1.430 ***	0.070	1.425 ***	0.070	1.481 ***	0.075
Coordinator		1.235 ***	0.069	1.258 ***	0.071	1.265 ***	0.061	1.244 ***	0.067
Manager		0.741 ***	0.029	0.733 ***	0.035	0.742 ***	0.032	0.735 ***	0.024
General manager		0.583 ***	0.050	0.622 ***	0.051	0.568 ***	0.054	0.574 ***	0.054
Higher education		0.566 ***	0.045	0.499 ***	0.090	0.489 ***	0.396	0.569 ***	0.045
Specialization		0.645 ***	0.053	0.891 ***	0.154	0.756 ***	0.069	0.850 *	0.077
Master's/Doctorate		0.564 ***	0.136	0.610 ***	0.185	0.755 ***	0.126	0.766 ***	0.178
Sales department		1.885 ***	0.016	1.672 ***	0.021	1.871 ***	0.039	1.878 ***	0.015
Race = Other		1.075 ***	0.038	1.052 ***	0.049	1.097 ***	0.033	1.052 ***	0.035
Constant		4.955 ***	1.238	6.288 ***	0.062	38.564 ***	12.226	19.818 ***	6.247
Pseudo - R2		0.118		0.145		0.179		0.159	
Hosmer - Lemeshow (p-value)		< 0.001		< 0.001		< 0.001		< 0.001	
KS		0.435		0.450		0.467		0.464	
Curve ROC		0.704		0.718		0.749		0.731	
Correct classification		0.730		0.712		0.737		0.732	

Notes: Robust standard errors (SE). *p<0.1, **p<0.05, ***p<0.01

In Panel A of Table 4, we have the results of the first-stage estimation, using the dummies variables that indicate the region where the employee worked as an instrument for unionization, and using the time without career advancement as an instrument for the type of termination. The result of the model for unionization indicates the validity of the chosen instrument, showing that the fact that the employee works in other regions increases the chance of being unionized compared to the Southeast region, and the result of the model for dismissal also shows the validity of the

instrument, such that the longer the time without a career movement, the higher the chance of involuntary termination (odds ratio = 1.091).

The pseudo- R^2 of the models is low, just over 20%, but the Hosmer-Lemeshow test indicates the adequacy of the models, and both have a high percentage of correct classification. The Sargan test indicates the exogeneity of the instruments, and the Wu-Hausman test detects the endogeneity for both unionization and the type of termination. All exogenous variables of the structural equation were used in the reduced equations.

The second-stage results are presented in Panel B of Table 4. As shown in Model 1, the odds ratio for unionized workers was greater than one and statistically significant with a 99% confidence level. Also, according to the odds ratio, a former unionized employee had approximately six times greater likelihood of filing a labor lawsuit, as compared to a non-unionized former employee, keeping all other variables constant.

For the first model, pseudo R^2 is about 12%. However, there are better indicators to assess the model's quality of fit. A Kolmogorov-Smirnov (KS) measurement of 43.5% was obtained, which indicates a good result because, according to Oliveira and Andrade (2002), a KS between 0.4 and 0.5 indicates excellent discrimination. There is also an area under the ROC curve of 70.4%, which indicates a good predictive power of the model (Hosmer and Lemeshow, 2000). Finally, the percentage of correct classification of the model was 73.0% for a cutoff of 50%. Thus, one can conclude that the model is adequate, and that Hypothesis 1 is confirmed.

Model 2 presents an odds ratio for dismissal that is greater than one and is significant with a 99% confidence interval. This means that, if an employee is dismissed, he or she has approximately 70.7% higher chances of filing a lawsuit compared to an employee who voluntarily resigned, keeping other variables constant.

Model 2 also presents adequate adjustment according to quality metrics. The pseudo R^2 is close to 15% and the KS measurement is 45%. Moreover, there is an area under the ROC curve of 71.8%, the percentage of correct classification is 71.2% for a cutoff of 50%. Thus, it can be concluded that the model is adequate, and that Hypothesis 2 is also confirmed.

Model 3 shows that the odds ratio of the interaction between unionized workers and (involuntary) dismissal is significant, with a 99% confidence interval, but it presents a value lower than one. This means that the increase in the probability of filing a labor lawsuit when a former employee becomes unionized is lower for those who were dismissed than for those who resigned. This confirms Hypothesis 3.

Figure 1 helps us interpret this interaction effect. It contains the propensity of taking legal action for unionized and non-unionized workers, separated by (involuntary) dismissal or (voluntary) resignation. In this figure, parallel lines indicate that there is no interaction between the factors considered, while lines with different slopes indicate that there is interaction between the factors, descriptively. For individuals who were dismissed, the propensity of taking legal action is higher than for those who resigned, both for unionized workers and non-unionized workers (always above 50%).

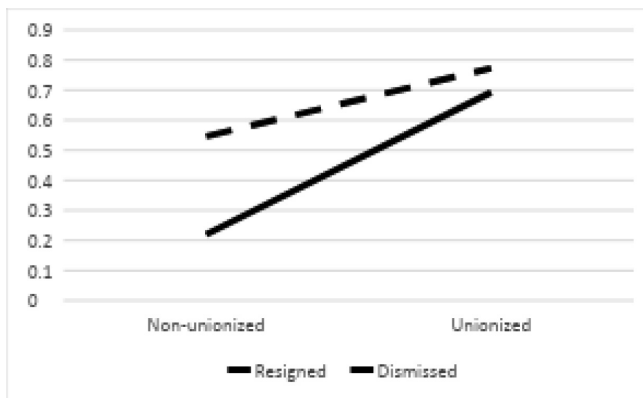


Figure 1 - Propensity of filing labor lawsuits for unionized workers or non-unionized workers, separated by dismissal or resignation.

Note: Propensities were calculated by using sample averages for age and time at the organization, in addition to single, male, operational, high school diploma, other races and sales department. The first stage included consideration of Southeast region and a period of 3 years for time without a career movement.

In addition, when we compare the likelihood of filing a lawsuit between non-unionized and unionized workers, this rate increases more significantly within the group of individuals who resigned. The slope of the dashed line represents the increase in the propensity of filing a labor lawsuit for an employee who was involuntarily terminated (dismissed) and it goes from non-unionized to unionized. Meanwhile, the slope of the solid line represents the increase in the propensity of filing a labor lawsuit for an employee who voluntarily resigned and it goes from non-unionized to unionized. Figure 1, thus, shows the existence of an interaction between unionization and resignation, which is also confirmed by the statistical significance of the interaction variable. Descriptively, the data in Table 3 show the same result.

Model 3 also presented an adequate adjustment, with a pseudo R^2 of 17.9%, and a KS measurement of 46.7%. The area under the ROC curve is of 74.9%, with a percentage of correct classification equal to 73.7% for a 50% cutoff.

Finally, Model 4 shows the main effects of unionization and dismissal, excluding interaction effects. There is a greater increase in the chances of legal action due to unionization compared to dismissal. We note that even with the variables unionized and dismissed in the same model, both are relevant with a 99% confidence level and have an odds ratio greater than 1, indicating the robustness of the results from Models 1 and 2 with these variables separated. In Model 4, Hypotheses 1 and 2 are also confirmed.

The last model also shows adequate quality, with pseudo R^2 of almost 15.9% and KS measurement of 46.4. Area under the ROC curve is of 73.1%, and the percentage of correct classification is of 73.2% for a 50% cutoff.

Control variables presented very similar values in the four models, and practically all factors were relevant in explaining the chance of filing a labor lawsuit (except gender in Model 2). Summing up the results, age increases the propensity to sue, as does time at the organization. Married or divorced individuals are more likely to file a labor lawsuit than single employees are. Individuals who worked in sales departments are more likely to litigate compared to those who work in administrative departments, and individuals of other races are more likely to file a lawsuit compared to whites. Junior analysts, analysts and coordinators are more

likely to take legal action compared to those in operational positions, while managers and general managers are less likely to do so, also compared to operational workers. Finally, individuals with higher education, specialization, or a Master's or Doctorate degree are less likely to file a labor lawsuit when compared to individuals with a high school diploma.

5.2. Propensity Score Matching Results

The Pearson Chi-square test was used for comparing the percentages of all variables in the propensity score to determine whether the groups are statistically similar (see Table 5). In our case, the control variables will be used in the regressions even after matching, that is, the comparison between the groups will consider the variability of the control variables.

Results in Table 5 indicate a difference in the profile of unionized and non-unionized employees for all variables in the total sample, which indicates the possible existence of a selection bias in unionization. Even after pairing individuals (PSM), position level ($p = 0.048$) and type of department ($p = 0.002$) are still not homogeneous using a confidence level of 95%, which led us to choose to estimate regression models controlling for demographic and occupational variables instead of calculating only the average treatment effect for each combination of unionized and type of termination categories.

Table 5 - Descriptive statistics of the categorical explanatory variables separated by unionized and non-unionized and Pearson's Chi-square association test, for the total sample and for the paired sample (PSM).

Type of termination	Total Sample					Propensity Score Matching				
	Non-unionized	%	Unionized	%	p-value	Non-unionized	%	Unionized	%	p-value
Dismissed	6190	66%	7311	84%	<0.001	5235	56%	5104	58%	0.138
Resigned	3181	34%	1422	16%		1273	14%	1404	16%	
Position level										
Operational	2.122	23%	2.393	27%	<0.001	1.908	20%	1.496	17%	0.048
Junior analyst	2.962	32%	3.807	44%		2.261	24%	2.859	33%	
Analyst	1.217	13%	424	5%		714	8%	346	4%	
Senior analyst	1.396	15%	1.270	15%		830	9%	1.056	12%	
Coordinator	1.083	12%	770	9%		576	6%	684	8%	
Manager	472	5%	62	1%		187	2%	61	1%	
General manager	119	1%	7	0.1%		32	0.3%	6	0.1%	
Education level										
High school	1.123	12%	863	10%	<0.001	738	8%	432	5%	0.055
Higher Education	5.301	57%	5.813	67%		3.868	41%	4.424	51%	
Specialization	2.707	29%	2.026	23%		1.785	19%	1.628	19%	
Master's / Doctorate	240	3%	31	0%		117	1%	24	0.3%	
Race										
White	7.504	81%	6.807	78%	<0.001	5.085	55%	5.112	59%	0.570
Other	1.787	19%	1.926	22%		1.423	15%	1.396	16%	
Marital status										
Single	4.938	53%	3.832	44%	<0.001	3.202	34%	3.113	36%	0.188
Married	4.010	43%	4.431	51%		2.960	32%	3.114	36%	
Divorced	423	5%	470	5%		346	4%	281	3%	
Gender										
Female	4.651	50%	5.259	60%	0.011	3.722	40%	3.662	42%	0.288
Male	4.720	50%	3.474	40%		2.786	30%	2.846	33%	
Type of department										
Sales	2.891	31%	6.801	78%	<0.001	2.268	24%	5.017	57%	0.002
Administrative	6.480	69%	1.932	22%		4.240	45%	1.491	17%	
Total general	9.371	52%	8.733	48%		6.508	36%	6.508	36%	

Note: Pearson's Chi-square association test between unionized and non-unionized and each explanatory/control variable.

For the numerical variables: Age and time working at the company, the groups are also homogeneous for the paired sample, as shown in Table 6.

Table 6 - Descriptive statistics comparing unionized and non-unionized workers.

Total Sample							
Variable		Mean	SD	Minimum	Maximum	t test	p-value
Age (in years)	Total	39	10	20	84		
	Non-unionized	37	9	20	84	-25.77***	< 0.001
	unionized	41	11	22	81		
Time in the organization (in years)	Total	10	10	0	54		
	Non-unionized	7	8	0	54	-44.20***	< 0.001
	unionized	14	11	0	51		
Propensity Score Matching							
Variable		Mean	SD	Minimum	Maximum	t test	p-value
Age (in years)	Total	38	10	21	84		
	Non-unionized	38	10	21	84	0.14	0.89
	unionized	38	9	22	81		
Time in the organization (in years)	Total	10	10	0	54		
	Non-unionized	8	9	0	54	-1.92	0.07
	unionized	10	10	0	48		

Note: p-value of the Student's t-test to compare the averages of the groups of employees who are unionized and non-unionized.

Table 7 presents the results of statistical modeling to verify the hypotheses based on the groups of unionized employees formed by the PSM method. The results obtained with the groups formed by the PSM method are similar to those presented in Table 4 with the entire sample. The hypotheses presented in the article are confirmed; that is, unionized employees are more likely to file a labor lawsuit after their dismissal (with almost five times higher chances than non-unionized employees), employees who have been involuntarily dismissed are more likely to file a labor lawsuit after their dismissal (with 30% higher

chances than employees who resigned), and there is an interaction between unionization and involuntarily dismissal that causes this probability to increase less for dismissed employees compared to resigned employees when they become unionized.

Table 7 - Results of the estimation of logistic regression models using instrumental variables and with propensity score matching to assess the hypotheses of interest and the quality adjustment measurements.

Panel A – First Stage

First Stage	Unionized		Dismissed	
Variables	Odds ratio	SE	Odds ratio	SE
North region	3.499 ***	0.550	0.987	0.160
Northeast region	2.148 ***	0.174	1.048	0.101
Midwest region	1.273 *	0.111	0.964	0.102
South region	1.701 ***	0.114	0.710 ***	0.055
Time without career advancement	1.005	0.179	1.051 ***	0.014
Constant	4.120 ***	0.766	0.322 ***	0.083
Exogenous variables	Yes		Yes	
Pseudo - R ²	0.291		0.287	
Hosmer - Lemeshow (p-value)	< 0.001		< 0.001	
Correct classification	0.788		0.799	
Wu-Hausman test (p-value) - endogeneity	< 0.001		0.008	
Sargan test (p-value) - IV exogeneity	0.595		0.481	

Notes: Robust standard errors (SE). *p<0.1, **p<0.05, ***p<0.01

Panel B – Second Stage

Second Stage		Model 1		Model 2		Model 3		Model 4	
Variables		Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE
Unionized	H1	5.617 ***	0.115			7.319 ***	0.186	6.897 ***	0.139
Dismissed	H2			1.302 ***	0.023	1.907 ***	0.099	1.398 ***	0.055
Unionized*Dismissed	H3					0.780 ***	0.017		
Age		1.051 ***	0.007	1.167 ***	0.017	1.020 ***	0.008	1.022 ***	0.008
Time in the organization		1.002	0.009	1.345 ***	0.033	1.169 ***	0.009	1.153 ***	0.009
Married		1.229 **	0.129	2.048 ***	0.245	1.081	0.114	1.107	0.117
Divorced		1.117 ***	0.036	1.104 **	0.042	1.149 ***	0.039	1.158 ***	0.039
Woman		0.948	0.038	0.628 ***	0.035	0.936	0.043	0.950	0.043
Junior analyst		1.329 ***	0.058	1.156 ***	0.025	1.311 ***	0.057	1.419 ***	0.073
Analyst		1.018	0.091	1.286 ***	0.088	1.189 *	0.108	1.235 **	0.112
Senior analyst		1.133 ***	0.061	1.158 ***	0.281	1.148 ***	0.053	1.148 ***	0.053
Coordinator		0.669 ***	0.076	0.784 ***	0.032	0.921	0.108	0.943	0.110
Manager		0.871 ***	0.083	0.640 ***	0.065	1.011	0.097	1.006	0.096
General manager		0.158 ***	0.063	0.385 **	0.160	0.104 ***	0.042	0.201 ***	0.078
Higher education		1.049	0.093	0.632 ***	0.071	0.107	0.099	0.030	0.091
Specialization		0.783 ***	0.158	0.624 ***	0.009	0.658 ***	0.579	0.622 ***	0.483
Master's/Doctorate		0.518 ***	0.098	0.584 ***	0.040	0.552 ***	0.162	0.674 ***	0.153
Sales department		1.490 ***	0.108	2.082 ***	0.156	1.878 ***	0.132	1.590 ***	0.110
Race = Other		1.085 *	0.052	1.615 ***	0.099	0.945	0.046	0.935	0.046
Constant		0.405 ***	0.091	0.060 ***	0.020	0.032 ***	0.010	0.025 ***	0.007
Pseudo - R2		0.207		0.191		0.224		0.217	
Hosmer - Lemeshow (p-value)		< 0.001		< 0.001		< 0.001		< 0.001	
KS		0.580		0.523		0.488		0.495	
Curve ROC		0.729		0.751		0.785		0.770	
Correct classification		0.758		0.782		0.789		0.774	

Notes: Robust standard errors (SE). *p<0.1, **p<0.05, ***p<0.01.

5.3. *Discussions and Implications.*

Our descriptive analysis shows that employees personal characteristics do affect the propensity to sue. This aligns with findings from previous scarce literature (HOYMAN & STALLWORTH, 1981, 1985). In our case, older workers and those who have worked longer at the organization are more likely to file labor lawsuits. This may be explained by professional experience, which makes an employee more aware of the tools to enforce their labor rights.

Descriptive analyses further show that unionized employees were significantly more likely to file lawsuits than non-unionized ones. This result is expected and is also in line with previous literature: Unions have a positive impact on workers' propensity for litigation (WEIL, 2004; HOYMAN & STALLWORTH, 1981, 1985). Moreover, employees who were involuntarily dismissed were almost twice as likely to file lawsuits than those who voluntarily resigned. This shows that, in fact, a worker who feels unfairly treated by an involuntary dismissal is more likely to seek justice through courts and labor laws. Although this result seems "logic" or "trivial", it consists of an original contribution by our paper to the literature, given the scarcity of research on this specific topic.

As for the logistic regressions, Models 1 and 4 in Tables 4 and 7 presented odds ratio greater than one and significant, thus confirming hypothesis H1, in which unionized employees are more likely to take legal action. As mentioned before, these results are in line with both classic and more recent discussions in the unionism literature, which predicts positive impacts of unionism on labor litigation.

Models 2 and 4 in Tables 4 and 7, which included the information on the type of termination, presented odds ratio greater than one and significant, thus confirming H2, in which involuntarily dismissed employees have a greater propensity to take legal action, *ceteris paribus*. Model 4, specifically, shows significant coefficients both for unionization and for involuntary dismissal. However, there is greater increase in the propensity of litigation due to unionization than due to dismissal.

Model 3 in Tables 4 and 7 present rich results of the interaction between unionization and type of termination. The odds ratio lower than one and significant confirms hypothesis H3, which states that if the employee be-

comes unionized, the probability of filing a labor lawsuit increases both for dismissals and for resignations; however, this increase will be greater for individuals who resigned.

At first glance, the fact that the increase in the chances of labor claims is greater for unionized employees who voluntarily resigned, compared to unionized ones who were involuntarily dismissed, may seem unexpected. However, it can be easily understood. When an employee is dismissed, their propensity to sue is high under any circumstances – whether they are unionized or not. A worker's non-conformism with their dismissal often leads them to resort almost automatically to labor courts. This does not happen when an employee voluntarily resigns. In such cases, there is typically less incentive to sue the employer. However, unionization has a clear and strong effect on these employees: With the union's support, the ex-employee finds reasons to start a labor claim, even when they voluntarily resigned from the job. For this reason, the impact of the unionization effect is significant.

Implications of the 2017 Labor Reform:

In November of 2017, Brazilian Congress approved Law N. 13.467 which became known as the "Labor Reform". It modified several of the legal guarantees workers and unions used to have before – indeed, it was a reform of several clauses (more than one hundred) within the CLT and other labor laws. Defenders of the reform argued that it would bring flexibility and modernization of Brazilian labor relations and, therefore, could have positive impacts in the overall labor market.

Two aspects of Law N. 13.467/2017 are noteworthy here. First, trade unions' traditional financial source – the mandatory union fee – was abolished. Now, each formal employee in the country only pays the annual union fee if he or she wishes. Second, and probably the most important aspect, in November 2017, the new law determined that non-prevailing parties would have to bear the burden of paying the prevailing parties attorneys' fees (*verbas de sucumbência*). In other words, whoever loses the lawsuit must pay the other party's legal and procedural costs. Before the Labor Reform of 2017, labor courts exempted such payment from workers who lost the lawsuit. Therefore, the new law might have generated high disincentives to "frivolous legal actions" (those in which the chances of

winning in court are small) and might have reduced the number of cases brought to labor courts. However, the impact of this clause – if confirmed – had a very short-lived effect. Very soon, on October 20th 2021, the Brazilian Federal Supreme Court (STF) decided that it was unconstitutional to place the burden of attorneys' fees on parties who are granted Judicial Gratuity (*"Acesso Gratuito à Justiça"*). This mainly implied a return to the previous situation where workers were exempted from paying attorney's fees, because, as mentioned earlier, there is preliminary evidence that the majority of Brazilian workers access labor courts freely (Salama, Carlotti and Yeung, 2018, as presented in Section 3 above).

Therefore, even though after the Labor reform bill had passed there was a decline in the number of lawsuits, as shown by the Superior Labor Court (*Tribunal Superior do Trabalho, TST*), the reversal by the STF might potentially bring labor litigation back to its previous levels. As mentioned before, this paper does not aim to measure the impacts of that labor reform. Our goal was to evaluate the impacts of employees' personal variables – not institutional or environmental ones – namely, their unionization status and reason for job termination, on the propensity to file lawsuits.

We defer to future studies a comprehensive investigation into the impacts of the 2017 Brazilian Labor Reform, particularly following thorough consideration by the Justices of the STF and the TST.

6. Conclusions

The purpose of the current paper was to verify whether factors such as union influence and the type of dismissal affect the likelihood of filing a labor lawsuit after an employee leaves the company. We had access to the complete database of a large national financial institution. It encompassed data from 18,104 employees. Through this dataset, we investigated the likelihood of filing labor lawsuits by analyzing explanatory variables pertaining to employees' personal characteristics.

Our results reveal that employees' personal characteristics influence their likelihood of filing labor lawsuits, consistent with previous literature (e.g., Hoyman & Stallworth, 1981 and 1985). Older employees and those with

longer tenure at the organization are more prone to file labor lawsuits, likely due to greater awareness of labor rights.

Logistic regression models confirm that unionized employees are significantly more likely to file lawsuits compared to non-unionized ones, consistent with existing literature (e.g., Weil, 2004). Involuntarily dismissed employees are nearly twice as likely to sue as those who resign voluntarily, indicating that perceived unfair treatment motivates legal action. Interestingly, unionized employees who resign voluntarily have a high propensity to sue, highlighting the strong impact of union support: The interaction between unionization and type of termination shows that the likelihood of suing increases more for unionized employees who resign voluntarily than for those dismissed involuntarily. This suggests that union support provides strong incentives for legal action, even for those who leave voluntarily.

This research has its limitations. First and foremost, it is not possible to determine, from our database, the real causes of dismissal or resignation. Knowing the reasons for a dismissal or a resignation would be important to determine the propensity to filing a labor lawsuit shortly after an employee has left the company. It would be important to distinguish, for example, whether an employee resigned because he/she had a better job offer, or because he/she was being harassed by colleagues or superiors (explicitly or veiledly). It would also be useful to know if the company fired an employee because they performed below expectations, committed some infraction at the workplace (knowing that, under Brazilian labor laws it is difficult to justify a fair cause of termination), or if the company simply needed to cut costs. Knowing the causes of employment contract terminations would help to better specify the likelihood of labor claims and to recommend differentiated policies for each situation.

Furthermore, as limitations of this paper, it is not possible to know, from our database, whether a lawsuit brought by a unionized employee after termination was motivated by their “true” dissatisfaction with the working conditions, or if the lawsuit was “merely” a result of the union’s efforts. In order to know the real impact of unionization on the intentions to take legal actions, it might be important to distinguish this effect (by carefully isolating any possible effect and selection bias of people who tend to unionize).

Finally, the sample used in this research was drawn from an organization in the financial/banking sector, which has very particular characteristics

regarding unionization and labor litigation. Future studies should investigate whether the findings on the relationship between unionization and the type of dismissal on labor lawsuits found herein hold true in other industries with different characteristics from the banking sector.

Understanding this phenomenon is not a simple task. The use of econometric models to predict the filing of labor lawsuits based on employee and employment relationship characteristics is almost nonexistent in previous literature. This study contributes to the academic literature by presenting evidence from a real database of the financial sector in Brazil.

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Data availability statement

The datasets generated and analyzed during the current study are not publicly available due to the financial institution's privacy issues, but they are available upon reasonable request to the authors.

DECLARAÇÃO DE DISPONIBILIDADE DE DADOS

Os dados utilizados neste estudo estão disponíveis mediante solicitação ao autor. Dados adicionais e informações complementares também poderão ser fornecidos para fins de verificação ou replicação. A disponibilização está condicionada à inexistência de restrições de acesso público.

CONTRIBUIÇÕES DE AUTORIA

LY: Conceitualização, Investigação, Administração de projetos, Recursos, Supervisão, Visualização, Escrita - rascunho original e Escrita - revisão e edição.

AB: Conceitualização, Curadoria de dados, Análise formal, Investigação, Metodologia, Recursos, Programas, Supervisão, Validação, Visualização e Escrita - revisão e edição.

FA: Conceitualização, Análise formal, Investigação, Recursos, Programas, Validação.

CONFLITO DE INTERESSE

Os autores declaram não terem quaisquer conflitos de interesse.

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