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Internal Control as State Capacity

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While previous research has thoroughly examined the consequences of external control on subnational governments, less is known about the drivers and consequences of internal control. This paper presents a series of findings on Brazilian municipalities' internal control systems, leveraging administrative data and quasi-experimental designs. First, I use cross-sectional data to document that there remains significant variation in the resources, mandates, and actions of internal control systems. Second, I use panel data and a causal event study design to show that legal reforms of internal control systems lead to an increase in hires of internal controllers. Third, I show these legal reforms have downstream consequences in the control of patronage, leading to a reduction in the size of the municipal workforce, and a higher incidence of civil service contracts. Fourth, I show that randomized federal anti-corruption audits have significant effects on municipal control systems. Together, these findings highlight the relevance of local internal control institutions and call for further research on the causes and consequences of their strength.

KEYWORDS
governance, state capacity, corruption, local governments, Brazil

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Control Interno como Capacidad Estatal

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Aunque investigaciones previas han analizado en detalle las consecuencias del control externo sobre gobiernos subnacionales, sabemos menos sobre las causas y las consecuencias de los sistemas de control interno. Este artículo presenta una serie de resultados sobre los sistemas de control interno en los municipios brasileños, aprovechando datos administrativos y diseños cuasi-experimentales. Primero, utilizo datos transversales para documentar que existe una variación significativa en los recursos, mandatos y acciones de los sistemas de control interno. Segundo, utilizo datos de panel y un diseño de estudio de eventos causal para mostrar que las reformas legales de los sistemas de control interno llevan a un aumento en las contrataciones de controladores. Tercero, demuestro que estas reformas legales tienen consecuencias a largo plazo en el control del patronazgo, conduciendo a una reducción en el tamaño de la fuerza laboral municipal y a una mayor incidencia de contratos por oposición. Cuarto, muestro que las auditorías federales anti-corrupción aleatorias tienen efectos significativos en los sistemas de control municipal. En conjunto, estos hallazgos destacan la relevancia de las instituciones locales de control interno e invitan a futuras investigaciones sobre sus causas y consecuencias.

KEYWORDS

gobernanza, capacidad estatal, corrupción, gobiernos locales, Brasil

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1 | INTRODUCTION

Decentralization efforts across the world face the twin challenge of insufficient capacity and rent-seeking among subnational governments. This challenge is particularly acute in the middle income countries of Latin America, which have significant variation in capacity and serious corruption problems at the local level. National governments have at their disposal a number of policy tools to address these challenges and ameliorate compliance and policy implementation by subnational units, including audits, fiscal rules, procurement rules, and performance-based financing. Recent studies have shown positive effects of these external control institutions, including audits (Avis et al., 2018; Zamboni and Litschig, 2018), fiscal rules (Grembi et al., 2016) and procurement rules (Lewis-Faupel et al., 2016; Coviello and Mariniello, 2014).

In contrast to the accumulation of experimental and quasi-experimental evidence in favor of these external control mechanisms, we know very little about the effects of internal control institutions. This gap is worth addressing because internal control is potentially a more direct and thus more effective way to limit rent seeking and improve the quality of public policies, for at least three reasons. First, internal control institutions intervene "at the source", identifying and addressing issues as they emerge, before malfeasance or ill-designed programs can hurt citizen welfare. Second, internal control institutions have the potential to intervene on a wider range of dimensions than external control ones. Third, internal control institutions can acquire better and more frequent information about public management, and are potentially better positioned to exercise fire-alarm accountability.

Despite the potential gains of internal control, the evidence base about their effectiveness is thin, particularly in middle-income contexts. Two recent studies have examined the role of internal auditors in the control of corruption in Italy (Vannutelli, 2024) and Spain (Fernández-Vázquez, 2018), but the treatment of those studies (nationally-deployed auditors) is not representative, and the context of high-income, established democracies may make their findings hard to translate to the Latin America region. One important reason to explain the scarcity of (causal) evidence on internal control institutions at the local level is that they rarely vary at the local level and, when they do, they do so endogenously.

The Brazilian context provides a privileged setting in which to study the strength of internal control institutions, for a variety of reasons. First, Brazil is a large federal democracy with significant variation in the strength and insulation of internal controllers at the local level. Second, there are rich administrative datasets available in Brazil about internal control and other dimensions of local governance. Third, there is variation across time and space in reforms of internal control systems.

2 | INSTITUTIONAL SETTING

Brazil has 5,570 municipalities which are distributed across 26 states and a federal district. Municipal governments are responsible for delivering basic services in policy areas including healthcare, education, and social assistance. Together, these three areas of social policy make up over 55% of municipal government spending in the average municipality. As a result of these responsibilities in service delivery, municipal workforces are typically large. On average, municipal governments hired 4.9% of all local residents and 38.2% of those

employed in the formal labor market in 2016.[1] Municipal jobs are typically highly desirable because of their stability (when in the civil service), because municipal workers enjoy a wage premium relative to the private sector (Colonnelli et al., 2020, 3090), similarly to other Global South contexts (Finan et al., 2017), and because employment opportunities in the typical municipality (which is small and relatively poor) are scarce.[2]

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 civil service contracts,[3] which have tenure for life after a short probationary period.[4] Approximately a third of municipal employees are hired on temporary contracts,[5] which can legally be used to hire political appointees for management or leadership positions, or to fill short-term or urgent staffing needs.[6] In practice, temporary hiring is often used where the civil service should prevail, often as a vehicle for political appointments.[7]

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, 2023). 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, 2024a), and their turnover, induced by political turnover, depresses the quality of public services (Akhtari et al., 2022; Toral, 2024b).

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. For politicians, the consequences of being charged for violating public employment rules are potentially very severe. If found guilty, they are subject to penalties, including the loss of their post, having their political rights suspended, substantive fines, and even imprisonment.[8] 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.[9] 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

[1] Figures are from the administrative labor data described below.

[2] According 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).

[3] Article 37.II of the Constitution.

[4] Tenured employees can only be fired in extraordinary circumstances, e.g., after a corruption conviction.

[5] I 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.

[6] Article 37.IX of the Constitution.

[7] In 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, 2024a).

[8] The legal penalties for breaches of public employment laws are contained in the Constitution, the Administrative Impropriety Law, the Electoral Law, and the Penal Code, among other legal instruments.

[9] The authors also find that politicians who lose their reelection bid are 65 percent more likely to receive a penalty than those who are reelected.

their political rights suspended (Anuário da Justiça, 2016).[10]

Local governments and politicians are also subjet to the control of other horizontal accountability institutions. Key among them is the Federal Comptroller's Office (CGU, *Controladoria-Geral da União*), which every year audits the accounts of a subset of municipal governments. Between 2003 and 2015, the CGU targeted its audits of municipal governments through public, randomized lotteries. Municipalities selected through the lottery are visited by a team of federal auditors to review local spending of federal transfers. The CGU releases the results of the audits to the media and to other accountability actors like the federal prosecutor's office, the audit court, and the police, as well as to the municipal legislative chamber. Details of these randomized audits are described by Avis et al. (2018). These randomized audits have been found to decrease corruption in the use of federal funds (Avis et al., 2018; Zamboni and Litschig, 2018), limit electoral clientelism (Bobonis et al., 2024), increase the prevalence of civil service hiring (Lauletta et al., 2022), improve service delivery (Funk and Owen, 2020), and reduce child mortality (Ramos et al., 2022).

3 | DESCRIBING VARIATION IN MUNICIPAL INTERNAL CONTROL UNITS

I use data from the federal 2019 Munic survey to describe cross-sectional variation in municipal internal control units. Munic is a yearly survey of municipal governments done by the federal government, with separate thematic focuses each year. The 2019 survey included a module about internal control, with a series of rich questions about the resources, the mandates, and the actions taken by internal control units / structures in the municipality. All but 2 municipalities submitted data to IBGE.

Descriptive data summarized in Figure 1 contains a number of insights. First, high levels of legal formalization coexist with relatively low levels of professionalization of internal control units. For example, 94.4% of the municipalities have formal internal control units and, in 88% of the cases, those units are formalized by law. On the other hand, 37.9% of the municipalities have a political appointee leading the internal control unit or system, and only 25% have a specific civil service track for control staff.

When it comes to the formal mandates of internal control systems, there seems to be high levels of isomorphism. For example, an overwhelming majority of municipal internal control systems cover municipal spending (90.6%), municipal revenues (87%), municipal budget execution (81.3%), and municipal personnel (75%). Yet few of them have functions to make them effective control institutions, including auditing functions (45.2%) and anti-corruption functions (33.2%).

Finally, when asked about specific control actions they have taken in the last 2 years, we find much less promising responses. While around two thirds of municipal internal control systems report having conducted some form of control (be it ex ante, ex post, or both), accounts of specific accountability actions are much less common. For example, only 18.6% of internal control units have reported irregularities to the state audit court in the last

[10]The number of cases where politicians are investigated for corruption is of of course larger. I scraped all news reports mentioning the word "mayor" in the website of the largest state prosecutor's office (that of São Paulo) and found 483 reports in the 10-year period from 2013 to 2022. Of those, 62% refer to cases of mismanagement and corruption.

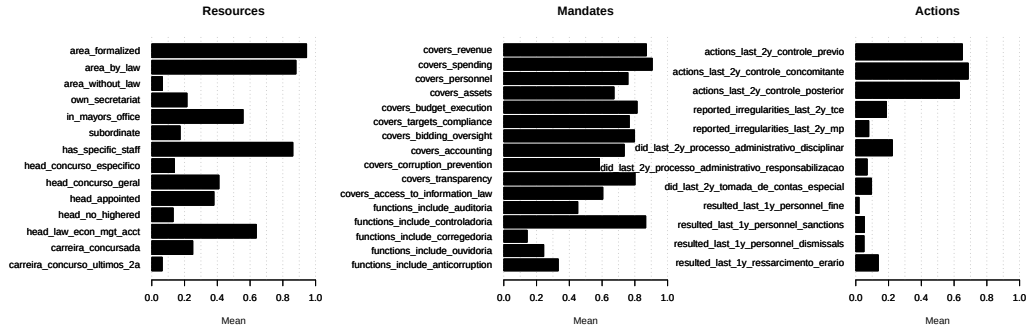

FIGURE 1 Descriptive Prevalence of Resources, Mandates, and Actions among Municipal Internal Control Units in 2019.

Descriptive data are from IBGE's 2019 Munic survey, which has data for 5,566 municipalities.

2 years.[11] Less than 25% report having started an administrative disciplinary procedure in the past 2 years. And if we look for evidence of actual sanctions against local government officials, we find that internal control systems report having imposed sanctions, dismissals, or fines in the past year only in 5.2%, 5% and 2% of the municipalities, respectively.

Based on these descriptive data from the Munic survey of municipal governments, it seems that while formally most municipalities have formally consolidated internal control systems, they vary considerably in their degree of political independence and professionalization, their anti-corruption attributes, and their actual incidence over within-government accountability.

In any case, these data are just descriptive. To better assess the causal impacts of internal control systems, I turn to a causal event study design exploiting variation across municipalities and years in legal reforms strengthening internal control systems.

4 | THE CONSEQUENCES OF INTERNAL CONTROL LEGAL REFORM

To measure the impact of internal control legal reform on local governance, I leverage variation in the passing of such reforms across years and municipalities. Using a novel, imputation-based causal event study approach (Liu et al., 2024) that bypasses some of the well-known issues with two-way fixed-effects specifications (Baker et al., 2022; Roth et al., 2023),[12] I identify the causal effect of internal control legal reform on two sets of outcomes. First, the hiring of control staff (auditors and accountants) and the prevalence of civil service contracts among them. Second, as proxies for good governance, I examine whether legal reform reduces the size of the municipal workforce (relative to the local population) and increases the prevalence of the civil service among municipal employees.

[11] The figure is even lower for reports to the prosecutor's office, 7.9%.

[12] Other recently developed approaches to causal inference in panel settings are inappropriate in this setting because they assume a balanced panel (Imai et al., 2023; De Chaisemartin and d'Haultfoeuille, 2020). The Liu et al. (2024) method is very similar to the imputation event study method developed in parallel by Borusyak et al. (2024). Other methods assume staggered adoption of treatment without reversals, and are therefore applicable in this setting (Callaway and Sant'Anna, 2021; Sun and Abraham, 2021). 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 estimates that are similar to each other and to the traditional two-way fixed-effects specification.

The findings, which leverage administrative data for all municipalities in Brazil, suggest that legal reform does cause an increase in the number and insulation of controllers, as well as a reduction of the municipal workforce at the expense of temporary employees.

4.1 | Identification

The Liu et al. (2024) imputation-based estimator of treatment effects is unbiased and consistent[13] under a strict exogeneity assumption.[14] This assumption involves the absence of time-varying confounders, anticipation effects, and carryover effects (Imai and Kim, 2019).[15] A key advantage of the imputation method of Liu et al. (2024) is that we can test for the validity of these identifying assumptions.

4.2 | Estimation

The Liu et al. (2024) estimator follows an imputation procedure. Using only untreated observations (i.e., municipality-year observations without an internal control law), 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: $\hat{\tau}_{it} = Y_{it} - \hat{\alpha}_i - \hat{\beta}_t$.[16] ITEs are then aggregated to obtain dynamic treatment effects for each period (DTEs) and overall average treatment effects on the treated (ATT).

4.3 | Inference

For inference, the Liu et al. (2024) procedure uses non-parametric block bootstrap clustered at the unit level for inference. In this case, that implies clustering at the municipality level, which is appropriate as municipalities are where treatment is assigned (Abadie et al., 2023). The block bootstrap procedure essentially entails resampling many times,[17] 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.

4.4 | Data

The treatment in this design is defined by the year at which a municipality approved its (latest) law of internal control, as reported in IBGE's 2019 Munic survey. Munic is a yearly survey of municipal governments done by the federal government, with separate thematic focuses each year. The 2019 survey included a module about internal control. The treatment

[13] Assuming spherical errors, the imputation method is also the most efficient among all linear and unbiased estimators (Borusyak et al., 2024).

[14] The strict exogeneity assumption implies the parallel trends assumption.

[15] The 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.

[16] The 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. (2024) and use the simple two-way fixed effects specification since results pass diagnostic tests.

[17] I use 1,000 block bootstraps.

history is reported below. I count a municipality as treated the year it passes its internal control law and thereafter.

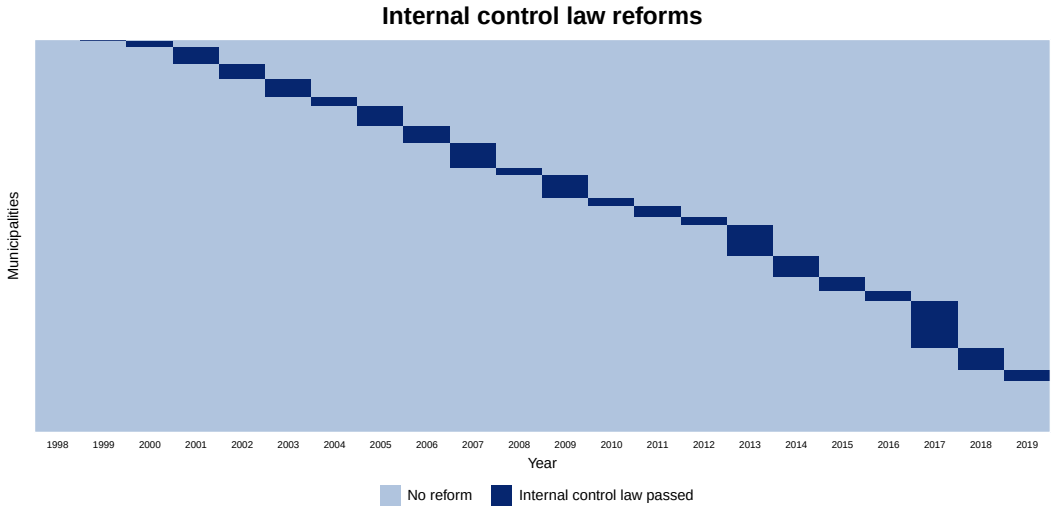

FIGURE 2 Passing of internal control laws across municipalities

To obtain time-varying measures of the strength of internal control units I use detailed administrative data on municipal employment. I use 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, and professional category, among other variables. I count the number of municipal employees in the categories "auditor" and "accountant", as identified by the Brazilian Classification of Occupations.[18] I also use the share of such employees that has a civil service contract.[19] To measure impacts on broader governance outcomes, I look at the number of municipal employees per 100 residents, and at the share of municipal employees who have civil service contracts.

4.5 | Results

Causal event study estimates reported below suggest that the passing of a municipal law focused on internal control causes large and significant increases in the number of control employees, and in the prevalence of civil service contracts among them (see Table 1 and Figure 3). In turn, results suggest that these legal reforms cause a small decrease in the size of the municipal workforce (relative to the local population) and a marginally insignificant increase in the prevalence of civil service contracts, as shown in Table 2 and Figure 4.

[18] CBO codes 252205 and 252210 correspond to *auditor* and *contador*, respectively. Because this classification was not implemented until 2003, analyses of these outcomes disregard data from before that date.

[19] I code contracts in the *regime jurídico único de servidores públicos* as civil service, and all others (which use a variety of legal regimes) as temporary. Unfortunately, RAIS does not allow a reliable identification of politically appointed employees (e.g., *cargo comissionado*, *função de confiança*).

TABLE 1 Average Treatment Effect on the Treated Estimates of Internal Control Legal Reform on the Number of Control Staff for Every 100 Employees

	Control employees	Control employees in the civil service
$\widehat{\text{ATT}}$	0.040***	0.029***
	(0.009)	(0.006)
	[0.023, 0.057]	[0.016, 0.042]
Mean outcome under control	0.116	0.078

*Columns 1 and 2 report, respectively, the ATT estimates for the number of control employees for every 100 employees – with any contract and with civil service contract, respectively. ***p<0.001. The municipality-clustered standard errors are in brackets, and the 95% confidence intervals, in square brackets, below them. Both are estimated through the block bootstrap. ATT estimates come from aggregation of dynamic treatment effect estimates reported in Figure 3.*

This reduction in hiring outside the civil service is meaningful because temporary hires in this context have 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, 2023). Accordingly, Lauletta et al. (2022) have shown that anti-corruption audits constrain the size of the municipal workforce, and increase the prevalence of civil service hires.

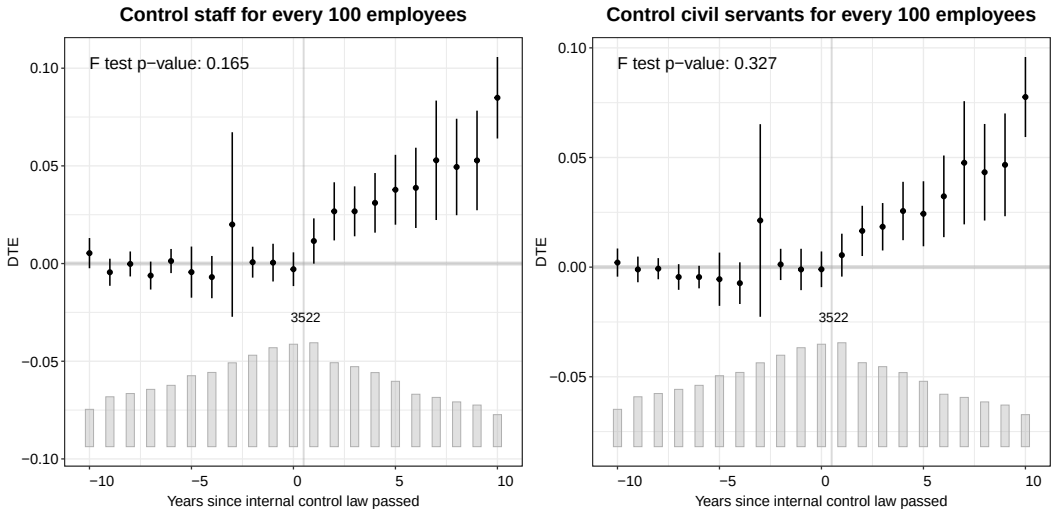

FIGURE 3 Dynamic Treatment Effect Estimates of Internal Control Legal Reform on the Number of Control Staff for Every 100 Employees.

Each subplot presents the estimated dynamic treatment effects (DTE) for switcher municipalities in each period (indexed relative to the year of internal control legal reform) as a dot, and its block-bootstrapped 95% confidence interval as a vertical line. The bar plot at the bottom represents the number of treated units in each period. The F test p-value reported in the upper left corner of each plot corresponds to the test of no pre-trend.

TABLE 2 Average Treatment Effect on the Treated Estimates of Internal Control Legal Reform on the Number of Employees per 100 Residents and the Share of Employees in the Civil Service

	Employees per 100 residents	Share employees in the civil service
$\widehat{\text{ATT}}$	-0.072*	0.011·
	(0.031)	(0.007)
	[-0.134, -0.010]	[-0.002, 0.023]
Mean outcome under control	4.571	0.667

*Columns 1 and 2 report the ATT estimates for the number of overall employees per 100 residents and the share of overall employees who hold civil service contracts, respectively. · p<0.10; *p<0.05. The municipality-clustered standard errors are in brackets, and the 95% confidence intervals, in square brackets, below them. Both are estimated through the block bootstrap. ATT estimates come from aggregation of dynamic treatment effect estimates reported in Figure 4.*

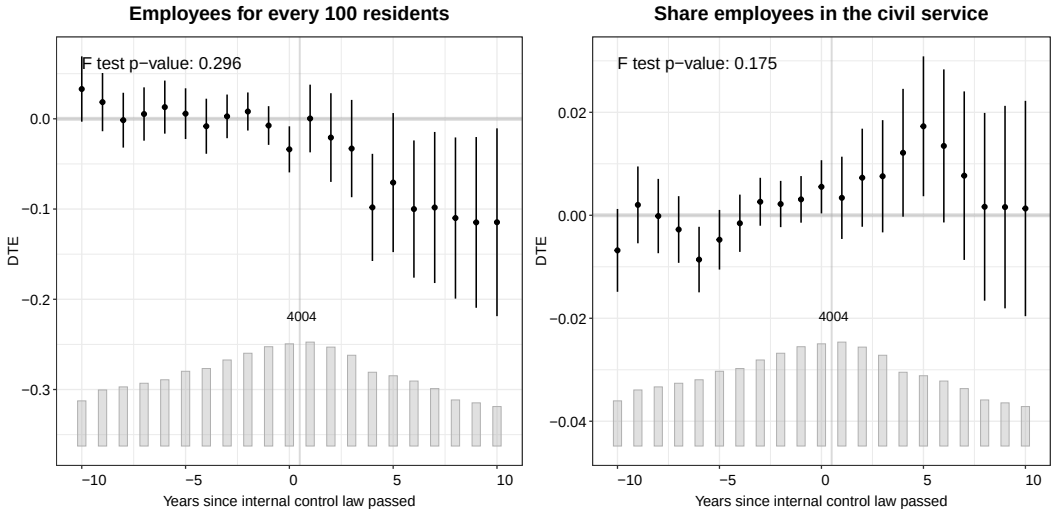

FIGURE 4 Dynamic Treatment Effect Estimates of Internal Control Legal Reform on the Number of Employees per 100 Residents and the Share of Employees in the Civil Service.

Each subplot presents the estimated dynamic treatment effects (DTE) for switcher municipalities in each period (indexed relative to the year of internal control legal reform) as a dot, and its block-bootstrapped 95% confidence interval as a vertical line. The bar plot at the bottom represents the number of treated units in each period. The F test p-value reported in the upper left corner of each plot corresponds to the test of no pre-trend.

5 | THE EFFECT OF RANDOMIZED AUDITS ON INTERNAL CONTROL

If the strength of internal control systems can meaningfully constrain rent-seeking, it is key to understand what drives the strengthening of internal controls systems. In this section I start exploring this question by focusing on the effects of a well-studied anti-corruption intervention, federal audits.

I leverage the random assignment of federal anti-corruption audits in the period 2003-2015 to study their effect on municipal internal control. Here, as above, I use the Liu et al. (2024) imputation-based estimator of treatment effects. The strict exogeneity assumption rests on the randomization of the audits in this period. Previous studies have documented

the rigor and transparency of the randomization process, and the balance across treated and untreated municipalities (Ferraz and Finan, 2008; Avis et al., 2018; Funk and Owen, 2020).

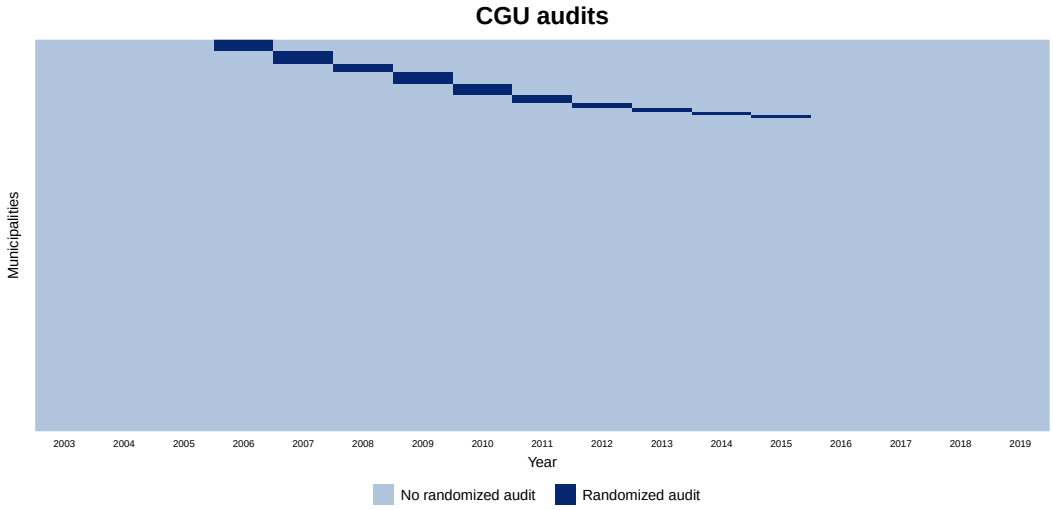

FIGURE 5 Randomized Federal Anti-Corruption Audits

As outcomes I consider when municipalities pass a legal reform of internal control (as reported in the 2019 Munic survey) and the relative number of control staff, both overall and in the civil service (as reported in RAIS). As treatment I use an indicator for whether a municipal-year observation has been subject to a federal audit, counting it as treated from the year of the lottery in which it was assigned to being audited. I examine heterogeneity by level of corruption, defining low-, medium-, and high-corruption municipalities as those where the audited uncovered a number of "serious faults" in the first, second, or third terciles, respectively.[20]

5.1 | Results

Overall, audits seem to have null or at best modest effects on the expansion of internal control bureaucracies (Table 3 and Figure 6). The ATT estimate for the relative number of control employees is positive yet marginally insignificant ($p < 0.07$). While positive, ATT estimates for legal reform and for the relative number of control employees in the civil service are not statistically significant.

These ATT estimates hide significant heterogeneity by the level of corruption uncovered in the audits. Where the audits find medium levels of corruption, they do appear to cause changes, as shown in Table 4 and Figure 7. Under medium levels of corruption, audits seem to cause the hiring of control staff, both in general and in the civil service. The ATT estimate for legal reform is not statistically significant, but it is positive ($p < 0.18$). By contrast, audits do not seem to have an effect on reforms when they find low levels of corruption (Figure 9).

[20] Using the number of "serious faults" as a measure of corruption is a common choice in the literature on Brazilian federal audits (Avis et al., 2018; Ferrali et al., 2024).

TABLE 3 Average Treatment Effect on the Treated Estimates of Federal Anti-Corruption Audits on Municipalities' Legal and Bureaucratic Reforms of Municipal Internal Control

	Legal reform	Control employees	Control civil servants
$\widehat{\text{ATT}}$	0.012	0.025$^{\cdot}$	0.010
	(0.022)	(0.013)	(0.010)
	[-0.032, 0.055]	[-0.001, 0.050]	[0.010, 0.030]
Mean outcome under control	0.422	0.163	0.119

*Column 1 reports the ATT estimate for whether the municipality reports having passed a legal reform of internal control. Columns 2 and 3 report the ATT estimates for the number of control employees for every 100 employees, with any contract vs with civil service contracts, respectively. · p<0.10; *p<0.05; **p<0.01 . The municipality-clustered standard errors are in brackets, and the 95% confidence intervals, in square brackets, below them. Both are estimated through the block bootstrap. ATT estimates come from aggregation of dynamic treatment effect estimates reported in Figure 6.*

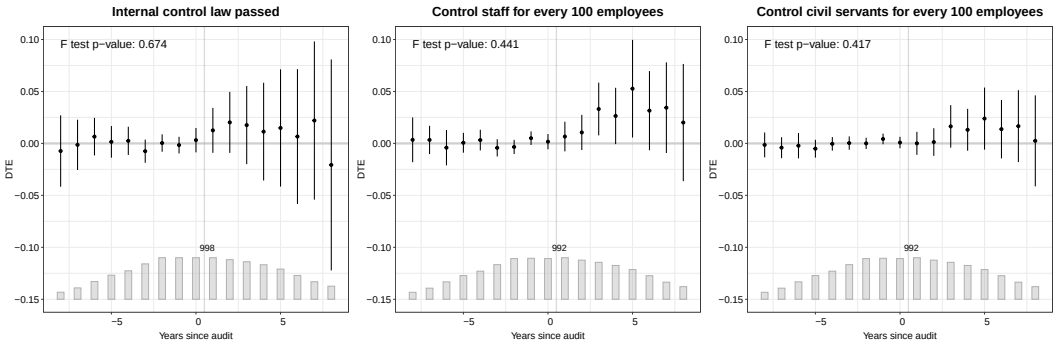

FIGURE 6 Dynamic Treatment Effect Estimates of Federal Anti-Corruption Audits on Legal and Bureaucratic Changes of Municipal Internal Control.

Each subplot presents the estimated dynamic treatment effects (DTE) for switcher municipalities in each period (indexed relative to the year of the audit) as a dot, and its block-bootstrapped 95% confidence interval as a vertical line. The bar plot at the bottom represents the number of treated units in each period. The F test p-value reported in the upper left corner of each plot corresponds to the test of no pre-trend.

On the other hand, when they find high levels of corruption audits seem to depress the hiring of control staff (Figure 8).

These results are meaningful for at least two reasons. First, they show that at least when they uncover medium levels of corruption, federal audits can lead to bureaucratic (and potentially legal) expansions of municipal government's internal control systems. This would help explain why audits have been shown to decrease corruption (Avis et al., 2018; Zamboni and Litschig, 2018), depress electoral clientelism (Bobonis et al., 2024) and patronage (Lauletta et al., 2022), and improve service delivery (Funk and Owen, 2020) and welfare (Ramos et al., 2022). Second, the negative results found for municipalities where audits find high levels of corruption suggest that they can lead to backlash, depressing or delaying efforts for strengthening internal control. This may follow if local politicians react to the higher risk of judicial causes, documented by Avis et al. (2018), by tightening their control over the local government.

TABLE 4 Average Treatment Effect on the Treated Estimates of Federal Anti-Corruption Audits on Municipalities' Legal and Bureaucratic Reforms of Municipal Internal Control – Conditional on Audits Revealing Medium Levels of Corruption

	Legal reform	Control employees	Control civil servants
$\widehat{\text{ATT}}$	0.028	0.025*	0.028**
	(0.020)	(0.012)	(0.010)
	[-0.012, 0.067]	[0.001, 0.049]	[0.008, 0.049]
Mean outcome under control	0.422	0.163	0.119

*Column 1 reports the ATT estimate for whether the municipality reports having passed a legal reform of internal control. Columns 2 and 3 report the ATT estimates for the number of control employees for every 100 employees, with any contract vs with civil service contracts, respectively. *p<0.05; **p<0.01 . The municipality-clustered standard errors are in brackets, and the 95% confidence intervals, in square brackets, below them. Both are estimated through the block bootstrap. ATT estimates come from aggregation of dynamic treatment effect estimates reported in Figure 7.*

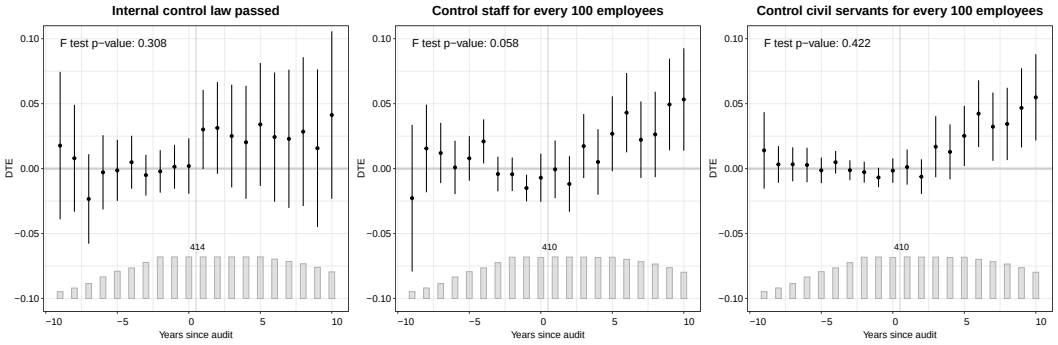

FIGURE 7 Dynamic Treatment Effect Estimates of Federal Anti-Corruption Audits on Legal and Bureaucratic Changes of Municipal Internal Control – Conditional on Audits Revealing Medium Levels of Corruption.

Each subplot presents the estimated dynamic treatment effects (DTE) for switcher municipalities in each period (indexed relative to the year of the audit) as a dot, and its block-bootstrapped 95% confidence interval as a vertical line. The bar plot at the bottom represents the number of treated units in each period. The F test p-value reported in the upper left corner of each plot corresponds to the test of no pre-trend.

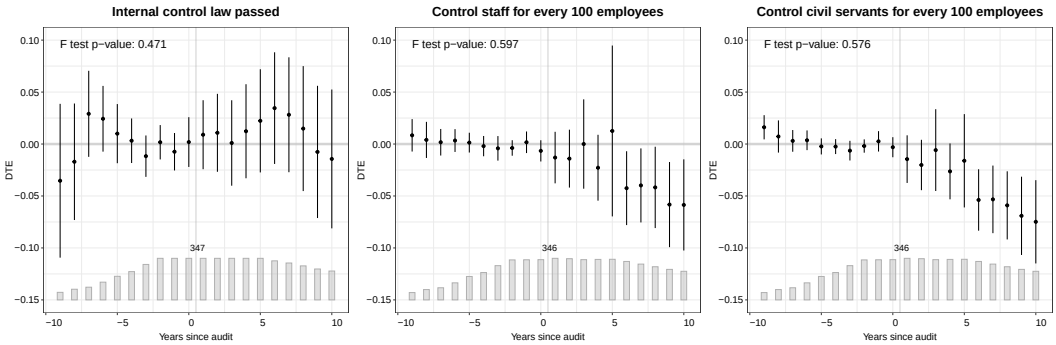

FIGURE 8 Dynamic Treatment Effect Estimates of Federal Anti-Corruption Audits on Legal and Bureaucratic Changes of Municipal Internal Control – Conditional on Audits Revealing High Levels of Corruption.

Each subplot presents the estimated dynamic treatment effects (DTE) for switcher municipalities in each period (indexed relative to the year of the audit) as a dot, and its block-bootstrapped 95% confidence interval as a vertical line. The bar plot at the bottom represents the number of treated units in each period. The F test p-value reported in the upper left corner of each plot corresponds to the test of no pre-trend.

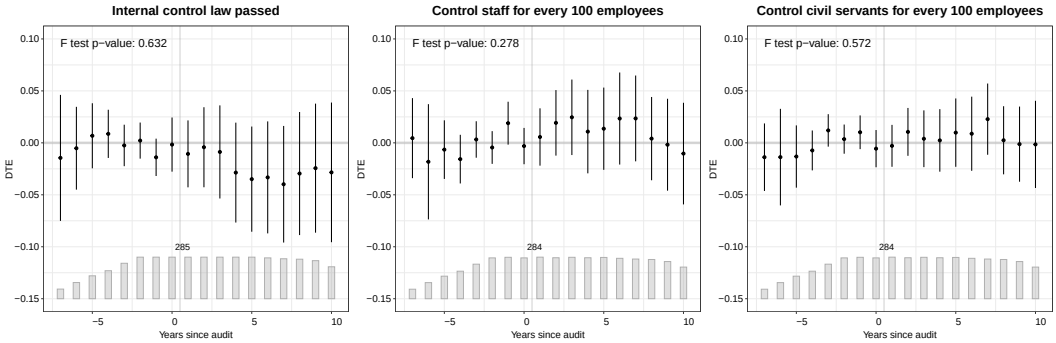

FIGURE 9 Dynamic Treatment Effect Estimates of Federal Anti-Corruption Audits on Legal and Bureaucratic Changes of Municipal Internal Control – Conditional on Audits Revealing Low Levels of Corruption.

Each subplot presents the estimated dynamic treatment effects (DTE) for switcher municipalities in each period (indexed relative to the year of the audit) as a dot, and its block-bootstrapped 95% confidence interval as a vertical line. The bar plot at the bottom represents the number of treated units in each period. The F test p-value reported in the upper left corner of each plot corresponds to the test of no pre-trend.

6 | CONCLUSION

Internal control systems are key to constraining rent seeking, improving service delivery, and boosting state capacity. Yet they have received scant attention in the literature, especially when compared to external control institutions like the judiciary, external audits, procurement rules, and fiscal constraints.

This paper contributes to filling that gap by examining the variation in the strength of internal control systems, its consequences for local governance, and some of its drivers, with a focus on Brazilian local governments. Through a combination of descriptive and

quasi-experimental analyses that exploit variation across time and space in the incidence of municipal internal control system reforms and in federal anti-corruption audits, this paper documents four key facts. First, despite significant isomorphism in the formal structures of internal control systems across Brazilian municipalities, there remains significant variation in their degree of insulation, capacity, and actual anti-corruption behavior. Second, legal reforms of internal controls systems lead to an increase in the hiring of bureaucrats with controlling functions (including auditors and controllers), especially in civil service positions that are more insulated from political influence. Third, legal reforms of internal control systems lead to reductions in the relative size of the municipal workforce and increases in the incidence of civil service contracts. Both of these findings can be understood as internal control systems effectively constraining patronage. Fourth, federal anti-corruption audits appear to have moderate but positive effects on the strengthening of internal control systems in cases where the audits uncover medium levels of corruption. In contrast, they do not appear to effectively strengthen internal control when they uncover low levels of corruption, and there is even evidence consistent with backlash when the audits uncover high levels of corruption.

All in all, this paper presents quantitative evidence from a relevant case that helps draw attention to the importance of internal control systems across Latin America and the Caribbean. While the data and findings are only preliminary, the descriptive and quasi-experimental findings presented in this paper suggest that internal control systems deserve more attention from both scholars and policy makers. Future research on Brazil and elsewhere in the region may seek to uncover richer data on the subnational variation of these systems, their drivers, and their consequences not just on local bureaucracies but also on public service delivery and human and economic development.

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