

Street-level rule of law:
Prosecutor presence and the fight against corruption*

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Preliminary and incomplete results

Abstract

Empowering autonomous prosecutor's offices is increasingly seen as a promising strategy to fight corruption. Yet we lack systematic evidence about whether they are effective at reducing corruption, and if so why. I argue that prosecutors' use of the tools that can make them effective anti-corruption actors (including autonomy, discretion, and timeliness) benefits from physical proximity to the communities they monitor. I test this theory through a causal event study of state prosecutors in Brazil, leveraging administrative data on their deployment and behavior across municipalities. I find that prosecutor presence causes more anti-corruption action targeted at the local government. In response to prosecutor presence, local politicians hire more bureaucrats in the civil service, rather than on temporary contracts – a common vehicle for corruption in this setting. I combine these quasi-experimental findings with insights from a survey of politicians and in-depth interviews with prosecutors. Together, results suggest that physical presence can make prosecutors more effective at fighting corruption, and provide rare causal evidence of the impact of prosecutor's offices on local governance outcomes.

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1 Introduction

Corruption is a major obstacle to economic and human development everywhere. In the European Union alone, corruption costs up to 1 trillion US dollars, about 5% of GDP, per year (Hafner et al., 2016). The problem is global and has far-reaching consequences, especially for poorer countries and more vulnerable populations. Accordingly, the UN Secretary-General referred to corruption as “an assault on the values of the United Nations.”¹ International organizations, government agencies, and civil society organizations invest major resources to limit corruption, but the problem has proven very difficult to solve for a variety of political, institutional, economic, and cultural reasons (Rose-Ackerman and Palifka, 2016).

Empowering autonomous prosecutor’s offices is often seen as a promising policy to fight corruption. Indeed, experts have identified a global trend of reforms empowering prosecutors (Langer and Sklansky, 2017; Voigt, 2021). Yet, while the power and discretion of prosecutors in criminal justice systems has been widely studied (Fionda, 1995; Davis, 2007; Wright and Miller, 2010), we have little systematic evidence about prosecutors’ behavior, their effectiveness at fighting corruption, and its sources.²

Two main reasons explain the scarcity of evidence about the effectiveness of prosecutors in fighting corruption. First, the strength of prosecutors is typically understood as a macro-level variable, and consequently empirical designs rarely go beyond observational or qualitative comparisons across countries (Van Aaken et al., 2010; Gutmann and Voigt, 2019) or states in a federation (Mueller, 2010). These designs limit our ability to learn about the impact of autonomous prosecutor’s offices, separate from other good-governance institutions that correlate with them. Second, we do not typically observe prosecutor’s actions taking place outside the judicial system, and thus it is hard to trace hypothesized causal chains and to test observable implications of arguments about prosecutors’ role in the fight against corruption. As a result, “empirical studies of prosecutorial processes, decision making, and outcomes based on original empirical research are almost nonexistent” (Tonry, 2012, 26).

¹UN News, 2018, “The costs of corruption: values, economic development under assault, trillions lost, says Guterres” (available at <https://news.un.org/en/story/2018/12/1027971>).

²The exception is the rich literature about US Attorneys. These federal prosecutors are hardly autonomous, since they are appointed by the president and serve at their pleasure. Accordingly, research has shown significant bias in the use of prosecutorial discretion against corruption by US Attorneys (Gordon, 2009; Nyhan and Rehavi, 2018; Davis and White, 2021).

This paper contributes to fill this gap. I start by theorizing what gives strong and autonomous prosecutors an advantage in the fight against corruption. I argue that prosecutors have an advantage, relative to other accountability actors like judges and auditors, because they have more power and discretion, can make use of a wider range of tools (including informal pressures and extra-judicial bargains and agreements), and because they can act “in real time” to deter malfeasance. Their effectiveness at using these tools depends on them being insulated from politics, a feature that cross-national research has emphasized ([Van Aaken et al., 2010](#); [Gutmann and Voigt, 2019](#)). I add that the effectiveness of autonomous prosecutors also depends on physical proximity to the communities they monitor, a factor that previous research has overlooked. Physical presence aids effectiveness because it helps prosecutors obtain information and exert formal and informal pressures on government officials, and because it can raise politicians’ perceived probability of detection.

My argument builds on previous studies that have examined the role of “presence” in the control of corruption and other bureaucratic tasks. Using an instrumental variable strategy, [Litschig and Zamboni \(2019\)](#) show that Brazilian municipalities that are the judiciary district headquarter have lower levels of corruption. Their argument and empirical tests focus on a bundled treatment combining the presence of judicial and prosecutorial teams, and examine only effects on corruption. This makes it hard to identify what component of the treatment drive the measured impacts on corruption, and through what mechanisms. Other studies have found positive effects of proximity on service delivery³ or tax collection.⁴ In contrast to these previous studies, this paper focuses on the physical presence of a specific kind of accountability actors, and traces its effects on both anti-corruption action and government officials’ decisions at the local level.

Empirically, I focus on Brazil, a large federal democracy where prosecutors are extraordinarily autonomous and strong, especially when compared to other countries in the global south.⁵ I leverage

³For example, [Bozcaga \(2020\)](#) shows that in Turkey, bureaucratic effectiveness at the local level benefits from geographic and social proximity among bureaucrats, which decreases transaction costs and thus facilitates service delivery. Other studies have found social embeddedness to undermine bureaucratic effectiveness, for instance among civil servants of the Indian Administrative Service ([Xu et al., 2023](#)).

⁴[Balan et al. \(2022\)](#) demonstrate with a field experiment that local chiefs in Congo are more effective at tax collection than centrally-deployed state agents, arguably thanks to their better information and higher ability to induce compliance. On the other hand, other studies have found centrally-deployed bureaucrats superior, for instance in historical state building in Latin America ([Soifer, 2015](#)).

⁵In a recent measure of prosecutorial independence across 97 countries ([Gutmann and Voigt, 2019](#)), Brazil is placed in the upper quartile of the distribution. All countries with higher scores of prosecutor independence are high-income countries. Several high-income democracies (including the United States, South Korea, France and Spain) score worse than Brazil.

variation across municipalities and years in the presence of state prosecutors, using an imputation-based causal event study approach (Liu et al., 2022). To measure prosecutors' presence and the anti-corruption actions they take for each municipality-year observation, I use administrative data scraped from the websites of the prosecutor's offices in eight states that cover over half of Brazil's population. I complement that data with detailed administrative data on municipal employment.

The event study results demonstrate that the arrival of a prosecutor to a municipality causes a significant increase in anti-corruption actions targeted at the local government, including investigations, recommendations, and extra-judicial agreements. Consistent with local government officials responding to prosecutors' pressures stemming from their local presence, treated municipalities also see a higher incidence of civil service hiring, as opposed to hiring on temporary contracts. Civil servants' selection and careers are insulated from politics, and the prevalence of the civil service is often associated to better government performance and reduced corruption (Charron et al., 2017; Aneja and Xu, 2023). I complement these quasi-experimental findings with observational findings from an online survey of politicians I did in 2019, and with insights from in-depth qualitative interviews of prosecutors, politicians and bureaucrats conducted between 2016 and 2022.⁶

In sum, this article advances our understanding of how autonomous prosecutor's offices can be effective at fighting corruption, by highlighting prosecutors' unique advantages (relative to other accountability actors like judges or auditors) and how they benefit from physical proximity to the communities they monitor. This is an under-appreciated driver of the effectiveness of prosecutor's offices that previous research has overlooked. More generally, the paper provides some of the first plausibly causal evidence about the effectiveness of prosecutors in the fight against corruption outside the United States, leveraging detailed administrative data on anti-corruption actions and on governance outcomes at the local level.

2 Prosecutors' advantage in the fight against corruption, and proximity as a source of their effectiveness

Prosecutors are a central figure in the fight against corruption, and of the rule of law more broadly. Recent research has documented "a strikingly broad trend around the globe in vesting greater

⁶I interviewed nine state prosecutors in Ceará, Rio Grande do Norte, and São Paulo. Details on interviews are included in Appendix A.

discretion and greater responsibility in prosecutors” ([Langer and Sklansky, 2017, 1](#)). This trends coincides with a global, upward trend in the conviction of politicians for corruption ([Da Ros and Gehrke, 2022](#)).⁷ Are these two trends causally related? Although anecdotal accounts of strong prosecutors leading to successful anti-corruption action are common, we have little systematic theory and evidence of whether, and how, prosecutor’s offices constrain malfeasance.

I argue that three factors provide prosecutors a critical advantage in the fight against corruption relative to other accountability actors: they have more power and discretion; they can make use of a wide range of tools, both judicial and extrajudicial; and they can use their combination of power and discretion to deter malfeasance before it occurs. I detail each of these advantages in the paragraphs below.

Prosecutors generally enjoy more power and wider discretion than other accountability actors, including judges, external auditors, and internal auditors. First-instance judges, for example, generally have low control over their docket of cases. When making decisions, judges follow high standards of proof and can have their rulings undone by higher instances. As a result, it may take a long time for corrupt politicians to be punished in court. External auditors generally act on a constrained mandate, are limited to examining misspending ex post, and their reports often do not have a direct effect over political careers. While audits have been shown to be effective in contexts like Indonesia ([Olken, 2007](#)) and Brazil ([Ferraz and Finan, 2011](#); [Avis et al., 2018](#); [Zamboni and Litschig, 2018](#)), audit weaknesses and capacity issues have been shown to limit the effectiveness in other contexts ([De la O et al., 2023](#); [Cuneo et al., 2023](#)). Because audits focus on only one dimension of public management, they can induce distortions in other, non-audited dimensions ([Gerardino et al., 2023](#)). The effectiveness of internal auditors, in turn, depends on their selection and careers being insulated from politics, a rare institutional arrangement ([Fernández-Vázquez, 2018](#); [Vannutelli, 2023](#)). In contrast, prosecutors often have significant power and discretion, unparalleled to other accountability actors, as often noted by legal scholars:

“Prosecutors are potentially the most powerful figures in any country’s criminal justice system. They decide what crimes to prosecute; whom to charge; what to charge; whether to plea-bargain, offer concessions, or divert a case; how aggressively to seek a conviction; and what sentence to propose. Police arrest people, but prosecutors decide whether those arrests lead to charges. Judges preside over trials and sentence convicted

⁷[Da Ros and Gehrke \(2022\)](#) document a large number of convictions of former heads of government for corruption charges all around the world: 30 in the 2010s alone.

offenders, but only those whom prosecutors bring before them.” (Tonry, 2012, 1)

Second, prosecutors often have a wide range of tools they can use in the fight against corruption, including investigations, court actions, and extra-judicial bargains and agreements. While this diverse set of tools and their discretionary use has been noted to lead to abuse in the criminal justice system (Davis, 2007; Sklansky, 2018), it does give prosecutors an advantage in the fight against corruption, which involves detecting, punishing and deterring multiple forms of malfeasance that are often easy to conceal, precisely because they involve powerful political actors.

Third, the combination of power and discretion makes prosecutors more capable of deterring malfeasance before it takes place. Whereas auditors and judges examine the facts *ex post*, prosecutors can act “in real time”, based on weaker but more immediate sources of evidence (such as a citizen report). While courts and auditors can also deter corruption, they do so only indirectly by contributing to an environment where politicians perceive a higher probability of detection and punishment of malfeasance. Prosecutors, in contrast, can intervene in particular instances, when or even before malfeasance occurs, by providing timely information, making credible threats of judicial action (and eventual convictions), and providing extra-judicial inducements.

The advantage of prosecutors in the fight against corruption depends on them being insulated from politics. It is therefore not surprising that in many countries prosecutors are subject to varying degrees of control from the executive power. In a cross-national study, Van Aaken et al. (2010) show that *de facto* prosecutorial independence is negatively correlated with corruption perceptions. In the United States, where the selection of prosecutors is essentially political,⁸ researchers have found significant bias in the targetting of anti-corruption efforts (Gordon, 2009; Davis and White, 2021), their timing (Nyhan and Rehavi, 2018), and the allocation of resources to support them (Alt and Lassen, 2012).

I argue that, in settings where prosecutors are sufficiently insulated from politics, their use of the power, discretion, and tools of their office to fight corruption benefits from being physically present in the locality they monitor. This argument complements the common political economy view of effective rule of law as a matter of insulation and capacity, and draws attention to the organizational and relational foundations of effective accountability institutions.

I hypothesize three key channels connecting prosecutorial presence to anti-corruption actions

⁸US Attorneys are appointed by the president, whereas district attorneys are elected.

and effectiveness. First, prosecutors have easier access to information about potential malfeasance in localities where they work. This is both because they can more directly obtain information (through observation, informal conversations, or investigations), and because affected parties (e.g., citizens, opposition politicians, or bureaucrats) can more directly report malfeasance to the prosecutor's office and provide supporting evidence. Second, physical proximity makes it easier for prosecutors to exert formal and informal pressures on government officials, be it through meetings, information requests, and more locally-relevant actions that build on richer information about local governance. Third, in localities where the prosecutor is present, government officials may perceive a higher probability of detection (and eventual punishment) of malfeasance, and thus adjust their behavior even in the absence of explicit prosecutorial action.

Identifying the role of presence on prosecutorial effectiveness is important because it can help us better understand what makes rule of law institutions effective in practice. It is not uncommon for prosecutor's offices and other accountability institutions to be decentralized,⁹ yet this is often thought as a merely organizational matter and not as a potential source of effectiveness. Moreover, by leveraging variation across districts, rather than across prosecutor agencies or countries, a focus on presence can help us obtain plausibly causal evidence of the impact of prosecutors, and explore the effects of alternative institutional arrangements. This can illuminate both theoretical and policy debates about the optimal design of effective anti corruption institutions.

3 Institutional setting

I focus on prosecutors in Brazil, a large federal democracy where prosecutors have extraordinarily high levels of capacity, autonomy, resources and discretion when compared to those of other countries ([Kerche, 2008](#)). Partly as a result of a decades-long building of bureaucratic autonomy ([Arantes, 2002](#); [Coslovsky and Nigam, 2016](#)), the Constitution and multiple laws guarantee Brazilian prosecutor's offices autonomy from the executive, legislative, and judicial powers,¹⁰ and grant high levels of discretion and autonomy to individual prosecutors. This section describes the key details of how prosecutor's offices are designed, the environment of municipal politics where they

⁹For example, in the United States each US Attorney is responsible for a federal judicial district. In the European Public Prosecutor's Office, the European Delegated Prosecutors are deployed to and work within each member state.

¹⁰Prosecutor's offices in Brazil are legally considered to be outside all three branches of government ([Garcia, 2017](#)).

operate, and the prosecution of local politicians.

3.1 State prosecutor's offices

State prosecutor's offices (*Ministério Público dos Estados*, MP) are in charge of prosecuting most corruption charges in Brazil.¹¹ This stems from their constitutional mandate to protect "inalienable social and individual interests,"¹² including "diffuse rights", i.e., public goods that do not have a single individual or entity affected by potential breaches of the law, such as the environment, consumer rights, and good governance. While prosecutors are also in charge of prosecuting crime, many are increasingly concerned and focused on fighting corruption (Arantes, 2002).

Each of Brazil's 26 states has its own prosecutor's office,¹³ all of them autonomous from state executive, legislative and judicial powers. While state prosecutor's offices follow their own rules and organization, there is significant isomorphism among them, partly because they all operate under a common legal framework¹⁴ and follow the guidelines of a national coordinating body, the National Council of Prosecutor's Offices (*Conselho Nacional do Ministério Público*, CNMP).

Each state prosecutor's office is territorially organized in districts (*comarcas*).¹⁵ Each of these districts typically corresponds to a medium or large municipality (or part of it), or to a group of smaller municipalities. In the latter case, the district has a headquarter in the most prominent municipality, where the prosecutor's office typically has an office and deploys its bureaucrats. Large districts have many prosecutors, often working in offices dedicated to specialized topics (e.g., healthcare, environment, or labor issues). The smaller districts typically have one prosecutor who, with a support team, takes care of all issues in the district. In any case, prosecutors are expected to live in the district to which they are deployed.¹⁶ The design I exploit in this paper leverages variation across municipalities and years in the presence of prosecutors in the headquarters of small

¹¹The exception is cases of corruption in the use of federal transfers, which are dealt with by the federal prosecutor's office (*Ministério Público Federal*).

¹²Article 127 of the Constitution, which also charges prosecutor's office with the "defense of the legal order" and of "the democratic regime."

¹³The federal district has its own prosecutor's office which, together with the federal, military, and labor prosecutor's office make up the Union Prosecutor's Office (*Ministério Público da União*).

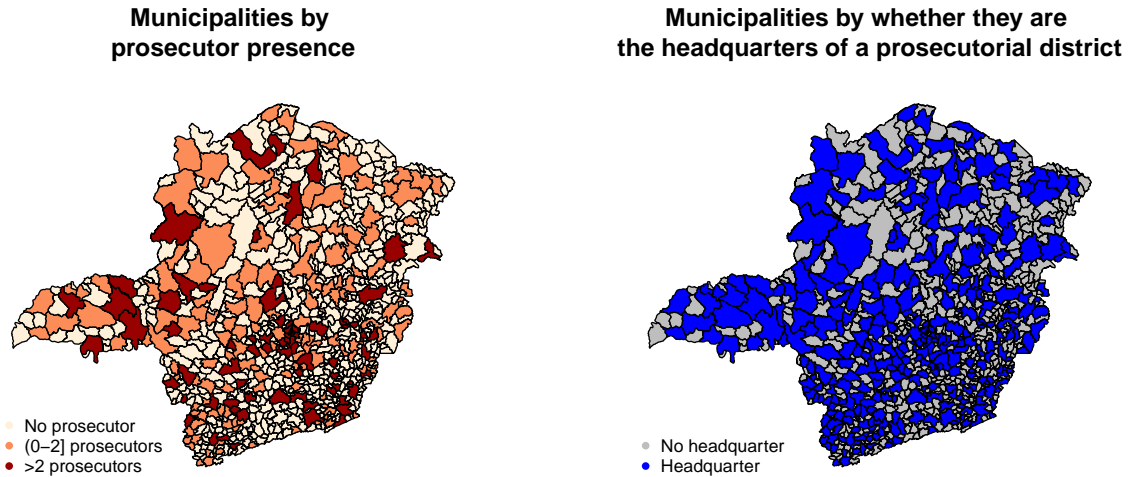
¹⁴Including a national law of the prosecutor's offices: the 1993 Law 8,625, *Lei Orgânica Nacional do Ministério Público*, available at https://www.planalto.gov.br/ccivil_03/leis/18625.htm.

¹⁵Prosecutorial districts often but not always coincide with the judicial districts (*comarcas judiciárias*).

¹⁶Article 43 of Law 8,625.

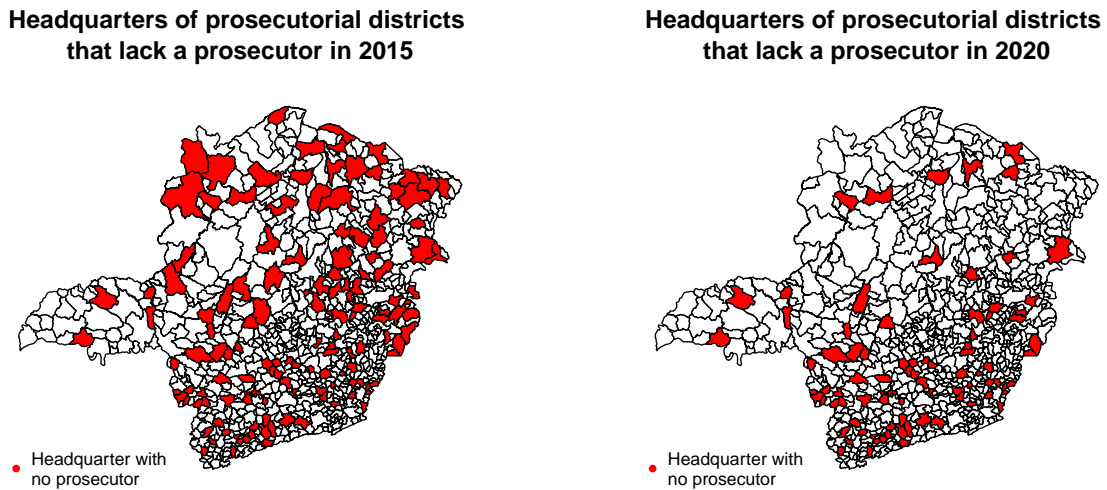
prosecutorial districts.¹⁷ This variation is illustrated with maps of the southeastern state of Minas Gerais in Figures 1 and 2 below.

Figure 1: Prosecutorial presence and district headquarters in the state of Minas Gerais in 2020



Prosecutor presence is measured with monthly payroll files. For every municipality, I count 1 prosecutor present for every 12 monthly payroll records of a prosecutor deployed to it.

Figure 2: Absence of prosecutors in district headquarters in Minas Gerais in 2015 and 2020



Prosecutor presence is measured with monthly payroll files. I consider a municipality lacks a prosecutor when there are less than 12 monthly payroll records of a prosecutor deployed to it.

¹⁷Municipalities that are not district headquarter do not have prosecutors deploy to them, whereas large districts such as state capitals always have a strong prosecutorial presence.

Seven institutional design features protect the autonomy of prosecutors from political influence and enhance their commitment to a bureaucratic ethos. First, prosecutors are selected through highly competitive civil service examinations.¹⁸ Second, once selected and after a two-year probationary period, prosecutors are appointed for life.¹⁹ Third, prosecutors cannot be moved from their post – once they take an office anywhere in the state, they cannot be forced to leave it.²⁰ Fourth, prosecutors advance in their career (and move towards more desirable posts if they so desire) based on seniority and merits,²¹ and the availability of posts.²² Fifth, prosecutors enjoy very high salaries. For example, prosecutors in the southeastern state of Minas Gerais were paid in 2020 an average net monthly salary of over 41,000 Brazilian reais (about 8,000 US dollars with the exchange rate at the time).²³ High salaries arguably make it harder for prosecutors to be captured by special interests, and ensure prosecutors' long-term commitment to the career.²⁴ Sixth, the heads of state

¹⁸To enter the selection process, candidates must be Brazilian citizens, have an undergraduate law degree, and have at least three years of professional legal experience (article 129 of the Constitution).

¹⁹Tenured prosecutors can only lose the job after a court ruling, in cases of crimes deemed incompatible with their role (article 38 of Law 8,625).

²⁰The only exception would be if a majority of the state prosecutor's office board, the *Conselho Superior do Ministério Público*, voted in favor of moving a colleague based on reasons of public interest (article 128 of the Constitution).

²¹Merits are assessed on objective criteria and assessments are public (Resolution 244 of the CNMP, available at <https://www.cnmp.mp.br/portal/images/Resolucoes/2021/Resolucao-n-244-2022.pdf>).

²²The career of prosecutors is typically organized in three main ranks. After being selected, entrants in the career are typically appointed as "substitute prosecutors" (*promotores substitutos*), essentially being deployed for short periods of time to work at a place with a particularly high demand, either on their own or supporting more experienced prosecutors. After two years they are given tenure and promoted to prosecutors (*promotores titulares*). Their first deployment is to a an entry-level district (*comarca de entrância inicial*). These are typically small districts grouping several municipalities, with low or no level of specialization, and where there is often only one prosecutor. Then, based on the availability of posts, seniority, and merits, prosecutors can move to other entry-level districts or promoted to medium-level districts (*comarcas de entrância intermediária*), in larger municipalities with more complexity and specialization; or final-level districts (*comarcas de entrância final*), typically in the state capital and sometimes in other large cities. Senior prosecutors can opt to be promoted (based on seniority, merits, and sometimes an internal examination) to the senior-level rank of *procurador*. The main difference is that *procuradores* can act before high-level courts, whereas *promotores* cannot.

²³Salaries vary with seniority. For instance, entry-level prosecutors (*promotores substitutos*) were paid on average about BRL 33,000, whereas prosecutors at the top of the career (*procuradores*) received on average BRL 47,000. These figures come from complete individual payroll reports obtained from the transparency portal of the state prosecutor's office. The averages I report here include base salary as well as extras and benefits, and are net of income tax withholdings.

²⁴In the United States context, [Boylan and Long \(2005\)](#) show that in districts where the private sector pays higher salaries assistant US attorneys are more likely to take cases to court as a way to gain trial experience in order to get a job in the private sector. They also show that in those districts, assistant US

prosecutor's offices (the *Procuradores-Gerais de Justiça*) are selected by the governor (the head of the state's executive power) but from a list of three prosecutors resulting from an internal election. Finally, prosecutors are forbidden from engaging in any partisan or political activity, charging any legal fees, or having any participation in firms (except as a stockholder).²⁵

In sum, the institutional design of Brazilian prosecutor's offices protects the autonomy of prosecutors from political influence. This contrasts with the design of prosecutor's offices in many high-income countries, where prosecutors are often dependent on the executive power (or, in the case of district attorneys in the US, on voters), do not have a career separate from that of judges, or are not empowered to act in the defense of collective interests such as good governance (Aken et al., 2004; Tonry, 2012).

3.2 Municipal governments

Brazil has 5,570 municipalities, distributed in 26 states and a federal district. Municipal governments are responsible for providing primary services in areas like education, healthcare, and social assistance. Partly due to their responsibilities in service delivery, the municipal workforce is typically large. On average, municipal governments hired in 2016 4.9% of the local population and 38.2% of those employed in the formal labor market.²⁶ Municipal employees enjoy a wage premium relative to the private sector (Colonnelli et al., 2020, 3090), similarly to other developing contexts (Finan et al., 2017). Employment opportunities in the typical municipality, which is small and relatively poor, are scarce.²⁷ Therefore, public employment is highly valued and can be mobilized for a variety of political purposes.

Mayors (who are elected by majority rule every four years, and can only be re-elected once) and the secretaries they appoint have some discretion over the hiring and firing of bureaucrats. Such discretion differs significantly between the civil service and other hiring modes with fewer employment protections. The Constitution mandates all permanent staffing needs to be filled with

attorneys have higher turnover rates.

²⁵Article 128 of the Constitution.

²⁶Figures are from the administrative labor data described below.

²⁷According to the 2010 census, the median municipality had fewer than 12,000 inhabitants and a per capita income of less than 500 Brazilian reais (about USD284 at the exchange rate at the time).

civil service contracts,²⁸ which have tenure for life after a short probationary period.²⁹ About a third of municipal employees are hired on temporary contracts,³⁰ which can legally be used to hire political appointees for management or leadership positions, or to fill short-term or urgent staffing needs.³¹ In practice, temporary hiring is often used where the civil service should prevail, often as a vehicle for political appointments.³²

The abuse of hiring outside the civil service has been shown to help politicians reward political supporters after getting to office (Colonnelli et al., 2020), build legislative coalitions (Mignozzetti et al., 2022), and mobilize supporters ahead of a re-election campaign (Toral, 2023a). It has also been shown to be detrimental for citizen welfare: bureaucrats selected under temporary contracts often have worse qualifications and experience (Colonnelli et al., 2020; Toral, 2023b), and their turnover, induced by political turnover, depresses the quality of public services (Akhtari et al., 2022; Toral, 2023c).

3.3 Prosecution of local politicians

Given the centrality of public employment in local politics, and the strong legal basis for mandating hiring in the civil service, prosecutors often seek to constrain local officials' use of temporary contracts. A prosecutor I interviewed in the northeastern state of Ceará referred to temporary contracts as "political currency."³³ A prosecutor I interviewed in the southeastern state of São Paulo reported a task-force was established to monitor the political appointment of bureaucrats.³⁴

For politicians, the consequences of being charged for violating legal rules on public employment are potentially very severe. If found guilty, they are subject to important penalties, including the loss of their post, having their political rights suspended, substantive fines, and even imprisonment.³⁵

²⁸Article 37.II of the Constitution.

²⁹Tenured employees can only be fired on extraordinary circumstances, e.g., after a corruption conviction.

³⁰I use the term temporary contracts to refer to all non-civil service contracts. These contracts can use a variety of labor regimes, all of which lack tenure.

³¹Article 37.IX of the Constitution.

³²In a face-to-face survey of bureaucrats I did in Rio Grande do Norte in 2018, 58% of respondents expressed the highest level of agreement with the statement "political connections influence the hiring of temporary bureaucrats" (Toral, 2023b).

³³State prosecutor interviewed in Ceará in August of 2017.

³⁴State prosecutors interviewed in the state of São Paulo in September of 2018.

³⁵The legal penalties for breaches of public employment laws are contained in the Constitution, the

Prosecutors have at their disposal a variety of tools to fight corruption at the local level, both judicial and extrajudicial. They can open formal investigations, issue recommendations, negotiate and sign extra-judicial agreements, and file public civil actions in court.³⁶ They can also use more informal tools, like meetings, phone calls, and e-mails. A prosecutor I interviewed in the southeastern state of Rio Grande do Norte acknowledged that sometimes such informal pressures can have an effect on local government officials.³⁷

In practice, it is not uncommon for politicians to be charged for corruption. [Lambais and Sigstad \(2023\)](#) estimate that about 7.7% of mayoral election winners or runner-ups are involved in a court case accused of corruption charges. [Bento et al. \(2021\)](#) document 1,716 judicial cases involving mayors and former mayors between 1992 and 2016 in the southern state of Rio Grande do Sul, which has 497 municipalities. In the state of São Paulo, 40% of municipalities had their mayors or former mayors convicted of corruption charges in just one year; 83% of them had to pay fines, and 68% of them had their political rights suspended ([Anuário da Justiça, 2016](#)). Because convictions are not rare, prosecutors can often induce compliance through extra-judicial measures, including recommendations and agreements.

4 Research design

To measure the impact of prosecutors on local governance, I leverage variation across years and municipalities in the physical presence of a prosecutor in the municipality. Using a novel, imputation-based causal event study approach ([Liu et al., 2022](#)) that bypasses some of the well-known issues with traditional two-way fixed-effects specifications ([Baker et al., 2022](#); [Roth et al., 2023](#)),³⁸ I identify the causal effect of a prosecutor being deployed to a municipality on anti-corruption action and on public employment. The findings, which leverage administrative data for all municipalities

Administrative Impropriety Law, the Electoral Law, and the Penal Code, among other legal instruments.

³⁶More details about each of these anti-corruption actions are included in Section 4.3 below.

³⁷Prosecutor interviewed in Rio Grande do Norte in June 2018.

³⁸Other recently developed approaches to causal inference in panel settings are inappropriate in this setting, either because they assume staggered adoption of treatment without reversals ([Callaway and Sant'Anna, 2021](#); [Sun and Abraham, 2021](#)) or a balanced panel ([Imai et al., 2023](#); [De Chaisemartin and d'Haultfoeuille, 2020](#)). The [Liu et al. \(2022\)](#) method is very similar to the imputation event study method developed in parallel by [Borusyak et al. \(2023\)](#). [Chiu et al. \(2023\)](#) replicate 38 panel data studies in top political science journals and show that, in practice, these new estimators often lead to similar estimates to each other and to the traditional two-way fixed effects specification.

in eight states across Brazil, suggest that prosecutorial presence increases anti-corruption action targeted at the local government and increases the prevalence of civil service hiring, often seen as a safeguard against corruption.

4.1 Identification

To identify the causal effect of prosecutorial presence, I exploit variation across municipality and years in the deployment of prosecutors. Several factors drive this variation in treatment. First, most state prosecutor offices lack enough prosecutors to staff all district headquarters. Over time, with the hiring of junior prosecutors growing at a higher rate than the retirement of senior ones, more district heads have been staffed.³⁹ Second, the prosecutorial districts that go from untreated to treated or vice versa are the relatively small and remote entry-level districts, typically staffed by junior prosecutors. As they advance in their careers, prosecutors seek to move to the capital city or close to it, where their living conditions can be better and more specialized prosecutor offices exist. Municipalities under control (i.e., without a prosecutor present) are subject to exactly the same rules and are monitored by prosecutors in a nearby municipality or district.

The [Liu et al. \(2022\)](#) imputation-based estimator of treatment effects is unbiased and consistent⁴⁰ under a strict exogeneity assumption.⁴¹ This assumption involves the absence of time-varying confounders, anticipation effects, and carryover effects ([Imai and Kim, 2019](#)).⁴² A key advantage of the imputation method of [Liu et al. \(2022\)](#) is that we can directly test for the validity of these identifying assumptions. These tests, presented below, all fail to detect violations.

Four substantive reasons make the strict exogeneity assumption reasonable in this setting. First, variation in prosecutor presence is mostly driven by entry-level districts, and thus by the hiring of junior prosecutors and the advancement in the career of more experienced ones. Second,

³⁹Prosecutor offices' recruitment capacity is limited, because recruitment is done through highly competitive examinations. Both limits in the ability or performance of candidates for those jobs, and the organization's intention of limiting recruitment numbers to maintain its image could explain the limited number of spots that are opened each year or two.

⁴⁰Assuming spherical errors, the imputation method is also the most efficient among all linear and unbiased estimators ([Borusyak et al., 2023](#)).

⁴¹The strict exogeneity assumption implies the parallel trends assumption.

⁴²The assumption of no anticipation effects would be violated if past potential outcomes directly affected current treatment. The assumption of no carryover effects would be violated if past treatment directly affected current potential outcomes.

prosecutor deployments are not announced *ex ante*. Third, the boundaries of prosecutorial districts are largely constant across time,⁴³ and set according to administrative criteria. Finally, state prosecutor's offices are autonomous and do not report to or depend on municipal governments.

4.2 Estimation and inference

The [Liu et al. \(2022\)](#) estimator follows an imputation procedure. Using only untreated observations (i.e., municipality-year observations without a prosecutor), municipality and year fixed effects are fitted, and then used to impute the counterfactual potential outcomes for treated units under control. The individual treatment effect for each treated observation (ITE) is estimated by taking the difference between its observed outcome and its imputed counterfactual outcome: $\hat{\tau}_{it} = Y_{it} - \hat{\alpha}_i - \hat{\beta}_t$.⁴⁴ ITEs are then aggregated to obtain dynamic treatment effects for each period (DTEs) and overall average treatment effects on the treated (ATT).

For inference, the [Liu et al. \(2022\)](#) procedure uses non-parametric block bootstrap clustered at the unit level. In this case, that implies clustering at the level of the municipality, which is appropriate since municipalities are where treatment is assigned ([Abadie et al., 2023](#)). The block bootstrap procedure essentially entails resampling many times,⁴⁵ with replacement, an equal number of municipalities from the original sample and re-doing the imputation and estimation of the ATT and DTEs with each bootstrap. Standard errors and confidence intervals are obtained from the standard deviation and percentiles of the resulting distributions of block-bootstrapped estimates.

4.3 Data

To analyze the impacts of prosecutor presence, I built a panel of municipality-year observations, leveraging administrative data from state prosecutors offices and from the federal government.

⁴³In the states for which I have assembled historical district data, there is only a handful of cases of district creation or reform. Using the same event study design, I find that when a municipality becomes the headquarters of a prosecutorial district it is more likely to have prosecutors deployed to it (Appendix E).

⁴⁴The imputation method can be used with more complex specifications (e.g., with an interaction between unit and period fixed effects) and with control variables. I follow the guidance of [Liu et al. \(2022\)](#) and use the simple two-way fixed effects specification since results pass diagnostic tests.

⁴⁵I use 1,000 block bootstraps.

To obtain data on prosecutors' presence and activity, I scraped the transparency portals of state prosecutor's offices. I use data for eight states displayed in Figure 3: São Paulo, Minas Gerais, Bahia, Rio Grande do Sul, Pernambuco, Goiás, Piauí and Tocantins.⁴⁶ These states are in all of Brazil's 5 regions, and together cover 110.9 million residents in 3,205 municipalities. This corresponds to 54.6% of Brazil's population and 57.5% of its municipalities (Table 1).

Figure 3: States included in the dataset

States with data on prosecutor presence



States with data on prosecutor activity



Table 1: Descriptive statistics of the states included in the dataset

	SP	MG	BA	RS	PE	GO	PI	TO	All
Residents (in millions)	44.4	20.5	14.1	10.9	9.1	7.1	3.3	1.5	110.9
Municipalities	645	853	417	497	184	246	224	139	3,205
Prosecutorial districts	318	297	203	164	152	127	64	41	1,366
Prosecutors	2,058	1,063	586	695	443	414	161	108	5,528
Data on prosecutor presence	✓	✓	✓	✓	✓	✓	✓	✓	
Data on prosecutor activity	✓	✓	✓	✓	✗	✗	✓	✗	

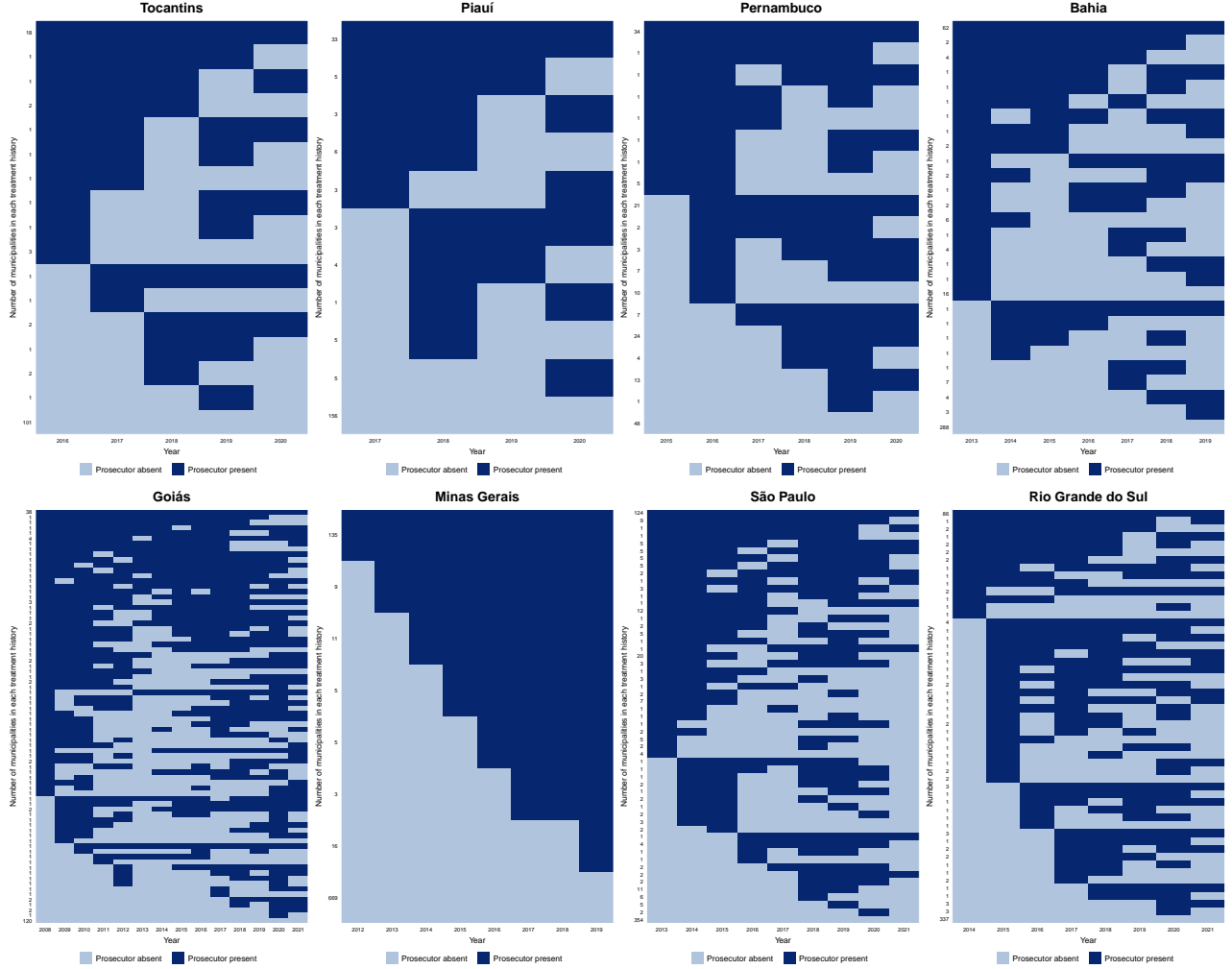
Population figures correspond to the 2022 census. Figures on municipalities, prosecutorial districts, and prosecutors refer to 2020. Prosecutor counts only include those active in the career. SP = São Paulo; MG = Minas Gerais, BA = Bahia, RS = Rio Grande do Sul, PE = Pernambuco, GO = Goiás, PI = Piauí, TO = Tocantins.

I measure the deployment of prosecutors by leveraging monthly staffing and payroll files. I identify a municipality-year observation as treated if there are at least 12 unique prosecutor-month

⁴⁶The sample includes some of the largest states, in number of municipalities and/or population, in each region.

records assigned to it. In total, I have prosecutor presence data for about 25,000 municipality-year observations, 27.7% of which are treated. Figure 4 displays variation across municipalities and year in the treatment indicator.

Figure 4: Treatment status changes across the 8 states in the sample



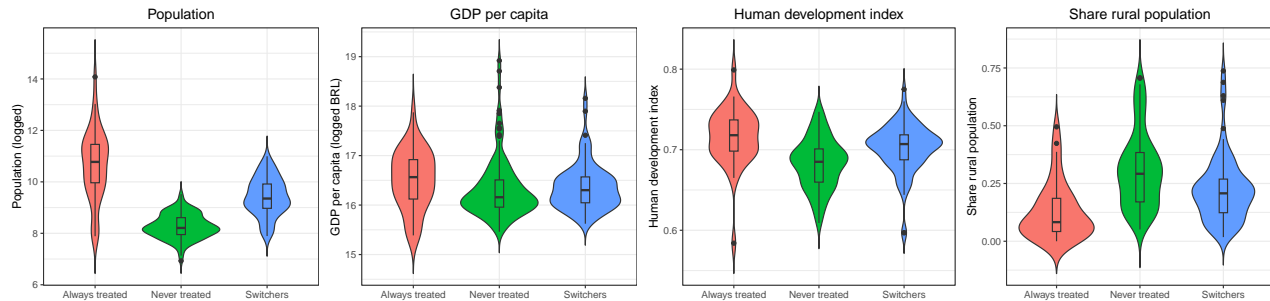
Each row in each subplot corresponds to a unique treatment history in that state, which in turn often corresponds to multiple municipalities. Darker (lighter) cells correspond to treated (untreated) observations, i.e., municipalities where a prosecutor is (not) present. The individual treatment histories of all municipalities in the sample are visualized in Appendix B.

Treatment effect estimates are driven largely by municipalities that switch from not having a prosecutor to having a prosecutor present.⁴⁷ These municipalities (*switchers*) are systematically different from both those that always have a prosecutor present (*always treated*) and those that

⁴⁷Untreated observations are used to estimate the counterfactual for treated observations. Always-

never do (*never treated*), as shown in Figure 5. While there is significant overlap, always-treated municipalities tend to be larger, wealthier, more developed, and less rural than switchers; the opposite applies for never-treated municipalities. Practically all switcher municipalities correspond to prosecutorial district headquarters.⁴⁸

Figure 5: Distribution of municipal characteristics by treatment group



Distributions in red, green and blue correspond to always-treated, never-treated, and switcher municipalities, respectively. Covariates are from the Human Development Atlas published by UNDP, and correspond to 2010.

To measure the effect of prosecutor presence on anti-corruption actions, I use scraped data for the five states in the sample where such activity can be identified at the municipality-year level.⁴⁹ In particular, I examine four types of anti-corruption action that prosecutors can take in the fight against corruption: preliminary proceedings, investigations, recommendations, and agreements. I count the number of each of these actions by municipality and year,⁵⁰ excluding all those that are not related to mismanagement or corruption.⁵¹

I examine two main types of investigations by prosecutors. Preparatory proceedings (*procedimentos preparatórios*) are preliminary investigations to gather evidence and to examine the facts

treated municipalities are disregarded completely by the imputation method, and dropped at the pre-processing stage, because estimating their counterfactual would require strong assumptions (Liu et al., 2022).

⁴⁸In states for which I have historical prosecutorial district data, 99.8% of treated municipality-year observations correspond to district headquarters.

⁴⁹The transparency portals of the state prosecutor offices of Pernambuco, Goiás and Tocantins only allow identifying prosecutor activity at the level of the district, not of the municipality.

⁵⁰I assign each anti-corruption action to the year of its establishment only.

⁵¹To select anti-corruption actions, I use prosecutor office's topical classification of actions and keep only those including key words such as public assets (*patrimônio público*), public mismanagement (*improbidade administrativa*), or administrative law (*direito administrativo*).

and the potential for prosecutorial action.⁵² Civil investigations (*inquéritos civis*), in turn, are more formal, are generally notified to the affected parties (except when the law allows for confidentiality), and can be extended longer in time.⁵³ At any point during preparatory proceedings or civil investigations, the prosecutor may archive the case or file a public civil action (*ação civil pública*) in court. Both preparatory proceedings and formal investigations can be established at the discretion of the prosecutor, unprovoked or after a request from an affected party.⁵⁴

I also examine two types of extra-judicial actions that prosecutors can take in the fight against corruption. In the context of preparatory proceedings or civil investigations prosecutors may issue formal recommendations (*recomendações*).⁵⁵ Recommendations can request that a party (e.g., a mayor, a secretary, or a bureaucrat) do something or cease to do something to ensure compliance with the law. Recommendations must include a rationale, a specific action requested, and a deadline.⁵⁶ Prosecutors can also negotiate and sign agreements (*termos de ajustamento de conducta*, TACs), which –unlike recommendations– are binding.⁵⁷ Agreements must contain specific obligations, and a daily fine the affected party will be subject to for breaches after the deadline. Agreements are intended to enhance compliance of public officials with the law and the compensation for the damages (including financial damage to government budgets) while avoiding the slow and costly procedures of a public civil action in court.

To measure how prosecutorial presence affects local governance outcomes I look at municipal employment. In this context, municipal employment, particularly in temporary contracts, is often mobilized for political purposes, either to reward supporters (Colonnelli et al., 2020) or to mobilize partisans and voters during campaigns (Toral, 2023a). In particular, I leverage the Ministry of the Economy’s Annual Social Information Report (RAIS, *Relação Anual de Informações Sociais*). All formal employers –including municipal governments– are legally obliged to report all their contracts to the Ministry of the Economy every year. RAIS therefore contains data on the universe of municipal employees, including contract type, start and end dates, salary, reason for termination,

⁵²Preparatory proceedings may last up to 180 days, as per the 2017 Resolution 23 of the CNMP (available at <https://www.cnmp.mp.br/portal/images/Normas/Resolucoes/Resolucao-0232.pdf>).

⁵³Civil investigations may last up to 2 years (Resolution 23 of the CNMP).

⁵⁴Requests to establish an investigation may be declined by the prosecutor in written with a justification.

⁵⁵In urgent cases, recommendations can also be issued before the establishment of preparatory proceedings or a civil investigation (Resolution 28 of the CNMP, available at <https://www.cnmp.mp.br/portal/images/Resolucoes/Resolu%C3%A7%C3%A3o-164.pdf>).

⁵⁶Recommendations sometimes also include the consequences that not following it may have.

⁵⁷Once signed, agreements have the same executive force as a court order. They are similar to the consent decrees used by prosecutors in the United States.

and professional category, among other variables. I count the number of new hires⁵⁸ in each municipality-year observation (between 2000 and 2020), by whether they have a civil service contract or a temporary one.⁵⁹ With this data, I examine the effects of prosecutor presence on the number of new hires in the civil service, the number of new hires on temporary contracts, and the share of new hires in the civil service.⁶⁰

5 Results

The event study estimates presented below demonstrate that the presence of a prosecutor in a municipality leads to an increase in anti-corruption action targeted at the local government (including preparatory proceedings, investigations, recommendations, and agreements). Consistent with public officials responding to prosecutorial pressures, prosecutor presence also causes an increase in the prevalence of civil service hiring. Tests for the identifying assumptions all lend support to the validity of the design.

5.1 Effects of prosecutor presence on anti-corruption action targeted at the local government

Causal event study estimates suggest that prosecutorial presence in a municipality causes an increase of anti-corruption action targeted at the local government. Figure 6 shows that, in average, the arrival of a prosecutor leads to an increase of 0.74 preparatory proceedings and 1.59 formal investigations on corruption and mismanagement by the local government ($p < 0.001$). These effects correspond to about 0.20 and 0.17 standard deviations of the number of preparatory proceedings and investigations in municipalities without a prosecutor.⁶¹

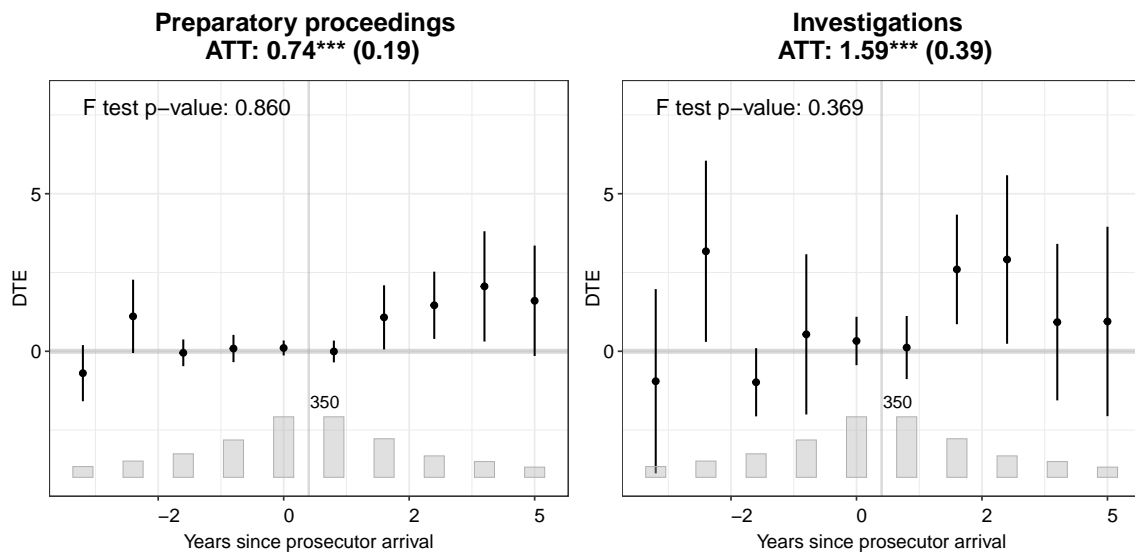
The increase in prosecutorial action is not restricted to mere investigations. Figure 7 shows

⁵⁸I exclude contracts for less than 40 hours a week (equivalent to a full-time job) so as to not double count employees that have several part-time jobs.

⁵⁹I code as civil service contracts those in the *regime jurídico único de servidores públicos*, and as temporary all other employees, who are hired through a variety of legal regimes. Unfortunately, RAIS does not allow a reliable identification of temporary workers who are politically appointed (e.g., *cargo comissionado*, *função de confiança*).

⁶⁰In order to keep all observations, I assign that share to zero when there are no new hires, but results

Figure 6: Dynamic and average treatment effects of prosecutor presence on the number of preparatory proceedings and investigations filed



Each subplot presents the estimated dynamic treatment effects (DTE) for switcher municipalities in each period (indexed relative to the year of prosecutor arrival) as a dot, and its block-bootstrapped 95% confidence interval as a vertical line. The overall average treatment effect on the treated (ATT) is reported below each subplot's title together with its standard error in brackets (\cdot $p < 0.10$; $*$ $p < 0.05$; $**$ $p < 0.01$; $***$ $p < 0.001$). The bar plot at the bottom represents the number of treated units in each period. Periods where the number of treated observations is less than 15% of the number of observations at the period of prosecutor arrival are omitted from the subplots. The F test p -value reported in the upper left corner of each plot corresponds to the test of no pre-trend.

that the arrival of a prosecutor also causes an increase in the number of recommendations issued to local government officials, and extra-judicial agreements signed with them. In particular, recommendations increase by 0.19 on average ($p < 0.01$) and agreements increase by 0.09 on average ($p < 0.05$), which is equivalent to increases of about 0.22 and 0.12 standard deviations, respectively.⁶²

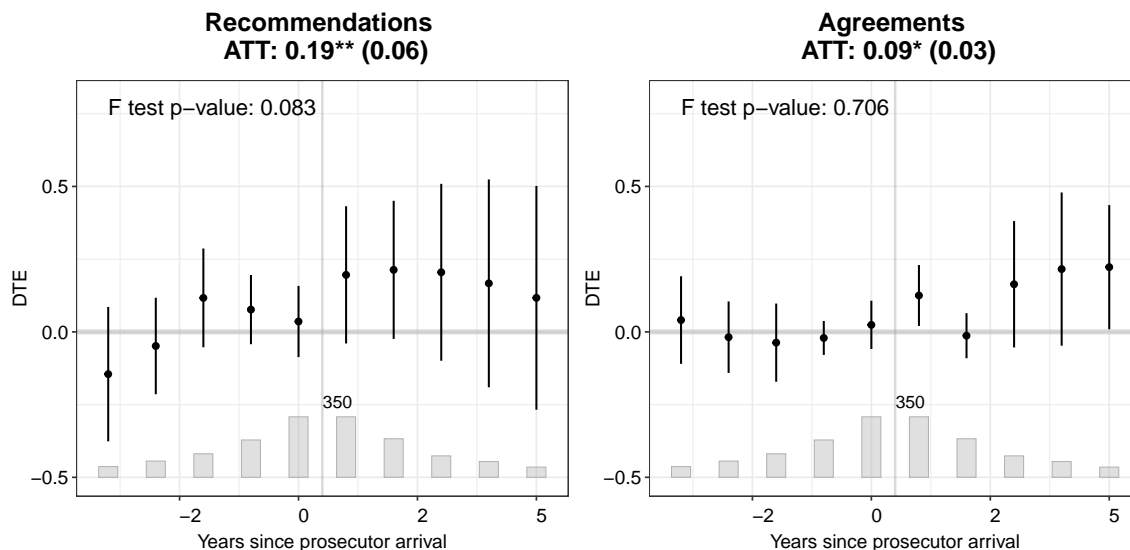
Multiple pieces of evidence lend support to the validity of the design. First, the pre-treatment DTEs are generally insignificant. Second, the F test for no pre-trend returns high p -values in all cases, as seen in the upper left corner of the plots. Third, placebo tests that re-estimate DTEs and the ATT assuming that the prosecutors arrive 1, 2 or 3 years before they actually do return

are similar when dropping those observations.

⁶¹In municipality-observations under control, prosecutors file on average 0.75 preparatory proceedings and 3.38 investigations.

⁶²In municipality-observations under control, prosecutors file 0.19 recommendations and sign 0.11 agreements, on average.

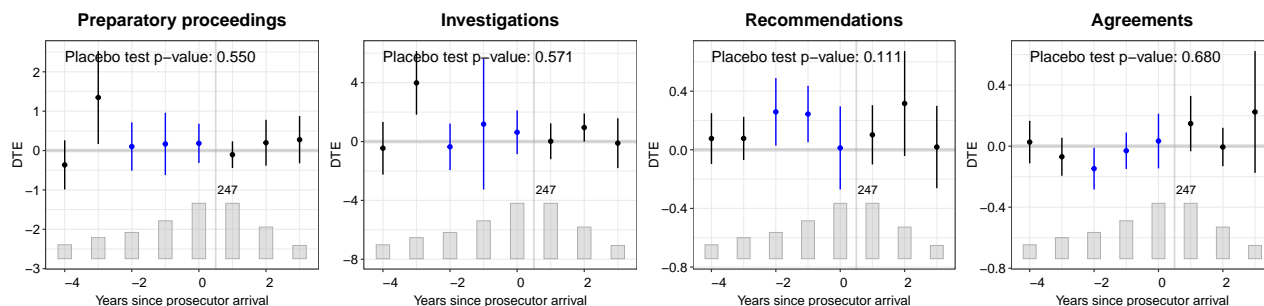
Figure 7: Dynamic and average treatment effects of prosecutor presence on the number of recommendations issued and agreements signed



See notes under Figure 6.

statistically insignificant results, as shown in Figure 8. Tests for the no carryover assumption that re-estimate DTEs and the ATT assuming that prosecutors stay 1 or 2 years after they actually depart also return insignificant results (Figure 9.) Last, results are unlikely to be driven by a misspecification of potential outcomes. As shown in Appendix C, ATT estimates are similar (in both substantive and statistical significance) using binary or logged measures of the outcomes.

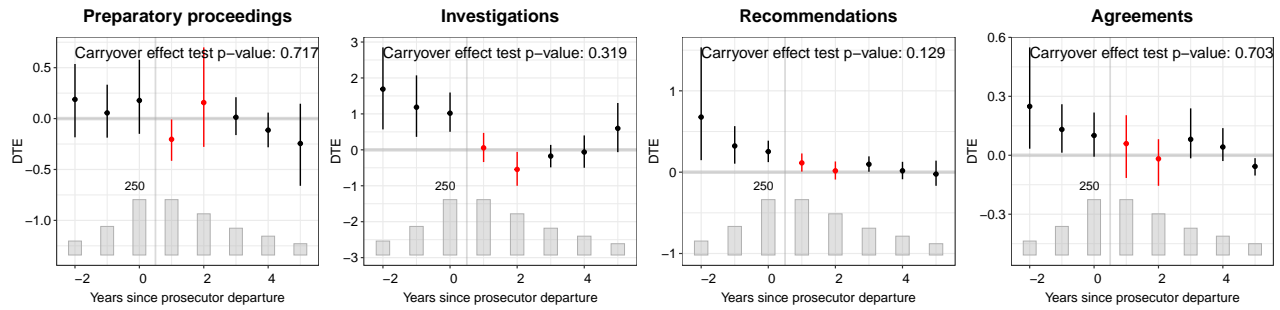
Figure 8: Placebo tests for the effect of prosecutor presence on anti-corruption actions



Bars and confidence intervals in blue (2, 3 and 1 years before actual prosecutor arrival) correspond to placebo tests. See notes under Figure 6.

Taken together, these results show that the presence of a prosecutor in a municipality leads to an increase of anti-corruption actions targeted at the local government. These actions include not just investigations, but also recommendations and even agreements that generate binding

Figure 9: Carryover tests for the effect of prosecutor presence on anti-corruption actions



Bars and confidence intervals in red (1 and 2 years after actual prosecutor departure from a treated municipality) correspond to carryover tests. Observations are indexed relative to the time of actual prosecutor departure. See notes under Figure 6.

obligations for public officials. These treatment effects suggest that indeed presence makes it easier for prosecutors to detect malfeasance, and highlight the role of physical proximity for accountability and rule of law institutions. This is consistent with what some prosecutors reported in interviews. A prosecutor I interviewed in the northeastern state of Rio Grande do Norte said: “it makes a big difference if the prosecutor is in the district.”⁶³ It is also consistent with efforts by state prosecutor’s offices to further extend their presence throughout the territory. The state prosecutor’s office of Minas Gerais, for example, has run since 2010 a program called “traveling prosecutor’s office”, which brings prosecutors, workshops, and events to small municipalities that are not district headquarters.⁶⁴

5.2 Effects of prosecutor presence on local municipal employment

Does the presence of prosecutors change local government officials’ decisions? Event study estimates of effects of prosecutor presence on municipal employment suggest that they do. Figure 10 shows that municipalities with a prosecutor present hire, on average, 6.5 more bureaucrats on the civil service than those without a prosecutor, although the difference is marginally insignificant ($p = 0.07$). On the other hand, prosecutor presence does not lead to any discernible increases in the number of temporary hires, which in fact appear to decrease over time after the arrival of a prosecutor. As a result, the share of new employees who are hired with civil service contracts appears to

⁶³Prosecutor interviewed in Rio Grande do Norte in June of 2018.

⁶⁴Similar projects exist in other states. More information about the one in Minas Gerais can be found at <https://www.mpmg.mp.br/portal/menu/areas-de-atuacao/cidadania/inclusao-e-mobilizacao-sociais/ministerio-publico-itinerante.shtml>.

increase with prosecutor presence, although again that difference is not statistically significant ($p = 0.15$). The magnitude of the absolute and relative increases in civil service hiring is not trivial: the ATTs shown on the left- and right-hand panels of Figure 10 correspond to about 9.3% and 4.6% of a standard deviation of the distributions under control.⁶⁵

Figure 10: Dynamic and average treatment effects of prosecutor presence on municipal employment



See notes under Figure 6.

These analyses with municipal employment outcomes also pass the validity tests: pre-treatment DTEs in Figure 10 are insignificant, the F test for no pre-trend returns high p -values, and the placebo and carryover effect tests are passed (Figures 11 and 12, respectively). On the other hand, the findings here, unlike those for anti-corruption action, are sensitive to the specification of the outcome. As shown in Appendix C, the results using binary and logged measures of employment outcomes are all statistically insignificant, although they move in the same direction as those reported in Figure 10.

These results, while less marked and robust as the more direct effects on prosecutor activity, suggest that local government officials do respond to prosecutor presence and adjust their decisions in one of the most important dimensions of public management in this setting – public employment. This is consistent with qualitative evidence from interviews with bureaucrats and politicians who explained changes in hiring practices were driven by pressures from the state prosecutor's office. For example, two municipal school directors I interviewed in the southeastern state of Rio de Janeiro said that while their school's teaching force had largely been on temporary contracts, the share of civil servants had increased significantly as a response from pressures from the state prosecutor in

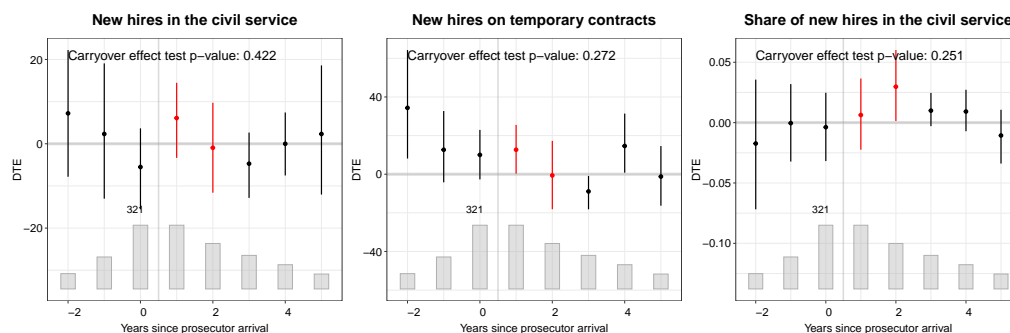
⁶⁵This contrasts with the ATT for hires under temporary contracts, equivalent to just 0.5% of a standard deviation.

Figure 11: Placebo tests for the effect of prosecutor presence on municipal employment



See notes under Figure 8.

Figure 12: Carryover tests for the effect of prosecutor presence on municipal employment



See notes under Figure 9.

the locality.⁶⁶

Three reasons make the effects of prosecutorial pressure on the prevalence of civil service hiring meaningful. First, they imply a reduction in the prevalence of temporary hiring, which sometimes allows politicians to use public employment for private gain, be it by rewarding supporters (Colonnelli et al., 2020), building and sustaining legislative coalitions (Mignozzetti et al., 2022), or mobilizing supporters ahead of elections (Toral, 2023a). Second, the growth in civil service hiring can further constrain local government's ability to engage in corruption, both in the short and in the long term. For instance, when politicians have direct control over bureaucratic careers, it is easier for them to manipulate procurement processes (Charron et al., 2017; Brierley, 2020). Finally, having a larger share of the bureaucracy on civil service contracts has the potential to improve public service delivery (Aneja and Xu, 2023). A key mechanism connecting civil service contracts to government performance is that they lessen the connection between political and bureaucratic turnover, which

⁶⁶Municipal school directors interviewed in the state of Rio de Janeiro in February of 2017.

has been shown to depress service delivery in Brazil ([Akhtari et al., 2022](#); [Toral, 2023c](#)).

6 Additional evidence from a survey of local politicians

Observational results from an online survey of local politicians provide additional evidence about the impacts of prosecutorial presence, consistent with the mechanisms outlined in section 2. In particular, politicians in municipalities with prosecutor presence report more meetings with prosecutors, and are more likely to believe that the prosecutor's office knows the local reality.

I did the survey in early 2019 in partnership with the audit court of the northeastern state of Rio Grande do Norte. The primary purpose of the survey was to measure intermediate outcomes of a field experiment that randomized an information treatment sent by the state audit court ([Toral, 2019](#)), but I included some questions about the state prosecutor's office. The survey was sent by the court to the mayor and the secretaries of education, healthcare, social assistance, finance, and administration of all 167 municipalities in the state. 455 politicians from 142 municipalities completed the survey (including 50 mayors and 405 secretaries), for a response rate of 45% – a high value for a survey of elites.⁶⁷

Correlational analyses reported in Table 2 suggest that politicians in municipalities where a prosecutor was present⁶⁸ were 25.7 percentage points more likely to report having held a meeting with a prosecutor in the previous three months ($p < 0.001$). This difference is equivalent to about half of a standard deviation. Politicians in municipalities where a prosecutor was present were 9.1 percentage points more likely to agree with the statement “the prosecutor's office knows the reality of this municipality” ($p < 0.05$), a difference of roughly a quarter of a standard deviation. On the other hand, there is no statistically significant difference in respondents' agreement about the statements “the prosecutor's office detects the management irregularities that take place in this municipality” or “I trust the prosecutor's office.”⁶⁹

⁶⁷Appendix F has a link to the survey instrument, details on respondent recruitment and non-response, and descriptive statistics.

⁶⁸I measure prosecutor presence using payroll files from December 2018, gathered from the transparency portal of the prosecutor's office of Rio Grande do Norte.

⁶⁹Results are similar when using the continuous rather than binary measures of the outcome, when controlling for municipality population, or when excluding municipalities with more than one prosecutor, although only the coefficient for meetings retains statistical significance (Appendix F.3).

Table 2: Correlation between prosecutorial presence and politician survey responses

	Met with a prosecutor in the past 3 months	<i>Agreement with statement:</i>		
		"The MP knows this municipality"	"The MP detects irregularities here"	"I trust the MP"
Prosecutor present	0.257*** (0.056)	0.091* (0.042)	-0.044 (0.053)	-0.056 (0.049)
Constant	0.337*** (0.034)	0.765*** (0.027)	0.613*** (0.031)	0.801*** (0.026)
Observations	450	455	455	455
R-squared	0.060	0.011	0.002	0.004

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Municipality-clustered standard errors in brackets. The dependent variables are dummies for whether the respondent reports having met at least once with a prosecutor over the previous 3 months, and whether the respondent's level of agreement is at or above the median for the following statements: "The prosecutor's office knows the reality of this municipality", "The prosecutor's office detects the management irregularities that take place in this municipality", and "I trust the prosecutor's office."

These correlations suggest that prosecutorial presence increases contact between prosecutors and politicians. This contact may help prosecutors collect richer information about potential malfeasance and mismanagement, and induce accountability pressures on local government officials. The fact that politicians in municipalities with prosecutor presence are not more likely to report that the prosecutor's office detects local irregularities, or that they trust the prosecutor's office, is consistent with the uneasy feelings about the prosecutor's office that local politicians often report in interviews. A former municipal secretary of administration in the northeastern state of Rio Grande do Norte told me in an interview: "the prosecutor's office thinks it's almighty and wants to meddle in everything; they should run for election."⁷⁰

7 Conclusion

Corruption is a major obstacle to economic and social development. While it takes many forms, it affects all countries around the world. Empowering independent prosecutor's offices has recently emerged as a promising avenue of reform, yet evidence about the effectiveness of prosecutors (and its mechanisms) is rare. This paper contributes to fill this gap by articulating a theory of how independent prosecutors can use their unique discretion and autonomy (unparalleled to that of any

⁷⁰Former municipal secretary of administration interviewed in Rio Grande do Norte in June of 2018.

other accountability actor) to fight corruption, and why physical proximity to the communities they monitor makes that task easier.

Estimates from an imputation-based causal event study design demonstrate that prosecutor presence leads to an increase in anti-corruption action targeted at the local government. These effects are significant both statistically and substantively, and include increases in investigations, recommendations, and extra-judicial agreements. The design also uncovers suggestive evidence of local government officials responding to prosecutor presence by adjusting their decisions on a key area of governance in this context – public employment. Estimates suggest that prosecutor presence increases the prevalence of civil service hiring, which has potential wide-ranging implications for politicians' ability to engage in corruption through public employment and other means. I complement these findings with correlations from an original survey of politicians, and with insights from in-depth interviews with prosecutors.

The paper makes three key contributions. First, it articulates a theory of prosecutor's advantage in the fight against corruption, emphasizing the role of a hitherto under-appreciated source of prosecutor effectiveness – physical presence. Second, it provides causal evidence of the effect of prosecutor presence on anti-corruption action and local governance outcomes. More generally, it presents plausibly causal evidence of the effects of prosecutors on anti-corruption efforts and on corruption. As far as I know, this is the first quasi-experimental study to present evidence on prosecutor effectiveness outside the United States, a context marked by the political selection of prosecutors.

The paper has some important limitations that will be addressed in future iterations. First, the data coverage is limited. Although the panel I use includes over 25,000 municipality-year observations, many of them are not directly leveraged for causal inference, since variation across municipalities and time in prosecutor presence is rare. To ameliorate coverage and statistical power, I plan to include more states and more years. Second, the current version of the paper examines a limited set of anti-corruption and governance outcomes. In the future I plan to also examine effects on public civil actions and on convictions, although the effects of presence on those outcomes are not immediately clear since extra-judicial efforts by prosecutors may decrease rather than increase reliance on courts. I also plan to examine effects on other governance outcomes such as spending and procurement. Third, evidence of mechanisms is limited. I plan to leverage heterogeneity analyses and additional interviews and surveys to assess what may be driving the effects presented in this paper.

Finally, the paper has important policy implications. First, it suggests that empowering autonomous prosecutor's offices may be an effective way to deter corruption at the local level. Second, it suggests that efforts at decentralizing autonomous prosecutor's offices may lead to important gains in effectiveness. More generally, the results presented here suggest that the internal organization and relational capacity of rule of law institutions may be an important complement to their independence.

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Appendices

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A Additional details on in-depth interviews

In-depth interviews with local actors gave origin to the hypotheses tested in this article, but were part of a larger empirical study of patronage in Brazil. Over 18 months of fieldwork in the period 2016-2019 I conducted 121 in-depth, semi-structured interviews with municipal bureaucrats and politicians, with prosecutors, and with other accountability actors. I recruited interviewees at their offices, and collected their oral consent after providing information about the research project and their rights as participants. I conducted interviews in Portuguese, face-to-face, and at the interviewee's office. I chose not to record interviews because some of the topics discussed were highly sensitive, including corrupt and illegal uses of public employment. While recording interviews would have allowed for more complete transcripts, it would have seriously hindered the reliability of the data and subjects' willingness to participate. Some subjects agreed to participate on the condition of anonymity or confidentiality. When quoting interviewees, I specify only their position, the state, and the month of the interview in order to safeguard their identity. In total, I interviewed 51 municipal politicians, 54 municipal bureaucrats, and 16 horizontal accountability actors.⁷¹ Interviews were done in 45 municipalities in 7 states across 3 different regions of Brazil.⁷² Locations were chosen to ensure diversity in political and socioeconomic variables.

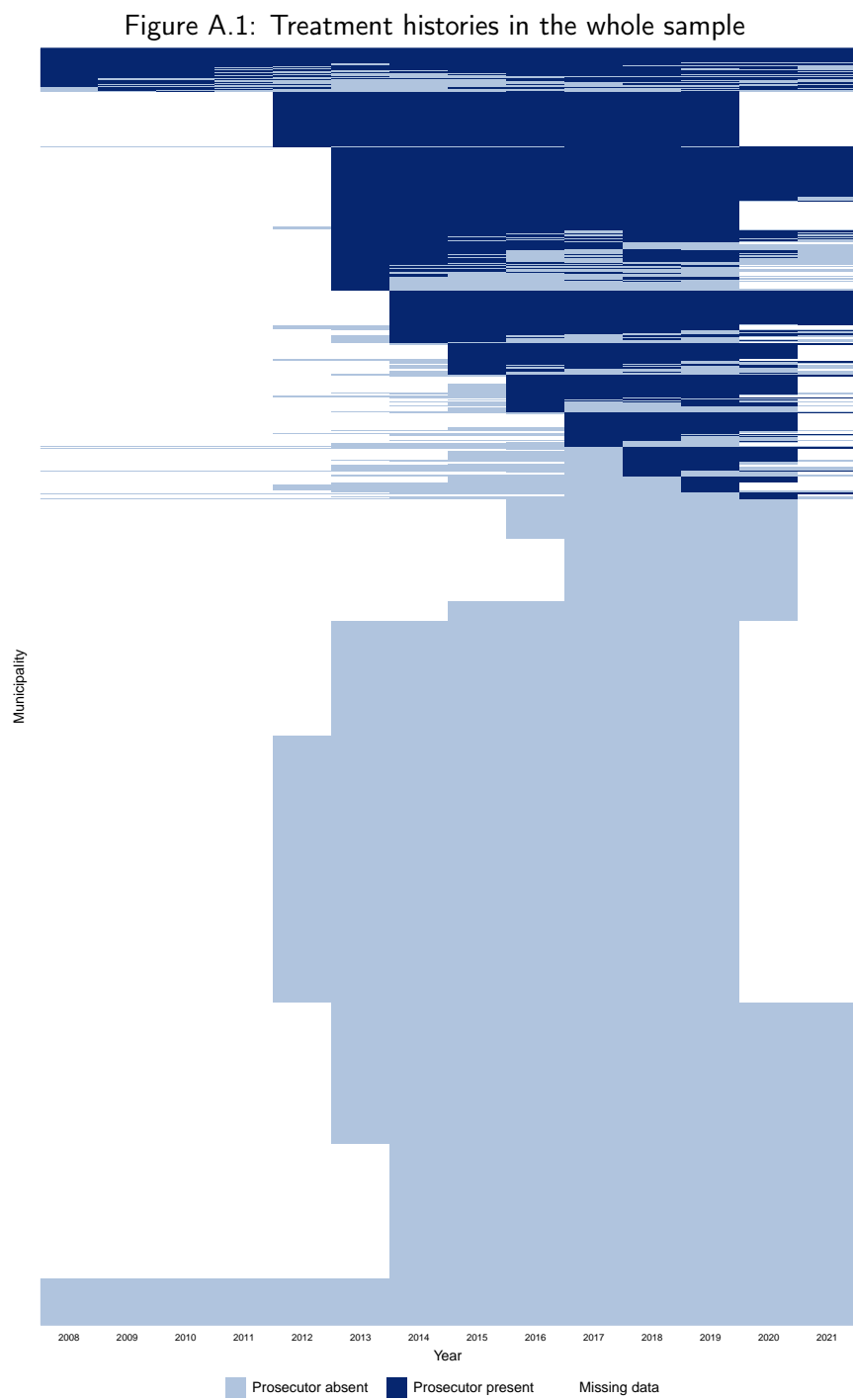
Within each municipality, fieldwork focused on the center, where government offices are. I approached potential interviewees at their offices and requested an interview after introducing myself and the research project. No compensation of any sort was offered or given to participants. Most subjects that I managed to speak to directly agreed to participate.⁷³ Interviews were semi-structured, and usually started as an open conversation about the interviewee's background, the challenges they faced in their position, and their perception of public services in the municipality. As the conversation advanced, I followed up with questions about the local dynamics of public employment, including in some cases specific questions about the connection between political turnover, bureaucratic turnover, and public service delivery. I took handwritten notes during and after the interviews. The median duration of interviews was one hour.

⁷¹41 of the 51 politicians were secretaries. 46 of the 54 bureaucrats were school directors, clinic managers, and social assistance center coordinators. Of the 16 horizontal accountability actors, 8 were state prosecutors.

⁷²Interviews were done in the states of Ceará (43 interviews), Rio Grande do Norte (21), Paraíba (15), Rio de Janeiro (19), Minas Gerais (10), São Paulo (1), and Goiás (12).

⁷³Some refused, mostly arguing they did not have time. Two refused due to the research topic.

B Treatment histories in the sample



C Alternative specifications of outcomes

Figure A.2: Dynamic and average treatment effects of prosecutor presence on anti-corruption action: Binary outcomes

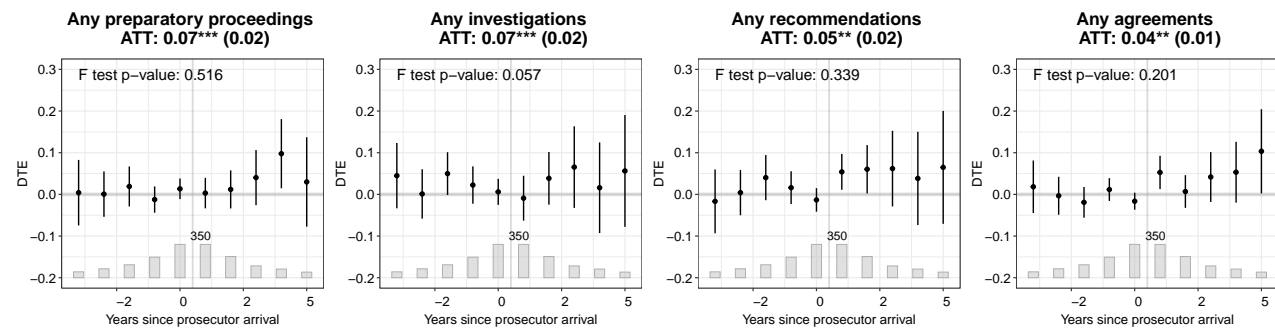


Figure A.3: Dynamic and average treatment effects of prosecutor presence on anti-corruption action: Logged outcomes

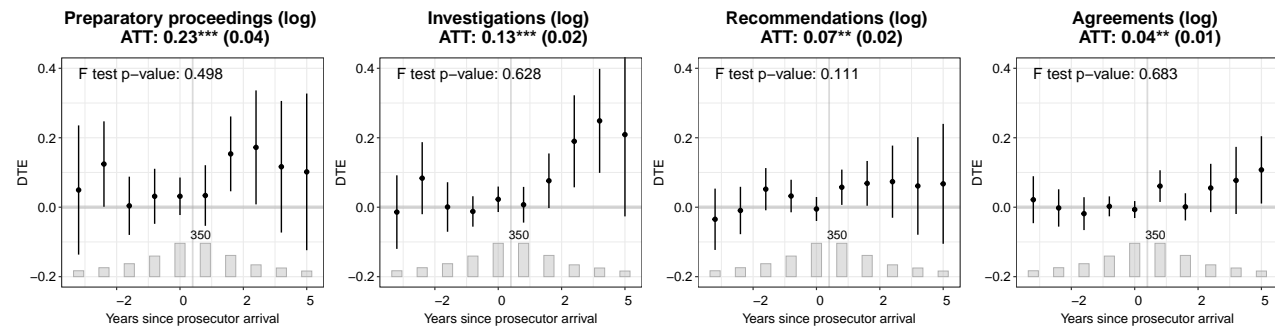
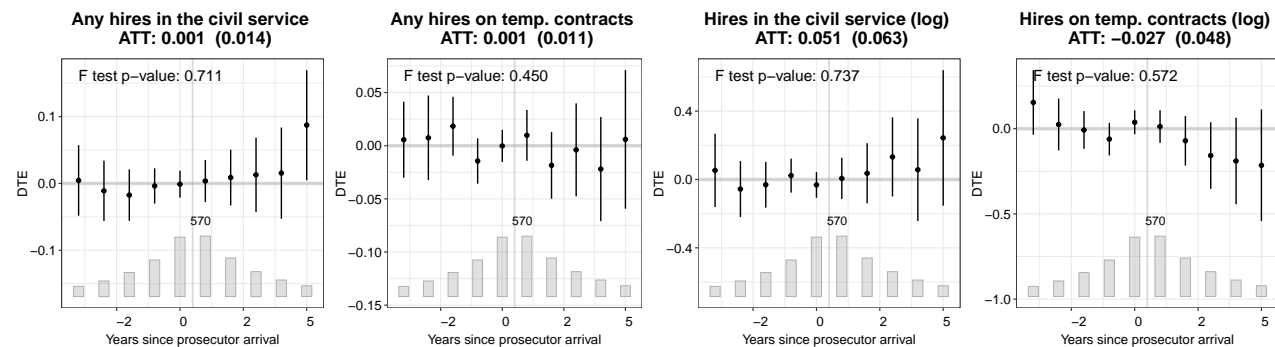


Figure A.4: Dynamic and average treatment effects of prosecutor presence on new hires: Binary and logged outcomes



D Heterogeneity of treatment effects across time

Figure A.5: Heterogeneity across time of dynamic and average treatment effects of prosecutor presence on anti-corruption action

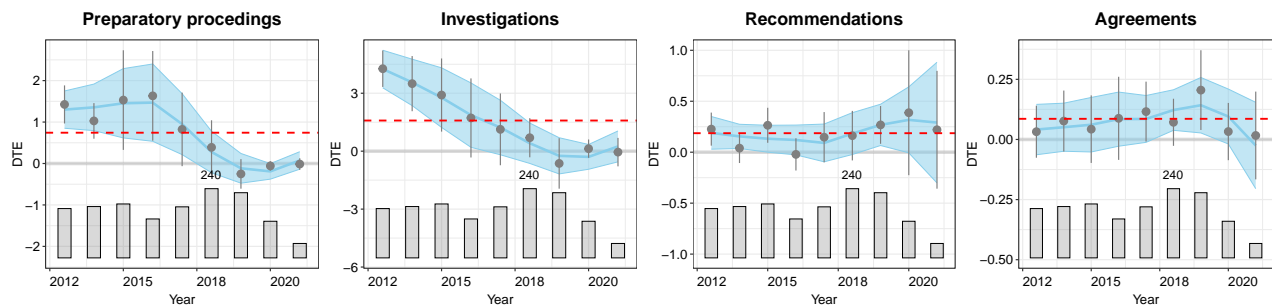
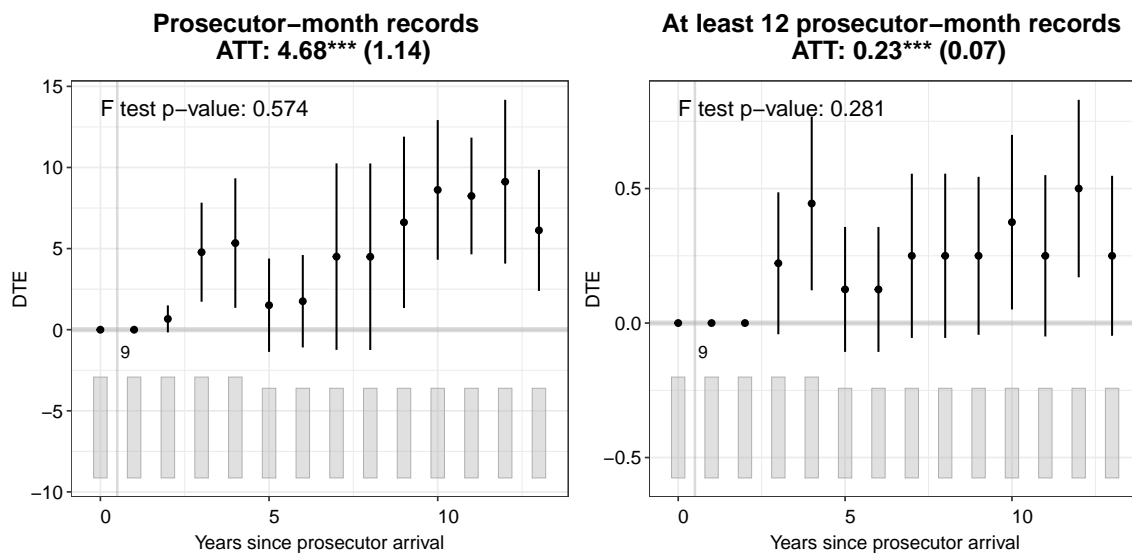


Figure A.6: Heterogeneity across time of dynamic and average treatment effects of prosecutor presence on municipal public employment



E Effect of prosecutorial district creation on prosecutor presence

Figure A.7: ATT estimates of the effect of prosecutorial district creation on prosecutor presence



F Additional details on the politician survey

The survey instrument (in English and Portuguese) is available [here](#).

F.1 Respondent recruitment and non-response

Table A.1: Correlates of the number of responses per municipality

	Respondents (log)	No respondents (dummy)	Respondents (log) w/o zeroes
Population (logged)	0.042 (0.056)	−0.008 (0.032)	0.040 (0.042)
GDP per capita (logged)	−0.209 (0.127)	0.118 (0.085)	−0.071 (0.117)
Deaths per thousand	0.036 (0.037)	−0.027 (0.019)	−0.003 (0.033)
Mayor was reelected in 2016	0.260 (0.114)*	−0.137 (0.046)**	0.072 (0.100)
Constant	2.466 (1.207)*	−0.652 (0.762)	1.710 (1.035)
R-squared	0.049	0.063	0.009
Observations	167	167	142

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$. HC1 standard errors in brackets.

The state audit court of Rio Grande do Norte sent the survey to all mayors and to secretaries of five key areas (education, healthcare, social assistance, finance, and human resources) in the 167 municipalities of the state through its online platform.⁷⁴ Participation was voluntary. A total of 455 politicians participated and finished the survey, of which 50 were mayors and 405 secretaries. These respondents come from 142 municipalities. Municipalities where mayors were in their second term were more likely to participate, but conditional on some politicians responding there are no significant correlations between the number of respondents and basic political and socioeconomic characteristics of the municipality, as shown in Table A.1. Participants were recruited through the court's online platform, where they received information about the research project and their rights as participants. Participants were not compensated in any form.

F.2 Descriptive statistics

⁷⁴The survey was also sent to city councilors, but their responses are excluded here because the theory in this paper focuses on executive politicians. Including city councilors' responses, however, does not alter the results.

Table A.2: Descriptive statistics for the survey of politicians, by position

	All (N=455)		Mayors (N=50)		Secretaries (N=405)	
	Mean	SD	Mean	SD	Mean	SD
Age	42.620	10.611	48.680	11.092	41.872	10.320
Female	0.569	0.496	0.220	0.418	0.612	0.488
High school degree or less	0.099	0.299	0.320	0.471	0.072	0.258
College degree or more	0.789	0.408	0.580	0.499	0.815	0.389
Party member	0.516	0.500	0.980	0.141	0.459	0.499
Experience as bureaucrat (years)	0.721	0.449	0.380	0.490	0.763	0.426
Experience as politician (years)	4.607	4.881	7.260	6.901	4.279	4.474

Table A.3: Correlation between prosecutorial presence and politician survey responses – Continuous outcomes

	Meetings with a prosecutor in the past 3 months	<i>Agreement with statement:</i>		
		“The MP knows this municipality”	“The MP detects irregularities here”	“I trust the MP”
Prosecutor present	0.348*** (0.074)	0.142 (0.087)	-0.039 (0.077)	-0.046 (0.064)
Constant	0.314*** (0.034)	3.119*** (0.050)	3.497*** (0.045)	3.745*** (0.039)
Observations	450	455	455	455
R-squared	0.084	0.006	0.001	0.001

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Municipality-clustered standard errors in brackets. The dependent variables are the logged count of self-reported meetings with a prosecutor over the previous 3 months, and the respondent's level of agreement (on a 4-point scale) with the following statements: “The prosecutor's office knows the reality of this municipality”, “The prosecutor's office detects the management irregularities that take place in this municipality”, and “I trust the prosecutor's office.”

F.3 Alternative specifications

Results are similar when using the continuous measures of the outcome, although the correlation for the question on the MP knowing the municipality is not statistically significant ($p = 0.102$).

Results are similar when excluding municipalities where more than one prosecutor was present in January of 2019. These correspond to large prosecutorial districts, which are unlikely to be vacant. When comparing only municipalities with one or zero prosecutors present, we still see a significant correlation between prosecutorial presence and meetings ($p < 0.05$) and a positive yet insignificant correlation with the statement about the prosecutor's office knowing the reality of the municipality ($p = 0.233$).

Finally, results are similar when controlling for municipal population, a key correlate of pros-

Table A.4: Correlation between prosecutorial presence and politician survey responses – Excluding municipalities with more than one prosecutor

	Met with a prosecutor in the past 3 months	Agreement with statement:		
		"The MP knows this municipality"	"The MP detects irregularities here"	"I trust the MP"
Prosecutor present	0.163* (0.063)	0.061 (0.051)	-0.047 (0.070)	-0.084 (0.065)
Constant	0.337*** (0.034)	0.765*** (0.027)	0.613*** (0.031)	0.801*** (0.026)
Observations	390	394	394	394
R-squared	0.020	0.004	0.002	0.007

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Municipality-clustered standard errors in brackets. The dependent variables are dummies for whether the respondent reports having met at least once with a prosecutor over the previous 3 months, and whether the respondent's level of agreement is at or above the median for the following statements: "The prosecutor's office knows the reality of this municipality", "The prosecutor's office detects the management irregularities that take place in this municipality", and "I trust the prosecutor's office."

Table A.5: Correlation between prosecutorial presence and politician survey responses – Controlling for population

	Met with a prosecutor in the past 3 months	Agreement with statement:		
		"The MP knows this municipality"	"The MP detects irregularities here"	"I trust the MP"
Prosecutor present	0.229*** (0.056)	0.082 (0.043)	-0.042 (0.055)	-0.070 (0.051)
Constant	0.332*** (0.034)	0.763*** (0.027)	0.613*** (0.031)	0.799*** (0.026)
Observations	450	455	455	455
R-squared	0.071	0.013	0.002	0.008

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Municipality-clustered standard errors in brackets. The dependent variables are dummies for whether the respondent reports having met at least once with a prosecutor over the previous 3 months, and whether the respondent's level of agreement is at or above the median for the following statements: "The prosecutor's office knows the reality of this municipality", "The prosecutor's office detects the management irregularities that take place in this municipality", and "I trust the prosecutor's office."

ecutorial presence, although the results for the question on knowledge is marginally insignificant ($p = 0.056$).