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ESSAYS ON ECONOMIC ANALYSIS OF LAW

Maria Clara de Azevedo Morgulis

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Doctoral Committee:

Prof. Sandro Cabral (Insper) - Advisor

Prof. Paulo Furquim de Azevedo (Insper) - Co-Advisor

Profa. Luciana Yeung (Insper)

Profa. Natália Pires de Vasconcelos (Insper)

Dr. Felipe de Mendonça Lopes (LCA Consultores)

Prof. Sergio Mittlaender Leme de Souza (FGV Direito SP)

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Abstract

This thesis is comprised of three chapters on the economic analysis of law. In the first two chapters the analysis of law is made in the context of healthcare litigation, while in the third chapter we present a critical review of empirical legal studies, especially in Brazil. The first chapter investigates the impacts of judges' characteristics on their final decisions in more than fifteen thousand healthcare cases decided in the lower courts of the State of São Paulo. Results obtained through logits and multinomial logits point to different effects for judges' general experience on the bench and judges' experience (or expertise) on healthcare cases, as the more healthcare cases a judge decides, the lower the chances of her deciding in favor of the claimant.

While the first chapter investigates questions of a more judicial behavior nature, the second chapter explores institutional aspects by investigating how the collaboration between organizations can impact judicial decisions in healthcare cases. Using geographical proximity between state attorneys' offices and health authorities as a measure of their collaboration, results indicate that the closer these organizations are, the higher are their chances of success before courts, even when we control for other aspects that might be influencing the judicial decisions.

Both the first and the second chapters contribute to the literature of health litigation by investigating unexplored aspects, in addition to contributing to the literature on economic analysis of law as there are very few researches using so many decisions from lower courts and exploring (i) judges' experiences or (ii) collaboration between organizations. Then, the last chapter presents a critical review of empirical legal research (in which the first two chapters are included), pointing out fragilities of current research and proposing the application of some econometric strategies to improve analysis.

KEY-WORDS: Empirical legal studies, quantitative, judicial analysis, healthcare litigation, judicial behavior, interorganizational collaboration, geographical proximity.

Resumo

Essa tese é composta por três capítulos envolvendo análise econômica do direito, sendo que nos dois primeiros capítulos referida análise é realizada no contexto da judicialização da saúde e no terceiro capítulo é apresentada uma revisão crítica sobre estudos empíricos em direito, especialmente no Brasil. No primeiro artigo investigam-se efeitos de características dos juízes sobre suas decisões finais em mais de quinze mil casos de direito à saúde decididos na primeira instância da Justiça Estadual de São Paulo. Os resultados obtidos a partir de logits e logits multinomiais apontam para efeitos diferentes entre a experiência de juízes na profissão e suas experiências (ou expertise) em casos de direito à saúde, de forma que quantos mais casos de saúde os juízes decidem, menores as chances de tomarem uma decisão a favor dos reclamantes.

Enquanto no primeiro artigo a análise é mais voltada para um aspecto de comportamento judiciário, o segundo capítulo explora aspectos institucionais ao investigar como a colaboração entre organizações pode impactar decisões judiciais. Usando a proximidade geográfica como uma medida da colaboração entre procuradorias e departamentos de saúde, os resultados indicam que conforme as organizações estejam mais próximas (em termos de localização geográfica), maiores suas chances de sucesso perante os tribunais, mesmo quando controlamos por outros fatores que podem influenciar a decisão judicial.

Tanto o primeiro quanto o segundo artigos contribuem com a literatura de judicialização da saúde ao abordar aspectos ainda pouco explorados pelos pesquisadores, além de contribuir com a literatura de análise econômica do direito, tendo em vista que são raros os trabalhos em que se utiliza tantos dados e para casos de primeira instância. Já o terceiro capítulo apresenta uma revisão crítica da evolução da pesquisa empírica em direito, na qual se incluem os dois capítulos anteriores, apontando fragilidades na forma como é atualmente desenvolvida e sugerindo a aplicação de estratégias econométricas para aprimorar as análises na área.

PALAVRAS-CHAVE: Estudos empíricos em Direito, quantitativo, análise judicial, judicialização da saúde, comportamento judicial, colaboração interorganizacional, proximidade geográfica.

Introduction

In the last decades courts took on a much more prominent role in modern society, gaining importance as people attribute important social decisions to the Judiciary, questioning laws, public policies and many other administrative measures taken, especially, by the Executive. One example is the role that Brazilian Judiciary has been playing during the Coronavirus pandemic, as even vaccines' approval have been judicially questioned, not to mention the closing of the economy in several cities, the reopening of private and public schools, among others. The significant impact that Court's systems have on society and its consequences over public policies is evident. Hence, studying Courts behavior and the effects that judicial decisions may have is of utmost importance.

At the same time, empirical legal studies are not new to the legal community. Generally characterized as a type of empirical study, legal studies on Courts are most commonly qualitative case studies and many times opinions issued by legal experts on important judicial decisions. However, scientific empirical legal research, based on solid methodology to test hypothesis clearly posed by researchers, is a much more recent phenomenon and still incipient in Brazil. Yet, quantitative empirical legal studies are more fitted for dealing with the analysis of the great number of lawsuits currently being decided by Courts and to check for litigation effects on society and economy than qualitative analysis alone. This is the foundation of all three chapters of this thesis, which begins with the first two chapters developing quantitative empirical legal research on health litigation.

Why health litigation? It is indisputable that healthcare is one of the most important aspects of modern society. Since the right to health has been constitutionalized in most of Latin American countries, many of them face high levels of health litigation. In these countries, Courts became an important actor of health law and health policy, deciding both individual cases and structural comprehensive demands for reform.

Health litigation numbers in Brazil are amazingly high. Looking only at lower courts,

from 2016 to 2017, more than 95,752 new lawsuits were filed before single judges and more than 40,000 appeals before courts. The state of São Paulo alone concentrates almost 25% of these new cases, with 23,465 lawsuits for the same period (Azevedo et al., 2019). Thus, litigation became a structural part of health policy as compliance with judicial orders leads to increasing policy expenditures and inefficiencies. Studying this field is very important to provide scientific insights on the phenomenon and guide future health policies and possible remedies to the high levels of litigation and its side-effects.

Considering the importance of healthcare litigation, it is a very promising field to develop empirical legal studies applying quantitative methods. Many authors have already done very thorough and interesting empirical researches on health litigation (as further explored in this thesis), however, quantitative research, applying statistical knowledge to analyze bigger datasets using new technologies, is rarely found. Also, as in any evolving field, there are aspects that are relevant to the health litigation problem but have not yet been explored. The first two chapters of this dissertation are dedicated to investigate through quantitative empirical legal research two aspects that required further digging: (i) judicial behaviour within health litigation, focusing on judges' experience; and (ii) collaboration between organizations involved in health litigation.

Although judges are central actors in litigation in general, including health litigation, there are very few studies on judicial behavior in Brazil. Given this lack of studies pondering judges as important actors in health litigation, the first chapter is dedicated to this topic and tries to disentangle the effects of different experiences of judges on how they decide health litigation cases. The main hypothesis is that there are heterogeneous effects of two types of prior experiences: as a judge in general, on the bench, and her expertise in deciding healthcare litigation. The idea behind experience variables is that there is a learning process both with the time on the bench and through prior decisions in similar cases, which can affect the way in which judges' decide.

Collaboration between organizations in health litigation has been identified by Vasconcelos (2018) as one type of response to health litigation that emerged from the excessive litigation problem. New bureaucratic structures were created in health departments across the country to manage the delivery of judicialized drugs, speed compliance of judicial orders, and help prepare legal defense. State attorneys and policy officials are now incentivized to work together to plan their legal defenses and prevent new lawsuits. De-

spite Vasconcelos's work being a great scientific investigation, it presents a qualitative analysis, restricted to the actors interviewed and organizations analyzed, requiring further investigation on (i) the generalization of the observed relations to the rest of the state attorneys and policy officials, and (ii) the effects of said relation. In the second chapter of this thesis, we investigate, using a quantitative approach, this particular relationship between state attorneys and policy officials in the state of São Paulo as cooperation and coordination between different actors. Since collaboration is not observed and considering that physical proximity is necessary for knowledge exchange, we use the geographical proximity between state attorneys' offices and regional health departments as a proxy for their collaboration initiatives.

Both in the first and in the second chapters of this dissertation we use logit and multinomial estimations to test our hypothesis, using the same dataset of 15,231 healthcare decisions by judges from São Paulo State Court (first instance), from 2008 to 2018 and relying on regular expressions to identify terms and classify case outcomes. But in each chapter further information was gathered to complete the dataset and allow for a proper investigation of each research question. In the judicial behaviour chapter, information on courts and judges was included in the dataset, while in the interorganizational collaboration chapter, information on the organizations had to be compiled and included in the analysis. Both studies are quantitative empirical legal studies, with statistical concerns in their development, aiming at increasing validity of the results.

For both chapters the quantitative approaches allowed for interesting and important inputs from the found results. From the investigation of the effects of judges' experience on health cases' outcomes, in Chapter 1, results point to the possibility of separating experience from expertise for the judges in the database. Additionally, judges' expertise appears to have heterogeneous effects on the outcomes depending on whether there is a court specialized in public administration or the case involves the public healthcare system. Results also indicate that judges with higher expertise on healthcare and using technical terms in their decisions tend to give less decisions with partial reason for claimant and decide more incisively pro or against the claimant.

In Chapter 2 we present robust results showing that the closer state attorneys and policy officials are, the better are their results in healthcare litigation decision outcomes. That is, results from the logit models indicate that the geographical distance between

state attorneys' offices and regional health departments are positively correlated with the probability of a decision in favor of the claimant. An additional finding was that distance might also interfere in the relationship state attorneys have with the court. As shown by evidence, the closer these pairs are to the judges where cases are being trialed, the higher are the chances of success.

In addition to the findings reached through these two quantitative empirical legal investigations, the researches that led to chapters 1 and 2 also present many of the difficulties faced by the literature on quantitative empirical legal studies. Empirical legal research has long been facing several obstacles to its development, including difficulties in being recognized by the legal community and several data-related issues. Recent studies began to apply new techniques, however, there are still few studies moving in this direction and much room to improvements: acknowledging and treating biases, implementing better sampling techniques and combining qualitative and quantitative legal research. Chapter 3 contains a critical review of quantitative empirical legal research, considering, first, the evolution of empirical legal research, how incipient quantitative research is in this area, the great difficulties faced by researchers in terms of data and acknowledgement by legal community, to then propose some future developments on the techniques used. There is already much knowledge developed in other social sciences (such as economics) regarding the methodological difficulties that could be applied also to legal studies, allowing very significant improvements to the area, especially regarding identification strategies (which are still little used in quantitative empirical legal research). Chapter 3 aims to contribute to the development and improvement of the quantitative empirical legal studies by pointing out some of the fragilities of current research and proposing the application of some econometric strategies to improve analysis.

Practice makes perfect? An analysis of judges' experience effect in health litigation

Abstract

If a judge had to decide several healthcare cases, does she accumulate some sort of expertise on the subject? Is this expertise changing the final outcome of her decision in healthcare cases? And is this expertise separable from the judges' general experience as a judge, on the bench? Using a database with more than fifteen thousand decisions from São Paulo State court (1st instance), this paper investigates these questions dialoguing with judicial behavior and healthcare litigation literatures. Results obtained through a logit and multinomial regressions indicate that judges' expertise and general experience are not only significant for a case's outcome, but also have separable effects. And the more healthcare cases a judge decides, the lower the chances of her deciding in favor of the claimant.

1.1 Introduction

There is no question that the Judiciary is of utmost importance in present societies. A vast literature discusses the judicialization of politics(Tate & Vallinder, 1995), social rights and human rights(Yamin & Gloppen, 2011), as people resort to the judiciary to demand the enforcement of public policies and constitutionalized rights. In this scenario, the role played by judges is undeniably relevant and has not been neglected by researchers

on judicial behavior, who have explored a great spectrum of aspects affecting judges' behavior and courts' decision making, such as ideology, gender bias, dissent in collegiate judicial decisions, judges' background, among others.

For more technical areas, such as antitrust and patent law, for example, an interesting approach from the literature is whether a judge's experience and prior knowledge affect the way in which she decides. In those cases, judges are required to understand and apply a specific area of law to disputes involving very technical aspects. For instance, deciding a dispute on patent obviousness involves not only applying intellectual property and patent laws but also understanding if the patent under dispute is indeed obvious (or conflicts somehow with other existing patents)(Lemley et al., 2014). Therefore, the judges' prior experience can play an important role on the decision-making process: having familiarity with patent law may even change the way she decides and cases' final outcome.

Yet, different sorts of experiences can have different impacts on judges: time on the bench, for example, can be a measure of judges' professional experience on the bench, which is different from an specific training on economics, for example, or from the expertise acquired from deciding other cases on the same subject (like other patent obviousness cases). The literature on judicial behavior has explored how a judge's prior experience can affect her decision-making process and even tried to disentangle prior experience from expertise (see Choi et al., 2013; Lemley et al., 2014; Miller & Curry, 2009). However, the context is generally that of common law (more specifically in the US), mostly for superior courts and looking at antitrust and patent cases.

What we propose in this paper is investigating the role of judges on another topic involving specific knowledge: healthcare litigation. Deciding healthcare cases includes more than knowing the constitutional right to health, it also understanding healthcare regulation, the related public policies, knowing which are the advisory boards available to help judges with the medical aspects of each case, among other aspects.

Brazilian healthcare litigation has been growing exponentially(Azevedo et al., 2019), to the point of being currently associated to mass litigation subjects¹. It is a pressing topic for society in general, as the phenomenon affects both public and private healthcare

¹Healthcare judicialization became such an important topic in Brazil that it is believed to have become a “parallel infrastructure in which patient-citizens and various public and private health actors and sectors come into contact, face off, and enact one-by-one rescue missions” (Biehl et al., 2012, p.49).

systems² and although there is a vast literature investigating healthcare litigation, there are still many aspects to be investigated. Quantitative studies, for example, are rare, as well as interdisciplinary approaches that combine knowledge from legal experts with that of other social sciences (Andia & Lamprea, 2019; Biehl et al., 2018).

Hence, we see healthcare litigation as a fertile territory to explore judicial behavior, especially to investigate separable effects from experience and expertise. Using a dataset of 15,231 healthcare decisions by judges from São Paulo State Court (first instance)³, from 2008 to 2018 and relying on techniques such as regular expressions to identify terms and classify case outcomes, this study investigates the relationship between case outcomes and judges' experience and expertise was investigated through logit and multinomial logit estimations. Results point to the possibility of separating experience from expertise for the judges in the database. Additionally, judges' expertise seem to have heterogeneous effects on the outcomes depending on whether there is a court specialized in public administration or the case involves the public healthcare system. Results also indicate that judges with higher expertise on healthcare and using technical terms in their decisions are less prone to decide partially in favor of claimant and decide more incisively pro or against the claimant.

These findings contribute to the literature on judicial behavior as they point to the possibility of separating judges' expertise and experience effects on case outcome, differently from the findings of Miller and Curry (2009) for US judges but more in line with Choi et al. (2013). This study also identifies topics that need further investigation in judicial behavior and organization, such as the impact of specialized courts in Brazil, both for healthcare litigation and other issues, similarly to Engstrom (2015) and Kondo (2002).

At the same time, this paper dialogues with healthcare litigation literature through a quantitative study that use legal knowledge combined with econometrics and new computational techniques, as well as with judicial behavior fundamentals (hence, interdisciplinary) and help public policy development by evidencing that judges' expertise and experience can affect judicial decision making and case outcomes.

²Brazil adopts a mixed system, where there is a unified public national health system ("Sistema Único de Saúde" – SUS) and several private healthcare companies that operate on a regulated market (the supplementary healthcare system, or private healthcare system).

³Access to reliable and extensive information on judicial cases is quite hard to obtain in Brazil, so this is one of the main difficulties for empirical legal studies in the country. As better explained in section IV, the State of São Paulo offered more complete data on healthcare cases and also had available information on judges, allowing the construction, by the author, of the dataset used in this paper.

This paper is structured as follows: Section II gives an overview of existing literature on judicial behavior and healthcare litigation allowing us to situate the hypothesis of this paper, which are outlined in Section III, along with a description of the database, how variables were constructed and methods used to test each of the hypothesis. In Section IV we present and discuss the results found in our estimations, contextualized by the tested hypothesis, and their impacts for existing theory. Finally, Section V contains our conclusions and presents points we believe deserve future research.

1.2 Literature Review

In order to develop the interdisciplinary investigation proposed in this paper, we have to dialogue both with the literature on judicial behavior, where lies our main questions and the basis of the concepts applied, and with the literature on healthcare litigation, which contextualizes the area of law in which we will test if judges' expertise and experience play any role in decision-making and if we can disentangle their effects.

1.2.1 Judicial Behavior

The literature on judicial behavior and political science has been investigating the relationship between judges' characteristics and their decision making for some time. Ashenfelter et al. (1995), found no evidence of judges' characteristics having an effect on cases' outcomes, when analyzing mass litigation cases (civil rights and prisoner's cases)⁴. In the following years, the literature on judicial behavior evolved: new variables and new approaches to judicial policies emerged, as Choi and Gulati (2004) presenting the controversial idea of a judges' tournament to induce higher efforts⁵. According to those authors, a judge's prior experience works as an apprenticeship for her future decision making. This idea caught the mind of other scholars and computing a judge's previous experience in general or within a given subject is not new to the literature in judicial behavior.

Past performance has been used as a measure of judges' judicial ability (Choi et al.,

⁴"An extensive political science literature empirically examines the influence of ideology, using such measures as the judge's political party, appointing president, experience on the bench, and other attributes." (Ashenfelter et al., 1995, p.258)

⁵From then, several essays discussed the idea of measuring judicial performance and judicial ability (Gey & Rossi, 2005)

2013) and to assess the advantages of courts specialized in patents vis-a-vis generalist courts (Lemley et al., 2014). Miller and Curry (2009) also study the role played by prior and accumulated experience on judge's decisions, separating judge's expertise (in this case a prior knowledge on the subject) from judge's experience (her accumulated experience as a judge).

However, the variability both between legal systems and within one legal system entails different judicial behaviors, depending on the incentives and the constraints faced by the judges (Posner, 2005). Most studies used data from common law systems: Baye and Wright (2011), Choi et al. (2013), Lemley et al. (2014), and Miller and Curry (2009) all include the judges' experience in their studies, varying courts and subjects, but always within the US context. Annus and Tavits (2004) made an interesting study in Estonia, but mainly exploring an important political regime change and considering judge's ideology based on their previous experience.

Brazilian legal system operates under the civil law structure, with substantial differences to the US judicial system. Among the very few studies on judicial behavior in Brazil, many are focused on Brazilian Supreme Court (*Supremo Tribunal Federal – STF*), where we have justices appointed by the President and approved by the Senate (see F. Lopes, 2018, 2019), or on Brazilian Superior Court (*Superior Tribunal de Justiça - STJ*) (see Yeung & de Azevedo, 2015). Also using data from a higher court in Brazil (the Superior Labor Court – *Tribunal Superior do Trabalho*) and focusing more on judges' characteristics, Ponczek and Grezzana (2012) find evidence of gender bias on decisions of said court. Castro (2018) presents a very interesting study investigating effects of judges' career background on judicial decision making, using criminal appeals of the São Paulo State Court of Appeal from 2009 to 2013⁶. There are no studies, so far, on judges' experience in Brazil.

In all studies in judicial behavior or involving courts decisions, the biggest difficulty faced by the literature is the low access to systematized and reliable information. Data on superior courts is more accessible than on lower courts, but volumes and appeal bias are significant. Empirical quantitative studies on lower courts of the Brazilian legal system are rare, especially when it comes to judicial behavior⁷.

⁶As one fifth of the judges from the São Paulo State Court of Appeal are not career judges, because 10% of the court seats are assigned to former lawyers and 10% to former prosecutors, Castro (2018) explores the effects of judges' background and experience on appellate decisions. Interestingly, Castro (2018) finds that designated judges tend to be more severe and former lawyers more forgiving with criminals in less serious cases.

⁷Ponczek and Grezzana (2012)

Considering (i) the importance of healthcare litigation, (ii) the lack of studies pondering judges as important actors in this problem, and (iii) the scarce literature on judicial behavior in Brazil, what we propose in this study is disentangling different experiences of judges from São Paulo’s State Court in order to investigate heterogeneous effects of two types of prior experiences: as a judge in general, and her expertise in healthcare litigation⁸. As Miller and Curry (2009) explain, the difference between the two variables is:

“In a sense, a judge who is an expert in a particular field possesses more extensive knowledge about the relevant minutiae than a similarly situated nonexpert and, perhaps more important, should be better equipped to apply his or her ideological schema to each individual case.” (Miller & Curry, 2009, p.844)

The idea behind experience variables in this paper is that there is a learning process both with the time on the bench and through prior decisions in similar cases. On the one hand, time on the bench is related to the judge’s age and can lead to higher corporatism, better administrative dexterity and improved skills as a judge in general. On the other hand, deciding more cases on one given subject, such as healthcare, is expected to lead the judge to a higher level of expertise on that particular theme: the more cases she has to decide, the greater the knowledge she can build on the subject, to the point where the judge creates an expertise in the area⁹. Having higher levels of expertise allows the judge to better systematize the information received from both parties (as per Miller & Curry, 2009).

1.2.2 Healthcare Litigation

Healthcare litigation is a subject studied by the literature for more than two decades, given the crucial role that access to healthcare services plays in our society. There have been different approaches to this topic: legal perspectives on the right to health and its enforcement through the courts (Ferraz, 2019; Marques & Dallari, 2007), public policies evaluation (Castro, 2018; Vieira & Zucchi, 2007; Wang et al., 2014), social rights defense

⁸Reasons for focusing on the State of São Paulo Court and why using 1st instance cases is interesting are presented in Section IV below.

⁹*“(...) repeatedly encountering such cases may act to increase that judge’s familiarity with those technical matters and bestow him or her with an added measure of competence in that legal area over time.”* (Miller & Curry, 2009, p.848)

(Silva & Terrazas, 2008), among others. The importance of the topic also led to the study of the institutional responses to healthcare litigation, as detailed in Wang (2015) and Vasconcelos (2018), which involved from public hearings and meetings organized by the National Council of Justice (*CNJ – Conselho Nacional de Justiça*) to the creation of technical support entities¹⁰.

Overall, empirical studies on healthcare judicialization in Brazil focus on the lawsuits themselves, analyzing the foundations of the decision, main ideas of the parties, characteristics of the parties and of the claims (Andia & Lamprea, 2019; Silva & Terrazas, 2008; Vieira & Zucchi, 2007). Another important and largely investigated topic is the possibility of deepening social economic inequalities through healthcare litigation, also referred to as regressiveness of healthcare litigation. According to Wang and Ferraz (2013), evidence “indicate that even litigation sponsored by public attorneys face important obstacles for reaching the neediest”¹¹.

Healthcare litigation in Brazil is characterized by a great volume of individual lawsuits and very high success rates for litigants (Biehl et al., 2018; Pepe et al., 2010; Vasconcelos, 2018; Wang et al., 2014). Even interlocutory decisions are in the vast majority favorable to claimants¹². Judicial decisions on healthcare cases have been found to have profound impact on public spending and are claimed to cause problems to the healthcare public policy (L. Lopes et al., 2019; Vieira & Zucchi, 2007).

When analyzing the foundations of decisions, scholars found out that not only do claimants win almost every case, but also most of the decisions are based solely on the claimant’s doctor prescription (Ventura et al., 2010; Vieira & Zucchi, 2007; Wang & Ferraz, 2013)¹³. By relying only upon the patient’s doctor prescription, the judges are not considering the public healthcare policy, or an impartial technical analysis of the case (“perícia técnica”), or the medical literature on the subject, or the recommendations

¹⁰Institutional efforts to better equip the Judiciary: (i) with the opinion of experts (“Núcleos de Assistência à Saúde” - NATs) and recommendations from a technical entity (Commission for Incorporation of Health Technologies in SUS – CONITEC).

¹¹In the same direction are the findings of L. Lopes et al. (2019) for the State of Minas Gerais and Silva and Terrazas (2008) for the city of São Paulo.

¹²As shown by Marques and Dallari (2007), in the State of São Paulo this is also the case, as “93,5% of interlocutory decisions granted the injunction so that the State had to supply the medicine demanded by the claimant” and, similarly, 90,3% of the sentences were in favor of the claimant, again obliging the State of São Paulo to supply the medicines requested. (Marques & Dallari, 2007, p.105)

¹³Wang and Ferraz (2013) analyzed 502 higher courts decisions where analogous insulin was claimed and found 88% of the cases judged in favor of patients-claimants and in 84% of the cases the judge decided based only on the patient’s doctor opinion. Similar results are found by Ventura et al. (2010) for the Rio de Janeiro State Court of Appeal in 2007 and 2008.

from the Commission for Incorporation of Health Technologies in SUS – CONITEC, not even the national health system’s official list of treatments and clinical protocols¹⁴. Non-observance of CONITEC’s recommendations is also analyzed by Wang et al. (2020), where the authors found no evidence of an effect on the odds of a decision in favor of claimant when there is a CONITEC recommendation for SUS to provide the treatment¹⁵.

The role of judges themselves on healthcare litigation has had little attention (not to say none) from scholars. Although the foundation of the decisions has been mapped by some healthcare litigation studies (Biehl et al., 2012; Pepe et al., 2010; Wang et al., 2020), there has not been a single study linking the characteristics of the judges themselves to decision outcomes. Some of the institutional measures to deal with this healthcare litigation phenomenon are related to better informing the judges. Information varies from the public spending involved with decisions that oversee the organization of the healthcare public system, to impacts on public spending in general, or what are the medical and expert’s opinions and recommendations and how to access them (linking the Judiciary to advisory bodies¹⁶), among other topics.

This paper aims to contribute to the literature on healthcare litigation by presenting a quantitative analysis (a scarce approach in this literature¹⁷), using greater number of decisions and computational strategies to extract information (independent of humans reading of all judicial decisions); considering the Judiciary structure as one of the control variables; and mainly by pondering judges’ themselves (individualize instead of collectivize judges) and their experiences. So far, as per Biehl et al. (2018), “studies in healthcare litigation are largely focused on the substance of legal claims and did not seek the perspectives of the multiple actors involved in the process, such as patients, lawyers, judges, politicians, etc.”¹⁸.

¹⁴An institutional response from the government in 2011 was to enact Federal Law nr. 12,401, as an effort to enforce the national health system’s official list of treatments and clinical protocols. The Law states (again) and makes clear that Brazil’s public national health system (“Sistema Único de Saúde” – SUS) is only obliged to supply citizens with the treatments listed on the national health system’s official list. Through the same law a Commission for Incorporation of Health Technologies in SUS – CONITEC was created to assess which technologies should be incorporated in the national health system. For more on the subject, see Wang et al. (2020) and Wang (2015).

¹⁵Wang et al. (2020, p.14)

¹⁶Such as NATs and CONITEC.

¹⁷Andia and Lamprea (2019) and Biehl et al. (2018) both review the literature and indicate that quantitative models are very scarce, as in most cases the literature relies on descriptive statistics and/or qualitative analysis.

¹⁸Biehl et al. (2018, p.2)

1.3 Hypothesis, Data & Methods

1.3.1 Hypothesis

We hypothesize that judges' experience is an important aspect to be accounted for when analyzing the largely debated healthcare litigation problem and that it is possible to disentangle experience from expertise. Our first hypothesis is that judges with greater experience in healthcare cases will be more willing to hear the healthcare insurance company and/or the public administration and, consequently, have a lower probability of ruling totally in favor of the claimant¹⁹. From the literature (and as confirmed by our data²⁰) we know that most healthcare judicial cases are decided in favor of the claimant, many times without the judge even hearing from other party²¹. The idea behind this first hypothesis is that more specific experience on healthcare cases allows judges to accumulate knowledge on healthcare systems, their structures, the laws and regulations involved, the players and the general problems faced when deciding matters related to a person's health. A judge's higher level of knowledge would make her more aware of the problems that healthcare litigation can cause both to the private and to the public healthcare systems, which is crucial to give the judge at least an inclination to listen to the other side of the story before deciding the case and go beyond the most common foundations of healthcare judicial decisions, such as the right to health and the immeasurable value of life. Hence, the first hypothesis can be stated as follows:

H1: *The more expert is the judge, the lower is the probability of a decision in favor of the patient (claimant).*

We also investigate whether this extra knowledge in healthcare cases is more related to public issues than to private ones, as in the public system we have the universal healthcare coverage on one hand and the public expenditures on the other, with the clear possibility of adversely affecting other human beings by redistributing public resources. On cases involving the private care system the other party is usually an insurance company, and hardly a non-profit one, which could incline the judge to be less willing to rule in favor

¹⁹In this case, the decision has a higher probability of being either partially in favor of the claimant or totally against him.

²⁰See 1.1 Table 1 below.

²¹Marques and Dallari (2007)

of the private company and against the individual in distress. There would be, therefore, a difference between the ways in which the experience of the judge on healthcare cases could influence the case's outcome. Our second hypothesis is then:

H2: *The more expert is the judge in healthcare cases, the lower is the probability of a decision in favor of the patient (claimant) in cases involving the public healthcare system, compared with cases involving the private system.*

Additionally, a judge with more knowledge on healthcare litigation will be more inclined to use non-legal technical grounds for her decision, citing technical bodies like NATs, CONITEC, or using judicial expert examinations or medical clinical protocols because she is aware of all this apparatus. If so, there would be a lower probability of a decision in favor of claimant, but not because technical terms are somehow associated with decisions against the claimant. The mechanism behind is that when judge's decision cites these technical resources, the judge's decision-making went beyond those most commonly used arguments: that claimant's doctor prescription is all the necessary evidence to decide the case. Hence, when judges' healthcare experience is combined with technical grounds in the decision, the claimant would have an even lower chance of a ruling totally in his favor.

H3: *Stronger effects are expected for judges' expertise in healthcare cases (that is, even lower probabilities of a decision in favor of the claimant) when there are healthcare technical terms in the decision.*

It is also possible that the judge's experience in previous healthcare cases may affect the case decision differently when combined with an organizational characteristic of the Judiciary system: the existence, in the district, of a lower court specialized in cases involving the public administration²². This hypothesis is based on the notion that such specialized courts already involve a better understanding of the public administration as a whole and may, when combined with a judge that priorly dealt with healthcare cases, increase the effect of the judge's expertise and lead to an even lower probability of the judge deciding totally in favor of the claimant.

H4: *Stronger the effects are expected for judges' expertise in healthcare cases (that is, even lower probabilities of a decision in favor of the claimant) when*

²²Called "Varas da Fazenda Pública".

there are is a district court specialized in cases involving the public administration.

To test all the hypothesis described above, we needed a dataset containing information (i) on healthcare lawsuits themselves; and (ii) on the judges. Though the literature on healthcare litigation in Brazil is vast, the topic is quite hard to study, given the heterogeneity among different states and regions; the difficulties to gather reliable data²³; and the difficulties to compare States and regions due to data structure differences (Azevedo et al., 2019). Most of the existing studies are based on original datasets²⁴, this is why the literature on healthcare litigation is based on the analysis of hundreds of cases, rarely on a few thousand judicial decisions²⁵.

This paper innovates on the volume of cases analyzed at once, which has only been possible by relying on technology: crawlers to download decisions, regex analysis to identify terms and extract valuable information to create variables, and regression analysis to understand the effects of the variables on decision outcomes. Although this innovation allows for greater volumes of cases being analyzed, it does have downsides, as any choice: information extracted is less precise and detailed. However, for the purposes of this paper, considering the hypothesis stated above, the depth of the information that we extract is more than sufficient for the proposed analysis. Besides, this is exactly the type of analysis missing from the literature (Biehl et al., 2018), since other authors have worked with much lower number of cases but always using researchers to read and interpret the decisions, allowing a deeper analysis and mostly qualitative.

As for the judicial behavior literature, we have no studies on lower court judges in Brazil, especially accounting for the judges' experience. Looking at cases in the initial phase, before appeals, allows lower levels of selection bias (except for the unavoidable bias of filing a lawsuit), and also allows researchers to analyze more cases and those that are decided fast and in the first instance, with no appeal. Due to an effort of the author to construct a dataset on the lower court judges it has been possible to test the effect of judge experience on case outcome for healthcare cases.

A description of the dataset and the construction of the variables is presented below.

²³Veçoso et al. (2014)

²⁴"Governmental data collecting systems are tenuous at best, and concerted efforts to gather comprehensive data on lawsuits for access to medicines are only in their beginning stages." (Biehl et al., 2012, p.38)

²⁵Biehl et al. (2018) lists several studies and presents this critique as well. Wang et al. (2020)

1.3.2 Data

The dataset on which this study is based has been constructed considering the information needed and the limitations imposed by the Brazilian Judiciary in terms of access to information. It has been necessary to resort to more than one source of data and combine all the information on judicial cases and judges in order to perform the analysis.

Not only the process number of healthcare lawsuits was gathered, but also details on the cases, such as the date of the decision, the text of the decision, parties involved (who filed the claim and against whom?), the final outcome (who won?). This information we obtained from Azevedo et al. (2019), which actually contains two sources of data: (i) judicial decisions gathered through web crawlers from the courts' electronic repository of precedents, and (ii) judicial cases classified by the courts as health cases, provided by the courts upon request based on Law No. 12.527/2011 ("*Lei de Acesso à Informação*"). Since the web crawlers' dataset had better information (more detailed and in much higher numbers) for the state of São Paulo, we chose to focus on said state.

In addition to the information on the processes obtained from Azevedo et al. (2019) as detailed in the Appendix, we also needed information on the judges deciding each case: based on the name of the judge, we had to know when she started her career as a judge and the judge's gender. This sort of information is even harder to obtain, especially when working with bigger datasets. To gather such information on judges, we resorted to the website of the São Paulo State Court of Appeal (*Tribunal de Justiça do Estado de São Paulo - TJSP*), where there is a bit of public information on magistrates from that court. Complementing data was requested to TJSP via Law No. 12.527/2011. Using these two sources we were able to complement the dataset with the date on which each judge started working in the Brazilian Judiciary²⁶.

The final information included in the dataset before defining and constructing variables was the administrative divisions of the State of São Paulo's Judiciary, which is divided into judiciary districts ("*comarcas*"). A judiciary circuit ("*circunscrição judiciária*") is the next level of administrative division inside the Judiciary and contains one or more judiciary districts. Finally, we have the judicial administrative regions as a collection of judiciary circuits. In the State of São Paulo there are currently 319 judicial districts²⁷, 57

²⁶More precisely, the date on which the judge was invested in the job ("*data da posse*").

²⁷<https://www.tjsp.jus.br/PrimeiraInstancia>

judiciary circuits and 10 judicial administrative regions²⁸.

Combining all information gathered as described, the final dataset used in this paper contains 15,231 lawsuits, decided between 2008 and 2017 by the State Court of São Paulo (1st instance). An overall description of the variables follows below.

1.3.3 Variables

Answering all the hypothesis requires knowing the decision outcome in each of the judicial cases that compose the dataset. That means identifying in favor of whom has the judge ruled: the claimant or the defendant. In this study we use the classification from Azevedo et al. (2019), which is based on regular expressions and cases were classified as follows: if the judge granted claimant all that had been claimed, the case was classified as *totally in favor of claimant* and numbered “3”; if the judge denied any of the claims, no matter which (including procedural issues, deadlines, fine values, etc.), the case was classified as *partially in favor of claimant* and the outcome numbered “2”; finally, for cases where all claims were denied and the judge ruled *totally against the claimant*, the case outcome was numbered “1”²⁹.

In addition to the decision outcome, it was also necessary to build variables measuring (i) each judge’s experience with healthcare judicial cases, (ii) if the decision contained healthcare technical terms as fundamentals³⁰, and (iii) if there were lower courts specialized in cases against the public administration in the district where the case was decided. With these three variables the hypothesis could be tested, however, controls are also necessary for the analysis. Hence, we also constructed the following additional variables: (i) judge’s general experience in the Judiciary, (ii) judge’s gender, (iii) if the demand involved the public healthcare system, (iv) the case’s duration, (v) if the demand was filed by or involved a person with a low income level³¹. A brief explanation on the variables and their construction is provided in the Appendix.

The descriptive statistics of each variable are presented in Table 1.1 below. As we can

²⁸<https://www.tjsp.jus.br/QuemSomos/QuemSomos/RegioesAdministrativasJudiciarias>

²⁹Decisions to extinguish the case represented very few judicial cases from the total and were dropped from the dataset used in this paper because they are uninformative as whether the judge favored one or the other party. The code used to classify the decision texts was written in Python and is available at: https://gitlab.com/danilopcarlotti/pesquisas/-/blob/master/common/_nlp/parserTextoJuridico.py.

³⁰This classification was also made by Azevedo et al. (2019)

³¹Control variables (iii) to (v) were constructed using one or more classifications designed from regular expressions defined by Azevedo et al. (2019). More details presented on the Appendix.

see, a judge from our dataset has decided on average 21 healthcare cases before issuing a decision, but there is a very important variation of expertise among judges: from a judge with one healthcare case experience to another with 224 cases. This is not unexpected since in the capital of the State of São Paulo we have (i) a much greater volume of cases and (ii) sectors within the State Lawyers’ Office (*Procuradoria do Estado*) specialized in healthcare that, consequently, have a much more specialized curriculum. The same high variability is found when analyzing judges’ general experience on the bench and, again, it is not unforeseen since we can have judges that have just began their careers while others have already been on the bench for quite some time (around 14,3 years). As for the duration of the processes, the standard deviation is again large (284 day) and processes take on average 258 days. It is also possible to see that all judiciary circuits and administrative regions of the Judiciary of the State of São Paulo are represented in the dataset.

Table 1.1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Outcome	15,231	2.2204	.5144	1	3
Claim Win	15,231	.2668	.4423	0	1
Judge’s Health Experience (#)	15,231	21.41	26.38	1	224
Low Income Claimant	15,231	.0334	.1797	0	1
Specialized Court	15,231	.8414	.3653	0	1
Technical Argument	15,231	.1511	.3582	0	1
Process Duration (days)	15,231	258.47	284.05	2	3132
Judge’s General Experience (days)	15,231	5,219.36	2,579.06	21	14048
Judge’s Gender	15,231	.5791	.4937	0	1
Public Healthcare System	15,231	.2371	.4253	0	1
Judiciary Circuits	15,231	9.579	16.0354	0	56
Administrative Regions	15,231	2.4088	2.4797	1	10
Pseudo R2					0.148

(#) number of prior healthcare cases

Source: elaborated by the author.

To further investigate the relation between the variables and the decisions’ outcomes, we present, in the next section, the empirical strategy applied on the described dataset for the purpose of testing the hypothesis of this paper.

1.3.4 Empirical strategy

To test the hypotheses proposed in this paper, we initially relied on logit models. As explained in the previous section, the decisions' outcomes were originally classified into three categories and, for the logits, we combined two classes into one. Only the cases with decisions totally in favor of the claimant were defined as "in favor" (and numbered 1) and all others were deemed as "not in favor" (and assigned 0)³².

In the first specification of the logit we considered the independent variable of interest, the judge's health experience (`health.exp`), as well as if there is a specialized court (`pub.court`), if the decision contained health-related technical terms (`tech.arg`), and whether the claim involved a low income party (`low.incm`)³³. A second specification included the judges' general experience (`time - days - on the bench`), to disentangle expertise (`health.exp`) from general experience (`general.exp`), as well as an additional control variable to also account for the gender of the judge and another to control if the case involved the public healthcare system. But there were still other controls deemed necessary, so a third estimation considers also year fixed effects and judicial circuit fixed effects³⁴, to control both for time and local policies or even specific local problems with the healthcare system that had not been explicitly accounted for by previous control variables. Finally, a fourth specification included interaction variables that we wanted to test according to the hypotheses, allowing us to disentangle heterogeneous effects: (i) health experience with public healthcare system, (ii) health experience with technical argument, (iii) health experience with specialized public court. For additional investigations, we also interacted (iv) specialized public court with public healthcare system, and (vi) specialized public court with technical argument.

All four specifications of the logit models were run in the software Stata 15. The variance-covariance matrices were estimated with clusters for judges, so that the errors

³²Several studies indicate that the majority of decisions in Brazilian healthcare litigation are in favor of claimant, hence we are adopting a conservative approach in this paper when we only consider cases decided "totally in favor" as "in favor". We consider this conservative approach more reliable because what is being denied by the judge can be an important healthcare provision itself and not a procedural issue, such as a deadline extension. Since we are not able to verify which is the case using regular expressions, we decided to take this approach.

³³Andia and Lamprea (2019) and Ferraz (2009)

³⁴Robustness checks were also ran with judicial district fixed effects, but estimations problems arose from no variability of decision outcomes in several judicial districts, compromising the effects of the logit and rendering unfeasible the estimation of a multinomial logit with the 272 judicial districts from the dataset used for fixed effect.

are independent across judges, but allow intragroup correlation. We clustered errors by judge because the great number of judges in the database did not allow us to use judge dummies to control for judge-specific effects in the estimation.

The equation for a general specification of the logit model is presented below and a table identifying all variables (X_i) in each specification is presented Table A.5 in the Appendix.

$$P(\textit{claimant}_i = 1) = \frac{1}{1 + \exp(-X_i\beta)}$$

Although the interpretation of the results from a logit model are easier, by combining the “partially in favor” and the “against claimant” categories there is a loss of information. Hence, to better understand the logit results and further investigate some hypotheses, we also ran a multinomial logit, which allowed an estimation considering all three possible results for the judicial decisions’ outcomes. Estimation equation and complete results for the multinomial logits are all presented in the Appendix.

1.4 Results and Discussion

1.4.1 Main Results

Estimation results for all the four the logit model specifications are presented in Table 1.2. Judge’s previous health experience has a consistently negative impact on the probability of a decision in favor of the claimant. However, the effect is not significant until we include all interaction terms (Logit 4), then it becomes significant at a 1% level, still with a negative sign and with a margin ten times higher in absolute terms (rises from -0.000411 to 0.00435). This indicates that there are heterogeneous effects. Although the judge’s previous health experience not seeming to impact the final decision when we look at the unrestricted model, when we interact said variable with public system, public court and technical argument, isolating heterogeneous effects, the healthcare experience variable alone is significant. Hence, evidence confirms our hypothesis 1 that a judge’s prior experience in healthcare cases is a relevant aspect to be considered, correlated to lower probabilities of decisions in favor of claimant.

Table 1.2: Logit Regression Results

Variables	Logit 1 Margins	Logit 2 Margins	Logit 3 Margins	Logit 4 Margins
judge's health experience	-0.000724 (0.000471)	-0.000364 (0.000389)	-0.000411 (0.000430)	-0.00435*** (0.00163)
low income claimant	-0.263*** (0.0519)	-0.175*** (0.0502)	-0.192** (0.0763)	0.0977* (0.0575)
public court	0.0856*** (0.0203)	0.0702*** (0.0218)	0.111*** (0.0323)	0.0385 (0.0325)
presence of technical terms	0.0172 (0.0163)	0.0199 (0.0150)	0.0194 (0.0123)	0.0267 (0.0350)
judge's general experience		-5.80e-06* (3.33e-06)	-7.14e-06** (3.22e-06)	-7.55e-06** (3.20e-06)
judge's gender		0.00897 (0.0171)	0.00582 (0.0168)	0.00638 (0.0166)
public health system		-0.130*** (0.0223)	-0.110*** (0.0194)	-0.258*** (0.0356)
case duration		4.95e-05*** (1.67e-05)	4.04e-05** (1.66e-05)	3.91e-05** (1.64e-05)
health experience * public system				-0.000133 (0.000719)
health experience * public court				0.00395** (0.00165)
health experience * technical terms				0.000627 (0.000501)
low income claimant * public system				-0.461*** (0.134)
public court * public system				0.186*** (0.0400)
public court * technical terms				-0.0275 (0.0365)
technical terms * public system				0.0214 (0.0365)
Observations	15,231	15,231	15,231	15,213
CJ FE	NO	NO	NO	YES
Year FE	NO	NO	YES	YES
Pseudo R2	0.0109	0.0236	0.0375	0.0436

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: elaborated by the author, using Stata 15.

From the interaction terms is possible to verify that for cases involving the public healthcare system the judge's prior expertise in healthcare does not seem to be correlated with the side she will take in the final decision. In this case, hypothesis H2 cannot be confirmed, although the sign is consistent with what expected, the interaction variable is not significant. The same goes for cases where the final decision uses technical terms: judge's specific experience in healthcare cases is not significant when interacted with the technical arguments variable (and not consistent with our hypothesis H3). But this same

prior expertise is relevant (significant at 5% level) when there is a lower court specialized in public matters, and with a positive effect, that is, enhancing the chances of a decision in favor of the claimant, which is the opposite of what we expected under hypothesis H4.

To sum up, the unrestricted model points to higher level of health expertise for judges leading to lower probabilities of a decision totally in favor of claimant, consistent with H1, but for our hypotheses related to the interaction of the health experience variable with other variables we either find no evidence of support (H3) or evidence in the opposite direction of that expected (H2 and H4). In view of the results, we decided to further investigate the hypotheses, resorting to multinomial logit estimations, where we can check the effects separating decisions partially in favor of claimant from those against claimant, having all three outcomes. The same specifications of the logit were applied to the multinomial logit and results (margins) of the last specification are reported below³⁵.

From the analysis of the margins of the multinomial logit it is possible to see that higher judge expertise in healthcare cases affects differently the three possible outcomes, considering both the expertise variable alone and when interacted with others. Prior healthcare expertise alone is significantly related to decisions in favor of claimant (partially and totally), but the most interesting aspects are the directions of this impact. The only probability positively affected by higher healthcare expertise is that of a decision *partially* in favor of claimant. For decisions *totally* in favor, the more a judge is acquainted with healthcare litigation, the lower are the probabilities of her deciding in favor of claimant. This is consistent with our hypothesis corroborating our conclusions from the logit models. Hence, the evidence is that our hypothesis H1 is confirmed and some sort of learning effect or expert knowledge accumulates in judges as they decide more and more healthcare cases, leading them to decide less in favor of claimant.

As for results involving the interaction terms of judges' prior healthcare expertise, again we find evidence corroborating our hypothesis H2 and H4. For cases involving the public healthcare system, only the effect over decisions against claimant are significant and the relationship found is positive³⁶.

³⁵More information on the estimation of the multinomial logits, its importance, equations and results for all specifications, see the Appendix.

³⁶The negative sign found for the interaction variable health expertise and public system in the logit model is due to the "partially in favor" outcome variable, which contains most of the observations of the database and is largely representative of variable "claim win = 0" in the logit model. Hence, the negative sign found for the coefficient of "partially in favor" helps understand the result initially deemed counter-intuitive.

Table 1.3: Margins from the Multinomial Logit Specification 4

MARGINS Variables	Multinomial Logit 4 - Margins		
	Outcome (1) Against Claimant	Outcome (2) Partially in Favor	Outcome (3) Totally in Favor
judge's health experience	-0.000818 (0.000584)	0.00519*** (0.00167)	-0.00438*** (0.00163)
low income claimant	0.0203 (0.0285)	-0.112* (0.0612)	0.0913 (0.0571)
public court	0.00344 (0.0124)	-0.0822*** (0.0242)	0.0835*** (0.0203)
presence of technical terms	-0.0759*** (0.0151)	-0.0134 (0.0188)	0.0175 (0.0162)
judge's general experience	-6.07e-07 (1.00e-06)	8.29e-06** (3.27e-06)	-7.68e-06** (3.18e-06)
judge's gender	-0.00537 (0.00482)	0.00144 (0.0168)	0.00394 (0.0165)
public health system	0.0713*** (0.0111)	0.185*** (0.0363)	-0.257*** (0.0356)
case duration	2.39e-05*** (5.72e-06)	-6.85e-05*** (1.73e-05)	4.46e-05*** (1.66e-05)
health experience * public system	0.000572*** (0.000205)	-0.00103 (0.000698)	0.000456 (0.000691)
health experience * public court	0.000306 (0.000542)	-0.00439** (0.00171)	0.00409** (0.00164)
health experience * technical terms	0.000464*** (0.000173)	-0.00152*** (0.000509)	0.00106** (0.000481)
low income claimant * public system	-0.00776 (0.0330)	0.448*** (0.106)	-0.441*** (0.112)
public court * public system	0.00832 (0.0119)	-0.196*** (0.0404)	0.187*** (0.0399)
public court * technical terms	0.0609** (0.0239)	-0.0176 (0.0402)	-0.0432 (0.0371)
technical terms * public system	-0.0126 (0.0156)	-0.0102 (0.0360)	0.0229 (0.0346)
Observations	15,231		
CJ FE	YES		
Year FE	YES		
Pseudo R2	YES		

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: elaborated by the author, using Stata 15.

The findings related to the interaction of prior healthcare experience and the existence of a court specialized in public administration issues are also relevant: in these cases, judges with higher expertise tend to decide more radically, either in favor or against claimant, but less partially in favor (although only the coefficients related to outcomes partially and totally in favor are significant). This result does not confirm hypothesis H4, but it sheds a light on how judges' expertise may have different effects depending on the existence of some sort of court specialization (keeping in mind that those courts are not specialized in healthcare cases).

Going back to the analysis of the margins found in the logit, as reported in Table 1.2 above, the results for judges' general experience indicate that the longer the judge has been working as a magistrate, the lower is the probability that she decides the case in favor of the claimant. Although the margins are always very low, indicating that this relation is weak in magnitude, the sign and significance are consistent over all three specifications containing the variable, even after including all other controls and interaction terms. Results from the multinomial logit corroborate this result, as the longer the judge is on the bench, the lower is the probability of her deciding totally in favor of the claimant (outcome 3), but the probability of deciding partially in favor (outcome 2) is higher. Margins, however, are consistently low in magnitude, again considerably lower than healthcare expertise effect.

Combined with the findings related to the judges' prior expertise in healthcare cases, the results related to the judges' general experience are especially important for this paper because it evidences that judges' prior experience in general and judges' prior expertise play different roles, in line with what is proposed by Miller and Curry (2009). Although Miller & Curry find no evidence of experience and expertise being separable concepts in the context of patent obviousness cases in US Federal Circuit courts, here in Brazil, in healthcare litigation cases, we do find evidence of separable effects from experience and expertise for judges from São Paulo State courts.

1.4.2 Additional Findings

The existence of lower courts specialized in cases against the public administration is expected to lead to outcomes more tailored to the problems presented because of the expertise of these courts: administrative expertise in cases involving the public adminis-

tration and more expedite procedures due to specialization. Those are the fundamentals behind the choice made within the judiciary to organize the system creating such specialized courts³⁷. They differ from judges' healthcare experience in the sense that these courts can have more than one judge and they decide not only healthcare cases, but also public civil actions, actions against improbity conduct, among others. Additionally, there are aspects involved in the specialized court that are not judge-related, from the organization of the whole judiciary system to the interaction with public attorneys.

When there is such a specialized lower court it means that all cases that involve the public administration will be decided by this lower court and all other cases will be decided by another lower court. Consequently, the range of subjects that are under the competence of the non-public lower court is also reduced, as it no longer has to analyze all judicial actions that involve the public administration. The specialization is somewhat double-sided for private and public judicial issues. We can then expect that court specialization in public administration cases, similarly to the judges' higher expertise in healthcare cases, would lead to a lower probability of a decision totally in favor of the claimant. This effect can come from healthcare cases both in the public and in the private systems, simply because the judge is, again, more prone to listen to the defendant and has a higher knowledge about both sides on the cases.

Nevertheless, if we consider the cases where the public system is involved and there is, in the district, a court specialization as described above, the effects should be potentialized, since judges from those specialized courts regularly deal with the public administration and, therefore, are more aware of its functioning, its limits and shall be more willing to hear the other party on a healthcare case than judges deciding cases against all sorts of private parties and who are not necessarily acquainted with healthcare insurance company or the related insurance market.

Though margins for the variable `pub.court` indicate no significance of this variable over decision outcome in unrestricted models specification (both for the logit and the multinomial logit), the effect is present and significant for all specifications before including the interaction terms. Results of the multinomial logit show that outcomes 2 and 3 are the ones pushing this significance: in the presence of courts specialized in public admin-

³⁷The same rationale from Miller and Curry (2009) when analyzing patent cases can be applied to healthcare cases as analyzed in this study. According to the authors, "*allowing judges to specialize in them will increase the efficiency with which those cases are handled as well as improve consistency in the law*". (Miller & Curry, 2009, p.841)

istration issues, we have a higher probability of decisions partially in favor of claimant and lower probability in decisions totally in favor. So, the findings are consistent across models and with the theory above. However, this effect seems to be due to the interaction terms. The interaction with healthcare expertise was analyzed above. For cases involving the public healthcare system in districts with those specialized courts, we can see in the multinomial logit results that judges seem to be more inclined to decide either in favor or against claimant and less partially in favor of claimant.

The results on public healthcare system and courts specialized in public administration are important to show that these two variables can affect healthcare litigation and the way a judge decides. They are quite important to both healthcare litigation and judicial behavior literatures, so we believe they are topics that deserve further investigation as they may contribute to Judiciary organization, allocation of judges to specialized courts and healthcare litigation institutional remedies. However, because the main idea in this paper is to explore judges' experience and expertise, these variables were only analyzed as additional investigation but mostly used as controls. Hence, there is still plenty of room to develop new research over both topics, in a structured study combining quantitative and qualitative investigations.

Another interesting finding was that the use of healthcare technical terms in the decisions apparently has no effect on the outcome of the decision. This result is stable in all specifications of the logit models, so we checked the multinomial logit for further explanation and technical terms in the decision seem to be related only to lower probabilities of a decision against the claimant. This is interesting because studies in Canada and England have found evidence suggesting a higher degree of deference by the Judiciary for a more "transparent and evidence-informed procedure" in healthcare cases³⁸. Hence, one could suggest that the judicial decision with more technical fundamentals went further into the analysis of the case and should, therefore, have a lower chance of being in favor of the claimant. This effect of non-legal technical arguments should be even stronger (that is, an even lower chance of an outcome totally in favor of the claimant) if we look at cases against the public administration. The result we found is not consistent with what we expected based on the literature, but it may be due to the fact that a very small number

³⁸ "Qualitative studies from Canada (Flood and Chen, 2010; Stabile & Tuohy, 2006; Flood & Essajee, 2012) and England (Syrett, 2011; Newdick, 2004; Wang, 2017) indeed suggest that a more transparent and evidence-informed procedure is perceived by courts as more legitimate and attracts greater judicial deference." (Wang et al., 2020, p.6)

of decisions contained healthcare technical terms (only 2,302 among the total of 15,231 decisions). It may be the case that judges may be using healthcare technical terms to explain decisions both pro and against claimants, but any conclusion in this direction needs additional research with more thorough (and human) interpretation of the judicial decisions.

Finally, the analysis of cases involving claimant's low level of income (low.incm variable) shows that it is always a relevant aspect to be considered in healthcare litigation decisions: claimants seem to have lower chances of winning if the case involves the public healthcare system. The coefficient is always significant and negative, up until we include the interaction between low income of the claimant and public healthcare system involved, then all negative effect seems to be captured by the interaction term and the low income variable alone changes sign, becoming positive. This means that low income claimants have a lower chance of success when the claim involved the public healthcare system and is particularly troublesome as it can be pointing to a confirmation of the regressiveness of healthcare litigation. Nevertheless, these findings should be better studied, and preferably combining the quantitative results to some qualitative field research, to better identify what can be driving the results reported herein.

1.5 Conclusion

Based on the notion that through the decision of healthcare cases, judges develop an expertise on the subject, we tried to disentangle effects of this expertise from the experience that judges accumulate on the bench, as judges in general. We also verified if the case involved the Brazilian public healthcare system, if there were courts specialized in public administration cases, if the decision issued contained healthcare technical terms and if cases involved a low-income claimant. Our main hypothesis was that there are separable effects from the different experiences, as judges accumulate specialized knowledge as they decide healthcare cases.

To test the hypotheses, we constructed and analyzed a database with more than fifteen thousand decisions from the State Court of São Paulo (1st instance), using regular expressions to identify the judge, the outcome and healthcare related terms, among others. Analysis of results obtained through a logit regression and subsidized by multinomial

logit estimations indicate that both judges' expertise and judges' general experience on the bench are significant, but the second has lower impact than the first. Results also evidence that the more experience a judge accumulates on healthcare cases, the lower the chances of her deciding in favor of the claimant, confirming our main hypothesis.

We have also discovered that although the use of healthcare technical terms in the decision seems not to be related to the decisions' outcome, it does have an effect if analyzed along with the judges' healthcare expertise, leading to lower chances of a decision partially in favor of claimant and higher chances of decisions either totally in favor or against claimant (with a higher magnitude for cases totally in favor). Relations between courts specialized in public administration, public healthcare system and judges' healthcare expertise have also proved to be interestingly significant in different directions of outcomes. Finally, the low income of the claimant in cases of the public healthcare system raised questions as to whether healthcare litigation is not making the neediest even worse (lower probability of a decision totally pro claimant).

These are important results that already have an impact in possible institutional responses inside the Judiciary. Judge specialization may be interesting, given results found for prior healthcare expertise on cases' outcomes. Further investigation on court specialization is another possible institutional response for the Judiciary in terms of organization, as results from this paper indicate that it also can play a significant role in final outcomes of healthcare cases.

In addition to the contributions to healthcare litigation, this paper also contributed to judicial behavior literature by presenting evidence that, on a civil law system, expertise on a subject can be derived from priorly deciding cases on the same subject and this has a different effect on judge decision making than her experience as a judge in general, from being on the bench.

By combining knowledge on law, economics, healthcare litigation and judicial behavior, this paper allowed for an interdisciplinarity that has shown a great value in opening new ways to see the same phenomena (healthcare litigation), with consequent new suggestion to deal with this issue. Additional research on court specialization and judges' training and specialization may prove to be beneficial to other technical areas besides healthcare litigation too, a finding allowed by the judicial behavior lenses.

1.6 Appendix

1.6.1 Data: additional information

The dataset extracted via web crawlers in Azevedo et al. (2019) contains process number, class, subject, judicial district, parties, name of the judge, date of the decision and the text of the decision. The dataset obtained via Law No. 12.527/2011 (“LAI dataset”) has complementary information³⁹ and is also regarded as a reliable source in terms of identification of healthcare lawsuits: while with the web crawler terms had to be used in Azevedo et al. (2019) to select healthcare cases, leading to many false positives, the information obtained via Law No. 12.527/2011 has a list of all healthcare lawsuits from 2008 to 2018, according to the classification made by the courts, which is expected to be more thorough than the open terms used in Azevedo et al. (2019) to identify healthcare cases. With the purpose of assuring that the cases analysed were, indeed, healthcare cases, we merged both datasets from Azevedo et al., 2019, to the State of São Paulo and from 2008 to 2017⁴⁰, using the process number, which is a unique identification number assigned to each new case initiated in the Brazilian justice system.

The new and compiled dataset obtained from Azevedo et al. (2019) contained, at this point, the following information: process number, class, subject, judicial district, parties, name of the judge, date of distribution of the claim (when it started), date of the decision and the text of the decision. We have also used, from Azevedo et al. (2019), the variable defining if each case had been decided totally in favour, partially in favour or against the claimant, and binary variables constructed according to the presence of certain terms in the text of the decision, as described Table A.1 below.

³⁹Although courts informed all the judicial cases from that period, supplied only basic information on each case: process number, class, subject, judicial district, date of distribution of the claim (when it started) and parties. Courts did not provide final or intermediary decisions outcome or text.

⁴⁰The year of 2018 had incomplete information, both in the crawlers database and in the LAI database.

Table A.1: Terms Searched

Variable Name	Terms searched for in the decision text
Privado	“suplementar”; “seguro de saúde”; “ANS”; “plano de saúde”; “cooperativa médica”
Público	“Secretaria”; “Ministério”; “Prefeitura”; “Município”; “Estado”; “SUS”; “Sistema Único de Saúde”
Perícia Médica Judicial	“perícia médica”; “perito”; “laudo pericial”; “laudo médico”
Protocolos Clínicos	“protocolo”; “PCDT”
CONITEC	“CONITEC”; “Comissão Nacional de Incorporação de Tecnologias”; “Câmara Técnica do Ministério da Saúde”; “Lei nº 12.401”
NAT	“Núcleo de Apoio Técnico”; “NAT”
Representação	“defensor”; “defensoria”
Insuficiência de renda	“pessoa carente”; “insuficiência de renda”, “baixa renda”

Source: elaborated by the author

The label and frequency of decisions outcomes, as classified in Azevedo et al. (2019) and used this paper, is presented below.

Table A.2: Outcomes in Dataset

Outcome	Outcome Label	Frequency	Percent
1	against claimant	706	4.64
2	partially in favor of claimant	10,461	68.68
3	totally in favor of claimant	4,064	26.68
Total		15,231	100.00

Source: elaborated by the author

This paper consolidates outcomes (2) and (3), considering as variable “claim win” only cases where the decision is totally in favor of claimant. When analyzing case by case, with a team of expert lawyers, Wang et al. (2014) has observed that most of the decisions are in favor of claimant on the matter discussed in the case. This means that there might be minor points (such as the deadline for providing treatment, or the value of the fine, or even procedural aspects) which the judge denied, but are not relevant for the overall analysis of the claim. However, it is also possible to have major and relevant points being denied. The verification of the contents of decisions would require legal expert researchers reading each and every partially in favor decision (10,461 cases), which was unfeasible under this study.

Also, there is an assumption behind the classification of decisions: that all claimants

are actually individuals demanding treatments, medicines, hospital beds, etc., from the private or the public healthcare system. This means individuals as claimants and companies or public administration bodies as defendants. According to the literature, Brazilian healthcare litigation is indeed characterized by individual claims this is really the case. However, it is an assumption that needed to be checked and through the analysis of the parties involved in the cases of the database used in this paper, the assumption has been confirmed. Word clouds clearly illustrate that that claimants are individuals and defendants are either private healthcare insurance companies or public administration bodies (Figure A.1 and Figure A.2).



Figure A.1: Most common terms in claimants



Figure A.2: Most common terms in defendants

In the Table A.3 below, a brief explanation on how the variables were constructed is presented.

Table A.3: Variable Construction

Variable	How the variable was defined	Measure / Values
Judge's Health Experience	measures how many healthcare cases has the judge previously decided (within the database)	number of healthcare cases previously decided by the judge
Technical Argument	uses the regex of "CONITEC", "NAT", "Pericia.médica.judicial" and "Protocolos.Clínicos" to identify technical fundamentals in the decision's text	= 1 if the decision text contains any of the listed terms; = 0 otherwise
Specialized Court	if in the local court there exists an area specialized in demands against the public administration in general (including healthcare)	= 1 if there is a specialized court for public administration demands; = 0 otherwise
Judge's General Experience	measures how long (in days) has the person been working as a judge when she issues the decision of the observation	days elapsed from date of judge's investiture until the date of the decision.
Judge's Gender	what is the judge's gender	= 1 if the judge is male, = 0 if female
Public Healthcare System	non-private healthcare system, that is, uses regex of "Privado" and subject ("assunto") classification as healthcare plan ("Plano de Saúde") and if both conditions ARE NOT present in the decision text, the case was categorized as a public healthcare system	= 1 if non-private healthcare system (public); = 0 if private healthcare system
Process Duration	process duration in days	days elapsed from distribution of the case in the Judiciary and the date of the decision.
Low Income Claimant	claimant is represented by a public attorney or the judge specifically uses expressions indicating that the claimant had insufficient income (uses the regex of "Insuficiência.de.renda" and "Representação")	= 1 if the decision text contains any of the listed terms; = 0 otherwise

Source: elaborated by the author

Table A.4 below presents an analysis of the data by outcome. For the continuous

variables, the statistics presented are the mean for each decision outcome (totally in favor of claimant, partially in favor of claimant and against claimant). Since the mean is quite non-informative for the binary variables, for this second set of variables we present the sum by outcome (indicating in how many cases the variable is equal 1). As per Table A.4, there are not so many cases in which technical arguments were found (only 15%), neither cases involving the public healthcare system (24%), while most of the cases were decided in courts that did have a specialized area for public administration issues (84%) and a little more than half the cases were decided by men judges (58%). What is strikingly low is the number of cases in which there are evidences that the claimant was from a low income level: only 509 from 15,231 cases, or 3% of the cases.

Table A.4: Descriptive Statistics

Variable/ Outcome	1 (against claimant)	2 (partially in favor of claimant)	3 (totally in favor of claimant)	Total
BINARY VARs	(SUM)	(SUM)	(SUM)	(SUM)
Technical Argument	116 (5%)	1,573 (68%)	613 (27%)	2,302 (100%)
Specialized Court	619	8,616	3,581	12,816
Gender	261	6,182	2,378	8,821
Public Healthcare System	640	2,392	580	3,612
Low Income	53	413	43	509
CONTINUOUS VARs	(MEAN)	(MEAN)	(MEAN)	(MEAN)
Judge's Health Experience	44.6119	20.2842	20.2751	21.4094
Judge's General Experience	6,238.353	5,202.775	5,085.048	5,219.364
Process Duration	284.9873	250.1682	275.236	258.4709

Source: elaborated by the author

It is also interesting to notice in distribution among the three outcomes of cases involving public healthcare system and those in which there is a low income claimant: in both cases the number of decisions against the claimant are particularly high when compared to the proportion we see for the other variables. While for the three other variables we have 3%-5% of the decisions against the claimant, for these two specific variables the rates are 18% (public court) and 10% (low income). Particularly in the case of low income claimant, we also have the lowest rate of cases totally in favor of claimant: only 8%.

Finally, the duration of the process does not vary significantly between each type of

outcome and the mean duration of the processes is of 258 days, which is consistent with that found by Pepe et al. (2010)⁴¹.

Table A.5 below presents the specifications of the regressions.

Table A.5: Regression Specifications

Variables	Specification 1	Specification 2	Specification 3	Specification 4
health.exp	X	X	X	X
low.incm	X	X	X	X
pub.court	X	X	X	X
tech.arg	X	X	X	X
general.exp		X	X	X
gender		X	X	X
pub.sys		X	X	X
duration		X	X	X
Year fixed effect			X	X
CJ fixed effect			X	X
hexp_pubsys				X
hexp_pubcrt				X
hexp_tec				X
lowi_pubsys				X
pubcrt_pubsys				X
pubcrt_tec				X
tec_pubsys				X

Source: elaborated by the author

⁴¹When analyzing the time elapsed between the beginning of the lawsuit and the decision in 1st Instance of the State Court of Rio de Janeiro (Tribunal de Justiça do Rio de Janeiro), Pepe et al. (2010) found that the median process duration is 239 days.

1.6.2 Results: miscellaneous

Table A.6: Logit Coefficients

Variables	Logit 1 Coefficients	Logit 2 Coefficients	Logit 3 Coefficients	Logit 4 Coefficients
health.exp	-0.00374 (0.00248)	-0.00191 (0.00206)	-0.00219 (0.00230)	-0.0232*** (0.00878)
low.incm	-1.358*** (0.265)	-0.916*** (0.259)	-1.020** (0.405)	0.522* (0.309)
pub.court	0.443*** (0.105)	0.368*** (0.114)	0.592*** (0.171)	0.206 (0.174)
tech.arg	0.0889 (0.0844)	0.104 (0.0791)	0.103 (0.0660)	0.143 (0.187)
general.exp		-3.04e-05* (1.75e-05)	-3.80e-05** (1.70e-05)	-4.04e-05** (1.70e-05)
gender		0.0470 (0.0899)	0.0310 (0.0891)	0.0341 (0.0887)
pub.sys		-0.682*** (0.122)	-0.584*** (0.105)	-1.380*** (0.190)
duration		0.000259*** (8.88e-05)	0.000215** (8.88e-05)	0.000209** (8.86e-05)
hexp_pubsys				-0.000710 (0.00384)
hexp_pubcrt				0.0211** (0.00882)
hexp_tec				0.00335 (0.00269)
Observations	15,231	15,231	15,213	15,213
CJ FE	NO	NO	YES	YES
Year FE	NO	NO	YES	YES
Pseudo R2	0.0109	0.0236	0.0375	0.0436

Source: elaborated by the author, using Stata 15.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A.7: Logit Coefficients (cont.)

Variables	Logit 1 Coefficients	Logit 2 Coefficients	Logit 3 Coefficients	Logit 4 Coefficients
lowi_pubsys				-2.465*** (0.718)
pubcrt_pubsys				0.993*** (0.211)
pubcrt_tec				-0.147 (0.195)
tec_pubsys				0.114 (0.195)
Constant	-1.293*** (0.0980)	-1.082*** (0.130)	-1.413*** (0.296)	-1.027*** (0.299)
Observations	15,231	15,231	15,213	15,213
CJ FE	NO	NO	YES	YES
Year FE	NO	NO	YES	YES
Pseudo R2	0.0109	0.0236	0.0375	0.0436

Source: elaborated by the author, using Stata 15.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

1.6.3 Robustness Checks

The combination of the “partially in favor” and the “against claimant” categories into one sole variable implies a loss of information for the logit models. For robustness checks, we ran the same specifications of the logit as a multinomial logit, which considered all three possible results for the judicial decisions’ outcomes. Running the multinomial logit is not only important to verify if the results from the logit hold, it is also particularly relevant with the database at hands because there is a great number of cases decided as “partially in favor of claimant”, representing 68.9% of the data.

$$P(\text{outcome}_i = j) = \frac{\exp(-X_i\beta_j)}{1 + \sum_{k=1}^{K-1} \exp(-X_i\beta_k)}$$

Where X_i are presented in Table A.5 and $j, k \in 1, 2, 3$.

All four specifications ran for the logit were also ran for the multinomial logits, clustering errors by judge to reduce correlation between equation errors, just as we did for the logits. The base outcome used was “totally in favor of claimant” (outcome 3). Results are presented below:

(see next page)

Table A.8: Multinomial Logit Coefficients

<i>COEFFICIENTS</i>	Multinomial Logit 1		Multinomial Logit 2		Multinomial Logit 3		Multinomial Logit 4	
	Outcome (1)	Outcome (2)	Outcome (1)	Outcome (2)	Outcome (1)	Outcome (2)	Outcome (1)	Outcome (2)
health.exp	0.0212*** (0.00556)	0.00150 (0.00193)	0.0136*** (0.00256)	0.000325 (0.00202)	0.00496* (0.00259)	0.00119 (0.00235)	-0.0122 (0.0227)	0.0249*** (0.00885)
low.incm	2.235** (0.887)	1.288*** (0.257)	0.849 (0.869)	0.984*** (0.244)	0.993 (0.747)	0.979*** (0.309)	0.371 (-1.073)	-0.524* (0.309)
pub.court	-0.350 (0.290)	-0.437*** (0.109)	0.130 (0.263)	-0.392*** (0.116)	0.258 (0.490)	-0.647*** (0.176)	-0.0360 (0.491)	-0.223 (0.174)
tech.arg	-0.160 (0.374)	-0.0859 (0.0822)	-0.622 (0.448)	-0.0842 (0.0776)	-0.699 (0.505)	-0.0741 (0.0639)	-2.872*** (-1.040)	-0.0640 (0.188)
general.exp		0.000103** (4.37e-05)	2.75e-05 (1.75e-05)	3.44e-06 (4.01e-05)	4.02e-05** (1.71e-05)	8.59e-06 (3.94e-05)	4.25e-05** (1.72e-05)	
gender		-0.693** (0.307)	-0.0146 (0.0898)	-0.242 (0.194)	-0.00831 (0.0885)	-0.210 (0.194)	-0.0136 (0.0888)	
pub.sys		3.992*** (0.265)	0.436*** (0.112)	3.473*** (0.205)	0.398*** (0.101)	3.599*** (0.407)	1.287*** (0.192)	
duration		0.000524* (0.000306)	-0.000309*** (8.97e-05)	0.000646*** (0.000227)	-0.000279*** (9.07e-05)	0.000688*** (0.000218)	-0.000276*** (9.07e-05)	
Observations	15,231	15,231	15,231	15,231	15,231	15,231	15,231	15,231
CJ FE	NO	NO	NO	NO	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	YES	YES	YES	YES
Pseudo R2	0.0251	0.0251	0.0963	0.0963	0.140	0.140	0.148	0.148
Wald	0	0	0	0	0	0	0	0

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: elaborated by the author, using Stata 15.

Table A.9: Multinomial Logit Coefficients (cont.)

<i>COEFFICIENTS</i>	Multinomial Logit 1		Multinomial Logit 2		Multinomial Logit 3		Multinomial Logit 4	
	Outcome (1)	Outcome (2)	Outcome (1)	Outcome (2)	Outcome (1)	Outcome (2)	Outcome (1)	Outcome (2)
hexp_pubsys							0.0189**	-0.00329
							(0.00789)	(0.00373)
hexp_pubcrt							-0.00520	-0.0226**
							(0.0210)	(0.00889)
hexp_tec							0.0126*	-0.00640**
							(0.00645)	(0.00264)
lowi_pubsys							1.472	2.397***
							-1.399	(0.597)
pubcrt_pubsys							-0.445	-1.027***
							(0.476)	(0.213)
pubcrt_tec							2.374***	0.147
							(0.889)	(0.197)
tec_pubsys							-0.548	-0.106
							(0.599)	(0.186)
Constant	-2.122***	1.273***	-4.735***	1.133***	-5.732***	1.483***	-5.316***	1.045***
	(0.245)	(0.1000)	(0.312)	(0.134)	(0.869)	(0.298)	(0.837)	(0.299)
Observations	15,231	15,231	15,231	15,231	15,231	15,231	15,231	15,231
CJ FE	NO	NO	NO	NO	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	YES	YES	YES	YES
Pseudo R2	0.0251	0.0251	0.0963	0.0963	0.140	0.140	0.148	0.148
Wald	0	0	0	0	0	0	0	0

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: elaborated by the author, using Stata 15.

Table A.10: Multinomial Logit Margins

<i>MARGINS</i>	Multinomial Logit 1 - Margins		Multinomial Logit 2 - Margins			
	Outcome (1)	Outcome (2)	Outcome (3)	Outcome (1)	Outcome (2)	Outcome (3)
health.exp	0.000842** (0.000346)	-0.000330 (0.000425)	-0.000513 (0.000373)	0.000460*** (9.06e-05)	-0.000299 (0.000392)	-0.000161 (0.000377)
low.incm	0.0543 (0.0376)	0.206*** (0.0561)	-0.260*** (0.0503)	0.00267 (0.0289)	0.184*** (0.0496)	-0.187*** (0.0476)
pub.court	-0.00128 (0.0124)	-0.0822*** (0.0242)	0.0835*** (0.0203)	0.0151 (0.0124)	-0.0822*** (0.0242)	0.0835*** (0.0203)
tech.arg	-0.00407 (0.0151)	-0.0134 (0.0188)	0.0175 (0.0162)	-0.0192 (0.0151)	-0.0134 (0.0188)	0.0175 (0.0162)
general.exp				2.83e-06* (1.52e-06)	2.98e-06 (3.53e-06)	-5.82e-06* (3.33e-06)
gender				-0.0236** (0.0116)	0.0157 (0.0203)	0.00786 (0.0168)
pub.sys				0.126*** (0.0167)	-0.0165 (0.0246)	-0.110*** (0.0193)
duration				2.65e-05*** (9.32e-06)	-7.91e-05*** (1.89e-05)	5.26e-05*** (1.68e-05)
Observations	15,231	15,231	15,231	15,231	15,231	15,231
CJ FE	NO	NO	NO	NO	NO	NO
Year FE	NO	NO	NO	NO	NO	NO

standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: elaborated by the author, using Stata 15.

Table A.11: Multinomial Logit Margins (continuation)

<i>MARGINS</i>	Multinomial Logit 3 - Margins		Multinomial Logit 4 - Margins			
Variables	Outcome (1)	Outcome (2)	Outcome (3)	Outcome (1)	Outcome (2)	Outcome (3)
	(5.95e-06)	(1.75e-05)	(1.67e-05)	(5.72e-06)	(1.73e-05)	(1.66e-05)
hexp_pubsys				0.000572*** (0.000205)	-0.00103 (0.000698)	0.000456 (0.000691)
hexp_pubert				0.000306 (0.000542)	-0.00439** (0.00171)	0.00409** (0.00164)
hexp_tec				0.000464*** (0.000173)	-0.00152*** (0.000509)	0.00106** (0.000481)
lowi_pubsys				-0.00776 (0.0330)	0.448*** (0.106)	-0.441*** (0.112)
pubert_pubsys				0.00832 (0.0119)	-0.196*** (0.0404)	0.187*** (0.0399)
pubert_tec				0.0609** (0.0239)	-0.0176 (0.0402)	-0.0432 (0.0371)
tec_pubsys				-0.0126 (0.0156)	-0.0102 (0.0360)	0.0229 (0.0346)
Observations	15,231	15,231	15,231	15,231	15,231	15,231
CJ FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: elaborated by the author, using Stata 15.

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Keeping your friends close: coordination between state attorneys and health authorities in São Paulo State

Abstract¹

What are the effects of collaboration strategies over health litigation? Literature has shown that health litigation decisions are mostly in favor of claimants regardless of what is requested. Based on the notion that presenting a single unite front where state attorneys and health officials join forces increases the chances of having a case decided against claimants, this paper investigates effects of interorganizational collaboration, using geographical proximity between state attorneys' offices and health authorities as a measure of their collaboration. Results from a logit model using healthcare cases from the State of São Paulo indicate that the closer these organizations are, the higher are their chances of success before courts, even when we control for other aspects that might be influencing the judicial decisions or cases themselves.

2.1 Introduction

Litigation is a structural part of health policy in Brazil. At least 100,000 (Azevedo et al., 2019) new lawsuits are filed every year against public authorities requesting medicines and treatments often not provided by the country's public health care policy, the Brazilian "Unified Health System" ("Sistema Único de Saúde" or SUS). Although the country offers

¹This chapter was written in collaboration with Natalia P. de Vasconcelos and Henrique Y. J. Wang.

a comprehensive basket of treatments and medicines, litigation over new technologies and new drugs has become a central part of managing health policy in Brazil. Almost all cases are individual claims based solely on a doctor’s prescription and over 80% of cases are decided against policy authorities.

Compliance with judicial orders leads to increasing policy expenditures and inefficiencies. In order to avoid fines and falling in contempt with the court, public authorities often need to import drugs or buy them at high prices on a case-by-case manner. Between 2007 and 2018 the federal government has allegedly spent close to US\$ 1 billion (close to R\$ 5 billion) in the compliance with judicial decisions (Vieira, 2020), while some state authorities, against whom the vast majority of lawsuits are directed, have declared to have spent in 2014 alone close to US\$ 150 million (R\$ 772 million) with judicial orders².

More than the financial costs directly associated with paying for drugs and treatments, hidden organizational costs are also on the rise. New bureaucratic structures have been created in health departments across the country to manage the delivery of judicialized drugs, speed compliance of judicial orders, and help prepare legal defense. State attorneys and policy officials, once isolated actors that would only meet at the day of the judicial hearing, are now incentivized to seat on the same table and effectively work together to plan their legal defenses and prevent new lawsuits. Collaboration, however, is a tricky business. While often argued as an easy, go-to solution to any problem involving more than one actor or organization, measuring its effect over policy outcomes is never a simple task.

In this paper we take a closer look at this particular relationship between state attorneys and policy officials in the state of São Paulo as a case study of responses to health litigation that involve cooperation and coordination between different actors. After describing what the current literature already knows about these initiatives through qualitative work, we test their results quantitatively using an original dataset and a logit model. Since collaboration is not observed and considering that physical proximity is necessary for knowledge exchange, we use the geographical proximity between state attorneys’ offices and regional health departments as a proxy for their collaboration initiatives. We present robust results showing that the closer these friends are, the better are their results

²See “TCU e Estados apontam aumento dos gastos com a judicialização da saúde”, available at <https://www.cnj.jus.br/tcu-e-estados-apontam-aumento-dos-gastos-com-a-judicializacao-da-saude/>, published Dec 11, 2017, last visited December 24, 2020.

in healthcare litigation decision outcomes.

2.2 Literature Review: health litigation and collaboration

Health litigation in Brazil has been vastly studied by scholars from law, social sciences, and public health. While the normative debate focuses on the legitimacy and institutional capacity of Courts to decide hard technical cases with redistributive effects that are potentially unjust (Ferraz, 2011a), the empirical debate struggles to determine who gets to access the judicial system, what they expect and get from judges and Courts, and what are the effects of litigation over health policy and the right to health.

The phenomenon is not solely Brazilian. Health litigation numbers are also high in other Latin American countries, such as Colombia (Lamprea & García, 2016), Argentina (Abramovich & Pautassi, 2008), and Costa Rica (Luciano & Voorhoeve, 2019; Norheim & Wilson, 2014). Since the right to health has been constitutionalized in most of the region's legal systems, Courts became an important actor of health law and health policy in these countries, deciding both individual cases and structural comprehensive demands for reform (Andia & Lamprea, 2019; Lamprea, 2017). Health litigation numbers in Brazil, nevertheless, are astonishing. Looking only at lower courts, from 2016 to 2017, more than 95,752 new lawsuits were filed before single judges and more than 40,000 appeals before courts. The state of São Paulo concentrates almost 25% of these new cases, with 23,465 lawsuits for the same period (Azevedo et al., 2019).

Few studies, however, focus on the broader consequences of litigation beyond particular cases³ and fewer look at the effects over health organizations and their bureaucracies. A common trace of these few studies is the importance of coordination and collaboration among once isolated departments when trying to establish standardized procedures and respond to judicial claims while mitigating their effects over policy.

³As important exceptions, see for example: Ferraz (2011b), Langford et al. (2017), Montealegre (2015), Rodriguez-Garavito (2011), Wang (2015), Wang et al. (2014), and Yamauti et al. (2020)

Responses to health litigation at the federal level

At the federal level⁴, coordination and collaboration have been the main response encouraged by the National Council of Justice (“Conselho Nacional de Justiça” or CNJ), an administrative organ that runs the country’s judicial system. After a 2009 public hearing held by the Federal Supreme Court⁵, where experts on public health and health law exposed their deep concerns with the skyrocketing numbers of health litigation throughout the country, the National Council of Justice decided to lead the way.

The council first addressed the matter through recommendations, advising state and federal courts to take public health indicators and regulation more seriously while assessing health cases. These recommendations were also followed by the creation of a national and interorganizational forum where state and federal courts, public health authorities and experts could seat together and discuss the directions of health litigation and health law Tullii (2018). These recommendations eventually became resolutions and similar versions of the federal council were also mimicked by states following the council demands (Azevedo et al., 2019; de Oliveira, 2019; de Vasconcelos, 2020). CNJ has also encouraged courts to create technical divisions aimed at helping judges decide health law cases (da Silva, 2012).

Responses to health litigation at the state level

At the state level, Vasconcelos (2018) describes the effects of health litigation over the organization of bureaucracies in four different states: São Paulo, Rio de Janeiro, Santa Catarina and Rio Grande do Sul. All four states face high numbers of lawsuits against their health departments every year and at least since 2009 have been experimenting with different governance solutions to mitigate the problem, some of them motivated by the National Council of Justice. Three of the four (São Paulo, Rio de Janeiro and Rio Grande do Sul) created special administrative procedures and pre-litigation responses

⁴Brazil is a federative country with three administrative levels – federal, state and municipalities, and 26 states. Its judicial system roughly follows this divide, comprising state and federal courts. To each state court there is a state attorney general, responsible for legally advise on administrative affairs that involve state administration and for representing the state government on lawsuits. The country’s 1988 constitution also secured that every state should create a public defender’s office to provide free legal aid to anyone in need of legal representation under a certain income threshold. For more information on the Brazilian judicial system, see Da Ros and Taylor (2017)

⁵For more on this public hearing, see de Oliveira Santos et al. (2015) and Gomes et al. (2014)

that attempt to prevent judicial conflict or settle disputes administratively. To deal with both defense and compliance, all four states have put together specialized health litigation units within their health departments, hiring or transferring from other health policy units multidisciplinary staff members while investing in electronic systems that can organize procedures and connect legal defense and compliance. And in four states, a strong partnership has been developed between the state attorney's office and health departments, where the first also specializes in health law and works close with policy makers in different strategies to prevent health litigation or mitigate its effects (de Souza, 2016; Teixeira, 2011).

In the state of São Paulo, Filho et al. (2010) and Vasconcelos (2018) show how public bureaucracies have reorganized their internal procedures to deal with health litigation. First, the informal creation of an organ within the health department – the “Coordination for strategic claims of SUS” (“Coordenação de Demandas Estratégicas do SUS” or CODES), later made “official” in 2017 by administrative decree, opened the way to rationalizing responses and legal defense in health litigation cases in the state. CODES put together “factory line” of 35 multidisciplinary experts (between lawyers, nurses, public health specialists, doctors and a nutritionist) that receive and respond an average of 1,500 legal cases per month (Vasconcelos, 2018, p.89). This integrated system designed by CODES, and called S-CODES, connects different teams within the health department with the state attorney's office and is their main tool to work quickly and prevent legal sanctions and contempt of court (Filho et al., 2010).

State attorneys and health authorities in São Paulo

The partnership between state attorneys and public health authorities is a central part of the responses to health litigation in São Paulo (Vasconcelos, 2018). Together, these actors have come up with strategies to prevent health litigation and to improve their chances of winning cases before courts. Indeed, collaboration between these two organizations is expected: both are under the same power – the state executive – and should engage in interactions similar to that of a client-attorney relationship, since state attorneys are, at the end of the day, lawyers for the government and its bureaucracy. Even if expected, it does not necessarily happen. First, these are two very different organizations. The state attorney's office in São Paulo (“Procuradoria Geral do Estado

de São Paulo” or PGE) predates the 1988 constitution⁶, and it counts with 1,429 officials, among lawyers, staff and interns⁷, spread across the São Paulo city or one of the 12 countryside offices⁸. Most of its officials are only trained in law and do not specialize in any legal area in particular. Their careers within the organization incentivize a generalist practice in law. They access the state attorney’s office through public entrance exams and are likely to remain in office for their entire professional careers. More importantly, they often see themselves closer to other traditional careers within the judicial system, such as public defenders and public prosecutors, than to public administration professions.

In the public health department, officers are of a broader range of areas within health and often hold more than one public job, acting as practitioners and administrative officials. They come from nursing, medicine, pharmacy, and nutrition, but also from non-health related areas, such as law and public policy. More importantly, they have specialized knowledge and are often recruited because of this knowledge. Entrance exams are also the main form of recruitment, but free-hiring posts are also available and form an increasing proportion of the public administration’s staff.

Even in the face of these differences, cooperation has been a central trace of the relationship between state attorneys and health officials. At the prevention level, teaming up with the state public defender’s office is a central piece of this strategy. While in Rio de Janeiro the bulk of health law cases brought before courts is represented by public defenders, in São Paulo the vast majority of lawsuits is filed by private attorneys. The public defender’s office is responsible for between 20 to 30% of the health litigation in the state (Chieffi & Barata, 2010; Filho et al., 2010). Still, the state attorney’s office and public health authorities signed a collaboration agreement with the state public defender’s office creating an administrative service that precedes litigation, where public defenders can attempt to settle disputes before a lawsuit, dealing directly with the health department.

When disputes have already been judicialized, coordination between state attorneys and healthcare officials becomes a central part of health litigation responses. A health

⁶For more information, see time line created by the state attorney’s office, available at: http://www.pge.sp.gov.br/institucionalnovo/historia2_pge.htm (last visited 29/12/2020).

⁷For more information, see “Porta da Transparência”, available at: <http://www.transparencia.sp.gov.br/BuscaAdmDirInd.html> (last visited 29/12/2020).

⁸The state attorney’s office not only represents the government in court disputes, but it is also in charge of providing legal advice to all governmental departments. At least one state attorney is normally allocated in one of these departments’ cabinets, all located in the city of São Paulo. Therefore, the health department in the city of São Paulo counts with a state attorney advising the health secretary on matters that do not involve litigation, and with a specialized health law division in the state attorney’s office.

division in the state attorney's office was created in 2008 in the city of São Paulo after health litigation numbers started to skyrocket. The division represents the state in São Paulo city and immediately surrounding areas, while coordinating the work of specialized and non-specialized state attorneys across the state. Specialized knowledge was then combined with more interorganizational cooperation on legal defenses. Vasconcelos (2018) shows through qualitative work, especially interviews with key actors, that one of the very first initiatives from the health law division was to put all division attorneys in vans and give them "a tour" through the public health care system in São Paulo city. Given the very unequal reality of healthcare offer in Brazil and in São Paulo, most of these public officials were used to healthcare provided by private hospitals and had terribly negative preconceived notions of the public system. The effect of these visits was to revert many of these prejudices⁹.

Another strategy was that of pairing up local health authorities throughout the state with a state attorney based in the same geographical precinct or one close by. The São Paulo city's team, formed by health division attorneys and CODES, started organizing local visits when they would invite countryside state attorneys and health officials to seat together and get to know each other while discussing health litigation in the area. This initiative, called by the team an "institutional marriage", was expected to build bridges for potential cooperation between offices that normally work separately during a legal procedure, rarely meeting in person, especially given the potentially long distances that separate offices in the state countryside (Vasconcelos, 2018, p.119).

Collaboration and geographical proximity

Since collaboration is a common trace of these post-litigation initiatives, it begs the question of whether more coordination and cooperation are affecting health litigation numbers. The literature on interorganizational collaboration teaches us that although collaboration might be often argued as the "holy grail" go-to solution to any public policy

⁹As one of the interviewees points out: "In the first week of operation of PJ 8, 8th sub-attorneys specialized in public health, we set up a meeting at the door of the building and two vans of the [health] secretariat appeared. The procuradores [state attorneys] were invited to enter the vans, so that we could know the pharmaceutical assistance of the SUS. A lot of people got their noses a little crooked, people snorting, but they all went. It was their first big ride into the system. At the end of the day, everyone was loving it. So we went to see from the pharmacy of the specialized component, we went through the assistance provided by the municipality, a UBS [unit for primary health assistance], and we then arrived at a unit that provided medicines ordered through legal action" (Vasconcelos, 2018, p.112)

problem (Peters, 1998), it is easier said than done (Bryson et al., 2006) and even harder to measure.

Interorganizational collaboration, especially between policy makers, is frequently an informal endeavor. As argued McNamara (McNamara, 2012), the first steps of collaboration start with decisions to cooperate, when organizations recognize “opportunities to share information, build capacity, or generate synergy” (McNamara, 2012, p.392). These efforts are largely informal, highly dependent on individuals within the organizations and short-termed. They can evolve, however, to more formalized interactions, assuming that both organizations want to embrace the pros and cons of creating stronger ties: if they exchange and stabilize these partnerships, they also lose the flexibility and plasticity of early forms of cooperation.

The nature of the problem is also an important factor that determine these decisions on whether to collaborate and how. Collaboration is more frequently associated with problems of a “tricky” nature, that often prove to be harder or impossible to solve by acting solely (Gray, 1989). Health litigation is one of such problems: its causes are associated with not only the acts or inefficiencies of the public administration, but often with the pressure for new and more expensive pharmaceutical technologies (Kapczynski, 2019). Moreover, it is a problem that necessarily involves more than one organization, as it happens through the court system and involves most of its actors – public and private lawyers, state attorneys, judges, public prosecutors – but originates from the public administration and its relation with citizens, involving public policy officials, healthcare authorities and patients.

However, even in the face of a tricky problem, cooperation might not happen. Other incentives to participate and stay in the collaboration need to be present. Ansell and Gash (2008) argue that trust and good-faith communication between the parts are an essential trace to most successful collaborations, both as a starting condition (in the case a prehistory of collaboration that might build or incentivize trust between the parts) and as a central feature of the collaboration process. Trust and good faith require face-to-face dialogue. The authors argue that collaborative governance requires face-to-face dialogue between stakeholders, as part of a “thick communication” that aims at consensus. It is “at the core of the process of breaking down stereotypes and other barriers to communication that prevent exploration of mutual gains in the first place” and “at the heart of a process

of building trust, mutual respect, shared understanding, and commitment to the process” (Ansell & Gash, 2008, p.16).

The literature on interorganizational collaboration has argued that physical or geographical proximity can help developing this thick and trustful communication and facilitate social proximity (Hansen, 2015; Knoblen & Oerlemans, 2006; Steinmo & Rasmussen, 2016; Torre & Gilly, 2000). It also helps fostering all other forms of proximity that characterize collaboration, such as cognitive, organizational, and institutional (Boschma, 2005), even if it does not determine collaboration alone. The logic behind it is that small distances help bringing organizations closer together, favoring “interaction with a high level of information richness” and facilitating “the exchange of, especially tacit, knowledge between actors” (Knoblen & Oerlemans, 2006). Even in a digital era where much of the communication and interaction happens online, face-to-face relations might be of central importance in establishing cooperation, even if this geographical proximity is temporary (through meetings and short visits, for example) (Torre & Rallet, 2005).

2.3 Methodology

What are the effects of collaboration strategies over health litigation? To answer this question, we look at cooperation between state attorneys and health authorities in the state of São Paulo and depart from a simple assumption: we consider that geographical proximity might be a proxy for collaboration. Given the informal ties between state attorneys and health authorities across states, making it difficult to observe collaboration or measure it directly, we assume that the closer state attorneys and health departments are, the higher are their chances for interaction which, consequently, increases the flow of technical information from one public institution to the other. This idea is similar to those presented by Morgan and de Ville de Goyet (2005): for complex, ambiguous knowledge virtual proximity does not substitute physical proximity and, more importantly, to create cooperation, face-to-face interactions are essential. Hence, in this paper we use the distance between state attorneys and health authorities as a measure of the collaboration between these two organizations and investigate its effect on judicial decisions on healthcare cases. A shorter distance allows state attorneys and health authorities to collaborate more and build better and more technical defenses in lawsuits, improving

their chances of success. Moreover, these shorter distances also allow for state attorneys and health officials to appear more frequently before courts and consult personally with judges, explaining their cases in their chambers and helping courts decide in their favor. More than better defenses, state attorneys and health officials can work strategically and choose which cases deserve more attention than others.

2.3.1 Data

This paper relies on an original dataset, created from data extracted of Azevedo et al. (2019), a research report published by the National Council of Justice that assess health litigation in Brazil from 2008 to 2017. As explained in Azevedo et al. (2019), most of the report’s data was scrapped from state and federal courts’ electronic repositories of precedents and decisions¹⁰ and categorized based on four main variables: date of the decision, the decision’s text, the parties involved (i.e., who filed the suit and against whom), and the final outcome (who won). This original dataset was reviewed and complemented with information provided by the courts upon legal request (based on the open records law – Law n. 12.527/2011 or “Lei de Acesso à Informação”).

This paper focuses only on health litigation within the State of São Paulo, to where the database is more reliable. Also, as per Vasconcelos (2018), in the state of São Paulo there have been some initiatives of collaboration between state attorneys and health authorities. The authors were also able to collect additional data on the individual judges through the São Paulo State Court of Appeal website. Combining all information gathered, the final dataset for this paper contains 15,231 lawsuits, decided between 2008 and 2017 by single judges from the São Paulo state justice system.

In addition to the decisions’ and judges’ data, we collected information on the organizations that compose the heart of this study: the state attorneys’ office and the regional health departments. The state attorneys’ office in São Paulo (“Procuradoria Geral do Estado” or PGE) is administratively divided into twelve regional offices and

¹⁰It is important to note that existing studies using legal cases are mostly based on original databases, as access to public and reliable information on legal cases is quite difficult. The majority of studies relies on the analysis of hundreds of cases by researchers who read the contents of the legal documents of healthcare cases. Azevedo et al. (2019) innovated by using technology to download decisions and gather information automatically using natural language processing and text analysis, which allowed for a more extensive dataset.

additional subdivisions (“seccionais”) with a delimited geographic area of competence¹¹. These divisions are not the same as the one that organizes São Paulo’s health department (“Secretaria de Estado da Saúde de São Paulo” or SES), which is administratively divided into seventeen regional departments of health (“Departamentos Regionais de Saúde” or DRS)¹². Finally, the state judicial system has also an administrative division, that is different from the other two: there are 319 judiciary districts (“comarcas”)¹³, 57 judiciary circuits (“Circunscrições Judiciárias”) and 10 judicial administrative regions (“Regiões Administrativas Judiciárias”)¹⁴. Each comarca has one or more judges responsible for legal cases of that district in different areas of law. Some comarcas might have specialized judges for criminal law, private law and for civil cases that involve the state government (state treasure courts).

2.3.2 Variables

Our dependent variable is the final decision for each judicial case of our dataset (our unit of observation is, therefore, a judicial case). This information was obtained from Azevedo et al. (2019), whereby text analysis and regular expressions was used to determine if the judicial decision was made in favor of claimant or defendant¹⁵. This paper defines only two possible outcomes: “in favor” of claimant (under the “claim win” variable = 1), and otherwise¹⁶. Only decisions totally in favor of claimant were considered “in favor” of claimant, since for the cases decided partially in favor of claimant, we do not know to which extent the main petitioner’s main claim was granted or denied. This is a conservative approach that allows us to avoid including decisions that were not actually in favor of

¹¹http://www.pge.sp.gov.br/Endereco/ENCARTE_ENDERECOS_TELEFONES_UTEIS_PGE.pdf

¹²<http://homologacaoportal.saude.sp.gov.br/ses/institucional/departamentos-regionais-de-saude/?page=1>, last visited on December 26, 2020.

¹³<https://www.tjsp.jus.br/PrimeiraInstancia>, last access on December 26, 2020.

¹⁴<https://www.tjsp.jus.br/QuemSomos/QuemSomos/RegioesAdministrativasJudiciarias>, last visited on December 26, 2020.

¹⁵The code used in Azevedo et al. (2019) to classify the decision texts was written in Python and is available at: https://gitlab.com/danilopcarlotti/pesquisas/-/blob/master/common_nlp/parserTextoJuridico.py, last visited on December 26, 2020.

¹⁶In Azevedo et al. (2019) cases were classified as follows: if the judge granted claimant all that had been claimed, the case was classified as totally in favor of claimant and numbered 3; if the judge denied any of the claims, no matter which (including procedural issues, deadlines, fine values, etc.), the case was classified as partially in favor of claimant and the outcome numbered 2; finally, for cases where all claims were denied and the judge ruled totally against the claimant, the case outcome was numbered 1. Decisions to extinguish the case represented very few judicial cases from the total and were dropped from the dataset used in this paper because they are uninformative as whether the judge favored one or the other party.

claimants.

The main variable of interest in this study is the distance between state attorneys' offices and regional departments of health. This variable was measured by creating a database with the addresses of each PGE office (including subsections) and each DRS. Also, we gathered the addresses of all judiciary districts in the State of São Paulo. Using all these addresses and the software QGiz to apply Google georeferencing tool, we mapped all courts, state attorneys' regional (PGE) offices and regional health departments (DRS) in the state of São Paulo and computed the distance in kilometers between each of them¹⁷. Figure 1 below presents São Paulo's state map, identifying each of the organizations' offices (PGE, DRS and court).

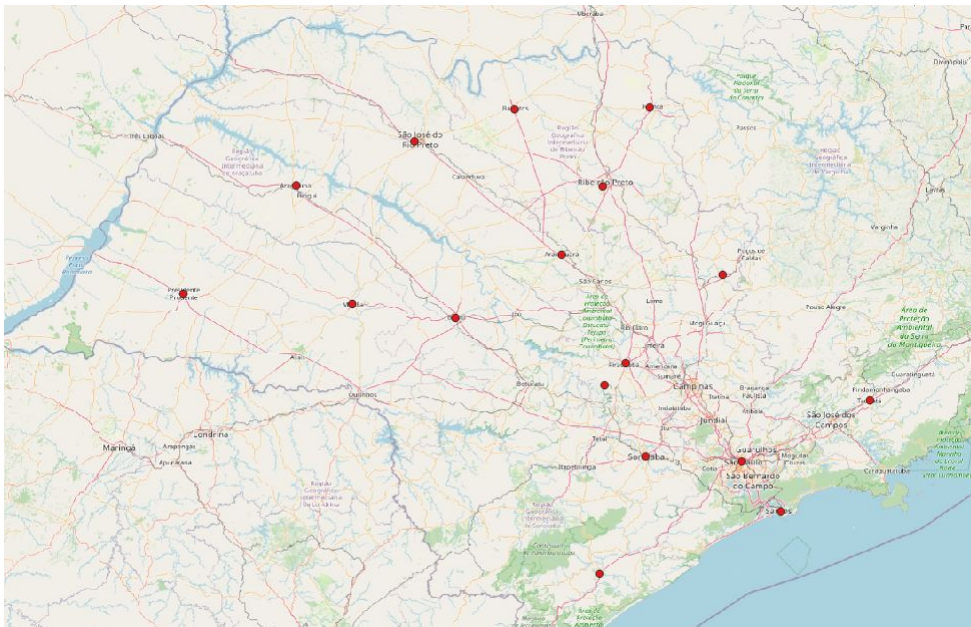


Figure 2.1: Regional Departments of Health (DRS)

¹⁷All distance measures are the linear distance between two points (addresses of PGE regional office and DRS regional office) and do not account for actual travel time or local transport options, such as airports, motorways, etc.

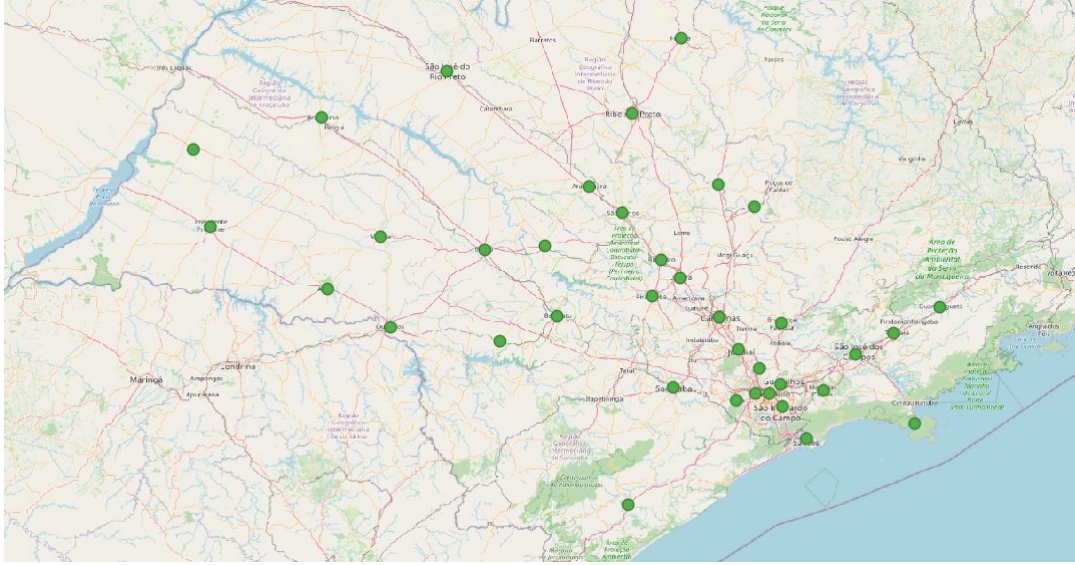


Figure 2.2: State attorneys' Offices (PGE)

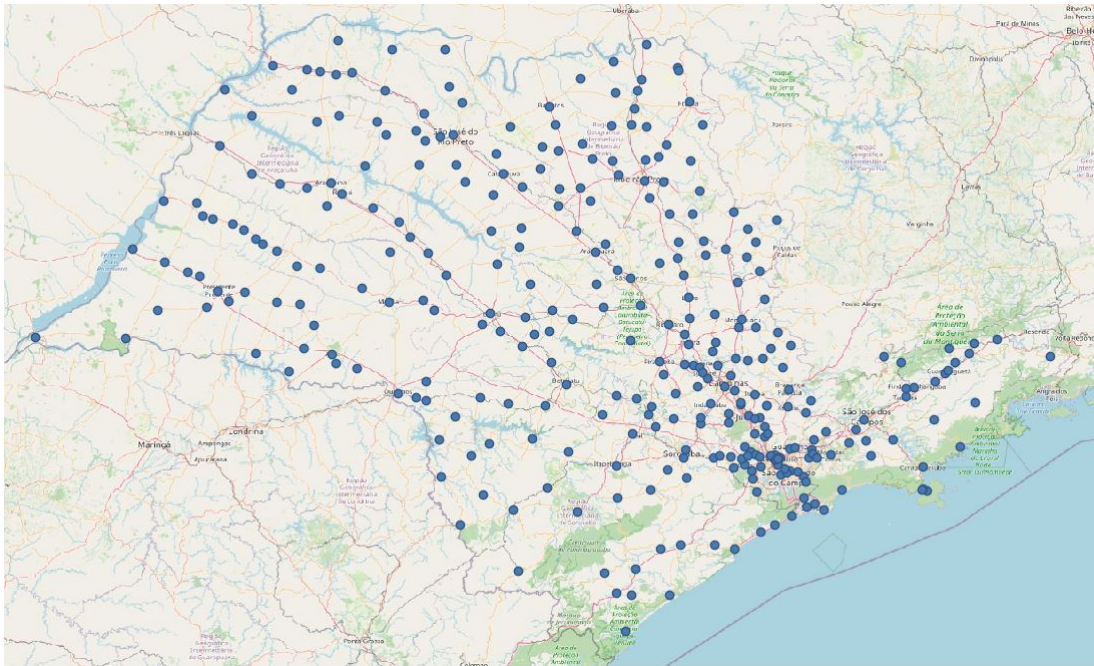


Figure 2.3: Courts

For each observation in our dataset, we assigned the respective PGE and DRS that were competent to deal with cases in the city where the conflict had been judicialized. This allowed us to identify the distances between PGE and DRS offices involved in each case, as well as the distance (in km) between each PGE office and the local court. The geographical distance in this paper plays the role of a good proxy for collaboration initiatives between actors in healthcare litigation, as we discussed in the previous section. Control variables in our model are:

- the effect of specialization in administrative law and health law. We created a dummy variable for the presence of a specialized state treasure court¹⁸ in the local comarca, which is normally responsible for only deciding cases involving the state public administration (here noted as pub.court). The assumption here is that the more specialized a court is, it will more likely decide in favor of health authorities, considering that claimants cases are often presented with little or no evidence (Wang et al., 2020).
- the experience of judges with health law cases, measured here by the number of health law cases each judge had decided (within the database) up to the date of the decision under analysis (health.exp). The assumption here is similar to the one above, i.e., more specialized judges are more likely to decide in favor of health authorities.
- the experience of judges in general, measured by the number of days each judge had on the bench up to the decision date (general.exp). The assumption here is that more experienced judges in general might be less aware of the systemic and redistributive effects of their decisions and be more in favor of claimants, while younger judges bring to the court a broader and more multidisciplinary understanding of law.
- the time of the dispute measured by the number of days that each case has lasted in the Judiciary. The assumption here is that the longer a case, the more complicated it might have been its decision-making procedure, as of involving more time for the production of evidence.
- the case’s subject classification, according to the National Council of Justice¹⁹. The assumption here is that the type of health law case might affect the decision.

Finally, the number of cases originated from the metropolitan region of the state of São Paulo greatly affect the results for the entire dataset, as the region concentrate the

¹⁸State treasure courts (“varas da fazenda pública”) are special divisions within the state court system that decide civil cases involving the state government.

¹⁹CNJ classifies healthcare cases into three categories, depending on the case subject: (i) healthcare plans; (ii) health services and (iii) health. See: https://www.cnj.jus.br/sgt/versoes.php?tipo_tabela=A, last visited on December 26, 2020. This classification has changed many times over the years. It is expected that cases classified as “health plans” involve demands between private insurance companies and their clients, which might not exclude public health authorities and state attorney’s representation (such as cases that involve the transfer and reimbursement of patients between private and public facilities).

vast majority of lawsuits and has closer DRS and PGE offices. As can be seen in the descriptive statistics presented in Table 1 and Table 2, the average distance between the state attorneys' office and the regional department of health increases from 9.28km to 28.38km when the metropolitan region is excluded. Similarly, the average distance between the state attorneys' office and the court is also much higher when we exclude the metropolitan region from the dataset (32.09km). This is an important aspect considered in the estimations.

Table 2.1: Descriptive Statistics - complete database

Variable	No	Yes	Total
Decision outcome (in favor of claimant)	11,167	4,065	15,232
Public Court	2,415	12,817	15,232

Variable	Obs	Mean	Std. Dev.	Min
Distance PGE DRS (km)	15,232	9.28	24.87	0.23
Distance PGE Court (km)	15,232	14.62	25.44	0.29
Duration (days)	15,232	258.48	284.05	2.00

Source: Original

Table 2.2: Descriptive Statistics - excluding the metropolitan region of São Paulo

Variable	No	Yes	Total
Decision outcome (in favor of claimant)	3,789	1,031	4,82
Public Court	2,006	2,814	4,82

Variable	Obs	Mean	Std. Dev.	Min	Max
Distance PGE DRS (km)	4,82	28.38	37.59	0.23	172.50
Distance PGE Court (km)	4,82	32.09	38.50	0.29	527.16
Duration (days)	4,82	279.49	312.90	2.00	3,132.00
General Experience	4,82	5,442.59	2,646.83	80.00	14,048.00
Health Experience	4,82	16.98	30.39	1.00	224.00

Source: Original

2.4 Empirical Strategy

To test our hypothesis considering our variables as described above, we use a logit probability model (binary outcome) in three specifications. The first was a restricted model, only with the independent variable of interest and the distance between state attorneys' offices and the Court. This specification helps to separate possible effects over judicial decisions from the state attorneys' office having greater access to the Court and, hence, possibly interacting more with judges in each case. In the second specification we add all of our control variables, while also controlling for the pairs of DRS-PGE that should interact in accordance to their geographical administrative divisions. This control (done through dummies for each pair) helps capturing local or geographical specificities that might affect collaboration. Finally, in the third specification, we ran the most unrestricted model, including controls for the year of each decision as a fixed effect.

The logit specification is presented below:

$$P(\textit{claim_win}_t = 1) = \frac{1}{1 + \exp(-\beta_1 \cdot \textit{dist.PGE_DRS} - \beta_2 \cdot \textit{dist.PGE_Court} - X_i \cdot \beta)}$$

Where:

$$X_i = \{\textit{pub.court}, \textit{health.exp}, \textit{general.exp}, \textit{duration}, \textit{subject}\}$$

Although dummies for each pair of state attorneys' office and regional health department may capture part of the collaboration effect, they are expected to explain many other unobservable aspects that influence the local public healthcare policy. It is also important to point out that unobservable characteristics of each judge, as well as unobservable aspects related to each city can have relevant effects on cases' outcomes. Hence, all estimations have been done considering errors clustered by judge and city²⁰.

Another noteworthy point is that the metropolitan region of São Paulo has the largest number of cases and only one pair of PGE-DRS. Consequently, we have no variability of our main independent variable for a great number of cases, which can be biasing our estimation. To address this problem, we also estimate the model for a smaller set of

²⁰Large number of judges makes the estimation of judge fixed effects impossible. The same stands for city fixed effects.

observations (4,802) which exclude all cases from the metropolitan region of São Paulo²¹.

For robustness, we also ran a linear probability model and a probit, with the same three specifications described above. Additionally, we ran the model only for the countryside (excluding the metropolitan region of São Paulo) and considering just cases where the subject was classified as health or hospital services (excluded cases that supposedly discuss health plan, as they are expected to be related only to the private healthcare system). This is, nonetheless, a conservative approach, as there are probably cases involving the public system but with the subject classified as health plan. Subject classification has changed many times during the analyzed period and, consequently, relying only on said classification to differentiate between public and private health systems is not a solid strategy.

2.5 Results

Results from the logit models indicate that the geographical distance between state attorneys' offices and regional health departments are positively correlated with the probability of a decision in favor of the claimant. This result is statistically significant at a 5% level of significance. This means that the further away the organizations are, the higher the chances of a decision in favor of claimant. Not only the effect is significant, but it is also strong: each additional kilometer between PGE and DRS adds 1.185 percentage points the chances of a decision in favor of claimants (Table 2.3)²². This effect is even stronger when we exclude the metropolitan region of São Paulo from the database, raising by 1.526 percentage points the probability (Table 2.4).

Similarly, a greater distance between the state attorneys' office and the court also has a positive impact: each extra 1km between the PGE's office and the court, adds 0.0876 percentage points to the probability of a decision in favor of claimants (Table 2.4).

²¹The metropolitan region of São Paulo is composed of 39 cities, as listed in <https://cetesb.sp.gov.br/licenciamentoambiental/licenca-previa-documentacao-necessaria/municipios-que-fazem-parte-regiao-metropolitana-de-sao-paulo/>, last visited on December 26, 2020.

²²Marginal effects reported in this paper are the average marginal effects, calculated in Stata 15 using the `margins, dydx()` command.

Table 2.3: Results: Logit Margins (including metropolitan region of São Paulo)

Variables	Margins		
	(1)	(2)	(3)
distance PGE-DRS in km	-0.000416 (0.000342)	1.150** (0.581)	1.185** (0.584)
distance PGE-Court in km	-0.000395 (0.000390)	0.000650* (0.000372)	0.000648* (0.000366)
pub.court		0.0935*** (0.0294)	0.0985*** (0.0288)
health.exp		-0.000107 (0.000377)	-0.000402 (0.000430)
general.exp		-5.54e-06* (3.27e-06)	-5.81e-06* (3.26e-06)
duration		4.46e-05** (1.75e-05)	3.79e-05** (1.70e-05)
Observations	15,232	15,209	15,208
Controls	NO	YES	YES
Pair FE	NO	YES	YES
Year FE	NO	NO	YES
Pseudo R2	0.00123	0.0348	0.0361
Wald	0.122	0.00307	0.00158

Robust standard errors in parentheses

*** p<0.01. ** p<0.05. * p<0.1

Source: original.

Table 2.4: Results: Logit Margins (without the metropolitan region of São Paulo)

Variables	Margins		
	Logit (1)	Logit (2)	Logit (3)
distance PGE-DRS in km	0.000219 (0.000340)	1.501*** (0.527)	1.526*** (0.528)
distance PGE-Court in km	0.000183 (0.000329)	0.000887** (0.000355)	0.000876** (0.000345)
pub.court		0.129*** (0.0344)	0.129*** (0.0342)
health.exp		-0.000986 (0.000626)	-0.00114* (0.000599)
general.exp		8.60e-07 (4.26e-06)	6.38e-07 (4.27e-06)
duration		2.39e-05 (2.49e-05)	2.39e-05 (2.48e-05)
Observations	4,82	4,802	4,802
Controls	NO	YES	YES
Pair FE	NO	YES	YES
Year FE	NO	NO	YES
Pseudo R2	0.000904	0.0910	0.0932
Wald	0.691	0.00146	0.000747

Robust standard errors in parentheses

*** p<0.01. ** p<0.05. * p<0.1

Source: Original

As discussed before, one would expect that more specialization would be correlated to more decisions in favor of public authorities. What we find in the models, however, is a positive effect: more specialization appears to be correlated with more decisions in favor of claimants, which seems counterintuitive.

Considering only results from the restricted model without the metropolitan region of São Paulo, no significant effect is found for the judge's experience on the bench or the duration of the case, but there is a slightly significant and negative effect (10% significance level in the restricted model) when we control for the judge's prior experience with healthcare cases, meaning that judges more experienced in health law tend to decide against claimants.

It is also interesting to point out that many of the pairs PGE-DRS have significant

effects, which could be due to specific aspects of the regions and local public policies happening where each pair operates.

Both the linear probability model and the probit, ran for robustness purposes, corroborate our results: there is a higher probability of judicial decision in favor of claimants the wider the distance between a state attorneys' office and its regional health department. These results are positively significant even when we exclude the metropolitan region of São Paulo from the database. The result also seems to hold under the most conservative robustness check: even for the logit using only countryside data and excluding cases where the CNJ subject is classified only as "health plans", the higher the distance, the more probable is a decision in favor of claimant. The significance level, however, falls considerably (significant at 12%)²³.

2.6 Discussion

The tendency towards coordination between organizations and actors involved in health litigation seems to be based in sound expectations. The closer lawyers and clients are, the higher are their chances of success before courts. This result might indicate that behind physical proximity there might be other forces at work. As we mentioned above, the literature on interorganizational collaboration has long tested the effect of distance and face-to-face interactions into the odds of starting a trustful collaboration and making it last.

But distance might also interfere in the relationship state attorneys and health authorities have with the court. As showed by evidence, the closer these pairs are to the judges where cases are being trialed, the higher are the chances of success. The overload of courts' dockets in São Paulo might explain the need for in person communication. First instance judges are often overworked²⁴, dealing with repetitive cases to which they devise

²³Due to the small number of cases that the subject is not classified as "health plans", the estimation from this robustness check is done with only 1,747 observations, so we also had to exclude the pair fixed effects as they represented a large number of dummies and were compromising the estimation.

²⁴As per analysis made by the National Justice Council, the first instance concentrates 94% of the judicial cases (<https://www.cnj.jus.br/painel-facilita-acompanhar-politica-para-o-1o-grau-de-jurisducao/>, access on December 30, 2020). For the State of São Paulo in 2019, while the case load for first instance judges was of 11,699.03, for second instance judges it was of only 3,617.20 (information available at: https://painis.cnj.jus.br/QvAJAXZfc/opendoc.htm?document=qvw_1\%2FPainelCNJ.qvw&host=QVS\%40neodimio03&anonymous=true&sheet=shResumoDespFT, access on December 30, 2020).

decisions templates depending on the topic²⁵. Often health litigation falls into this kind of repetitive judgement, mostly in favor of claimants regardless of what is requested. Being close to court and presenting a defense in person before the trial judge might change the perception of the court and ask for a more detailed assessment of the case²⁶. Also, presenting a single unite front where state attorneys and health officials join forces increases the chances of having a case dismissed or revert non-favorable injunctions. Geographical proximity, hence, becomes a central part of day-to-day life of the court, a common habit of most lawyers who “visit” their cases constantly.

The relationship between geographical distance and judicial decisions invites a concurrent explication to that of coordination between state attorneys and public health officials. It can be argued that the results are explained by the effect of better and more specialized professionals located in bigger cities or lesser rural areas. The fact that health authorities, state lawyers and courts are physically closer might indicate that these organizations are in bigger or more developed cities, attracting better judges, lawyers and public health officials. However, our model deals with this possibility by adding dummies for each pair DRS-PGE, which consubstantiate effects from the geographical area where the pair operates, as well as fixed aspects related to the pair itself (as may be the quality of the professionals in the PGE). Additionally, clusterizing the errors by comarca and judge also helps alleviating estimation problems due to the unobserved characteristics of the court, cities and legal professionals from where the demand is being decided.

Moreover, specialized courts are not correlated with more wins to the government, but on the contrary, where there was a specialized court the chances would suddenly be against health authorities. This result allows to question the impact of specialization within the court system and in health litigation numbers. It has been argued that specialized courts could improve the quality and level of technical assessment of health law cases. The findings here suggest that this specialization needs at least to move beyond general administrative law.

²⁵The use of standardized decisions by São Paulo’s State Court of Appeals (TJSP) has even been recently discussed and disapproved by the Superior Justice Court (STJ). See: <https://www.conjur.com.br/2020-nov-26/stj-anula-ordem-tj-sp-delegava-decisao-padronizada-juiz>, access on December 30, 2020.

²⁶The national council of justice has decided that judges cannot refuse to receive a lawyer into their chambers. See https://www.conjur.com.br/2007-ago-08/juiz_ao_recusar_receber_advogado_reafirma_cnj, last visited 30/12/2020.

2.7 Conclusion

The relevance of health litigation has long been reported by public authorities around the world and studied by the literature. Brazil is one example of a country with very high levels of litigation regarding healthcare policies, where decisions are mostly in favor of the claimants. Although there have been several initiatives proposed by the National Council of Justice to address the problem, it is a topic that involves several actors, from different organizations, so important improvements depend on the collaboration between these organizations. However, interorganizational collaboration is not a simple endeavor (Bryson et al., 2006) and depends on the parties involved being open to cooperate, on the nature of the problem and on other incentives to participate and to stay in the collaboration. In this paper we use geographical proximity as a proxy for collaboration between health departments and state attorneys in health litigation cases in São Paulo state. Based on qualitative evidence from the literature (de Souza, 2016; Teixeira, 2011; Vasconcelos, 2018) we assume that these institutions have incentives to join forces in order to increase their chances of having a case decided against claimants. Results from a logit model using healthcare cases from the State of São Paulo indicate that the closer these organizations are, the higher are their chances of success before courts, even when we control for other aspects that might influence judicial decisions or legal cases. These results are robust in other models, and even in a more restricted dataset. Using geographical proximity as a proxy to collaboration is a limitation of this study. However, measuring collaboration is overall a particularly hard endeavor as many decisive aspects of the phenomenon are informal or happening behind closed doors. Moreover, the literature recognizes that geographical proximity can help developing cooperation between organizations by facilitating communication and social proximity (Hansen, 2015; Knoben & Oerlemans, 2006; Steinmo & Rasmussen, 2016; Torre & Gilly, 2000). In the case of the state of São Paulo, the connections between state attorneys and public officials are formal only before the Court, within the client-lawyer relationship. Beyond that, they remain informal, although mapped and discussed by the literature through qualitative work. This paper's findings help shed light on the effects of health litigation over the organization and strategies of bureaucracies and state actors. Moreover, it adds evidence to the literature that sustains that local proximity is a relevant aspect of interorgani-

zational collaboration and its success. This paper also presents some practical insights for public policy as it indicates that straightening the ties (figuratively and physically) between health departments and state attorneys could have a positive effect over health litigation.

2.8 Appendix

2.8.1 Estimation Results: miscellaneous

Table B.1: Results: Logit Coefficients (including metropolitan region of São Paulo)

Variables	Coefficients		
	(1)	(2)	(3)
distance PGE-DRS in km	-0.00213 (0.00175)	6.089** (3.077)	6.281** (3.102)
distance PGE-Court in km	-0.00202 (0.00199)	0.00344* (0.00197)	0.00344* (0.00194)
pub.court		0.495*** (0.156)	0.522*** (0.153)
health.exp		-0.000564 (0.00200)	-0.00213 (0.00230)
general.exp		-2.93e-05* (1.73e-05)	-3.08e-05* (1.73e-05)
duration		0.000236** (9.34e-05)	0.000201** (9.08e-05)
cod_subjct = 2. health		-1.488*** (0.247)	-1.492*** (0.244)
cod_subjct = 3. hospital services		-0.635*** (0.169)	-0.630*** (0.164)
Constant	-0.963*** (0.0589)	-3.644*** (1.294)	-3.054 (1.989)
Observations	15.232	15.209	15.208
Controls	NO	YES	YES
Pair FE	NO	YES	YES
Year FE	NO	NO	YES
Pseudo R2	0.00123	0.0348	0.0361
Wald	0.122	0.00307	0.00158

Source: elaborated by the author, using Stata 15.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table B.2: Results: Logit Coefficients (without the metropolitan region of São Paulo)

Variables	Coefficients		
	(1)	(2)	(3)
distance PGE-DRS in km	0.00130 (0.00204)	9.779*** (3.467)	9.974*** (3.484)
distance PGE-Court in km	0.00109 (0.00197)	0.00578** (0.00231)	0.00573** (0.00225)
pub.court		0.840*** (0.227)	0.846*** (0.226)
health.exp		-0.00643 (0.00413)	-0.00742* (0.00397)
general.exp		5.61e-06 (2.77e-05)	4.17e-06 (2.79e-05)
duration		0.000156 (0.000163)	0.000156 (0.000163)
cod_subjet = 2. saude		-1.596*** (0.281)	-1.579*** (0.279)
cod_subjet = 3. servicios hospitalares		-1.040*** (0.240)	-1.045*** (0.243)
Constant	-1.375*** (0.147)	-3.212*** (0.908)	-4.198*** (1.027)
Observations	4.820	4.802	4.802
Controls	NO	YES	YES
Pair FE	NO	YES	YES
Year FE	NO	NO	YES
Pseudo R2	0.000904	0.0910	0.0932
Wald	0.691	0.00146	0.000747

Source: elaborated by the author, using Stata 15.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

2.8.2 Robustness Checks

Table B.3: Robustness Checks: linear probability model and probit model (including metropolitan region of São Paulo)

Variables	MARGINS (1)		MARGINS (2)		MARGINS (3)	
	LPM	Probit	LPM	Probit	LPM	Probit
distance PGE-DRS in km	-0.000397 (0.000305)	-0.000428 (0.000328)	1.057* (0.551)	1.079* (0.569)	1.082* (0.556)	1.115* (0.573)
distance PGE-Court in km	-0.000361 (0.000335)	-0.000359 (0.000344)	0.000626* (0.000359)	0.000666* (0.000375)	0.000619* (0.000364)	0.000665* (0.000373)
pub.court			0.0845*** (0.0243)	0.0912*** (0.0279)	0.0887*** (0.0240)	0.0962*** (0.0275)
health.exp			-9.86e-05 (0.000335)	-0.000147 (0.000365)	-0.000351 (0.000373)	-0.000438 (0.000416)
general.exp			-5.66e-06* (3.33e-06)	-5.53e-06* (3.22e-06)	-6.00e-06* (3.33e-06)	-5.83e-06* (3.22e-06)
duration			4.64e-05** (1.91e-05)	4.59e-05*** (1.77e-05)	4.01e-05** (1.85e-05)	3.94e-05** (1.72e-05)
Observations	15.232	15.232	15.232	15.209	15.232	15.208
Controls	NO	NO	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	YES	YES
Pseudo R2	0.00136	0.00121	0.0351	0.0354	0.0367	0.0367
Wald	0.0927	0.113	0.00167	0.00218	0.000870	0.00111

Source: elaborated by the author, using Stata 15.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table B.4: Robustness Checks: linear probability model and probit model (without the metropolitan region of São Paulo)

Variables	MARGINS (1)		MARGINS (2)		MARGINS (3)	
	LPM	Probit	LPM	Probit	LPM	Probit
distance PGE-DRS in km	0.000223 (0.000355)	0.000227 (0.000346)	1.530*** (0.593)	1.447*** (0.520)	1.562*** (0.592)	1.474*** (0.520)
distance PGE-Court in km	0.000191 (0.000357)	0.000180 (0.000326)	0.000953*** (0.000337)	0.000893*** (0.000330)	0.000948*** (0.000337)	0.000886*** (0.000325)
pub.court			0.126*** (0.0328)	0.127*** (0.0324)	0.127*** (0.0328)	0.128*** (0.0322)
health.exp			-0.000608* (0.000366)	-0.000945* (0.000499)	-0.000672* (0.000346)	-0.00107** (0.000471)
general.exp			6.73e-07 (4.62e-06)	5.10e-07 (4.12e-06)	3.83e-07 (4.70e-06)	2.89e-07 (4.14e-06)
duration			2.57e-05 (2.99e-05)	2.59e-05 (2.52e-05)	2.55e-05 (2.97e-05)	2.58e-05 (2.50e-05)
Observations	4.820	4.820	4.820	4.802	4.820	4.802
Controls	NO	NO	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	YES	YES
R2 or Pseudo R2	0.000956	0.000911	0.0876	0.0929	0.0896	0.0951
Wald	0.696	0.695	0.000245	0.000527	0.000172	0.000247

Source: elaborated by the author, using Stata 15.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table B.5: Robustness Checks: logit model with restricted data (without the metropolitan region of São Paulo and excluding cases with subject classified as “health plan”)

Variables	Logit 1		Logit 2	
	Coeff	Margins	Coeff	Margins
distance PGE-DRS in km	0.0116*	0.000924	0.0121*	0.000912
	(0.00666)	(0.000628)	(0.00730)	(0.000629)
distance PGE-Court in km	-0.0117	-0.000930	-0.00441	-0.000332
	(0.00868)	(0.000787)	(0.00704)	(0.000536)
pub.court			1.574***	0.119**
			(0.535)	(0.0513)
health.exp			-0.00526	-0.000397
			(0.00428)	(0.000298)
general.exp			-0.000132**	-9.96e-06**
			(6.36e-05)	(5.01e-06)
duration			0.00151***	0.000113**
			(0.000565)	(4.57e-05)
Constant	-2.320***		-3.056***	
	(0.303)		(0.620)	
Observations	1,752	1,752	1,747	1,747
Controls	NO	NO	YES	YES
Pair dummies	NO	NO	NO	NO
Year FE	NO	NO	YES	YES
Pseudo R2	0.0232		0.0920	
Wald	0.218		3.23e-06	

Source: elaborated by the author, using Stata 15.

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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Quantitative Empirical Legal Research: Difficulties and Opportunities

Abstract¹

Empirical legal research has been improving in a fast pace using machine learning and statistical approach to rationalize the data. But in Brazil those studies are still focusing mostly in qualitative approach, using very few quantitative data and discussing legal dogmatic and hermeneutic. Observing very few studies advancing in the trend of legal research in United States, this paper acknowledges some empirical bias and facts in legal databases in Brazil and contextualize some helpful methods to identify phenomena and relationships in legal research as an incentive for researchers to explore tools from others social sciences and computer science to improve the quantitative and qualitative legal research.

3.1 Introduction

Empirical research is not something new for social sciences. For centuries we have psychologists, sociologists and social scientists producing interesting and very relevant empirical research. In law, however, empirical research has for long been confined to a not so recognized position among legal professionals, with few case studies and mostly in the form of opinions. Scientific empirical legal research, based on solid methodology to

¹This chapter was written in collaboration with with Henrique Y. J. Wang.

test hypothesis clearly posed by researchers, is a much more recent phenomenon (Epstein & King, 2002; Kritzer, 2010; Veronese, 2007). Quantitative empirical legal research is even more recent. It has been growing around the world especially since the 2000's. Technology advances helped researchers access judicial decisions and courts increased internal control using statistical data, allowing legal researchers to apply quantitative analysis. At the same time, courts took on a much more prominent role in modern society, so studying impacts of courts on society and the economy became something of interest and high importance.

But how can a legal researcher check whether specialized courts are more efficient than non-specialized ones? Society in general does not provide a controlled environment for social scientists such as legal researchers, so they either have to run lab experiments (Mittlaender, 2019), or they have to work with observational data. In this context, having domain of statistical tools is very important to overcome data problems and estimation difficulties, especially in order to find causal relationships. These aspects were rarely debated in empirical legal research in most parts of the world. In the US, Epstein and King (2002) reported this problem and since then empirical legal research has been improving, but in other countries, such as Brazil, there still much to be developed with respect to quantitative techniques being applied to legal research.

There are some very relevant methodological difficulties that empirical legal researchers must face, from access to structured data to applying the correct treatments, from lack of financing to lack of recognition from his peers and a great difficulty to communicate with the legal community. According to Horta and Costa (2020), Brazilian legal researchers conducting quantitative empirical studies must also face a prejudice from the local legal community, that is mostly focused on legal reasoning and legal hermeneutics². But relying on the increasing importance that the Judiciary has been taking and considering the evolution of other fields such as economics on dealing with statistical problems in observational data analysis, quantitative empirical legal research is expected to increase all around the world.

In order to develop the field, it is important to acknowledge the current problems and where empirical legal research can improve. This paper aims to contribute to the development and improvement of the field by pointing out some of the fragilities of cur-

²Horta and Costa (2020, p.98)

rent research and proposing the application of some econometric strategies to improve analysis. It starts presenting a general overview of empirical legal research in Section 3.2. Then, Section 3.3 discusses some of the most common difficulties faced by empirical legal researchers conducting quantitative studies, especially in Brazil. In part due to the difficulties, there are also many problems in terms of sampling, biases and results' interpretation that appear in the literature, which is the topic of Section 3.4. But as technology advances and there is already much knowledge developed in other fields regarding the methodological difficulties that could be applied also to legal studies, Section 3.5 is fully dedicated to possible improvements and identification strategies that are still little used in quantitative empirical legal research but that are quite promising. Finally, Section 3.6 presents a brief conclusion.

3.2 Empirical Legal Research

3.2.1 Origins and Development

Empirical legal research began between the 1920 and the 1930's and was originally very US centered. It declined in the late 1930's to reemerge in the 1950's. The beginning of legal empirical research is focused on criminal justice and deeply related to the legal realism movement and to the increase of available judicial statistics in the UK and in the US (Horta et al., 2014; Kritzer, 2010). In 1964 the Law and Society Association was created and there is a new boost on empirical research focused on public policy, where law is seen as possible tool to solve social problems (Horta et al., 2014). Finally, a stronger movement and another boost in empirical legal research occurred after the 2008 financial crisis, which led to a need for better integration between law, society and politics.

Brazilian empirical legal research started much later than in the US. According to Horta and Costa (2020), Brazilian legal researchers like Joaquim Falcao, Claudio Souto, Roberto Lyra Filho and José Eduardo Faria (among several others) were already using empirical techniques since the 1970's. Their work was always into legal sociology, which was more open to empirical research than other areas of law. In 2004 the 45th Brazilian Constitutional Amendment created the National Council of Justice and stated as one of its competences to produce statistical reports on processes and decisions from different courts (Brazilian Federal Constitution, article 103-B, paragraph 4, IV) and in 2006 the

Judiciary Research Department was created within the National Council of Justice to develop and fund researches to help formulate judiciary policies (Horta et al., 2014). The creation of bodies dedicated to researching and to funding researches in law evidences the increased importance given to empirical legal research by government and society.

Meanwhile, at law schools, research is isolated from all other human sciences and evolved less than scientific research in other areas, as most of legal publications and studies were still in the format of opinions and mainly theoretical discussions. Very little was being done as empiric legal investigations, with scientific methods applied (Nobre, 2004). Veronese (2007) identifies a low level of empirical research in post-graduation programs of law schools from the State of Rio de Janeiro, in the early 2000's, and suggests that this was due more to lack of investment on scientific empirical research than an incompatibility between law and scientific research methods.

This does not mean that no legal empirical research was done at the beginning of the 2000's. F. L. de Oliveira and da Silva (2005), for example, analyze judicial decisions from different periods, focusing on the discourse used by judges. In 2011 the first report of the project "Supremo em Números", an initiative of Fundação Getulio Vargas (Rio de Janeiro's Law School) with the support of the Applied Mathematics School, is released and it is the first quantitative empirical legal research based on big data in Brazil: it analyzes 1.2 million judicial cases in the Brazilian Supreme Court, from 1988 to 2009. In the last decade, empirical legal studies increased and nowadays there is more scientific legal research made in Brazil, by very well prepared legal scholars (Arguelhes & Ribeiro, 2016; Ferraz, 2009; Hartmann et al., 2016; Mittlaender, 2019; Vasconcelos, 2017; Wang, 2012). There are even publications that are regularly publishing empirical legal papers, such as *Direito and Praxis* and the *Brazilian Journal of Empirical Legal Studies*.

3.2.2 Qualitative and Quantitative Empirical Research

Empirical research is not homogeneous and there are several ways to develop the analysis of facts. As the sociologist Howard Becker already pointed out in 1986³, in social sciences there are two methods to develop an empirical research: the qualitative approach and the quantitative approach. Both methods are used to answer questions based on

³Becker (2014) translates the 1986 original chapter by Howard Becker in the book *Ethnography of Human Development: Context and Meaning in Social Inquiry*

observed facts and data, and in both methods generalization on social life is what the analysis of those facts tries to produce.

When we analyze empirical legal research, it is mostly qualitative, although even the legal professionals conducting these researches are unaware that what they are doing is qualitative empirical research (Webley, 2010). Brazilian law scholars are mainly focused on theoretical research, discussing legal dogmatic and hermeneutic, so there is little empirical work developed in legal research. And even when debating the lack of empirical research in Brazilian legal academia, Horta et al. (2014) and Veronese (2007) focus on qualitative legal research.

It is undebatable that quantitative legal research has developed in the last decade, but it is still incipient in Brazil. A search for papers containing the term "quantitativ*" in the Brazilian Journal of Empirical Legal Studies⁴ resulted in only 24 papers, out of which 4 were not quantitative at all.⁵

The higher number of qualitative research in law is expected as there are several difficulties to develop legal quantitative analysis (further discussed in Section 3.3) and also because legal research in Brazil is historically connected to sociology, anthropology and philosophy, which also apply more qualitative methods due to the nature of the needed information. On the other hand, fields as economics and business have developed a greater spectrum of quantitative techniques to explain social phenomena.

It is important to highlight that both qualitative and quantitative research use scientific methods, where research design is essential and scientific rigor in conducting each phase of the research is required. And there is no hierarchy between them: defining if the research is taking the qualitative or the quantitative approach depends on the research design, the object of the investigation, data specifics and even researcher's training. There is very high quality qualitative and quantitative research being produced over the same topic. For instance, in health litigation, (Vasconcelos, 2018) provides a qualitative analysis while Wang et al. (2020) uses a much more quantitative approach.

Therefore, the question is not whether quantitative overcomes qualitative research, on the contrary, working hand-by-hand and combining quantitative and qualitative analysis is the most promising road for empirical legal research to follow, given the characteristics

⁴Search conducted directly in the journal's website search tool.

⁵Although the first issue of the journal was only released in 2014, it is a publication dedicated to legal empirical research

of the area. Yet, Brazilian empirical and scientific research still has a long road ahead, as it remains incipient and rarely uses rigorous scientific methods.

3.2.3 Why quantitative legal research matters

While qualitative research helps understand the agents, mechanisms, decision argumentation and iconic cases, it can hardly lead to generalization of the results. A case study and interviews with some agents are not representative of the all legal cases from the same subject, let alone all legal cases from the studied court.

After the 1988 Federal Constitution, the Judiciary has taken on a leading role in Brazilian public life, as a wide range of rights and liberties, individual and collective, were guaranteed by the 1988 Constitution. But it is only after the 2004 judiciary reform, when the Brazilian National Council of Justice is created, that data provision effectively started, allowing the important diagnostic of a “huge increase in caseloads since the enactment of the 1988 Constitution” (Ros & Taylor, 2017). The Judiciary became more powerful as people attributed important social decisions to judges, questioning laws, public policies and many other administrative measures taken, especially, by the Executive. One example is the role that Brazilian Judiciary has been playing during the Coronavirus pandemic, as even vaccines’ approval have been judicially questioned, not to mention the closing of the economy in several cities, the reopening of private and public schools, among others. It even seems that after every controversial decision from the Executive (municipal, state or federal), a lawsuit disputing it will follow. This evidences the significant impact that the Brazilian court system has on local society and its consequences over public policies⁶.

With the greater importance of the Judiciary comes the greater relevance of studying the impacts of judicial decisions, especially for public policies’ purposes. If judicial decisions are affecting (and possibly changing public policy, as reported in Vasconcelos (2018)), assessing the impact of litigation in the different areas of law is necessary for future public policy decisions, future law making processes and even for better judiciary policies. And quantitative empiric legal research can be an effective tool to measure the impact of judicial decisions.

Given the enormous number of lawsuits, within a great spectrum of subjects, with cases that are intrinsically different between themselves, statistical analysis is a powerful

⁶For more on the subject, see V. E. de Oliveira (2019).

and needed weapon. Also, if researchers want their results to be representative of all the other cases they did not analyze (sample representative of the population), then the way they select their data and sample from it is of utmost importance.

Another relevant impact of the greater number of judicial cases is judicial overload, demanding the Brazilian Judiciary to organize itself, improve internal controls in order to assess judges' caseload, redistribute cases if necessary and consider strategies such as court specialization to increase efficiency. Again, quantitative empirical legal research is key to finding out which type of judiciary policy can benefit the most the judiciary structure, as well as to identify strangulation points.

Measuring the impact of a new legislation or even to what extent a certain law is being applied by the judges is another type of assessment that requires working with quantitative data in order to give informative and reliable insights on the question.

It is past time that Brazilian legal researchers either dive into the statistical world or start working with other areas, such as political science and economy, to develop high quality quantitative research in law. This paper points out some of the most common difficulties currently face by a quantitative legal researcher in Brazil and suggest possible statistical and technological techniques to deal with those problems. Implementing sampling techniques, critically studying the collected data to check for biases and inconsistencies, and applying more modern models such as regression discontinuity design (RDD).

3.3 Difficulties in conducting quantitative legal research in Brazil

Running experiments in social sciences is costly and hardly representative, as subjects tend to be university students or some small group of people that accept participating on a experiment. As a social science, legal research has the same problem: it is very hard and costly to hold everything else constant and just change a law, or have a set of identical litigants with identical claims over exactly the same set of facts, to test whether a court from a certain state decides differently from another one. These type of investigation depends of a very well designed experiment, where researchers are careful with sampling. For non-experimental observed data, special statistical techniques had to be developed

to try to isolate effects and control for other relevant factors that may be affecting the outcome of interest, trying to improve analysis given the restrictions. As Epstein and Martin (2010) point out:

“virtually in every discipline that has developed a serious empirical research program - law not excepted - scholars discover methodological problems that are unique to the special concerns of that area” (Epstein and Martin (2010), p. 902)

This is why, for instance, economics has developed a whole field mixing statistics with economics (econometrics) to analyze and measure impacts of events on the economy. But what Epstein and Martin (2010) do not say is that there are also location-related problems, given that each country has its legal system, with its own idiosyncrasies, along with other country or even region-specific aspects that can affect quantitative empirical legal research. What we try to do in this section of the paper is to identify what we consider the most pressing problems faced by empirical legal research in Brazil.

Qualitative research techniques in Brazilian legal literature are more common to find, simply because law researchers seem to be more acquainted with qualitative analysis and there are many more studies using qualitative methods. As for quantitative studies, they remain scarce and evidence a low level of adherence from the legal community to statistical knowledge. In the 24 papers containing the term “quantitativ*” found in the Brazilian Journal of Empirical Legal Studies, twelve presented just descriptive statistics of the collected data, such as mean, mode and percentage of cases with one or another variable. In only seven papers there were statistical models and regressions, showing some concern with correlating the variables. Even so, the *fundamental problem of inference*, where researchers take into account that there is an unobserved counterfactual, as described by Epstein and Martin (2010), is hardly a concern in Brazilian empirical legal research.

3.3.1 Communication

The first difficulty faced by legal researchers is statistics. The lack of statistical training and comprehension among legal professionals was (and at some measure still is) a problem also faced by the US, as report Kritzer (2010) and Epstein and Martin (2010). Similarly, law schools in Brazil do not teach students how to develop a quantitative research and

do basic statistics (most necessary tools). And this is not only in graduation programs, but also in post-graduation programs from law schools around the world. Law students that are interested in quantitative research generally turn to post-graduation programs from other fields, such as political science or economics, since law schools are still very focused on either theoretical discussions or, at most, empiric qualitative research, such as case studies.

According to Horta and Costa (2020), Brazilian legal community has a prejudice against empirical research in general. Then, the difficulties for conducting quantitative legal research go beyond a lack of training from researchers and their audience, they affect the spine of the work, as this type of study is out-cornered by the community. Under these circumstances, empirical legal researchers are seen almost as outsiders and quantitative legal research is given less value (if any) by their peers. Fortunately, this view is changing and law schools and legal scholars are slowly accepting and recognizing empiric and quantitative legal researchers, as quantitative research gives a more accurate description of litigation as whole (not individual cases) and can offer important subsidies to solving complex cases and even to improve judiciary system's management.⁷

3.3.2 Data

Data access is another difficulty faced by legal researchers in Brazil. Although most judicial cases are public, as well as judges' decisions, accessing them is not that simple. In the last ten years most courts transited to digital dockets, but older cases that did not end yet remain in paper. Some of the paper files have been scanned, but not all of them and there is not a common criteria even within the same court on what is scanned and what is not. Judicial decisions, on the other hand, have been digital for longer, but, again, not every decision is available through courts' websites and there is no clear criteria adopted by courts to decide which decisions are uploaded. Even publications in the official press are not clearly defined and it is not everything that is published (not in its entirety, at least). Even so, there is a good number of decisions available at Brazilian courts' website. Quality of the website, problems of unstable access and captchas to avoid mass download of data varies between federal and state courts, as well as among state courts websites. Superior courts are already better equipped, as they have been working online for a longer

⁷Horta and Costa (2020), pp.99-100; F. d. S. Silva (2016)

period (Brazilian digital justice was implemented top to bottom). The Brazilian Supreme Court of Justice (STF) and the Brazilian Superior Court (STJ) have better precedent repositories and more user-friendly search engines. Data from state courts varies from one state to the other, as each state justice is independent and autonomous. An alternative way to access courts' decisions is directly requesting the data to the courts of interest, via Law Nr. 12.527/2011 (*Lei de Acesso a Informação - LAI*, which guarantees the access to public information). This process can take a few months and not all the courts respond⁸, but it allows researcher another path to access all judicial cases on the subject of interest.⁹

Recently, researchers are resorting to technology (especially crawlers for data scraping) to have access to a greater number of judicial decisions and other legal documents (Conti, 2020; Salama et al., 2019). Although being a very good alternative, data scraping using crawlers also has its downsides. Courts are generally averse to the idea of mass downloads, especially because law-techs and startups transformed judicial decisions in a product and started selling these huge datasets of judicial decisions, performing basic analysis in order to help law firms to somehow predict cases' outcomes. The result was that courts began to invest in captchas and other technologies trying to make access to information on judicial cases more difficult.

3.3.3 The Topic to be Researched

Judicial disputes can verse about a variety of legal subjects and researchers are usually interested on investigating one or two subjects at a time (especially considering that legal subjects greatly differ among themselves). So how to select only decisions on the subject of interest? How to sort, from an immense number o lawsuits, only those that discuss the topic that is the object of the research? Again, this is an issue for legal researchers in Brazil. There is a subject classification in which courts assign every new case to one or two subjects, depending on the matter under dispute. However, there are no clear criteria on how this classification is made and it basically depends on the person who is inputting the case on the system (who can either be the individual filing the claim online or the court public servant who receives petitions physically filed). Even the list

⁸Azevedo et al. (2019) report difficulties on getting information about health litigation from the state court of Pará and being denied access by the state court of Rio Grande do Sul, for example.

⁹Despite the difficulties mentioned above, access to data in Brazil, when compared with other countries that are not the US or the Uk, is actually not bad. There is more information than in many developed countries and important technological advances that ended up aiding the research community.

of possible subjects is still not uniform across different state courts. Even though the National Council of Justice defines the possible subjects and topics of judicial cases, in practice we find a mix of old classifications with new ones, state courts that simply disregard the classification suggested by CNJ and, also, a great number of cases that are wrongfully classified. Still, using the CNJ classification to determine what will be the universe studied by the researcher remains the best option. However, it requires a subsequent re-classification and a careful look into the cases before digging to further analysis.

3.3.4 Variables

Constructing variables is another very interesting topic for any analysis of law. Empirical research using legal documents (one of the most common types of empirical legal research) will necessarily involve lots of reading in order to identify characteristics and aspects that will become the researcher's variables. But difficulties start with the *reading* part. First, Brazilian legal community uses lots of jargon in a unusually complex and formal structure of the text. It goes beyond using technical terms, as even when they are simply stating the facts, law-related professionals seem to be expressing themselves in a different language. Second, legal documents, such as judicial decisions, petitions, contracts and even laws, have a very distinct structure, so that reading them requires some training. Hence, legal texts are not easily read and understood by others and their analysis requires at least basic legal knowledge. And here is where constructing variables becomes a hurdle: how to analyze a high number of contracts or judicial decisions, coding the variables and collecting sufficient data for a representative study of the subject? What we most see in the literature are (i) researchers with resources to pay for a team of law students (graduated or not) to read and codify the variables for 1,000 or more judicial cases; or (ii) researchers having to work with few hundreds of cases which they analyze on their own. Either way, there is rarely a research with a N great enough to be really representative of a subject, simply because it is humanly and financially infeasible to conduct a research in these terms.

It is also important to remember that any law or contract is naturally and inevitably incomplete. There is no possible way to foresee every different situation that may occur in the future that will either require the application of the law or regulation by the contract.

To apply the law in a concrete case, judges have to interpret it. Hence, reading a judicial decision and classifying its outcome to construct the research variables will necessarily involve understanding the judges' vote. The case's outcome is generally only one of the variables from the legal study, many others derive from the reading and interpretation, by researchers, of the rest of the judges' decisions or the parties petitions. All the process of obtaining variables from law texts involves lots of interpretation. And two main difficulties arise from all this interpretation involved in empirical legal research: (i) it is much harder to mimic human reading by any type of machine learning process, a point that this paper addresses in Section 3.4; and (ii) legal researchers need to be extra-cautioned with biases.

3.4 Biases and Other Statistical Problems Commonly Overseen by Brazilian Legal Research

There are several sources of bias to be accounted for in empirical legal research, such as selection bias, judge bias, court bias, among others. However, very few researchers seem to be aware of those biases, as there rarely is a disclaimer in a paper on possible biases. Even scarcer is the employment of statistical techniques to treat biases. As sampling can be the origin of most of the biases, discussing how to properly sample from judicial decisions is of utmost importance.

3.4.1 Sampling

As discussed in this paper, most of the Brazilian empirical legal studies use small databases, because it is costly to read and encode legal texts. If the sample is not big enough it could also be biased, since the observed cases could be a phenomena from a specific court or region or on a specific type of claim or subject. Moreover, small samples may not be representative at all, so results cannot be generalized. In order to address this issue, the perfect solution would be to get all existing cases on the subject of interest and then randomly select a sample. Only in this case researcher could be absolutely sure that his sample reflects perfectly the behavior of the population (that is, all the existing judicial cases). But, again, information is incomplete, it is simply not possible to access the whole population and even if it were possible, it would be way too costly.

What researchers can and should do is work on getting a sample that is sufficient to

enable the observation of general results, which means that the sample must represent a good stratification of the population according to the analyzed variables. To build this type of sample (stratified), it is necessary to summarize the data by the characteristics for which the researcher wants to control (for example, number of lawsuits per region, per subject and per type of claim) . Then the whole database should be classified according to these characteristics and researcher should sample the cases from within each group of cases with the desired characteristics¹⁰. For example, suppose that the researcher is studying judicial cases on land conflicts. There are several types of land conflicts: in rural areas involving indigenous people, in urban areas for the right to adequate housing, in urban areas but due to protests, among others. Some of these conflicts are much more common than others, so if the researcher draws a non-stratified random sample, the distribution of types of land conflict cases will follow that found on the population of cases, which may mean having very few land conflicts in rural areas involving indigenous people, or even none of those cases, for example. If observing all sorts of conflicts is an important aspect of the research, it may be necessary to draw random samples from within each category of land conflict. This is what it means to do stratified sampling and it allows researchers to get a sample that better represents the population¹¹.

While stratification is important to have a representative sample, it does not mean that if researcher applies said technique the sample can be small. Sample size is key to allow statistical significance of the results as the bigger the sample is, the closer sample variance will be to the population variance, allowing for more representative results. This approximation happens because sample variance, by definition, has a bias that decreases as the sample size increases. Moreover, sample size is directly related to the error of rejecting an important variable in the model (saying that it has zero effect when it has some effect, negative or positive) but not the error of accepting an unimportant variable (saying that a variable is relevant when it is not). The statistical significance is defined *ad hoc* by the researcher and consists on the accepted percentage of error type I (rejecting an important variable that was actually relevant to the model). The error type II is also defined *ad hoc* by the researcher, as it is intrinsically connected to the chosen acceptance level of error type I: the lower the chances of making one type of error, the higher the

¹⁰To observe the average of the relevant characteristics in the population, researcher can resort to data from census, exploratory studies or summarizing studies from bureaus, like CNJ's *Justiça em Números*.

¹¹For more information on sampling and stratification, see Wooldridge (2010, ch.20)

chances of committing the other type.

Statistical significance level is an important tool to evaluate the statistical relevance of the variables for the observed results. The significance level gives the chance (a percentage) that a variable has no effect on the observed result, the higher the significance level (lower percentage), more probably the variable is important to explain the observed result. For example: J. A. Silva et al. (2019) used a regression model to investigate judges' productivity and found that the number of judges was "always significant (p-value < 0.01), with a negative effect". The significance level adopted was 1%, meaning that, for a certain court, the chances of the number of judges actually having no effect on the court judges' productivity is lower than 1%. So the authors can conclude, with a 99% level of certainty, that the increase in the number of judges is correlated with a decrease in the average productivity of all judges from a certain court¹².

Also, sample size is directly related to the number of explanatory variables or characteristics of the subjects that are analyzed. If researchers are using regression models, they must keep in mind that each additional variable reduces by one unit the degrees of freedom of the model and higher degrees of freedom are always preferred in regression analysis because then model's prediction is more accurate.

Another common issue with Brazilian empirical legal research is that most studies focus on one court or one state and the analysis is restricted to the selected location. As a consequence, results cannot be generalized and extended to other courts and states, being restricted to the origin of the research sample.

3.4.2 Biases

Any empirical legal study working with judicial decisions must consider an intrinsic selection bias: if the case is being decided it means that the conflict was taken to the court by the parties, while other analogous conflicts were not. The simple fact that some parties are filing a lawsuit while others decide not to do it is already indicative of some difference between (i) the cases or (ii) the parties. Since there are costs related to start a lawsuit, the party first has to evaluate if the expected benefit from the lawsuit surpasses the costs to start it. If benefits are higher than costs, the party files the lawsuit; otherwise, it is preferable to try an out-of-court solution to the conflict. This is the self-selection

¹²J. A. Silva et al. (2019), p. 247

bias that all judicial cases have, by concept. Although self-selection bias is a fact for all studies involving judicial decisions, it is frequently not acknowledged in empirical legal studies, but it is important, since it censors the database to the lawsuits in which the proponent evaluates the expected benefit of filing the claim more positively.

A second bias that frequently appears in Brazilian empirical legal research is an appeal-bias, because there is a large number of studies based on State Courts of Appeals. In the same way that the party evaluates if it is worth filing a claim and taking a conflict to the courts, deciding whether to appeal from a judge's decision also involves a cost-benefit analysis. Again, there is a self-selection bias and the observed decisions from State Courts of Appeals are over cases that are systematically different from non-appealed cases. This is another self-selection bias that is hardly mentioned by the literature but is also very relevant for any analysis.

While self-selection biases are related to parties and cases, there are also biases related to judges and courts that are worth mentioning. Brazilian studies seldom consider judges as a potential source of decision bias, unless judges' characteristics are themselves the object of the study. But it is undeniable that the judge plays a central role in any judicial decision, as to apply the law to a concrete case the judge must evaluate which rules are applicable and interpret these rules as to how they should define the case's outcome. Judges are very important players in the analysis of judicial cases and should be accounted for in any statistical analysis of courts' decisions, otherwise the conclusions will have an omitted variables bias.

A last noteworthy point is that random assignment of cases between judges (i) cannot overcome the problem of omitted variable bias and (ii) is restricted to the court where the claim was filed, that is, cases' assignment to judges is random within the court. Moreover, if there is a specialized court, assignment of cases is not so random anymore as these courts usually have very few judges. A possible court bias will arise as judges working in the same court tend to interact more among themselves, leading to more similar decisions.

3.4.3 Correlation is not Causation

Any researcher with basic statistical training has already heard a few times the mantra that "correlation is not causation" and knows that it is not because one variable correlates

with another one that this is a causal relationship¹³. There are observed facts that correlate, that is, they are associated and tend to vary together, but their relation is not at all causation. When we see that the divorce rate in Maine and the per capita consumption of margarine are very closely correlated (99.26%)¹⁴ this concept that “correlation is not causation” becomes quite clear, as no further study is necessary to know that it is not the consumption of margarine that is causing couples to divorce in Maine.

Nevertheless, when studying social phenomena it is not so clear whether the relationship that we are trying to measure is a correlation or if there is one variable actually causing the other to vary in a certain way. Suppose that we believe that the number of lawyers is causing the volume of lawsuits to grow. It is expected that we have more lawyers in places where there are lots of lawsuits, but we do not know if the number of cases filed is *caused* by the number of lawyers. In order to know if there is a causation relationship, we would need to hold constant every other factor that might be affecting the number of lawsuits, such as factual conflicts between people, companies and the public sector, their willingness to litigate, access to justice, number of courts, among others¹⁵. If we could hold all of these aspects constant and only change the number of lawyers and then see how it changed the number of lawsuits, we could see and measure the causal effect of the first variable on the second one. But it is impossible to do so. There is no “all other things being constant” in empirical social sciences as we cannot fully control social phenomena (take, for instance, the actors willingness to litigate).

At the same time, the implications of this difference between correlation and causation are important for any researcher and there are tools developed to help researchers in finding causation and not only correlation. When using regression models to trace the relationship (if existing) between the variables, what researchers can and should do is trying to control for other factors that may be affecting the result variable (such as the

¹³For an easy reading, see the article “Correlation is not Causation” by Nathan Green, on The Guardian, from 2012, available at <https://www.theguardian.com/science/blog/2012/jan/06/correlation-causation> #:~:text=%22Correlation%20is%20not%20causation%22%20means,causes%20frenzied%20high-street%20spending, last access on March 17, 2021.

¹⁴Information retrieved from the website Spurious Correlations, available at: <https://www.tylervigen.com/spurious-correlations>, last accessed on March 17, 2021.

¹⁵This problem sits on top of the fundamental inference problem, as researchers will never observe the same situation with AND without treatment, a topic well explained in the legal context by Epstein and King (2002). In the example of lawyers and litigation, it would required having each judicial district with an increase in the number of lawyers with all other aspects held constant AND, at the same time, the same district *without* such increase in the number of lawyers. This is an impossible situation and that is why this is called the fundamental problem of causal inference

number of courts and specific potential conflict sources observed, in the example of lawyers and litigation). However, a common misinterpretation of regression results in empirical legal studies is the assumption of the effects found by the model as a causal relationship. Although regression results present the relationship between variables, this relationship do not necessarily mean that one variable causes a positive or negative effect on the other variable. Regressions can be showing only a correlation. Controls are very important to help discard the possibility of other factors affecting the result variable and avoid biased coefficient estimators. It is also possible that the relationship shown by the regression is due to the fact that both variables are affected by a third one in the same way (what is called a confounder effect), so empirical legal researchers must keep this in mind when designing their methodology and interpreting their results.

3.5 Improvements to Empirical Strategies in Legal Research

Despite the issues discussed in the previous section, there are many opportunities to improve empirical legal research using new technologies, as well as methodological strategies developed in other areas (such as economics) to deal with the problem of identifying causation and not just correlation. This section discusses some of these opportunities.

3.5.1 Data gathering, organization and encoding

In recent studies, many authors use automatic data gathering based on Machine Learning algorithm (Azevedo et al., 2019; Salama et al., 2019) to download or organize the data available in websites or public database and store it, also known as data scrapping. This technique allows researchers to gather, organize and analyze more information than if download was done manually by humans, allowing much bigger and more comprehensive datasets. However, these types of scripts for download of data from websites (also known as crawlers) are commonly used by law-techs and startups interested in gathering this information to sell it to companies for prediction of lawsuits results, so courts have been closely watching and controlling their websites to avoid said crawlers. Most of the courts' efforts are focused on barriers to automatic access to their information, so courts require some kind of manual verification (known as captcha), or restrict the access by limiting

users' time in the webpage. Despite the courts' efforts, there are many strategies available in machine learning forums to bypass those controls and still access the information.

An important drawback of using automatic data gathering is that it requires attentive and dedicated work on the organization of the database. Quality of the downloaded information tends to be an issue since most of the data is based on text transformation from one type of file to another, which can lead to some errors. Many times it is necessary to split the transformed files based on observed patterns, in order to separate different court decisions that ended up in the same converted file. This text separation using patterns is subject to flaws, as patterns may not be as exact one would think, so one case may end up divided into two different texts, as if it were two cases, and two different cases can be joined in one sole text. Consequently, researchers using machine learning to download and separate legal texts need to constantly check the database quality and improve the split accuracy in order to get a well shaped database.

Finding these patterns to divide the texts is not a simple task. As previously mentioned, even within one court, there is not a formatting pattern used by all judges in their decisions or other judicial documents, increasing the difficulties for researchers to come up with a rule to be followed by the machine for identifying the desired unit of observation. Also, small changes in courts' way of publishing the decisions may have a great impact for the algorithm and require new solutions for organizing the dataset. These changes are rarely informed, so it is up to researchers to identify them and adjust the algorithm.

Once data is collected and the dataset is duly organized, machine learning techniques are also useful to work with very big datasets. The first step is to translate the text data into numbers. Mikolov, Sutskever, et al. (2013) and Mikolov, Yih, et al. (2013) present efficient representations of text data into numbers, so that you can classify the judicial cases and sample from them. Mikolov, Chen, et al., 2013 present an interesting technique to find words that are closely related as synonyms or gender equivalent. With text data expressed as numbers, both supervised and unsupervised classifications techniques can be used. In a simplified way, in supervised classifications, the researchers need to classify a sample and the machine learning algorithm will analyze the pattern from classified cases and classify the rest of database based on it. This type of technique demands manually inputting and correcting classifications during the model's training, but with enough examples, the classification presents high accuracy. This is just one of the many different

supervised classification models available, which present more accuracy depending on the type of data. In unsupervised classifications, the machine learning algorithm will split the database into patterns automatically, based on words distribution (Blei et al., 2003) or vocabulary of the text. In most unsupervised models the researcher only inputs the number of patterns that will be allowed and then observes the results generated for each pattern found by the model's algorithm. This type of technique is recommended to do exploratory analysis, where there is no clear pattern previously known and defined by the researcher.

Another helpful use of machine learning when dealing with legal texts is using algorithms in the construction of variables. Many of these machine learning techniques of textual analysis are applied in studies in finance, where researchers look for words in a specific list using regular expressions (Kravet & Muslu, 2012; Tetlock, 2007). A similar approach can be used for legal texts: researchers can input some text patterns and expressions that will identify a variable. Then, the algorithm will look for those expressions in the legal texts and count them when found, so that you can identify in which cases you have or do not have the chosen expression, constructing the variable. It is also possible to use machine learning to find words closely related by the context (Mikolov, Chen, et al., 2013; Theil et al., 2018), which could solve the problem of a vast vocabulary in legal texts, where there are many different ways to express the same idea.

Because legal texts use a very distinct technical language and legal vocabulary is extensive, combining qualitative research in the construction of legal texts for big data is the most promising path. Qualitative researchers are generally acquainted with the regular expressions most common on the field they research, as well as on how those expressions may appear (and why, as this is sometimes the core of qualitative research). Hence, combining machine learning expertise with qualitative knowledge on the legal topic under research is an interesting solution for the difficulties of using machine learning in legal texts.

3.5.2 Solving some biases

The self-selection bias discussed in Section 3.4, is usually addressed in economic papers by a Heckman test¹⁶. For judicial cases, this test would be comparing analogous cases

¹⁶For more information see Angrist and Pischke (2008), page 157.

in regions with different costs to file the lawsuit, for example. The Heckman test would then first map the probability of the lawsuit being filed and then the final regression with respect to the lawsuit's result is corrected according to the found probabilities. The reason why we do not see this type of correction for self-selection biases in empirical legal studies is that knowing or even calculating the probability of a lawsuit being filed requires (i) access and identification of analogous cases that were not brought to the courts; and (ii) having a great amount of information on the case that gave origin to the judicial claim, including characteristics of both parties involved and information on what actually happened between them (even in past interactions!). However, what researchers learn on the case is generally through the judges' lenses, on the written court decision. Information on the parties is scarce, the original facts are never known to researcher, at best he has access to both parties narratives of the events in the judicial procedure. Hence, implementing the Heckman test becomes almost impossible.

The judges' and court's biases discussed in Section 3.4.2 arise because in several cases there are many omitted variables in the model. Normally in statistics, it is recommended to have models with sample size greater than the number of variables, meaning that if it is necessary to control for judges or courts characteristics, the sample size would be bigger than in models without those controls. Again this problem is related to the degrees of freedom and the accuracy of the model described in Section 3.4.1. Yet, it is not simple to get a sample as big as necessary, since to control for all courts in the state of São Paulo (around 320) and, even worse, all judges that appear in a database (there are more than two thousand acting magistrates in the state of São Paulo) one needs quite a large dataset. This is why most of the current papers on judicial analysis do not control for those variables. Although controlling for judges and courts biases using dummies is, in most cases, impossible, there is a way to reduce judges' and courts' biases: using clustered errors in the regressions. It does not solve the problem but at least addresses it as much as the data allows.

Machine learning techniques also help to deal with huge database, since it allows the researcher to find and build the database from unstructured information in websites or files with crawlers that find and organize the information. Those techniques may be applied to extract samples in different ways to minimize the bias using stratification and random draws.

3.5.3 Identification Strategies

In empirical studies, correlation and causality are both important because they help answering different questions: if in some cases correlation is enough, in others researchers need to have causation for a relevant contribution. Identification strategies vary according to the type of relationship the researcher is aiming at, as correlation and causality need to be identified with different strategies. The most used models in empirical legal research are Ordinary Least Squares (OLS) regression models and binomial (eventually multinomial) discrete choice models (logit and probit). In most studies, those models are applied to study the relationship between variables as number of lawyers, lawsuit subjects, facts or requests by the claimant, duration of the lawsuit and the case's final decision (granted; partially or not granted), the number of lawsuits or the proportion of lawsuits in a period. But note that none of those variables necessarily promote just one type of decision or one type of lawsuit, for example. So, we can only see correlations between variables, in a sense that more lawyers may be related to a higher volume of litigation, but it does not mean that more lawyers causes higher levels of litigation. Many other controls and identification strategies are needed to come to said conclusion.

In order to claim causality, is necessary to find variables that allow us to (i) compare analogous lawsuits with only slight differences and (ii) specifically observe the factor whose changes we are interested in (number of lawyers, cases duration, final decision or volume of lawsuits). There are many strategies that can be used to solve for this causality identification problem. In Angrist and Pischke (2008), the authors present many different identification strategies and we will focus on a few types that can be applied to empirical legal studies and come mostly from policy evaluation econometrics.

Instrumental Variable (IV)

Instrumental variables are usually used with OLS and discrete choice models, because the idea behind instrumental variables is to have an exogenous variable when the variable of interest is correlated with the error of the regression. It is not a simple task to find a variable that can work as an IV, but it definitely helps with model identification.

Ponticelli and Alencar (2016) use an instrumental variable to check effects of court enforcement of bankruptcy laws on firms' investment. Correlation tests showed that effects of stronger creditor's protection on lending and investment depended on the quality

of local law enforcement. But court efficiency (measured by court congestion) is observed after introduction of the Brazilian bankruptcy reform and there were an endogenous sorting of firms across municipalities before introduction of the reform. Consequently, an OLS estimate would have a potential downward bias. Hence, the authors used an instrument variable: measure of potential extra-jurisdiction¹⁷, which is shown to be strongly correlated with the level of court congestion across Brazilian courts and, conditional on a set of controls, is uncorrelated with firms' initial characteristics. The assumptions behind the use of this IV are that (i) the number of judges, staff and other resources did not adjust to the additional workload of cases originated in neighboring municipalities and (ii) potential extra-jurisdiction is exogenous with respect to the outcomes of interest.

Differences in differences (Dif-in-dif)

In the differences in differences technique, researchers compare the difference between two variables in two different periods. The idea behind dif-in-dif models is that we have two groups (treatment and control) varying together before a certain event (the treatment on the treatment group) and both groups would still vary together if it was not for said event. All changes in the treated group that are not due to the treatment (event) itself are then captured by the control group, as both groups are supposedly very similar in all relevant characteristics, but only treatment group is affected by the event (that is, is treated). Lopes (2018) uses the dif-in-dif technique to study whether TV broadcasting changed the behavior of Brazilian Supreme Court justices. As justices are expected to be more concerned with cases with broader audience, Lopes (2018) used as control group cases that challenged state laws (stricter implications from broadcasting as expected audience is smaller) and as treatment group cases that challenged federal laws (broader implications and bigger expected audience). The treatment event was “the introduction of live broadcasting in August 2002”. Note that in this neat design the type of legal discussion involved in both groups is similar: whether a law is valid or not, so the cases from control and treatment groups are expected to have very similar relevant characteristics.

¹⁷According to Brazilian laws, not all municipalities qualify to be a judicial district. Court jurisdiction over municipalities that do not satisfy the requirements is assigned to the courts of one of its territorially contiguous municipalities. Each judicial district is subject to receiving cases originated in neighboring municipalities that do not have courts, so the Ponticelli and Alencar (2016) use a measure of extra-jurisdiction that is the number of territorially contiguous municipalities that do not satisfy the requirements to become a judicial district.

Also, all cases are being decided within the same period and by the same court, so other external events should have the same impact on treatment and control groups. Changes in the difference between these two groups must, then, have come from treatment: TV broadcasting.¹⁸

Matching

Another useful method is *matching*, which consists of finding, for each treated individual (or lawsuit, as in many empirical legal researches), another statistically similar individual that was not subjected to treatment and then compare the result variable for treated and untreated matched individual (who would work as a sort of control). The idea is finding what Helland and Tabarrok (2004) call “two statistical doppelgangers” who could be seen as the same individual being treated and untreated at the same time. Of course the comparison must be between several treated and untreated matched individuals, not just one pair. Also, as researchers increase the number of variables across which individuals are matched, the closer treated and untreated matched individuals would be, however, as more characteristics are included in the matching, the harder it gets to find an untreated matching individual. It is also important to note that there is a strong assumption behind matching models: that researcher knows the factors that make people get treatment, that are the factors on which the matching must be made.

Helland and Tabarrok (2004) use data on US cases where defendants made bail and how they made bail (surety bond, own recognizance, etc) in order to evaluate how this aspect causes defendants failure to appear at trial. The authors use a propensity score to match defendants, that is, they match individuals according to a probability of being treated given a certain set of individual-specific characteristics (such as past experience with criminal justice system, the type of crime committed, sex, age, failed appear at trial in the past). After running an ordered probit to generate the propensity scores¹⁹, Helland and Tabarrok (2004) do the matching and calculate treatments effects. According to the

¹⁸Lopes (2018) showed that “as politicians, justices use television as free advertising and seek to maximize their exposure by writing longer votes (which are read aloud in court sessions) and by engaging in longer discussions with their peers”(Lopes, 2018), page 43.

¹⁹“It is important to emphasize that the propensity scores are not of direct interest but rather are the metric by which members of the treated group are matched to members of the “untreated” group (“differently” treated in our context). After matching, and given the conditional independence assumption, the treated and untreated groups can be analyzed as if treatment had been assigned randomly. Thus, differences in mean FTA (fail-to-appear) rates across matched samples are estimates of the effect of treatment.” Helland and Tabarrok (2004), page 101

authors, “a match is defined as the pair of observations with the smallest difference in propensity scores so long as the difference is less than a predefined caliper”²⁰.

Regression Discontinuity Design (RDD)

Regression discontinuity research design (also known as RDD) is a technique applied by econometricians that involves identification over a discontinuity, normally caused by a rule or a law. While in an experiment treatment is assigned randomly, in RDD there is a clear and known rule defining who is in the treatment group and who is not, so assignment to treatment is definitely not random, implying a systematic difference between those who receive treatment and those who do not. Take, for instance, a poverty program that grants a financial benefit to families with a daily income lower than \$20.00 per capita. There is a clear discontinuity in the per capita income when it reaches \$20.00 (the cutoff). Note that there will not be families with the same income per capita both receiving and *not* receiving the benefit, as the rule uses per capita income as criteria to define whether people are eligible or not to receive the benefit.

Though the rule is clear on who gets the benefit and who does not, there is reason to believe that families earning \$19.00 per capita are not that different from families earning \$21.00 in respect to every other aspect than the financial benefit. Due to the threshold, those earning less than \$20.00 will get the benefit while the others won't. What is actually making them so different is treatment (receiving the benefit) itself. Hence, we have what econometricians call a quasi-experiment. Nevertheless, it is important to notice that if people can manipulate the treatment, for instance, work just a bit less to drop family income to \$20 and then receive the benefit, researchers should not use RDD because the basic assumption is compromised and the rule defining treatment assignment may not be actually followed. Hence, those observations on small neighborhoods around a threshold are not as similar as they should be.

Synthetic Control

Suppose now that we want to study the impact of a rule in a city or state, but knowing that this state or city is quite different from the others. It is still possible to compare it to the others states or cities, using a mix of them based on economical, sociological

²⁰Helland and Tabarrok (2004), page 105

or political variables. This technique is called synthetic control, where we "build" an analogous state or city with a mix of all other existing ones, based on some variables/ characteristics. For example, suppose that we want to study the impact of the abortion rule in state X on criminality rates. Since the population in each state is quite different, we could make a mix of all other states based on education rates, racial proportion, wage proportion and other social variables. We then build a synthetic control state, that is analogous to state X, with a mix of characteristics from all other states, without the abortion rule, so that the result in criminality rate could be due the rule itself (causal effect).

3.6 Conclusion

Empirical legal research has long been facing several obstacles to its development, including difficulties in being recognized by the legal community and several data-related issues. Recent studies began to apply new techniques, as Azevedo et al. (2019) and Salama et al. (2019) that use machine learning and statistical approaches to rationalize the data.

However, there are still few studies moving in this direction and much room to improvements: acknowledging and treating biases, implementing better sampling techniques and combining qualitative and quantitative legal research. As explored in this paper, quantitative methods are very useful to observe phenomena or relationships, while qualitative research are really good in understand the mechanisms that explain those phenomenon and relations in legal studies. But while well done quantitative empirical research allows for generalization of the found results, qualitative legal research does not (at least not as broadly).

This study contributes to quantitative empirical legal research by pointing out some of the common problems faced by researchers in quantitative empirical legal studies and attention points in the current way most studies are developed. At the same time, it suggests applying techniques from other fields to help developing quantitative legal research. Techniques mentioned in this paper are a small part of a whole field in Economics, Statistics and Computer Science. Importing those techniques and combining quantitative and qualitative empirical legal studies are the next step into a more scientific approach into law and the legal area.

3.7 References

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