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Political turnover, electoral incentives and public inefficiencies: evidence from unfinished infrastructure projects in Brazil

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Advisor: Prof. Claudio Ferraz

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To my mother, for her support
and encouragement.

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Abstract

Ferreira, Gabriel Anesi Saavedra Granato; Ferraz, Claudio (Advisor). **Political turnover, electoral incentives and public inefficiencies: evidence from unfinished infrastructure projects in Brazil**. Rio de Janeiro, 2020. 96p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Public infrastructure projects like roads and schools have been regarded as drivers of development, yet developing democracies systematically fail to deliver such investments, and half-finished projects are a common issue. Using a novel database of over 75,000 small development projects in Brazil, we estimate that more than 40% of projects that start are never completed. Employing a close races regression discontinuity design on Brazilian mayoral elections, we find that turnover negatively impacts the delivery of projects inherited in a construction stage, while causes positive responses on the delivery of more recent projects. We argue that our results are consistent with a theory linking project non-conclusion to electoral incentives, where inefficiencies on project procurement are driven by a credit-claim dynamics that disincentives the conclusion of works inherited from the opposition. Our findings highlight the importance of insulating policies from the electoral process in local politics.

Keywords

Political Turnover; Electoral Incentives; State Capacity; Public Works.

Resumo

Ferreira, Gabriel Anesi Saavedra Granato; Ferraz, Claudio. **Alternância política, incentivos eleitorais e ineficiências públicas: evidência de projetos de infraestrutura inacabados no Brasil**. Rio de Janeiro, 2020. 96p. Dissertação de Mestrado – Departamento de Economia, Pontifícia Universidade Católica do Rio de Janeiro.

Projetos de infraestrutura pública, como estradas e escolas, são considerados propulsores do desenvolvimento. No entanto, democracias em desenvolvimento falham sistematicamente em fornecer esses investimentos, e projetos semi-acabados são um problema comum. Usando um novo banco de dados com mais de 75.000 pequenos projetos de desenvolvimento no Brasil, estimamos que mais de 40% dos projetos iniciados nunca são concluídos. Empregando um design de regressão em descontinuidade em eleições acirradas de prefeituras brasileiras, descobrimos que a alternância partidária afeta negativamente a entrega de projetos herdados em uma fase de construção, enquanto causa respostas positivas na entrega de projetos mais recentes. Argumentamos que nossos resultados são consistentes com uma teoria que vincula a não conclusão de projetos a incentivos eleitorais, em que as ineficiências na entrega de projetos são motivadas por uma dinâmica de reivindicação de crédito que desestimula a conclusão de obras herdadas da oposição. Nossas resultados destacam a importância de isolar políticas públicas do processo eleitoral na política local.

Palavras-chave

Alternância Política; Incentivos Eleitorais; Capacidade Estatal; Obras Públicas.

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"And those who govern ought not to be lovers of the task? For, if they are, there will be rival lovers, and they will fight."

Plato, *The Republic.*

1
Introduction

The concern that political turnover might bring undesired outcomes on policy implementation dates back at least to the *Federalist Papers*, where Hamilton wrote: "To reverse and undo what has been done by a predecessor is very often considered by a successor as the best proof he can give of his capacity and desert" (Hamilton et al. (2008)). Likewise, seminal articles such as Barro (1991) and Alesina and Perotti (1996) have shown that political instability, defined as the frequency government collapses (either through democratic elections or *coup d 'états*), harms investment and GDP growth especially in regions with weak institutions. Although recent papers identified the impact of political change over the bureaucratic structure and its adverse consequences on the quality of public services[1], Hamilton's view of past policy undermining as a deliberate decision of the current incumbent has been widely overlooked when it comes to a crucial driver of development – public infrastructure.

This article provides evidence of such behavior by analyzing municipalities' performance on the implementation of federal-funded infrastructure projects in Brazil. Brazilian public infrastructure procurement is, in many ways, an ideal context for such a study. First, the execution of public construction works in the largest democracy of the southern hemisphere heavily depends on local bureaucrats to oversee procurement contracts. Therefore, regular elections on the local level provide us plenty of variation on political change. Moreover, a byproduct of a centralized source of funding is a novel monitoring database of over 75,000 infrastructure projects. The 8-year panel contains detailed information about each municipal construction project funded with federal transfers, and allow us to deal with recurrent data limitations of the literature on infrastructure procurement[2]. Furthermore, a descriptive analysis of the novel dataset indicates that project non-conclusion in Brazilian procurement is a widespread phenomenon: we estimate that about 45% of signed projects never see completion, consuming 7.8% of total gov-

[1] Akhtari et al. (2017); Colonnelli et al. (2017); Brollo et al. (2017)

[2] For instance, Rasul and Rogger (2018) have hand-coded the evolution of 4,700 infrastructure projects in Nigeria. Also, Williams (2017) hand-coded 14,000 small development projects in Ghana.

ernment realized expenditure[3]. The magnitude of this fiscal waste is smaller than in other studies; for instance, Williams (2017) estimates that the Ghanian government wastes 20% of total funds in projects that are never completed, whereas Finan and Mazzocco (2016) and Olken (2007) estimate inefficiencies of similar magnitude in other contexts. Nonetheless, project abandonment still has a significant welfare cost: the R$ 2.191.632.746,00 amount wasted since 2007 on abandoned projects accounts for the construction of 654 health facilities or the reform of 2587 existing ones.

We argue that a share of those inefficiencies can be attributed to newly elected parties, which intentionally mismanage inherited infrastructure projects to increase reelection chances. This behavior is motivated by a credit-claim dynamics where the new party in power have weaker incentives to complete projects from the previous term, as it would imply sharing the credit of them with the opposition. However, claiming that differences in municipalities' outcomes after a turnover have such motivation presents significant challenges. Beyond the lack of data on project monitoring afflicting this literature, from an empirical perspective, every attempt to estimate the causal impact of political alternation on the delivery of projects in the next term is complicated by endogeneity issues. Without a credible source of exogenous variation in political turnover, socio-economic factors influencing both dimensions can drive the empirical correlation between electoral outcomes and non-conclusions. Furthermore, even if we can establish this causal relationship, to pin down the credit-claim dynamics as the reason of project interruption after a political turnover is not a trivial task, given the variety of possible mechanisms.

In this paper, we succeed in dealing with those difficulties. Our research design exploits a regression discontinuity in mayoral electoral races in Brazil, which provides an exogenous variation in political change and resolve endogeneity complications. We focus on four measures of project delivery: (i) conclusions and (ii) stoppages of inherited projects, and the (iii) beginning and (iv) conclusions of new projects. Specifically, we use the regression discontinuity (RD) design in close elections pioneered by Lee (2008) and identify the effect of party turnover over project delivery by comparing places where the incumbent party candidate barely won with areas where the incumbent party candidate barely lost. Moreover, to argue that electoral incentives drive project interruptions, we make an important distinction regarding the stage of the project when inherited. We assume that a visible construction site during term transition is a necessary condition for the electorate to attribute any

[3]Since we cannot observe projects beyond the availability of data, the estimation of projects that are ever completed requires some extrapolation and this value might differ depending on the period.

credit of completing the project to the previous mayor. Thus, under the light of our credit-claim mechanism, projects inherited with an on-going construction work differs qualitatively from projects inherited in a pre-construction stage, and we expect that political change directly affects only the former.

Our results using the RD design indicate that having a party turnover has a negative and significant effect on delivery rates of construction works inherited from the previous term. In particular, we find that, when compared to municipalities where the incumbent party got reelected, municipalities with party turnover had, on average, an 11.8 percentage points decrease on the share of conclusions of projects inherited in a construction phase. Similar results for stoppages measures suggests that, rather than slowly progressing, projects are not advancing at all at a higher proportion for turnover municipalities. We also find that the negative impact of political alternation is particular to projects inherited in the construction phase. In line with our predictions, party turnover does not affect the completion nor stoppage rates of projects inherited in a preliminary stage.

Similarly, we find opposing effects when analyzing the turnover effect on new projects. Although the impact on conclusions of new projects is insignificant, power alternation in a municipality leads to a higher share of new projects in the following term. In particular, the results indicate that turnover can lead to an increase of up to 9.2 percentage points on the share of new projects on the pool of projects administered by the next mandate. We interpret these results on the procurement of new projects as an indirect effect of not devoting resources to inherited projects. Through a span of control mechanism, newly elected mayors can redirect bureaucratic resources when applying to new contracts.

We also exploit the time dimension of our panel by computing the RDD specification for each quarter of the data set. The event-study analysis of the turnover effect suggests that, rather than a permanent impact on public investment, turnover causes a delay in project delivery, since the effect fades away when we analyze outcomes near the end of the term. We conceal those results with our theory by arguing that the credit-claim mechanism is predominant in the early stages of the mandate and gradually disappears in later stages. In particular, we assume that an inherited project is highly associated with the previous mayor in the first moments of the mandate and becomes the new mayor's responsibility as the term advances. Thus, given electoral incentives, it implies that inherited projects would be strategically concluded at the end of the mandate.

Moreover, we provide further evidence of the credit-claim mechanism by

performing a heterogeneity analysis of the turnover effect. Similar to the hypothesis that a construction site during term transition is a necessary condition to the attribution of any credit to a previous incumbent, we also argue that the amount of project executed by the predecessor influences the decision of the current mayor. Since we assume that projects inherited in advanced stages are more associated with the previous mayor than projects inherited in initial stages, we expect that completing advanced projects implies a more considerable improvement of challenger's electoral prospects. Ultimately, it means that places with a preliminary pool of inherited projects would be less impacted by party turnover than places with more advanced projects. Therefore, we replicate our main specification in a sample divided accordingly to the average physical completion of each municipality's inherited projects. The results indicate that the turnover effect over conclusions in the sub-sample of municipalities with projects inherited in more advanced stages is, at least, twice as large than the effect of alternation in municipalities, which inherited more initial works. Although we cannot state that the turnover effect in municipalities with a preliminary pool of projects is lower because of projects' stages, we interpret this evidence as suggestive of discrimination between completing advanced and incipient infrastructure.

We also show that our results are consistent with a theoretical model where project non-conclusion arise through political alternation and electoral incentives. In short, we adapt a probabilistic voting framework to our context by assuming that the completion of public construction works has different impacts on the electoral prospects of newly elected vis-a-vis reelected parties. In our scenario, the ruling mayor faces the decision of allocating the bureaucracy efforts into new or inherited projects and is constrained by the administrative capacity of the city hall. Nevertheless, since we assume that voters evaluate candidates retrospectively based on previous incumbencies' experiences, the marginal benefits of completing each kind of project on the probability of reelection differ across mayors. While a reelected party benefits the same from finishing a new or an inherited project, the newly elected one will benefit relatively more from starting new projects of its own, as completing inherited projects also improves the evaluation of the previous party in power. This simple framework has different implications for reelected and newly elected parties. Whereas the former will direct the bureaucratic efforts to complete existing projects, the latter will prioritize projects from his administration.

Although the quasi-experiment arguably provides a randomized variation on political change concerning most covariates, it also impacts electoral incentives through a different channel. Brazilian mayors have a term limit of

two mandates, which implies that some reelected parties will have mayors being reelected for the second mandate, while turnover parties will necessarily have its candidate running for the first mandate. Therefore, our close-elections design also captures the change in the probability of having a mayor in his first term, which equals one in turnover municipalities and less than one in reelection ones. Thus, an alternative explanation for our results would be different electoral incentives driven by more mayors in reelected parties who cannot run for reelection. To deal with the unbalanced sample, we replicate our main specification in a sub-sample of elections in which the mayor is in his second term and can not run for reelection. In this strategy, we compare races where every elected mayor is in his first mandate. Hence, the remaining effect is necessarily driven by the different categories of the elected party, where some were able to elect a successor for the previous incumbent, and some are newly elected ones. Our results are robust to this alternative specification[4].

Overall, this paper demonstrates not only that political change negatively impacts the delivery of public construction works, but also that the pattern of this destructive effect is consistent with a theory where new incumbents, driven by a non-ideological motivation, intentionally cause project interruption. Therefore, we depart from previous works on the literature, which have studied the impacts of political change using micro-level evidence but have proposed different explanations for the underlying channel. For instance, Akhtari et al. (2017) argues that political change worsens the provision of public education through the alternation of key personnel in school staff. In their explanation, the inefficiency is seen as an undesired cost of disruption in bureaucracy employees. In our case, although we do not dismiss that patronage induced bureaucratic turnovers impact municipality's capacity of delivering public works, we argue that the political control over bureaucracy also produces intentional mismanagement of past projects[5]. By doing so, we also connect with Bandiera et al. (2009) discussion on government spending wastes by showing that political alternation leads to the creation of active waste through this deliberate delay of public construction works in detriment of better reelection chances.

Moreover, our paper provides novel empirical evidence that advances our understanding of the infrastructure delivery puzzle (Robinson and Torvik (2005); Callander and Raiha (2017)). The single empirical work exploring the political causes of inefficiencies on this topic has focused on the non-

[4]Indeed, we observe slightly higher coefficients, which is following our expectations, as we are taking mayors with lower electoral incentives out of the reelection parties group.

[5]The intentional discontinuation of predecessor's policies have also been studied in Pettersson-Lidbom (2008), Ferreira and Gyourko (2009), Fiva et al. (2018), Dippel (2019). Nevertheless, they focus on partisan disruptions on fiscal policy, while we rely on a credit-claim mechanism to explain unfinished infrastructure.

instrumental nature of infrastructure investment waste (Williams (2017)). On the other hand, our study exploits a mechanism in which the incumbent improves his electoral perspectives by redirecting resources to his own projects, exposing unfinished projects' instrumentality. These findings also complement an extensive literature that links the inefficiency in public investment to electoral incentives and political uncertainty faced by incumbents in a democratic environment. Some works use the different preferences of future incumbents to explain underinvestment as a natural product of a majoritarian decision-making affair (Besley and Coate (1998); Leblanc et al. (2000)), while others have highlighted clientelistic practices which arises from the disruptive character of the electoral process (Robinson and Torvik (2005); Robinson and Verdier (2013)). In our study, we propose a credit-claim dynamics as a new channel that can lead to disruption in policies and inefficient expenditure[6] . Lastly, the exposure of a novel explanation for policy disruption on local-level politics complements a literature on bureaucracy reforms, which highlights the importance of insulating policy execution from politicians discretion (Rauch (1994); De Figueiredo (2002); Spiller and Tommasi (2003); Xu (2018)).

The remainder of the dissertation is organized as follows. Section 2 provides some institutional background and introduces the data used in the analysis. Section 3 formalizes our argument in a theoretical framework. In Section 4, we discuss our empirical strategy. Section 5 presents the results. Section 6 concludes.

[6]In a similar fashion, we also connect to a literature on political cycles which highlights reputation concerns of politicians when enacting policies (see e.g. Rogoff and Sibert (1988); Rogoff (1990); Majumdar and Mukand (2004))

2
Institutional Background and Data

Brazilian Political System

Brazil is a federal presidential democracy with 5,570 municipalities spread across 26 states and one federal district. The Brazilian electoral system holds one election every two years, which generally happens in October. These elections alternate between (i) national elections, where the population elects a president, one governor for each state and one for the federal district, senators, federal deputies, and state deputies, and (ii) municipal elections, where the constituents elect one mayor for each municipality and local legislators. All members of the executive branch, except mayors from municipalities with less than 200,000 eligible voters, are directly elected through a majority rule (run-off). Whereas, in towns with less than 200,000 voters, the mayors are directly elected through a plurality rule.

The electoral system in Brazil operates under a highly fragmented multi-party system. Parties are weakly institutionalized, have high electoral volatility, low party identification in the electorate, and usually lack a robust ideological platform. However, after the 1988 Constitution, most Brazilian presidents were able to assemble stable post-electoral coalitions through tools such as veto power on essential issues and exclusive rights over budget allocation and federal transfers (Figueiredo and Limongi (2000), Pereira and Mueller (2002)). Currently, there are 32 registered parties in Brazil and 4 of them[1] control more than half of the municipal administration. In particular, the Brazilian party distribution in the last two elections had a sharp veer to the right on the 2016 municipal elections and the 2018 national elections. On those occasions, PT, the more massive left party in Brazil, lost more than half of its presence in municipalities (Power and Rodrigues-Silveira (2019)).

Party turnover is frequent in Brazilian prefectures, on the last three elections, on average, 71.3% of them experienced turnover. Indeed, in line with other developing countries, evidence indicates that incumbency in Brazil is an electoral *disadvantage* (Titiunik (2009); Brambor and Ceneviva (2011)). Moreover, anecdotal evidence points out to the unwillingness of completing projects inherited from a challenger's administration. Newspaper articles highlighting

[1]MDB, PSDB, PSD, and PP

this issue are typical – repeatedly, there are news denouncing that projects inherited from the opposition's previous administration are left unfinished (Folha (2017); Globo (2019)). Likewise, the following extract of an interview with the former chief of staff from Rio de Janeiro's city hall exemplifies the issue:

"Sim, de fato existe um certo desinteresse em prefeituras recém-eleitas em completar obras de mandatos anteriores. Por exemplo, aqui no Rio de Janeiro, se o Crivella entregasse a obra do BRT da Avenida Brasil logo no início do mandato, para quando estava prevista, o crédito seria praticamente todo nosso ... Internamente, a gente chama isso de colocar a "azeitona na empada dos outros"."

— Federal Deputy Pedro Paulo (DEM-RJ)[2], Interview with the author.

The local political jargon of "azeitona na empada" better translated as the icing on the cake of the opposition highlights a central behavior to our analysis. At least anecdotally, evidence suggests a credit-claim dynamics where completing projects inherited from the opposition poses a threat to the newly elected incumbent reelection. In the following section, we formalize this idea in an adapted probabilistic voting model and derive empirically testable implications corroborated on the subsequent empirical analysis.

Federal Transfers and Project Monitoring

The Brazilian municipal administration budget resources come from (i) local taxes and fines, such as real state taxation and (ii) federal, state, or inter-municipality transfers. The most significant revenue comes from federal transfers, which account for 46.5% of the average municipality budget. These transfers are (i) mandatory transfers, which consists of automatic transfers tied to a program or of unrestricted use (e.g. Fundo de Particpação dos Municipios, FPM), and (ii) voluntary transfers, mostly related to infrastructure projects. The municipal administration depends heavily on those transfers to operate, given that, on average, tax revenues amount to 7.9% of municipalities' budget (Tesouro Nacional (2018)).

This research will analyze transfers targeting infrastructure projects from both mandatory (Termos de Compromisso) and discretionary (Contratos de Repasse) sources. We focus on those as they are contracts overseen by Caixa Economica Federal (CEF), a state-owned bank that operates as a trustee of the federal government in this process. Among other responsibilities, CEF is in charge of assessing the project's evolution to release further installments of the transfer. This assessment, which is conducted through municipalities'

[2]Rio de Janeiro's City Hall's Ex Chief of Staff (2009-2012/2013-2016).

self-reports and on-site inspections from CEF engineers, generates the administrative data we use.

Effectively, for the voluntary transfers, the executive branch drafts a yearly budget through the Budget Directive Law (Lei de Diretrizes Orçamentárias), which goes through to several amendments voted by the legislative branch. Legislators mostly use these amendments to bring the pork home, as the majority of the changes propose targeted transfers to limited regions. After the authorization of the bill by a budget committee, they submit the law for presidential approval. To benefit from those transfers, mayors must apply for the available programs foreseen in the bill on the correspondent Ministries. On the other hand, the mandatory transfers in our dataset are related to projects granted by Law 11,578, which regulates the Growth Acceleration Program (PAC), a massive infrastructure program of the federal government with a similar budgetary dynamics.

Subsequently, to receive any transfer, the municipality must submit a proposal to the respective ministry in a web application (SICONV) for one of the available programs. Following the project's acceptance, CEF begins an operational analysis where the municipal administration must send several regularity documents to sign the transfer contract, including a work plan (Plano de Trabalho). After the contract is signed, the municipality must present a basic project (Projeto Básico) to be analyzed by CEF. If approved, the city hall is then allowed to begin a tendering process regulated by Law 8,666. Then, CEF evaluates the tender result and authorizes the construction of the project.

During the construction stage, the project's payment is divided into installments made available only after the submission of several documents, including a measurement report card (Boletim de Medição) filled by a municipal employee (Fiscal de Obras). This report card must certify the physical progress of the project for the installments release. CEF engineers also conduct regular on-site inspections as a monitoring practice. If the municipality is unable to prove the project's physical evolution by not presenting the required documents or presenting an unexpectedly low physical development on the report card, the installment is blocked, and the project receives a paralyzed status. In this case, municipal administration can apply to an extension of the budgeting or alter the work plan. Nevertheless, if the municipality fails to comply with accountability requirements, it can be audited by the TCU (Tribunal de Contas da União)[3] [4].

[3]Refer to Jardim et al. (2017) for a description of the Tomada de Contas Especiais audit procedure.

[4]For a more detailed description of municipality's and CEF's role, please refer to Tribunal

CEF made available weekly positions of their monitoring data, which contains detailed information of each project including signature year, description of the project, project value, a measure of physical completion, the amount disbursed, stoppage status, audition status, among other information. Tracking the progress of contracts across the years was a challenge, as their records had mixed patterns. Appendix A-1 details the cleaning procedure employed to create our final panel. Our final database comprised 29 quarterly observations, starting in the third quarter of 2011 until the second quarter of 2019, with a three-quarter gap in the last quarters of 2012.

Figure 4 presents our universe by the year of project signature and type of project (infrastructure work or capital acquisition). There are 93,264 projects signed along 24 years, where 75,424 are construction works, and the remaining are contracts directed to capital acquisition. For the remainder of the article, we will focus on contracts directed to the execution of infrastructure works. Notably, the bulk of monitored projects were signed after 2007. There is no data from before because the execution of infrastructure projects, as previously described, was regulated by the Decree 6170, from July 2007. Before this piece of legislation, infrastructure investments were regulated by another decree[5], which do not foresee any monitoring activity from CEF.

Figure 5 provides a profile of the value of these infrastructure projects and the areas where resources were employed. From the histogram, we can conclude that projects contemplated in the data are mostly small projects which cost less than one million reais (approx. U$ 250,000)[6] and that this kind of transfer is mostly used to finance general infrastructure projects. These include road paving, construction of community squares, sewerage, touristic infrastructure, among others. The other labels, Agriculture, Education and Sports, and Healthcare, account for projects such as public warehouses, multi-sport courts in schools, and basic healthcare facilities, respectively.

Non-completion Profile

More than 95.6% of projects have not even started within one year following its signature. After four years, 76% of projects have started, and only 34.4% have been concluded. Even eight years after signature, only 54.4% of projects were concluded. Moreover, the probability of project evolution drops significantly after four years: if the project is not completed in a 4-year time window, in the 5th year, 73.3% of them see zero or near-zero physical

de Contas da União (2016)

[5]Decree 1819, February 1996.

[6]When contrasted with municipalities' yearly budget, we find that, for the average municipality, the face value of every project signed in 2018 accounts for 3.5% of the yearly amount of federal transfers.

progress[7]. Figure 6 summarizes these dynamics for each project category and the full sample. Projects labeled as Infrastructure, Education and Sports, and Agriculture drive the describe dynamics and have similar conclusion patterns.

Nevertheless, projects related to Healthcare infrastructure belong to a much worse scenario, where only 17.5% of projects are concluded after eight years. Furthermore, the high amount of unfinished projects is not caused by long schedules, as shown in Figure 7. The median project was scheduled to be completed in 3 years and 5 months. Moreover, 76.3% of projects were planned to be concluded in less than four years.

Since the time window where we observe project evolution is limited, it is impossible to observe the eventual completion rate of every project in our sample. However, assuming that the observed distribution of project completion duration represents the actual time-to-completion distribution of every project, we can infer the share of projects that are never completed. As mentioned, 46.6% of projects are still unfinished after eight years of project signature. Thus, given that only 3.3% of the observed conclusions happens after 8 years, extrapolating those rates to the whole sample implies that 43.7% of all projects are never completed[8]. Those predictions should be taken with grains of salt as they are based on the available data. Potentially, conclusion rates might vary depending on the observed period.

Furthermore, the observed unfinished projects have had a significant amount of investment in them. Projects that remain unfinished after eight years have, on average, 11.3% of physical completion and have 11% of the total contract value disbursed to the executor[9] [10]. Assuming that 43.7% of projects are indeed never completed and considering that expenditure on these projects averages 11% of the total contract value, a back-of-the-envelope computation implies that 4.8% of the total government planned expenditure is wasted. Since 56.3% of the total budget is directed to successful projects, we have a total disbursement of 61,1% of the planned expenditure, where 7,85% of this value is waste. Taking into account that the planned investment of the Brazilian government observed in the database since 2007 is of R$ 45.659.015.541,00, this share implicates that an investment of R$ 2.191.632.746,00 is waste. This value

[7]Indeed, 62.2% see no evolution at all.

[8] $\frac{Completed}{All} = \frac{Completed}{Completed_{\leq 8}} * \frac{Completed_{\leq 8}}{All} = \frac{1}{1-0.033} * 0.544 = 0.563$

[9]The disbursement information should be taken with grains of salt as financial information is missing in 10.1% of these projects.

[10]These are low rates because most of the unfinished projects have not even transited to the construction stage (74.3%), having a physical completion of 0. If we look into the 25.7% of projects in which construction has started, we find that they have an average of 44.1% in its physical completion and 38.1%of total contract value disbursed. In this sub-sample, only 2.43% have missing disbursement data.

accounts for the construction of 654 healthcare facilities and the reform of 2587 of those units[11] indicating that the inefficiencies which arise from government spending in infrastructure have a substantial social opportunity cost, not to mention the bureaucratic resources employed in failed projects.

Selected Sample

We will focus on the 2012 and 2016 elections as project monitoring data encompasses this period. Also, we limit our sample to municipalities where the incumbent party attempted reelection during these elections. In our baseline analysis, we use every project which was not completed until the beginning of the subsequent term, and every new project started in the mandate. The selected sample consists of 46,804 projects distributed over 4,136 municipalities across both mandates. Figure 8 plots the evolution of the pool of these projects. Visual inspection of these two figures suggests that turnover harms the delivery of projects from the previous term, as municipalities with a party turnover have systematically lower conclusion rates of inherited projects.

Basic descriptive statistics of the inherited projects, electoral outcomes, and municipal characteristics are presented in Table 1. Besides providing background on the average municipality's socioeconomic and political characteristics; the table also reports falsifications tests to check if there are any systematic differences between municipalities just below or just above the close elections cut-off, to test for the RD design validity. Column (1) presents the mean for the 3,132 municipality-election observations where happened a party turnover (treatment group), whereas column (2) exhibits the average for the 2,756 observations where the incumbent party was able to be reelected (control group)[12]. Column (3) presents the standard deviation of the respective variable. Column (4) reports the estimated treatment effect using a local linear regression as in equation (15) with the CCT optimal bandwidth. As falsification tests for some variables, column (5) presents the p-value of the turnover effect over the respective variable using a local linear regression in the CCT optimal bandwidth. Figures 9-11 allows visual inspection of the regression discontinuity analysis summarized on the p-values of column (5). In column (6), we adjust those p-values for the False Discovery Rate using the Benjamini and Hochberg (1995) procedure.

Panel A presents the political characteristics of those municipalities, namely the proportion of cities ruled by the respective incumbent party in the term preceding the elections of 2012 and 2016, the political competition

[11] Using average values of 2018 of, respectively, R$ 3.351.160,00 and R$ 847.187,00

[12] From the total of 5,973 municipality-election observations, 99 of them inherit no project nor signs a new contract during the subsequent term. These observations are not included in the empirical analysis.

index used in the heterogeneity analysis, and a dummy indicating if the party attempting reelection has a second term incumbent. Municipalities have similar reelection rates for all parties, except for locations previously governed by PT, which are more likely to have a party turnover on these elections, and places previously ruled by PSDB, which are more prone to reelect the incumbent party. The political competition index variable is balanced for both samples, while there is an apparent unbalance concerning the second-term dummy. However, the p-values column (5) and (6) indicates that the RD analysis is not compromised by this disequilibrium, as the statistics imply that there are no significant differences in political characteristics around the vicinity of the cut-off.

Panel B presents the characteristics of the inherited projects at the beginning of the new term. Note that in this case, these estimates can not be taken as falsification tests as the inherited project's characteristics may be affected by the electoral outcome[13]. Losing an election may impact the current mayor's behavior during the last two months of his term. Indeed, this is what we observe in data. Electoral losers end up the mandate with fewer projects than winners. From Table 1, we can tell that this is driven by a higher number of new projects signed between elections and the new mandate in municipalities where the incumbent party was reelected. Moreover, we can tell that turnover municipalities inherit more expensive projects, consequently having higher counterpart contributions. However, differently from the number of recent projects, the value and every other characteristic do not change abruptly on the discontinuity.

Panel C presents the balance checks for socio-demographic characteristics from the 2010 census. Turnover municipalities are slightly more urbanized, have more access to piped water, a lower literacy rate, and have similar access to electricity and sewerage. They also do not differ in measures of inequality and development. Similar to the previous characteristics, none of the socio-demographic features suffers a sudden change in the RD discontinuity, not threatening the RD identification[14].

[13]Falsification tests for project characteristics can be found in Table 2, where we present features of municipalities' active projects one year before elections. We are unable to present these falsification tests for the period right before elections, as 2012 data is missing. Thus, we also present, only for 2016, placebo tests on the lagged outcome variable and placebo tests for project characteristics right before the 2016 elections. We find one discontinuity, which is better discussed in Section 4.

[14]Although the literacy rate has a naive p-value of 0.05, we do not reject the null hypothesis of no effect after correcting for the FDR.

3
Model

Previous literature on political science has widely explored pork-barrel politics and their credit-claim dynamics. Although many of the advances have been made on legislative elections, most researches highlight electoral motivations related to infrastructure delivery[1]. In particular, regarding the local executive sphere in Brazil, Samuels (2002), while pointing out reasons against the credit-claim instrumentality of pork-barrel politics for federal deputies, argues that local mayors "often steal deputies' thunder and claim credit for pork-barrel project implementation", since they are the agents who are in charge of *implementing* such investment[2].

Therefore, the theoretical framework developed in this section departs from a probabilistic voting setting where voters retrospectively evaluate past incumbents' performance through the delivery of public construction works in a credit-claim fashion. The principal aspect of the model is that the completion of public construction works inherited from the previous mandate have heterogeneous impacts over the incumbent probability of reelection, in reelected vis-a-vis newly elected incumbencies. Such heterogeneity occurs since the marginal benefit of completing a project is lower if the project began on the term of a potential challenger, as the opposition has a higher probability of claiming credit over the concluded public work. In this scenario, the concluded project would improve voters' evaluation of both incumbent and challenger, yielding a lower and possibly negative impact on the incumbent's reelection probability. Consequently, the model implies that newly elected parties would direct fewer resources to the conclusion of inherited projects when compared to reelected ones.

The Environment There are two opposing parties which alternate on the positions of Incumbent (I) and Challenger (C). Parties are purely *opportunistic* and receive utility solely from being (re)elected. A population consists of N individuals indexed by i, which evaluates incumbent's performance with preferences given by:

[1]Refer to Evans (2011) for a literature review.

[2]Further reading on Brazilian pork-barrel politics can be found on Morgenstern et al. (2002) Ames (1995)

$$V^I(g_n, g_p) = H(g_n, g_p) \tag{3-1}$$

Where we assume that $H(g_n, g_p)$ has the following form:

$$H(g_n, g_p) \equiv log(g_n) + log(g_p) \tag{3-2}$$

Where g_n represents government resources employed in new projects and g_p the investment in projects inherited from the previous mandate. $H(g_n, g_p)$ can be interpreted as a linear utility function on two public goods x_n and x_p, which production have diminishing returns on the respective inputs, g_n and g_p. We also assume that such investment is bounded by a given budgetary constraint:

$$g_n + g_p \leq \tau \tag{3-3}$$

Note that, in our empirical context, the source of investment in infrastructure is the federal government, and the local government has no discretion over investment decisions. Nevertheless, as local projects' execution is highly dependent on the city hall's bureaucratic efforts, one can reinterpret those expenditures as the discretion the local government has over bureaucracy resources.

Voting behavior. We combine retrospective and probabilistic voting (see, e.g., Persson and Tabellini (2002), Chapter 3). We assume that voters reward or punish the incumbent government based on economic considerations, ultimately dependent on government investment decisions on infrastructure. They vote retrospectively to reelect or not the current party in power considering if his evaluation of the incumbent is above a given reservation utility. However, ideology also plays a role, as citizens have an idiosyncratic component of their preferences towards a given party. Specifically, citizen i will vote for the incumbent if:

$$V_i^I(g_n, g_p) \geq \sigma_i + V_i^C(g_p) + \delta \tag{3-4}$$

If (3-4) turns the other way, the citizen vote for the only opposition party. The first term of the right-hand side of the inequality, σ_i, represents an idiosyncratic bias towards the opposition party. We assume that σ_i is distributed uniformly with mean 0 and density ϕ. Citizens with high σ_i are more demanding of the ruling government.

The second term is given by $V_i^C(g_p) = \alpha + I(T = 1) * (\pi(\rho) * H_C(g_p))$, and represents the evaluation of the challenger party, which is different for places with a newly elected government ($T = 1$) or a party in a consecutive term ($T = 0$). On the top of α, which represents a given relative evaluation of the

challenger party based on previous incumbencies, when $T = 1$, the challenger party has probability $\pi(\rho)$ of claiming credit over the provision of projects which were inherited from the previous mandate, yielding an improvement of $H_C(g_p)$ on its evaluation. Where:

$$H_C(g_p) \equiv \gamma * log(g_p) \tag{3-5}$$

Intuitively, this feature conceptualizes a credit-claiming dynamics where the new mayor receives only part of the credit for concluding the infrastructure project, and the other part of it is attributed to the mayor who started the construction. This reasoning not only makes the marginal benefit of completing inherited projects smaller, but it potentially turns it into a cost (if $\gamma > 1$), as the completed project might reduce the incumbency advantage by improving the evaluation voters attribute to the challenger.

Moreover, the stage of inherited public works at the moment the new mandate begins affects challenger's ability to claim credit over such projects. Specifically, we assume that $\frac{d\pi(\rho)}{d\rho} > 0$ and $\lim_{\rho \to 0} \pi(\rho) = 0$. Where ρ is a measure of inherited project's completeness at term start. This feature incorporates the idea that public works inherited in early stages had no significant contribution from the previous term incumbent, which in turn impacts the expectation of credit attributed to the opposing party when a newly elected party concludes an inherited project.

The last term on the right-hand-side of (3-4) is a random shock to the popularity of the challenger party, common to all voters. Such stochastic partisanship shock is unknown to voters and politicians until right before elections and can be interpreted as last-minute electoral campaigns which disproportionately benefit one of the candidates or even political scandals which are brought to surface on the brink of elections. Thus, when the incumbent government chooses the allocation of resources to new and inherited projects, it knows the distributions for σ_i and δ, yet he does not know the realization of the aggregate popularity shock δ. In line with other probabilistic voting models, this uncertainty related to the stochastic partisanship shock creates a smooth mapping between policy choices and expected electoral outcomes.

Timing and Equilibrium. The timing of the game, depicted in Figure 1, is the following: (i) the previous electoral outcome determines if the incumbent belongs to a reelected or a newly elected party; (ii) the incumbent party set the infrastructure policy; (iii) the stochastic partisanship shock (δ) is draw from a uniform distribution; (iv) voters observe the policy and the shock, and vote. An equilibrium of this game is:

I - a policy of infrastructure investment optimally selected at stage (ii) by the incumbent party in each possible type of government (new or reelected), taking into consideration the expected equilibrium outcome at stage (iv).

II - an electoral outcome, given the equilibrium policy and the type of government.

Reelected incumbent. We begin by analyzing policy choices under a government in a consecutive mandate. In this scenario, inherited construction projects are from the same government, and the conclusion of them does not impact challenger's popularity. Take $F(\cdot)$ as the cumulative distribution of σ^i. Hence, the share of votes for the incumbent party is given by $F(V^I - V^C - \delta)$ while $1 - F(V^I - V^C - \delta)$ represents the challenger's vote share. Thus, the overall incumbent vote share is:

$$vs_I = F(V^I - V^C - \delta) \tag{3-6}$$

Taking into account that $F(\cdot)$ is the c.d.f. of a uniform distribution with mean 0 and density ϕ, and that δ is also uniformly distributed with mean 0 and density ψ, it is straightforward to see that the probability of incumbent reelection is given by:

$$P[Reelection \mid T = 0] = \frac{1}{2} + \frac{1}{2\psi}\Big[H(g_n, g_p) - \alpha\Big] \tag{3-7}$$

The equilibrium policy results from the maximization of (3-7) regarding g_n and g_p, subject to (3-2) and (3-3). This optimization produces the policy[3]:

$$g_n^* = g_p^* = \frac{\tau}{2} \tag{3-8}$$

Newly Elected Incumbent. Newly elected parties have different incentives for completing infrastructure projects. The execution of inherited projects not only impacts the reelection probability through an improvement of incumbent's evaluation, but also through the increase of the expected popularity of the challenger. Therefore, through the same steps as before, it is easy to see that the probability of reelection of a newly elected incumbent is given by:

$$P[Reelection \mid T = 1] = \frac{1}{2} + \frac{1}{2\psi}\Big[H(g_n, g_p) - \alpha - \pi(\rho)H_C(g_p)\Big] \tag{3-9}$$

The maximization of this objective function subject to (3-2), (3-3), and (3-5) yields a slightly different policy outcome, which is given by:

[3]Note that this is also the choice of a benevolent social planner as we are maximizing citizens' utility over public infrastructure.

$$g_n^* = \frac{\tau}{1 + (1 - \pi(\rho)\gamma)} \quad \text{and} \quad g_p^* = \frac{\tau}{1 + \frac{1}{(1-\pi(\rho)\gamma)}} \tag{3-10}$$

In this case, the ruling government deliberately underinvests in inherited projects because it jeopardizes his reelection by improving opposition's evaluation. Also, the budgetary restriction implies that the behavior of newly elected and reelected parties will differ concerning new projects as well. This additional effect happens because of a span of control mechanism: since inherited projects are less attractive to newly elected mayors, they end up directing relatively more effort to new construction works as there are more bureaucratic resources available. Moreover, note that the adverse impact on inherited projects investment is smaller for small values of ρ. Such differential effect exists because projects inherited in preliminary stages hardly contribute to the increase of challenger's evaluation, as the ruling party executed most of the project, implying in a lower probability of the opposition to claim credit over it successfully[4].

A comparison of g_n^* and g_p^* under distinct scenarios given by (3-8) and (3-10) allow us to verify these implications. Since $1 > (1 - \pi(\rho)\gamma)$, we have that g_p^* is comparatively higher under (3-8) and g_n^* is greater under (3-10). Figure 2 presents a mayor's optimal choice under two hypothetical cases to depict the distortion caused by electoral incentives: (i) when the mayor is from a reelected party; and (ii) when the mayor is from a newly elected party and $\pi(\rho)\gamma = 0.5$. The exercise indicates that a party turnover implies a deviation of a socially optimal policy (equivalent to the reelection scenario) driven by the underinvestment in inherited projects in detriment of new projects. Precisely, under the given parametrical setting, the hypothetical exercise implies in an increase of 33.3% (16.6 p.p.) on the share of the budget directed to new projects, and in a reduction of 33.3% (16.6 p.p.) on the share of the budget devoted to inherited projects.

Therefore, we can summarize the implications of the model in the following propositions:

Proposition 1. *The overall level of government resources directed to inherited projects differ in newly elected and reelected governments. Newly elected parties invest relatively less in inherited projects because those projects yield a lower electoral advantage by improving opposition's evaluation.*

[4]Our empirical analysis indicates that, rather than completely abandoning inherited projects, newly elected administrations delay their conclusion to the end of the mandate. This effect suggests that the odds of attributing the credit of inherited projects to the opposition party decreases as the term advances.(i.e. $\pi(\rho, a)$; and $d\pi(\rho, a)/da < 0$, where a is the age of the mandate).

Proposition 2. *Through a span of control mechanism, by dedicating fewer resources to the execution of inherited projects, newly elected parties can employ relatively more bureaucratic effort in new projects.*

Proposition 3. *The differential effects become less preeminent when projects are inherited in preliminary stages.*

4
Empirical Strategy

Identification Identifying the causal effect of party turnover on execution measures of new and inherited projects is not a trivial task, as socio-economic characteristics are likely to be correlated with both project delivery and electoral outcomes. Comparing delivery rates between municipalities where the incumbent party was able to be reelected and in municipalities where it does not, is likely to generate biased estimates, as municipality characteristics such as the selection of politicians and political alignment of the incumbent party could be correlated both with delivery rates of projects and with electoral outcomes.

The close-race RD design setup is particularly useful to deal with this challenge. Define $\tau_m(1)$ as the potential outcome of a generic project delivery measure in municipality (m) if there is a party turnover, and $\tau_m(0)$ as the potential outcome of the same municipality if the incumbent party is reelected. The variable T_m defines party turnover. The observed outcome is thus $\tau_m = T_m \cdot \tau_m(1) + (1 - T_m) \cdot \tau_m(0)$. The estimand of interest is the local average treatment effect (LATE), $E[\tau_m(1) - \tau_m(0)]$.

In a simple correlation exercise, with no covariates:

$$\tau_m = \pi_0 + \pi_1 T_m + \epsilon_m \tag{4-1}$$

the estimated $\hat{\pi_1}$ will provide a biased estimate of the LATE if municipalities with different characteristics that affect stoppage and conclusion rates of projects self-select into party turnover. Even with the inclusion of observable variables of the municipalities, the $\hat{\pi_1}$ OLS estimator is likely to be biased in the presence of unobserved characteristics affecting both outcome and selection into treatment.

To address the presence of confounding variables, we rely on an RD strategy and compare municipalities where the challenger party candidate barely won with municipalities where the challenger party candidate barely lost. Specifically, we calculate the margin of victory of the best challenger party over the incumbent party in each municipality m (MV_m). At the cutoff $MV_m = 0$, the turnover treatment (T_m) sharply changes from 0 to 1.

The key idea of the identification strategy is that MV_m is dependent not only on observable and unobservable factors but also on random events on the election day. To identify the ATE effect, each candidate must have: (i) a probability of winning which is never equal to 0 or 1 and (ii) identical chances of winning or losing the election by a narrow margin (Lee (2008)).[1] In this setting, all confounders that play a significant role in determining political turnover (such as campaign financing, incumbent's past performance or the unobservable appeal of candidates) do not present a threat to identification if random events also have a minor contribution. In particular, the margin of victory and thus the party turnover condition depends on both observable elements and random chance, yet in razor-close elections, only random chance plays a significant role. Hence, the close races ATE is defined as

$$E[\tau_m(1)-\tau_m(0)|MV_m = 0] = \lim_{\eta \downarrow 0} E[\tau_m|MV_m = \eta] - \lim_{\eta \uparrow 0} E[\tau_m|MV_m = \eta] \quad (4\text{-}2)$$

Under the identification assumptions, equation (2) delivers the causal ATE of party alternation over project outcomes, and we expect this effect to be positive when the variable of interest is the stoppage rate of inherited projects and negative when it is the conclusion rate. On the other hand, given the span of control mechanism, when it comes to new projects, we expect this relationship to be the opposite, with better delivery rates for newly elected parties. However, this is a local average treatment effect (LATE) and may not be extended to all municipalities without assuming additional homogeneity hypothesis.

Nonetheless, the identification hypotheses are not always guaranteed in close elections (Caughey and Sekhon (2011))[2]. Hence, a necessary step to guarantee the validity of the analysis is the conduction of a variety of density and falsification tests to support the identification assumptions and exclude the possibility of manipulative sorting in razor-close electoral races. Also, as highlighted by Eggers et al. (2015) and De la Cuesta and Imai (2016), placebo tests conducted in an RD framework suffers of multiple inference problems. An extensive battery of tests might produce some rejections of the null hypotheses merely by statistical chance, leading to false positives which do not jeopardizes the validity of the RD design. Therefore, given that we run the same RD

[1] These conditions are equivalent to the standard RD assumptions in Hahn et al. (2001), where potential outcomes must be a continuous function of the running variable at the threshold.

[2] Particularly, it is shown that, for the U.S. Congress, winners in close elections are more likely to be incumbents, to receive more campaign financing and to be the predicted winners in preelection ratings.

specification over almost one hundred different outcomes and covariates along the paper, we should expect some false positives in our results.

Hence, to account for the multiple inference issue, we perform the following adjustments in order to control for the False Discovery Rate (FDR) (Benjamini and Hochberg (1995), henceforth BH). On the placebo tests, we present the FDR adjusted p-values following the procedure described in BH, and on the main results we exhibit the equivalent False Coverage Rate-Adjusted BH-Selected confidence intervals (Benjamini and Yekutieli (2005)). These placebo tests are presented in column (5) and (6) of Tables 1 and 2, where is displayed the p-values and adjusted p-values of the Calonico et al. (2014) estimator of the party turnover effect over a set of pre-determined variables.

Although some covariates seem unbalanced before the p-value adjustment, the point estimates presented on column (4) are small when compared to the standard deviation of the respective variable. Moreover, when controlling for an FDR of 10%, we only reject the null hypothesis of a balanced sample around the threshold for a single covariate (the lagged share of concluded projects inherited in the pre-construction stage). Nevertheless, by inspecting the unbalanced variable discontinuity in Figure 13 we interpret that the effect is being driven by a few outliers in the vicinity of the threshold. Additionally, on the Appendix A-2, we also perform the main analysis controlling for the unbalanced characteristic and our results remains qualitatively the same. Therefore, we understand that both, McCrary density test[3] and placebo tests, corroborate with the validity of the RD design in this situation and visual inspection of figures 9-13 reinforces this conclusion.

Estimation. The outcomes of interest are delivery measures of projects inherited from the previous mayor term and delivery measures of new projects. They include measures of stoppage, conclusion, and new signatures. We analyze (i) the share of paralyzed and (ii) the share of concluded projects over the total number of projects inherited from the previous term; (iii) the share of new projects over the total number of projects administered by the mandate; and (iv) the share of conclusions on new projects [4]. First, we calculate the share of paralyzed/concluded/new contracts of each municipality for every quarterly observation available in the panel. Then, we use the tenth quarter after the beginning of the mandate as the primary outcome variable, as this is the last

[3]Figure 3 presents the McCrary density test, which do not reject the null hypothesis of no sorting on the running variable.

[4]As robustness, the log of 1 plus the number of paralyzed/concluded/new projects and shares weighted by project value are also analyzed.

shared quarter available in both mandates. [5]

An important distinction for our analysis of inherited projects is the stage of the project when inherited. Under the light of our credit-claim mechanism, projects inherited in a construction phase differs qualitatively from projects inherited on a pre-construction stage. Thus, we split (i) and (ii) and compare results of relative shares of projects inherited in a construction phase with shares of projects inherited without any physical progress.

A variety of approaches can be used to estimate the LATE presented in equation (4-2). In accordance to Imbens and Lemieux (2008), we perform local linear regressions, which restricts the observations to a narrow margin around the cut-off, i.e. $MV_me \in [-h, +h]$, and estimate the following:

$$\tau_{me} = \alpha_e + \pi_0 MV_{me} + \pi_1 T_{me} + \pi_2 T_{me} MV_{me} + \epsilon_{me} \tag{4-3}$$

where α_e is an election fixed effect and the optimal bandwidth h is selected as in Calonico et al. (2014).

The estimated coefficient $\hat{\pi_1}$ is of primary interest since it identifies the LATE of party turnover, we expect a negative coefficient for the conclusion outcomes, a positive coefficient for the stoppage outcomes, and positive outcomes concerning new signatures and new projects completion. Note that given the fit of MV_{me} in a spline regression, close electoral races do not need to be determined since the LATE is identified as the difference between the boundary points of two fitted regressions on either side of zero. Thus, close races are those with a margin of victory close to zero at the limit. Furthermore, we also present the results with three alternative bandwidths [-10;+10], [-5;+5] and [-2.5;+2.5].

Additionally, we exploit the time dimension of our panel by computing the CCT local linear estimator for each quarter of the data set. In this occasion, we estimate the effect for each election separately, as we are not able to pool every relative quarter[6]. Although we present those results in an event-study framing, note that we can verify the equivalent of parallel pre-trends only for the results regarding the stoppages of inherited projects. The other results, on conclusions and new projects, cannot be estimated for periods before turnover, as, by definition, every observation has zero conclusions of inherited projects and zero projects signed by the new mayor before the new mandate.

[5] Alternatively, we also average over the time-span to generate cross-sectional municipality level outcomes.

[6] For instance, we cannot observe the last quarter of the mandate of the mayor elected in 2016, but we can observe the last quarter of the mayor elected in 2012.

Furthermore, to analyze the heterogeneous effects on project stage, we adopt a sub-sampling approach. Thus, we run regression (4-3) in sub-samples divided accordingly to the stage of the inherited pool of projects in each municipality. We present results of the RD estimates for municipalities below and above the sample median of the following index:

$$H_{me} = \frac{\sum_p^P (Completion_{pme})}{P} \tag{4-4}$$

The index is the average physical completion rate, during term transition, of projects inherited on the construction stage . The division of municipalities below or above the median of this variable is useful to provide empirical evidence of Proposition 3. We expect that the turnover effect will be larger on municipalities with an advanced pool of inherited projects and that newly elected parties will have worse delivery indicators in those places. This prediction arises because advanced projects have a higher impact over the expected challenger's evaluation if completed, which leads to a smaller incentive to its implementation under the perspective of a newly elected party.

Moreover, we highlight that these are not causal estimates of the heterogeneous impact regarding inherited project stage. Instead, the results should be interpreted as causal impacts of turnover in different sub-populations, which share characteristics that systematically impact this effect. This impact on turnover effect can not be regarded as causal because these characteristics might be correlated with other municipalities' features that can also impact the turnover coefficient.

Finally, given mayors' two term limit, we cannot ignore that the discontinuity effect might also be capturing different incentives from mayors in the first and second mandates. To perceive this issue, note that the probability of having a mayor in the first mandate jumps on the right-side of the discontinuity as a newly elected party necessarily implies in a mayor in the first term. Therefore, as a robustness check, we run regression (4-3) for every bandwidth choice limiting the sample for municipalities where parties are running for reelection, but the current mayor is on his second term and can not reelect himself. This approach allows us to isolate the party turnover effect from the effect of having a mayor in his first mandate since every elected mayor in our sample will be governing for the first time.

5
Results

We begin this section by presenting estimates of the average effect of party turnover on conclusion and stoppage rates of inherited works. In Table 3, the outcome variable in all panels is the share of inherited works in a given condition in the tenth quarter of the respective term. Hence, results should be interpreted as the LATE of party turnover over the percentage of concluded/stopped works two years and one semester after the term changed. Column (1) shows the results of a simple correlation between turnover and stoppage and conclusion measures of project execution. Columns (2)-(5) performs the local linear regressions as in equation (4-3) and presents the results in 4 different choices of bandwidth, respectively, the optimal CCT bandwidth, and the fixed ten, five, and two and a half bandwidths. All regressions include term fixed effects.

Panels A presents the results related to conclusion outcomes. Our dependent variable is the share of conclusions over inherited projects. The OLS estimate in column (1) implies that having a party turnover in a municipality is correlated with a 4.1 percentage points decrease in the average share of concluded projects. This result point in the expected direction, yet it is prone to be a biased estimate of the causal impact of turnover on project interruption. For instance, if turnover happens systematically in municipalities where the incumbent is incompetent and mismanages more projects, the estimates of the OLS regression are inclined to have a negative bias, as municipalities which there was a party turnover are also the ones who inherited the higher number of projects compromised by the inability of the previous mayor.

On the other hand, it is also possible that municipalities where political competitiveness is high, and turnover is typical, are also the ones where politicians are more skilled in delivering public construction projects, as the competitive environment selected them. In this scenario, the OLS estimator's bias is expected to be positive, as municipalities with a higher probability of turnover are also the ones where the politicians are more likely to conclude a project. Nevertheless, as we turn on the estimates of the RD design (columns (2) - (6)), we can conclude that those biases are nonexistent or cancel out each other, as the point estimates remain stable and loose significance when

estimated in narrower bandwidths.

Panel B presents the results related to stoppage outcomes. The dependent variable is the share of inherited projects which are paralyzed. The interpretation of results over stoppage outcomes is complementary to the conclusion variable as it indicates if the non-conclusion issue is only a matter of slower execution or if there is no project evolution at all. Because of the same reasons described in the previous paragraph, we expect that the column (1) OLS estimates of a 1.3 percentage points increase on stoppages are biased. However, similar to the conclusion shares results, the results of the RD design estimations indicate that the mentioned biases are prone to be nonexistent or to cancel each other. If any, there is a negative bias on the OLS estimator as the causal effect of approximately three percentage points given by the RD estimates over the two outcomes is slightly higher than the OLS result. Like the conclusion outcomes, in most RD specifications, the results are not significantly different from zero.

At first glance, the results in Table 3 suggests that turnover leads to insignificant effects on inherited project execution[1]. Nevertheless, this interpretation ignores critical aspects of our data. First, as presented in Section 2, the pool of inherited contracts significantly differs in turnover municipalities. Reelected parties sign more contracts than political losers in the two months that precede the term change. This behavior implies that newly elected parties receive a pool of projects with an average conclusion rate that is more advanced than the pool of reelected ones. Second, as explicit in the model developed in Section 3, we expect that the differential effect on non-conclusion will be more preeminent on projects on advanced stages. Therefore, the inclusion of recently signed projects in a preliminary stage on the computation of the outcome variable increases disproportionately the denominator of the reelected municipalities share, potentially hiding the effect that turnover has on more advanced projects.

Therefore, to deal with the issue mentioned above, we run the RD specification in different projects' sub-samples. Table 4 presents the impact of turnover in the conclusion of inherited projects. Following the same column pattern of Table 3[2], it examines the same universe of inherited contracts but splits the analysis in projects inherited on the pre-construction phase and projects inherited on a physical stage. Panel A & B, presents the turnover

[1]Figure 14 exhibits the graphical analysis of the CCT bandwidth regression for the conclusion and stoppage outcomes of all inherited projects. Visual inspection of these graphs confirms the results described above, as there are small discontinuities around the cut-off for the outcomes.

[2]OLS, CTT, ten, five, and two and a half percentage points bandwidths.

effects over the average share of concluded projects. Panel A shows the results when we look at the sample of works inherited in the pre-construction phase. On the contrary, Panel B exhibits the effects on the outcomes regarding the sample of projects inherited in the construction phase.

On Panel A, only the OLS specification (column 1) is significant, and we observe smaller and insignificant effects when referring to the RD specifications. A possible interpretation for these results is that the inherited projects' characteristics negatively bias the negative impact of 4.3 percentage points of the OLS coefficient. City halls with low-quality mayors are more likely to design bad projects and also more likely to lose an election. Thus, when we estimate the effect at the discontinuity, comparing similar municipalities, we observe no effect at all. On the other hand, when we turn into the analysis of projects inherited on the construction phase on Panel B, the results point in a different direction. The comparison between the OLS correlation on column (1) and the identified regressions on columns (1)-(6), indicates that the seven percentage points coefficient on column (1) has a positive bias and the causal effect of turnover ranges from a negative impact of 10.7 percentage points to 16.4 percentage points over the share of concluded works depending on the specification. A plausible explanation for the opposite directions of bias[3] is that the conclusion of projects inherited in the construction phase correlates with a characteristic, other than previous mayor quality, which also correlates with turnover. For instance, a plausible assumption is that the success of projects inherited in the construction phase correlates with the new mayor's quality. Thus, if the assumption holds, we can have municipalities with highly competitive political environments (i.e., opposition candidates with high valence) self-selecting into turnover treatment and positively biasing the OLS estimator.

Table 5 reproduces the same analysis concerning stoppage rates. Similarly to the effects over conclusion measures, the turnover coefficients on stoppage rates show different results in inherited projects of different stages. Panel C presents that turnover *reduces* stoppage rates of projects inherited on a pre-construction phase. Although statistically insignificant, the coefficients indicate that party alternation implies a reduction of 1.8 percentage points to 5.6 percentage points on the average share of stoppages on these projects, depending on the bandwidth choice. Oppositely, panel D shows that turnover leads to more paralyzations of projects inherited on the construction stage. In this universe of projects, turnover implies a 6.4 percentage points to 12.9

[3]This opposite direction of biases is consistent with the results of Table 3, which presents similar effects on the OLS and the RD specifications, indicating that on the aggregate (all inherited projects) these biases cancel out

increase in the average share of stoppages. Overall, a similar pattern over stoppage rates suggests that the lower share of concluded projects is not a matter of a delay on conclusions caused by a lower rate of project evolution. On the contrary, the turnover impact over stoppages suggests that those projects are not advancing at all.

The upper rows of Figure 15 exhibits the graphical analysis of the CCT bandwidth regression for the conclusion and stoppage outcomes for projects inherited on the pre-construction stage, while the analysis for the projects inherited in the construction stage is on the lower panel. Visual inspection of these graphs confirms the results described above, as there are visible discontinuities around the cut-off for both variables in the lower panel but no discontinuities on the upper panel.

Furthermore, we look at how turnover affects the mayor's performance regarding the beginning of new projects. We expect that turnover impacts the execution of new projects, even if the electoral benefits of completing them are the same in both treatment and control. This effect would happen through a span of control mechanism: by devoting less bureaucratic efforts to the conclusion of inherited projects, a newly elected administration would be able to employ more efforts to execute new projects.

Table 6 presents estimates of the party turnover effect over two measures of bureaucracy efficiency concerning the start of new construction works. Following the same pattern of Table 3[4], Panel A presents the results concerning the share of new signatures in the universe of all works managed by the elected administration. Panel A outcome variable is the share of projects signed in the new mandate. Panel B shows the coefficients on the share of new projects that are concluded in the subsequent term. Both measures represent the tenth quarter of the respective mandate because we face data limitation issues, as explained in Section 2.

The results point out a positive and significant effect of turnover on the share of new signatures. Although the coefficients on the CCT [5] and ten percentage points bandwidth choices are statistically insignificant, in narrower bandwidths, we find positive and strongly significant coefficients of 7.9 percentage points 9.2 percentage points on the five and two and a half percentage points specification, respectively. On the other hand, the results on the share of new projects which are completed are statistically 0. This last result is likely to be related to the long schedules of construction projects in Brazil. As explored in Section 2, projects in our sample not only take a long

[4]OLS, CTT, ten, five, two and a half percentage points bandwidths.

[5]Figure 16 exhibits the graphical analysis of the CCT bandwidth regression for both new projects outcome. Visual inspection of these graphs confirms these results.

time to be completed, but they also take a long time even to start. Considering that we are restricting our analysis to projects signed in the same mandate in these regressions, we believe that the difference in completion rates of new projects has not yet taken place[6]. Few projects are concluded in less than two and half years after its signature, and the mean of the dependent variable in those regressions corroborates with this interpretation.

Overall, we interpret these results as evidence of an electoral incentive mechanism behind the turnover effect. The explanation of worse public services caused by bureaucratic disruption, as proposed in Akhtari et al. (2017) for educational outcomes, is inconsistent with different management performances regarding projects in various stages. Similarly, preference motivated abandonments do not explain the observed pattern, as we do not observe a significant impact on projects inherited with a defined plan in a pre-construction stage. Thus, we conclude that evidence indicates that the electoral mechanism described in Section 3 is a primary driver of project non-conclusion after a party turnover in a municipality. Comparatively, the conclusion of an inherited project is less attractive to a newly elected administration because completing a project started by its challenger increases the electoral prospects of the opposition and reduces its reelection odds through a credit-claim mechanism. Hence, the exclusivity of the effect on projects inherited on the construction phase corroborates with this explanation, as the credit-claim dynamics require the project to be associated with the opposition party, and that only happens if the past mayor has initiated its construction.

Additionally, the evidence on the impact over the signature of new projects further corroborates with the electoral incentives hypothesis through a span of control mechanism. In a scenario where the administrative capacity of the city hall is rigid, the lower degree of bureaucratic efforts devoted to the execution of inherited projects leads to more bureaucratic resources employed on the promotion of new projects, which ultimately leads to more signed contracts. On the contrary, a passive waste narrative driven by a bureaucratic disruption effect would lead to a negative impact of turnover on the administration of new projects as well, which is not the case.

Although the analysis of mayors' performance regarding projects in different stages in a cross-sectional setting is useful to understand their incentives, it does not allow us to acknowledge anything related to the non-conclusions dynamics, neither regarding the long-term effects of turnover on procurement. Thus, we also estimate a local linear regression using the CCT

[6]In the event study analysis ahead, we find that, for the 2012 term, these effects are still not significant even after six and a half years after term start.

bandwidth for the turnover effects in each quarter of our data to provide further evidence on those matters. Since we observe a different set of relative quarters for each election, we present results for each mandate separately, and the results for the 2012 and the 2016 mandates are exhibited on Figures 17 and 18, respectively. The results are presented in an event-study framing where each graph plot, turnover coefficients over each outcome, and their respective confidence interval for every quarter available. [7]

Figure 17 has three panels, one for each set of outcome variables. On the first panel, we present the evolution of the turnover effect on the share of conclusions (stoppages) on projects inherited in a construction stage. Both graphs present a similar pattern: a powerful and significant negative (positive) effect that begins to fade away after the third year of the mandate. The second panel exhibits the results regarding the share of conclusions and stoppages of projects inherited in a pre-construction stage. Although we face small insignificant coefficients on the conclusions variable, which resembles our cross-sectional results, the coefficients on stoppages start to increase on the third year of the mandate and become significant after the end of the term, indicating a reduction of approximately four percentage points on the paralyzed share of projects[8]. The third panel presents the results concerning new projects. It points to an increasing coefficient of the turnover impact on the participation of new projects on the new term; however, there are no significant coefficients. Figure 18 also presents a similar pattern in a smaller time window concerning the 2016 elections.

Although the fading effect presented on the first panel suggests that, rather than abandoned, inherited projects are *delayed* by newly elected parties, we interpret them as consistent with our theory. The source of inefficiencies on the proposed mechanism is the misallocation of bureaucratic resources towards new projects in newly elected administrations, which does not imply that these prefectures choose to shut down inherited projects. Hence, if we assume that electoral incentives on devoting resources to inherited projects can vary during the mandate, it is possible to be strategically better for the newly elected party to conclude old projects at the end of its mandate. Specifically, a plausible narrative that might drive those results is a changing perception of inherited

[7]Note that we can verify the equivalent of parallel pre-trends only for the results regarding the stoppages of inherited projects. The other results, on conclusions and new projects, cannot be estimated for periods before turnover, as, by definition, every observation has zero conclusions of inherited projects and zero projects signed by the new mayor before the new mandate. Still, parallel trends are satisfied for each analyzable outcome.

[8]We interpret this effect as a confirmation of the existence of a span of control mechanism: dedicating fewer efforts to projects associated with the previous mandate, newly elected parties can perform better on other projects.

project's responsibility. At the beginning of the term, an inherited project is highly associated with the previous administration, and its conclusion would yield more inputs for a credit-claim campaign of the opposition on the coming elections. On the contrary, at the end of the term, after years under the new party's management, responsibility for the project shifts to the new mayor. Thus, this shifting perception would generate different incentives faced by new mayors during the mandate, ultimately implying in a strategic timing of inherited project conclusion.

Therefore, the coefficients reported in Table 4 Panel B gives us the dimension of infrastructure procurement inefficiencies created by political change. Although our analysis does not suggest permanent damage to public investment, turnover causes significant delays in project delivery. To illustrate, take the 12,216 projects which were active in the 2012 term transition. Of the total amount of projects, newly elected mayors inherited 5,627, and 2,987 of those were contracts inherited on the construction stage. Assuming that we can extrapolate the LATE to the whole sample and that the effect is temporary, we can infer that $2,987 * 0.118 = 352$ (using the CCT specification) projects would not have been delayed if there were no political turnover on those places.

Furthermore, we argue that this is a lower bound of the estimated inefficiencies for two reasons. First, these numbers are estimated considering the municipalities with party turnover where the incumbent party attempted reelection, disregarding prefectures where there were no reelection attempts. In 2012, 2,256 municipalities had no reelection attempt from the incumbent party, implying that party turnover happened on 3,895 prefectures. Since the previous back-of-the-envelope calculation only accounts for turnover in the 1,639 municipalities where there was a frustrated reelection attempt, the actual waste caused by electoral incentives is potentially two times greater than the estimated value. Second, the theoretical model and the empirical evidence presented in the next paragraphs imply that the turnover effect is even more damaging in locations with low political competitiveness. Hence, since we are estimating a LATE on a close-races RD design, we expect that the turnover effect will be higher when extrapolating this effect to the rest of the sample as close-races are more common in highly competitive places.

Heterogeneity and further evidence

In this subsection, we further explore the implications of the model developed in Section 3. More specifically, we present evidence of the validity of Proposition 3 through a sub-sample heterogeneity analysis. Thus, we begin by presenting the heterogeneous effects of the completion rate of the pool of projects during term transition. We expect that municipalities that had

advanced projects in term transition will have more substantial turnover effects on project non-conclusions. This theoretical implication arises because the source of project non-completion after a party turnover is the impact that the conclusion of inherited projects will have over the opposition popularity. In this narrative, we assume that a completed project from the opposition indicates to the electorate a better governing competence of a potential challenger, reducing the reelection probability of the current incumbent. Moreover, we assume that the more significant contribution of opposition for the execution of a given project, the higher the probability project's credit to be attributed to the last incumbent. Hence, because of the heterogeneous probability of opposition's credit-claiming on projects in different stages, we expect that turnover will have a more substantial impact on conclusion rates in municipalities with a pool of projects inherited in an advanced stage.

Table 7 presents the heterogeneous effects regarding different completion rates of inherited projects measured by the index in equation (4-4). We proceed by estimating equation (4-3) in three different bandwidth choices (CCT, ten percentage points, and five percentage points) for different sub-samples of municipalities. Columns (1)-(3) presents the results for municipalities with an inherited project completion rate index below the full sample median index. On the other hand, on columns (4)-(6), we present the results for the municipalities with an index above this median. We focus on projects inherited in the construction phase as they are the projects affected by turnover. Panel A presents the results regarding conclusion outcomes, while Panel B exhibits the coefficients concerning stoppage outcomes. Both panels present the respective share of projects which are concluded/paralyzed in the tenth quarter of the analyzed term. We expect that municipalities below the median index will have turnover effects closer to zero as they inherited less advanced projects.

The comparison of the results presented in columns (1)-(3) with the coefficients exhibited in columns (4)-(6) corroborates with our model predictions. On municipalities with an inherited project stage index below the sample median, the estimates of the turnover effect on the share of conclusions presented on panel A range from a negative and significant coefficient of 9.3 percentage points on the CCT bandwidth choice to insignificant and lower magnitude coefficients on the alternative samples. On the other hand, on the sample of municipalities above the median, the estimated effects range from 15.9 percentage points on the CCT specification to 17.8 percentage points on the five percentage points vote margin bandwidth choice, and all coefficients are highly significant. On Panel B, the presented effects over stoppage rates show a similar, but less divergent pattern. Except for the results on the five percentage

points bandwidth sample, all specifications present a higher and statistically stronger effect on the stoppage share of inherited projects when it comes to observations above the median of the completion rate index. Overall, we interpret those results as consistent with our model predictions as it implies that newly elected parties have less incentive to complete inherited projects in an advanced stage.

The upper rows of Figure 19 exhibit the graphical analysis of the CCT bandwidth regression for the conclusion and stoppage outcomes for municipalities that inherited projects in a preliminary stage, while the analysis for municipalities which inherited advanced projects are on the lower panel. Visual inspection of these graphs confirms the results described above, as there are visible discontinuities around the cut-off for both variables in the lower panel but no discontinuities on the upper panel.

Table 8 presents the same heterogeneous effect on new projects outcomes[9]. In our theory, we expect that the bureaucratic effort that was not employed on the execution of inherited projects would flow to the engagement on new construction contracts. Thus, in municipalities above the median, we expect a higher turnover effect on new project outcomes as they have directed comparatively less effort to conclude inherited projects. Therefore, Panel A presents the turnover effect on the proportion of administered projects which were signed in the new mandate, and Panel B presents the turnover effect on the share of conclusions concerning these projects signed in the new term. The organization of columns follows the same pattern as in Table 7.

In line with the results presented in Table 7, the comparison of columns (1)-(3) with columns (4)-(6) corroborates with the implications of the proposed model. On columns (1)-(3), which exhibits the results concerning the set of municipalities with an inherited project completion index below the sample median, the turnover impact on the share of projects signed in the new mandate is zero. The presented estimates are not only statistically insignificant, but they also have tiny coefficients; the CCT specification, for instance, indicates a 0.5 percentage points point coefficient. On the other hand, on the municipalities with an index above the median, although statistically insignificant on the CCT and ten percentage points specifications, the point estimates are orders magnitude larger. The estimates range from a 2.7 percentage points turnover impact on the CCT sample to a 7.5 percentage points increase on the 5 percentage points bandwidth choice, which is statistically significant at 5 percent. The pattern in panel B is analogous, statistically insignificant effects with tiny coefficients on the first columns and insignificant but larger

[9]Figure 20 presents the analogous graphical analysis using the CCT bandwidth

coefficients on the columns concerning the sample of municipalities that inherited advanced projects.

Robustness

A major concern with the previous specifications is the higher proportion of mayors in the first mandate when there is a party turnover. On the right side of the discontinuity, the elected mayor is in his first mandate with probability one, whereas for reelected parties, there are mayors on the second mandate. This unbalancing of mayors in the first mandate may bias our results as newly elected mayors face more substantial reelection incentives than second-term mayors who seek to elect a successor.

Therefore, to deal with this issue, we reproduce our primary analysis of Tables 4-6 restricting our sample to municipalities in which the incumbent party is trying to elect a successor for a mayor on the second term. This approach assures that the comparison of municipalities with a running variable right above and right below the turnover discontinuity will be between prefectures ruled only by mayors on the first mandate. Nevertheless, a shortcoming of this strategy is the reduced sample. From the 5,973 municipality-election observations we had on the primary analysis, we are left with 1,423 [10].

Tables 9-11 presents those results. Table 9 analyzes the same conclusion outcomes as Table 4 on the reduced sample. Panel A presents the results concerning projects inherited on a pre-construction stage, while Panel B presents the estimates related to outcomes from projects inherited in the construction stage. The pattern of Table 4, where the turnover effect is exclusive to projects inherited in the construction stage, remains present. Although the estimates of the five and two and a half percentage points bandwidth are not significant given the small sample, the effects of turnover on the CTT and ten percentage points specifications are even larger than the ones observed in Table 4, having negative coefficients of 16.8 percentage points and 14.3 percentage points, respectively.

The results on Table 10 concerning stoppage outcomes are even more strikingly, the CCT and the ten percentage points specification, when estimated on the reduced sample, generate highly significant coefficient's point estimates that are more than two times greater than the main specification results. From an 8.1 percentage points and 8.6 percentage points coefficient on the main results, we find that the reduced sample estimates indicate that turnover causes a 23.7 percentage points and a 21.2 percentage points increase on the stoppage share of projects inherited on the construction stage. On the

[10] Of those municipality-election observations, 30 of them do not inherit nor signs any new project on the new administration. Hence, they are not included in the regressions

other hand, the results regarding projects inherited in the pre-construction phase remain insignificant.

Moreover, the results presented in Table 11 regarding new project outcomes suggest that the effect on new projects is robust to this alternative approach. Although there are no significant outcomes, the coefficients point in the right direction, and, in most specifications, they have higher point estimates than the ones presented on the main results (Table 6).

Overall, we conclude that our main results are robust to an alternative sample selection where we do not face a first-term mayor unbalancing issue. Furthermore, we interpret that the higher coefficients found in this robustness check can be attributed to increased reelection incentives faced by mayors in the first term. On the main specification, some mayors from the control group were reelected into a consecutive mandate. Thus, if these mayors on the second term face fewer reelection incentives than first term successors, a straightforward implication is a higher control group average effort employed in the conclusion of inherited projects in the robustness sub-sample. Ultimately, this feature implies in higher turnover coefficients as the incentives of the treatment group remained the same in the alternative sample.

Finally, we also reproduce the analysis using alternative outcome measurements. Namely, on tables A4-A9 of the appendix A-2, we show the main results on the: (i) respective share of each outcome weighted by project value; (ii) on the average share of quarterly observations, instead of the single observation on the tenth quarter of the mandate; (iii) on the log of one plus the amount of concluded/paralyzed/new projects of each analyzed outcome, instead of its share. Although some results using the log specifications are not significant, all of them point in the right direction, and the results are robust to every other outcome specification.

6
Conclusion

This article exploits a novel data set on public construction work monitoring in Brazil to study political alternation impacts on infrastructure procurement. Using a close elections RD design and an adaptation of a probabilistic voting model, we show that party alternation in municipalities' executive power leads to worse delivery indicators of projects inherited from the previous administration. For instance, in comparison with municipalities where the incumbent party was able to be reelected, party turnover increased the share of paralyzed projects in 8.1 percentage points and reduced the share of concluded projects in 11.8 percentage points, when we compare the outcomes in the middle of the new term. We also find that those are temporary discrepancies. In an event-study analysis of separate elections, we face results suggesting a fading effect that gradually converges to zero as the coming elections approach. These results provide micro-level evidence of political alternation shortcomings on policy implementation and contribute to the understanding of an infrastructure puzzle in modern democracies, where a large share of projects start but are never completed.

The paper also contributes to a broader literature which associates inefficiencies in public investment to electoral incentives. Further results indicate that the turnover impact is more substantial for projects inherited in final stages, presenting statistically insignificant effects for projects inherited in a pre-construction stage, and opposite effects for projects started in the new mandate. We interpret these estimates as evidence of electoral motivations of project non-delivery. Through the lens of a simple model, we argue that advanced projects are delayed in newly elected administrations because they are associated with the previous incumbent – one potential challenger – who can claim credit over the provision of the public infrastructure. Therefore, to increase reelection chances, the newly elected party underinvests in inherited projects.

Overall, our findings are relevant for understanding the adverse effects of political alternation on state efficiency and how we can remedy it. If political change leads to worse infrastructure projects delivery indicators, and this happens through distorted incentives motivated by reelection prospects of local

mayors, mechanisms aiming to insulate the execution of those projects from local politics should be implemented. The discussion of which is the most effective design of promoting such insulation remains an important topic for future research.

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Tables and Figures

Table 1: Descriptive Statistics and Falsification tests

	(1)	(2)	(3)	(4)	(5)	(6)
					p-values	
	Turnover	Reelected	S.D.	Effect	Naive	FDR
Panel A: Politics						
# Observations	3,132	2,756				
Political Competition Index	0.15	0.16	0.09	-0.00	0.94	0.99
Second Term Incumbent	0.26	0.22	0.43	-0.05	0.08	0.34
PT	0.14	0.11	0.33	0.00	0.81	0.98
MDB	0.24	0.24	0.43	0.00	0.89	0.98
PSDB	0.14	0.16	0.36	-0.04	0.10	0.39
PSB	0.06	0.07	0.25	-0.01	0.66	0.92
PP	0.09	0.10	0.29	-0.02	0.40	0.73
PSD	0.05	0.04	0.20	0.00	0.93	0.99
DEM	0.05	0.05	0.23	0.01	0.36	0.69
Panel B: Inherited Projects Characteristics						
# Projects	3.72	4.36	5.51	0.01	0.98	0.99
# Projects on Construction Phase	1.84	2.05	2.53	0.24	0.12	0.39
New Signatures After Election	0.38	0.55	0.59	-0.13	0.00	0.02
Share Paralyzed	0.34	0.31	0.41	0.02	0.58	0.87
Share Audit	0.02	0.01	0.11	0.01	0.20	0.51
Financial Completion	0.32	0.33	0.22	-0.02	0.29	0.61
Physical Completion	40.70	40.26	22.74	0.77	0.67	0.92
Project Value	526030.22	456710.11	852826.07	135291.11	0.02	0.18
Counterpart Value	81821.84	72834.07	466869.47	11875.89	0.26	0.57
Share Infrastructure	0.73	0.74	0.30	0.01	0.71	0.93
Share Health	0.05	0.04	0.14	0.00	0.98	0.99
Share Education	0.19	0.19	0.27	0.00	0.88	0.98
Share Agriculture	0.03	0.03	0.11	-0.01	0.41	0.73
Panel C: Socio-demographics (2010 census)						
Population	44335.43	33513.78	218602.46	-790.03	0.84	0.98
Income p. Capita	523.62	512.01	251.42	-14.54	0.40	0.73
Urban	0.66	0.64	0.22	-0.02	0.15	0.45
Water	86.65	85.68	14.55	-0.46	0.62	0.89
Sewerage	8.35	8.25	12.21	0.30	0.69	0.93
Electricity	97.34	97.64	5.74	0.12	0.79	0.98
Literacy	18.67	19.98	12.61	1.86	0.05	0.24
HDI	0.67	0.66	0.07	-0.01	0.19	0.51
GINI	0.49	0.49	0.07	0.00	0.29	0.61

Notes: All municipalities with party reelection races in the 2012 and 2016 elections. Turnover municipalities are those where the winner is a runner-up. Reelection municipalities are those where the winner is a reelected mayor. The first two columns report the average values in the respective sub-samples; Column (3) presents the local linear estimator as in equation (4-3) using the optimal CCT bandwidth; p value refers to the significance of the local linear estimator around the cutoff using the CCT bandwidth. Panel A provides descriptive statistics on variables related to politics. Political competition index is the average margin of victory of the elected mayor over the second best candidate on the previous three elections. Second term incumbent is a dummy indicating whether the party running for reelection appoints a new mayor (0) or the current incumbent (1). PT, MDB, PSDB, PSB, PP, PSD, DEM, are a dummies indicating the party which is running for reelection. Panel B provides the descriptive statistics on the average characteristics of the pool of inherited projects. New signatures after election is the log of 1 plus the number of new projects signed in the two months between elections and term change. Panel C provides descriptive statistics and placebo checks on 2010 census socio-demographics characteristics. Urban, Water, Sewerage, Electricity, Literacy, stand for the share of municipalities' population which: lives in urban areas, have access to piped water, have access to sewerage, have access to electricity, is literate.

Table 2: Falsification tests on project's lagged characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
					p-values	
	Turnover	Reelected	S.D.	Effect	Naive	FDR
Panel A: One-year lagged pool of projects (both elections)						
# of Signed Projects p/ Muncipality	3.37	3.63	4.43	0.16	0.52	0.85
# of Projects on the Construction Phase	1.85	1.97	2.44	0.31	0.04	0.24
Share of Municipalities w/ Projects	0.82	0.84	0.38	0.00	0.85	0.98
Avg. Project Value	521330.70	431093.13	929145.95	126389.08	0.04	0.24
Avg. Project Age	2.17	2.03	1.11	0.16	0.03	0.21
Avg. Physical Completion	19.64	19.16	19.69	1.82	0.14	0.45
Avg. Financial Completion	13.30	13.01	16.57	2.39	0.02	0.18
Avg. Share of Stoppages	0.13	0.11	0.24	0.02	0.24	0.53
Avg. Share of Auditions	0.01	0.00	0.06	0.01	0.04	0.24
General Infrastructure	0.75	0.76	0.29	-0.00	0.85	0.98
Education	0.20	0.19	0.27	0.01	0.72	0.93
Health	0.02	0.02	0.09	-0.00	0.90	0.98
Agriculture	0.03	0.03	0.12	-0.01	0.24	0.53
Panel B: Pool of projects one quarter before elections (2016 only)						
# of Signed Projects p/ Muncipality	3.98	4.41	5.55	-0.06	0.88	0.98
# of Projects on the Construction Phase	1.92	2.04	2.67	0.29	0.23	0.53
Share of Municipalities w/ Projects	0.86	0.88	0.33	-0.04	0.21	0.51
Avg. Project Value	572477.97	525496.12	947874.68	167333.47	0.12	0.39
Avg. Project Age	2.57	2.39	1.52	0.00	1.00	1.00
Avg. Physical Completion	19.03	17.93	18.53	0.97	0.62	0.89
Avg. Financial Completion	17.28	16.88	16.31	0.06	0.97	0.99
Avg. Share of Stoppages	0.25	0.23	0.29	0.04	0.19	0.51
Avg. Share of Auditions	0.01	0.01	0.09	0.02	0.11	0.39
General Infrastructure	0.72	0.72	0.30	-0.03	0.39	0.73
Education	0.20	0.20	0.27	0.04	0.29	0.61
Health	0.04	0.03	0.13	0.01	0.58	0.87
Agriculture	0.04	0.05	0.14	-0.02	0.18	0.51
Panel C: Lagged outcomes (2016 running variable on 2012 outcomes)						
Share Concluded	0.41	0.44	0.37	-0.07	0.12	0.39
Share Paralyzed	0.13	0.12	0.24	-0.01	0.70	0.93
Share Concluded (Construction Phase)	0.53	0.54	0.42	-0.02	0.75	0.95
Share Paralyzed (Construction Phase)	0.15	0.15	0.30	0.02	0.50	0.83
Share Concluded (Pre-construction Phase)	0.28	0.33	0.39	-0.13	0.01	0.07
Share Paralyzed (Pre-construction Phase)	0.08	0.07	0.21	-0.02	0.41	0.73
Share of New Projects on All Projects	0.33	0.32	0.25	0.03	0.31	0.61
Share of Conclusions on New Projects	0.01	0.00	0.05	0.00	0.59	0.87

Notes: All municipalities with party reelection races in the 2012 and 2016 elections. Turnover municipalities are those where the winner is a runner-up. Reelection municipalities are those where the winner is a reelected mayor. The first two columns report the average values in the respective sub-samples; Column (3) presents the local linear estimator as in equation (4-3) using the optimal CCT bandwidth; p value refers to the significance of the local linear estimator around the cutoff using the CCT bandwidth. Panel A presents descriptive statistics and placebo tests on characteristics of municipalities' pool of projects one year before the beginning of the new term. Panel B presents these same variables on the quarter before elections for the 2016 races. Panel C provides placebo checks for the 2016 races using 2012 outcome variables. General Infrastructure, Education, Health and Agriculture, stand for the share of each category on the pool of projects.

Table 3: Effect of Having a Party Turnover on Municipality's Inherited Project Conclusion and Stoppage Shares

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of inherited projects concluded in the subsequent term					
Party Turnover	−0.041***	−0.038	−0.019	−0.032	−0.077
	(0.010)	(0.026)	(0.032)	(0.045)	(0.063)
	[-0.069;-0.01]	[-0.105;0.03]	[-0.106;0.066]	[-0.181;0.117]	[-0.29;0.135]
Mean Dep. Var. (T=0)	0.427	0.447	0.443	0.44	0.437
Bandwidth	–	0.153	0.10	0.05	0.025
Observations	5,164	2,963	2,122	1,155	580
Panel B: Share of inherited projects paralyzed in the subsequent term					
Party Turnover	0.013*	0.035*	0.034	0.028	0.029
	(0.008)	(0.020)	(0.024)	(0.032)	(0.046)
	[0.002;0.045]	[-0.018;0.088]	[-0.031;0.097]	[-0.079;0.136]	[-0.125;0.182]
Mean Dep. Var. (T=0)	0.189	0.184	0.183	0.177	0.184
Bandwidth	–	0.135	0.10	0.05	0.025
Observations	5,164	2,687	2,122	1,155	580

Notes. This table analyzes the effect of having a party turnover on two measures of project delivery in a municipality : (i) conclusion and (ii) stoppages. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables are the share of concluded/paralyzed projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Panel A (B) dependent variable is the number of concluded (paralyzed) projects over the total number of inherited contracts. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (4-1). Columns (2) to (5) present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 4: Effect of Having a Party Turnover on Municipality's Inherited Project Conclusion Shares

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of projects inherited in the pre-construction phase concluded in the subsequent term					
Party Turnover	-0.043^{***}	-0.001	0.015	0.043	0.026
	(0.012)	(0.031)	(0.038)	(0.055)	(0.077)
	[-0.064;0.005]	[-0.082;0.08]	[-0.089;0.12]	[-0.139;0.226]	[-0.233;0.285]
Mean Dep. Var. (T=0)	0.32	0.333	0.329	0.318	0.329
Bandwidth	–	0.158	0.10	0.05	0.025
Observations	4,099	2,341	1,636	882	443
Panel B: Share of projects inherited in the construction phase concluded in the subsequent term					
Party Turnover	-0.070^{***}	-0.118^{***}	-0.107^{***}	-0.117^{**}	-0.164^{**}
	(0.013)	(0.033)	(0.039)	(0.055)	(0.078)
	[-0.118;-0.045]	[-0.203;-0.033]	[-0.215;-0.001]	[-0.3;0.067]	[-0.427;0.099]
Mean Dep. Var. (T=0)	0.551	0.57	0.569	0.578	0.56
Bandwidth	–	0.149	0.10	0.05	0.025
Observations	4,070	2,311	1,698	922	468

Notes. This table analyzes the effect of having a party turnover over conclusion measures of infrastructure projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables is the share of concluded projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Panel A (B) dependent variable is the number of concluded projects on the total number of contracts inherited on the pre-construction (construction) phase. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (4-1). Columns (2) to (5) present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 5: Effect of Having a Party Turnover on Municipality's Inherited Project Stoppage Shares

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of projects inherited in the pre-construction phase paralyzed in the subsequent term					
Party Turnover	−0.027***	−0.026	−0.032	−0.018	−0.056
	(0.009)	(0.025)	(0.028)	(0.039)	(0.054)
	[-0.043;0.007]	[-0.092;0.039]	[-0.108;0.043]	[-0.148;0.112]	[-0.239;0.127]
Mean Dep. Var. (T=0)	0.173	0.166	0.167	0.167	0.176
Bandwidth	–	0.119	0.10	0.05	0.025
Observations	4,099	1,883	1,636	882	443
Panel B: Share of projects inherited in the construction phase paralyzed in the subsequent term					
Party Turnover	0.045***	0.081***	0.086***	0.064	0.129**
	(0.011)	(0.026)	(0.032)	(0.044)	(0.062)
	[0.024;0.083]	[0.012;0.149]	[-0.002;0.173]	[-0.084;0.211]	[-0.081;0.338]
Mean Dep. Var. (T=0)	0.209	0.203	0.2	0.192	0.21
Bandwidth	–	0.151	0.10	0.05	0.025
Observations	4,070	2,334	1,698	922	468

Notes. This table analyzes the effect of having a party turnover over stoppage measures of infrastructure projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables is the share of paralyzed projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Panel A (B) dependent variable is the number of paralyzed projects on the total number of contracts inherited on the pre-construction (construction) phase. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (4-1). Columns (2) to (5) present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 6: Effect of Having a Party Turnover on Municipality's New Projects Shares

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of total projects which were signed in the subsequent mandate					
Party Turnover	0.055***	0.008	0.013	0.079***	0.092**
	(0.007)	(0.019)	(0.022)	(0.030)	(0.043)
	[0.016;0.056]	[-0.042;0.058]	[-0.047;0.071]	[-0.02;0.179]	[-0.05;0.235]
Mean Dep. Var. (T=0)	0.349	0.358	0.358	0.366	0.336
Bandwidth	–	0.128	0.10	0.05	0.025
Observations	5,874	2,977	2,450	1,332	669
Panel B: Share of projects signed in the subsequent mandate which are concluded					
Party Turnover	−0.003	0.001	−0.001	0.016	0.029
	(0.004)	(0.009)	(0.012)	(0.016)	(0.020)
	[-0.015;0.006]	[-0.023;0.026]	[-0.033;0.031]	[-0.036;0.069]	[-0.037;0.095]
Mean Dep. Var. (T=0)	0.028	0.031	0.03	0.035	0.025
Bandwidth	–	0.158	0.10	0.05	0.025
Observations	4,940	2,878	2,016	1,091	546

Notes. This table analyzes the effect of having a party turnover on two measures of project delivery in a municipality : (i) new signatures and (ii) conclusion of new projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. The dependent variables are the share of new/concluded projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Panel A (B) dependent variable is the number of new projects (concluded projects) on the total number of administered contracts (new projects). Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (4-1). Columns (2) to (5) present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 7: Effect of Having a Party Turnover on Municipality's Inherited Project Conclusion and Stoppage Shares - Inherited Project Stage Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
		Below Median			Above Median	
	CCT	10 p.p.	5 p.p.	CCT	10 p.p.	5 p.p.
Panel A: Share of projects inherited in the construction phase concluded in the subsequent term						
Party Turnover	−0.093**	−0.056	−0.063	−0.159***	−0.162***	−0.178**
	(0.043)	(0.054)	(0.079)	(0.044)	(0.052)	(0.071)
	[-0.206;0.019]	[-0.202;0.091]	[-0.326;0.2]	[-0.273;-0.046]	[-0.303;-0.02]	[-0.415;0.058]
Mean Dep. Var. (T=0)	0.438	0.444	0.418	0.692	0.695	0.725
Bandwidth	0.168	0.10	0.05	0.141	0.10	0.05
Observations	1,217	829	430	1,142	868	492
Panel B: Share of projects inherited in the construction phase paralyzed in the subsequent term						
Party Turnover	0.074*	0.059	0.082	0.094***	0.126***	0.064
	(0.039)	(0.050)	(0.071)	(0.031)	(0.040)	(0.054)
	[-0.028;0.176]	[-0.077;0.195]	[-0.153;0.317]	[0.012;0.176]	[0.019;0.234]	[-0.114;0.243]
Mean Dep. Var. (T=0)	0.262	0.26	0.284	0.155	0.139	0.107
Bandwidth	0.17	0.10	0.05	0.167	0.10	0.05
Observations	1,233	829	430	1,284	868	492

Notes. This table analyzes the inherited-stage heterogeneous effect of having a party turnover on two measures of project delivery in a municipality : (i) conclusion and (ii) stoppages. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables is the share of concluded/paralyzed projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Panel A (B) dependent variable is the number of concluded (paralyzed) projects on the total number of contracts inherited on the construction phase. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Columns (1) to (3) presents the results for the sub-sample of municipalities with the index on equation (4-4) below the median sample index. Columns (4) to (6) exhibits the estimates for the sub-sample of municipalities with an index above this median. All columns present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (columns 1 and 4), considering observations with margin of victory in the intervals [-0.1;+0.1] (columns 2 and 5), [-0.05;+0.05] (columns 3 and 6). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 8: Effect of Having a Party Turnover on Municipality's New Projects Shares - Inherited Project Stage Heterogeneity

	(1)	(2)	(3)	(4)	(5)	(6)
		Below Median			Above Median	
	CCT	10 p.p.	5 p.p.	CCT	10 p.p.	5 p.p.
Panel A: Share of total projects which were signed in the subsequent mandate						
Party Turnover	0.005	−0.011	0.016	0.027	0.023	0.075**
	(0.024)	(0.028)	(0.040)	(0.020)	(0.026)	(0.037)
	[-0.057;0.067]	[-0.087;0.064]	[-0.118;0.151]	[-0.025;0.079]	[-0.049;0.095]	[-0.046;0.197]
Mean Dep. Var. (T=0)	0.28	0.278	0.282	0.294	0.293	0.308
Bandwidth	0.144	0.10	0.05	0.176	0.10	0.05
Observations	1,099	829	430	1,330	868	492
Panel B: Share of projects signed in the subsequent mandate which are concluded						
Party Turnover	−0.007	0.001	−0.001	0.027*	0.010	0.031
	(0.011)	(0.012)	(0.013)	(0.015)	(0.016)	(0.022)
	[-0.036;0.022]	[-0.03;0.033]	[-0.044;0.041]	[-0.012;0.067]	[-0.034;0.054]	[-0.042;0.104]
Mean Dep. Var. (T=0)	0.026	0.026	0.024	0.025	0.016	0.024
Bandwidth	0.167	0.10	0.05	0.132	0.10	0.05
Observations	983	662	337	907	735	416

Notes. This table analyzes the inherited-stage heterogeneous effect of having a party turnover on two measures of project delivery in a municipality : (i) new signatures and (ii) conclusion of new projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. The dependent variables is the share of new/concluded projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Panel A (B) dependent variable is the number of new projects (concluded projects) on the total number of administered contracts (new projects). Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Columns (1) to (3) presents the results for the sub-sample of municipalities with the index on equation (4-4) below the median sample index. Columns (4) to (6) exhibits the estimates for the sub-sample of municipalities with an index above this median. All columns present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (columns 1 and 4), considering observations with margin of victory in the intervals [-0.1;+0.1] (columns 2 and 5), [-0.05;+0.05] (columns 3 and 6). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 9: Effect of Having a Party Turnover on Municipality's Inherited Project Conclusion Shares - New Mayors Sub-sample

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of projects inherited in the pre-construction phase concluded in the subsequent term					
Party Turnover	−0.031	0.026	−0.051	0.060	0.055
	(0.026)	(0.059)	(0.080)	(0.112)	(0.157)
	[-0.091;0.058]	[-0.129;0.18]	[-0.273;0.17]	[-0.328;0.448]	[-0.513;0.623]
Mean Dep. Var. (T=0)	0.325	0.344	0.332	0.342	0.358
Bandwidth	–	0.195	0.10	0.05	0.025
Observations	925	611	370	207	107
Panel B: Share of projects inherited in the construction phase concluded in the subsequent term					
Party Turnover	−0.055**	−0.168**	−0.143*	−0.070	−0.066
	(0.027)	(0.068)	(0.080)	(0.111)	(0.156)
	[-0.175;-0.022]	[-0.348;0.012]	[-0.372;0.074]	[-0.453;0.313]	[-0.634;0.501]
Mean Dep. Var. (T=0)	0.581	0.613	0.62	0.64	0.607
Bandwidth	–	0.137	0.10	0.05	0.025
Observations	924	504	387	210	109

Notes. This table analyzes the effect of having a party turnover over conclusion measures of infrastructure projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables is the share of concluded projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016, and the incumbent mayor was in his second mandate. Panel A (B) dependent variable is the number of concluded projects on the total number of contracts inherited on the pre-construction (construction) phase. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (4-1). Columns (2) to (5) present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 10: Effect of Having a Party Turnover on Municipality's Inherited Project Stoppage Shares - New Mayors Sub-sample

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of projects inherited in the pre-construction phase paralyzed in the subsequent term					
Party Turnover	−0.034*	−0.006	0.008	−0.064	−0.053
	(0.018)	(0.045)	(0.051)	(0.073)	(0.099)
	[-0.069;0.034]	[-0.126;0.114]	[-0.134;0.15]	[-0.318;0.19]	[-0.408;0.303]
Mean Dep. Var. (T=0)	0.159	0.134	0.136	0.122	0.129
Bandwidth	–	0.13	0.10	0.05	0.025
Observations	925	455	370	207	107
Panel B: Share of projects inherited in the construction phase paralyzed in the subsequent term					
Party Turnover	0.059***	0.237***	0.212***	0.119	0.069
	(0.021)	(0.057)	(0.061)	(0.080)	(0.092)
	[0.059;0.171]	[0.086;0.388]	[0.04;0.377]	[-0.157;0.395]	[-0.263;0.402]
Mean Dep. Var. (T=0)	0.162	0.131	0.121	0.109	0.102
Bandwidth	–	0.111	0.10	0.05	0.025
Observations	924	419	387	210	109

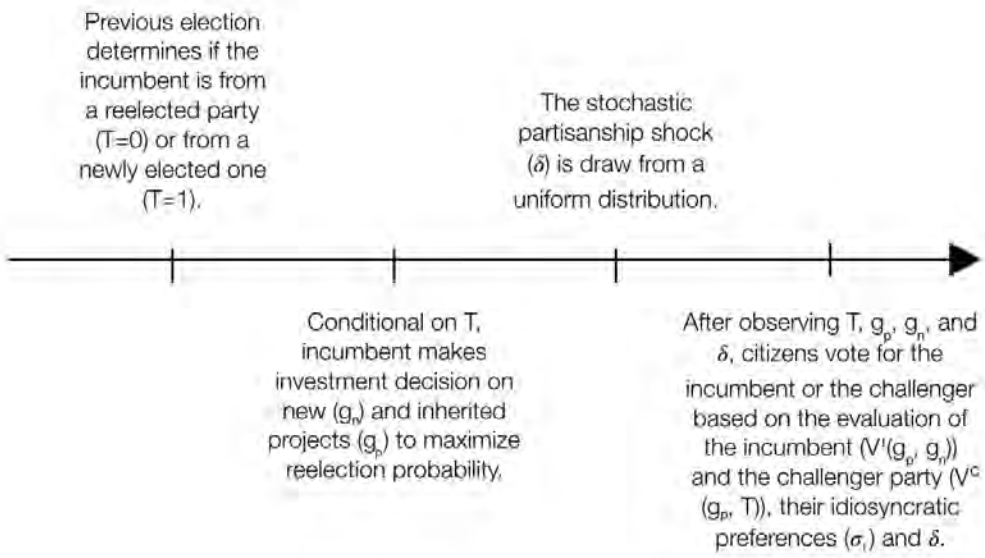
Notes. This table analyzes the effect of having a party turnover over stoppage measures of infrastructure projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables is the share of paralyzed projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016, and the incumbent mayor was in his second mandate. Panel A (B) dependent variable is the number of paralyzed projects on the total number of contracts inherited on the pre-construction (construction) phase. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (4-1). Columns (2) to (5) present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Table 11: Effect of Having a Party Turnover on Municipality's New Projects Shares - New Mayors Sub-sample

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of total projects which were signed in the subsequent mandate					
Party Turnover	0.054***	0.022	0.041	0.070	0.113
	(0.015)	(0.037)	(0.043)	(0.058)	(0.076)
	[-0.003;0.08]	[-0.074;0.119]	[-0.082;0.155]	[-0.129;0.268]	[-0.153;0.379]
Mean Dep. Var. (T=0)	0.359	0.358	0.373	0.371	0.342
Bandwidth	–	0.134	0.10	0.05	0.025
Observations	1,393	740	588	324	163
Panel B: Share of projects signed in the subsequent mandate which are concluded					
Party Turnover	0.002	0.007	−0.001	0.004	0.033
	(0.007)	(0.022)	(0.023)	(0.033)	(0.041)
	[-0.022;0.017]	[-0.051;0.064]	[-0.064;0.062]	[-0.11;0.118]	[-0.11;0.177]
Mean Dep. Var. (T=0)	0.029	0.028	0.023	0.035	0.033
Bandwidth	–	0.124	0.10	0.05	0.025
Observations	1,186	582	497	272	138

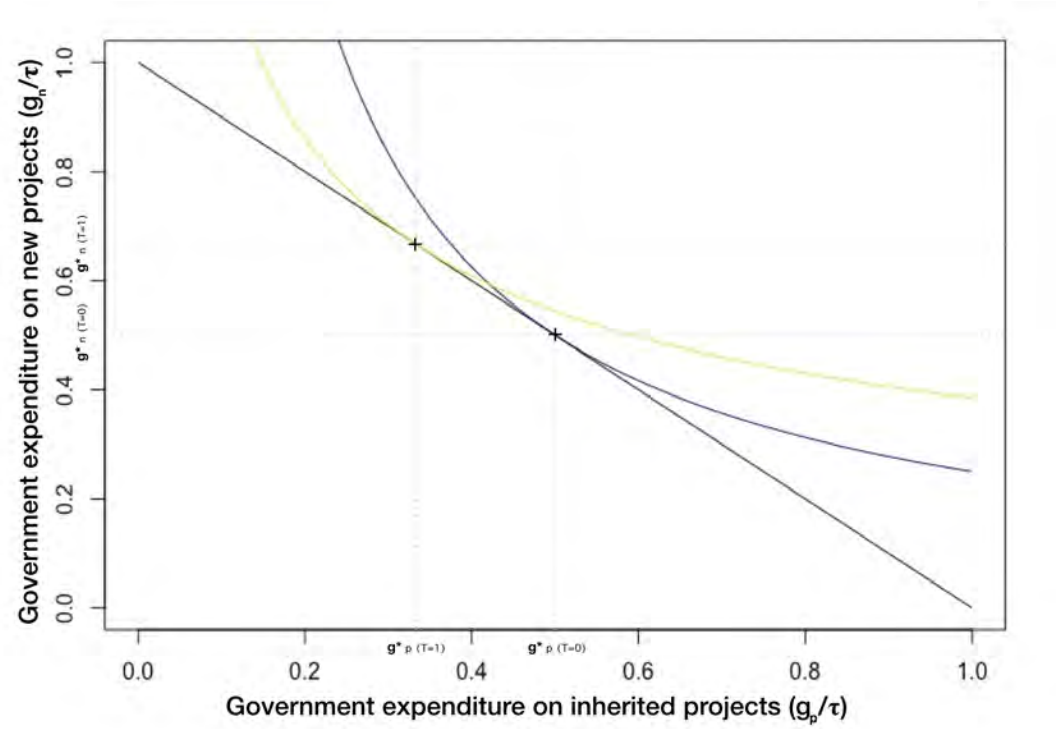
Notes. This table analyzes the effect of having a party turnover on two measures of project delivery in a municipality : (i) new signatures and (ii) conclusion of new projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables are the share of new/concluded projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016, and the incumbent mayor was in his second mandate. Panel A (B) dependent variable is the number of new projects (concluded projects) on the total number of administered contracts (new projects). Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (4-1). Columns (2) to (5) present local linear regression estimates, based on equation (4-3) and considering alternative bandwidths: optimal bandwidth calculated following Calonico et al. (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). FCR-Adjusted BH-selected confidence intervals (Benjamini and Yekutieli (2005)) controlling for a FDR of 10 p.p. in brackets. Robust standard errors in parenthesis.

Figure 1: Timing of the game



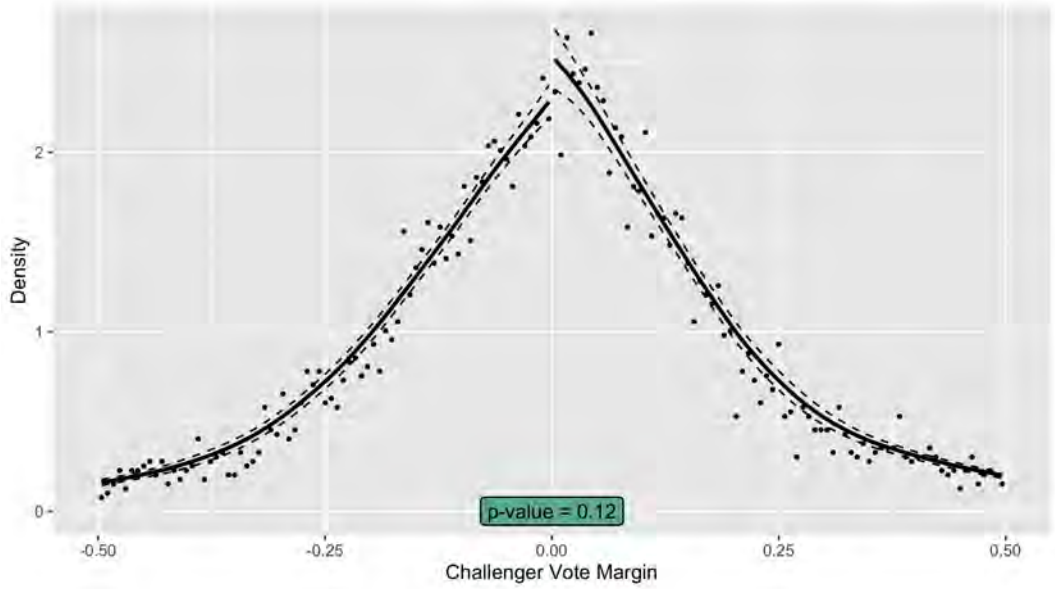
Notes. This figure presents the timing of the game. On the beginning of the period, a previous election determines if the incumbent is from a newly elected or reelected party. Then, during the mandate, the incumbent decides the allocation of government investment which maximizes his probability of reelection, taking into consideration his type (reelected or newly elected) and the expected electoral outcomes. In the end of the period, the uncertainty regarding the stochastic partisanship shock ends and voters decide between incumbents and challenger, taking into consideration the evaluation of their past performances through the delivery of public goods, their idiosyncratic preferences, and the stochastic partisanship shock itself, as in equation (3-4).

Figure 2: Mayors optimal decision - Reelected (blue) vs. Turnover (yellow) - $\pi(\rho)\gamma = 0.5$



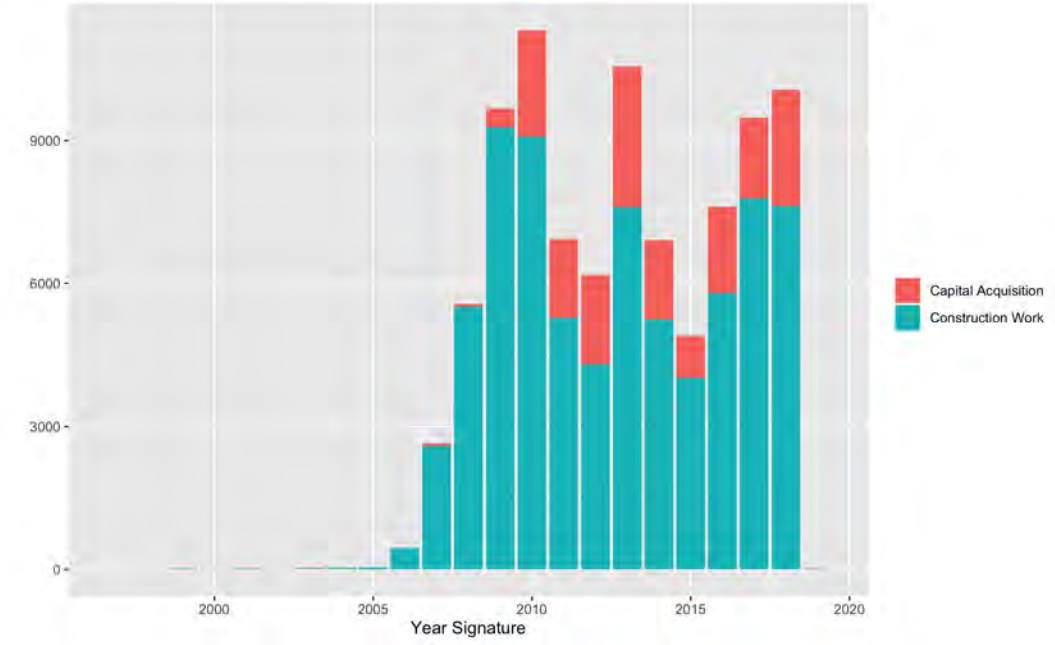
Notes. This figure is a graphical representation of incumbent's optimal investment decision under a reelected (blue) vs. newly elected (yellow) administration. The x-axis presents the share of the total budget directed to investment in projects inherited from the previous administration (g_p/τ). The y-axis exhibits the the share of the total budget directed to investment in new projects (g_n/τ). For the graphical representation we assume that $\pi(\rho)\gamma = 0.5$.

Figure 3: McCrary Test



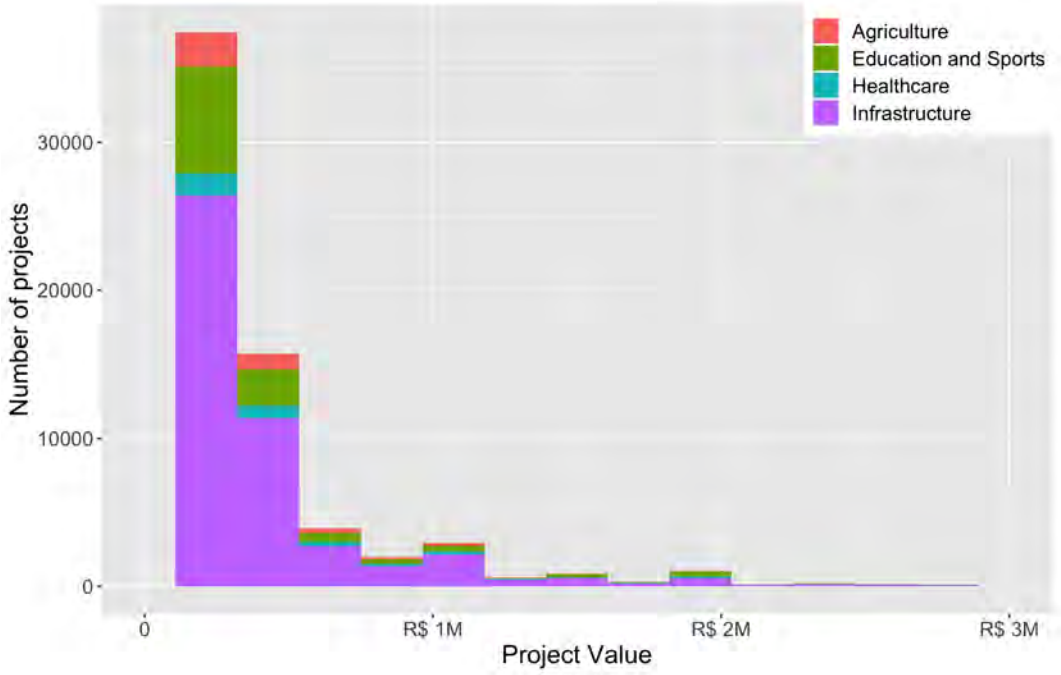
Notes: This figure shows the McCrary Test for manipulation of the running variable in the RDD, MV_{me}. The test fails to reject the null hypothesis that MV_{me} is continuous at the zero threshold. The estimated discontinuity is 0.097 (log difference in height) with a standard error of 0.063, which implies that it is not statistically different than 0 under a 10% significance level.

Figure 4: Signature Year by Type of Project



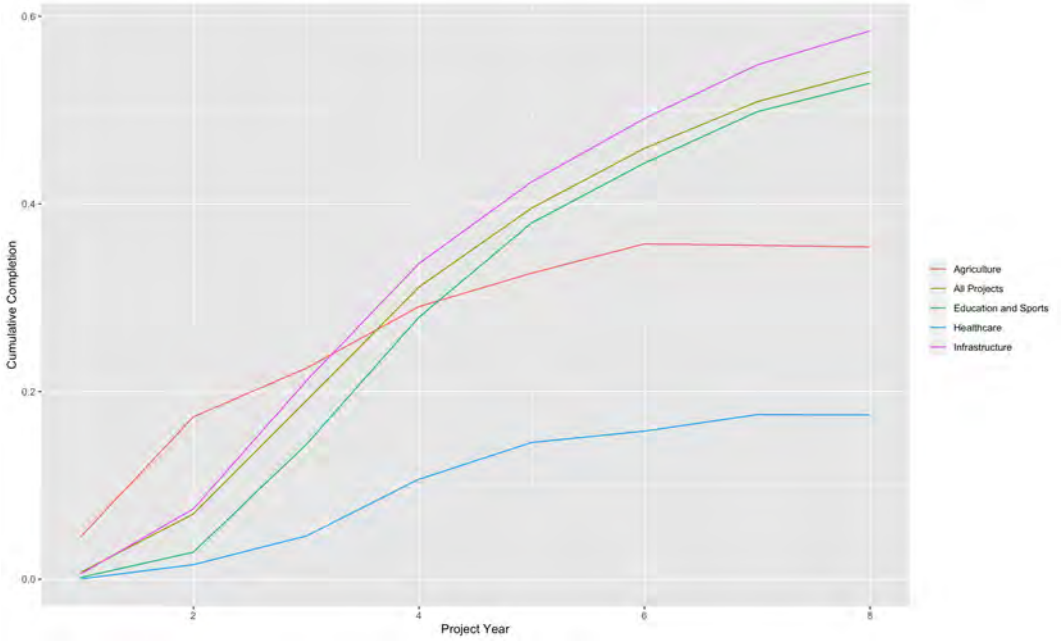
Notes: This figure presents our universe of contracts by the year of project signature and type of project, infrastructure work or capital acquisition. The bars accounts for the number of projects signed in a given year. The blue area represents the share of projects which involves an infrastructure work, while the red stands for the share of contracts directed to capital goods acquisition.

Figure 5: Project Value by Project Area



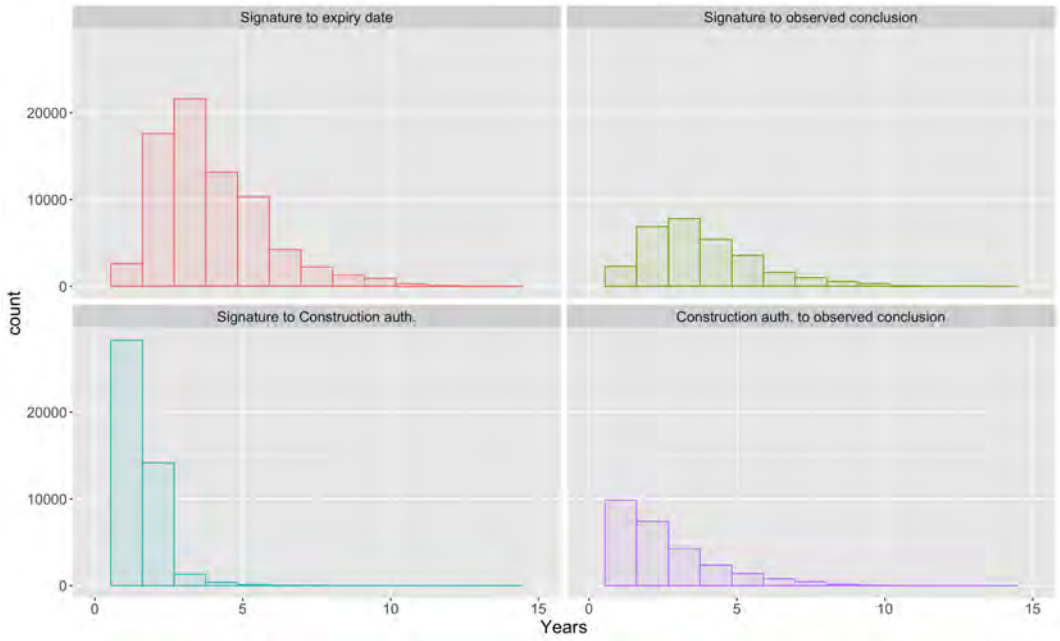
Notes: This figure presents the distribution of infrastructure projects' values and the areas where resources were employed. The bars represent the number of projects in a given range of project value, and the colors stands for the share invested in each area.

Figure 6: Cumulative Project Completion



Notes: This figure presents the cumulative distribution of completed infrastructure projects years after project signature. Each point on the graph represents the share of projects which were completed x years after its signature. Each line plots the share of a different project area. The dark-green line presents this share for the whole sample.

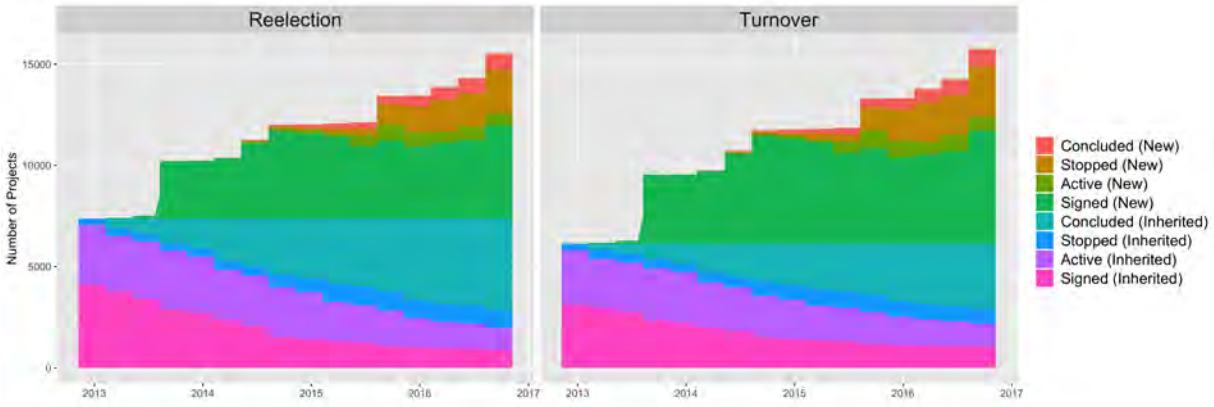
Figure 7: Project Duration Distribution



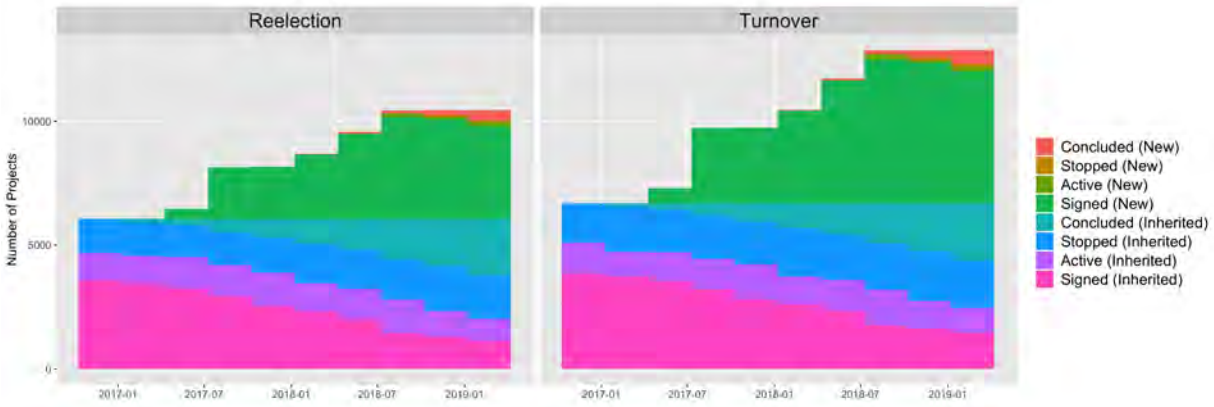
Notes: This figure presents the duration distribution of four different stages of project procurement. The upper panel presents the whole contract duration on the left-hand side, and the time taken to complete the infrastructure work after its signature on the right-hand side. The lower panel presents the duration of the pre-construction stage on the left-hand side, and the duration of the construction stage on the right-hand side.

Figure 8: Project Composition Evolution

2012 electoral term

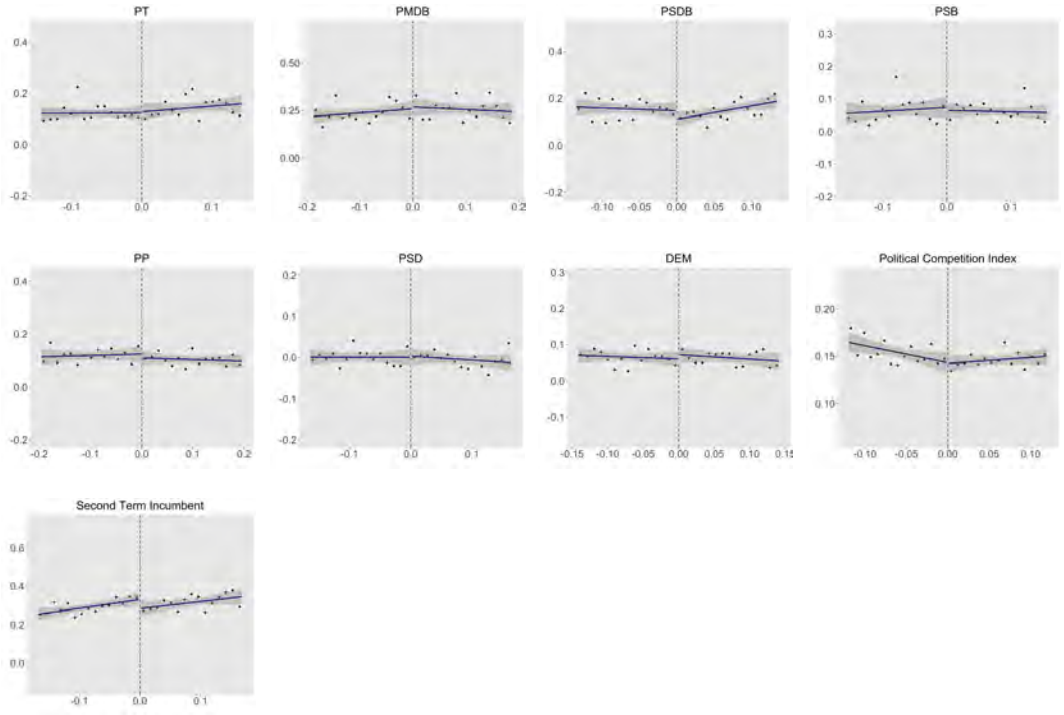


2016 electoral term



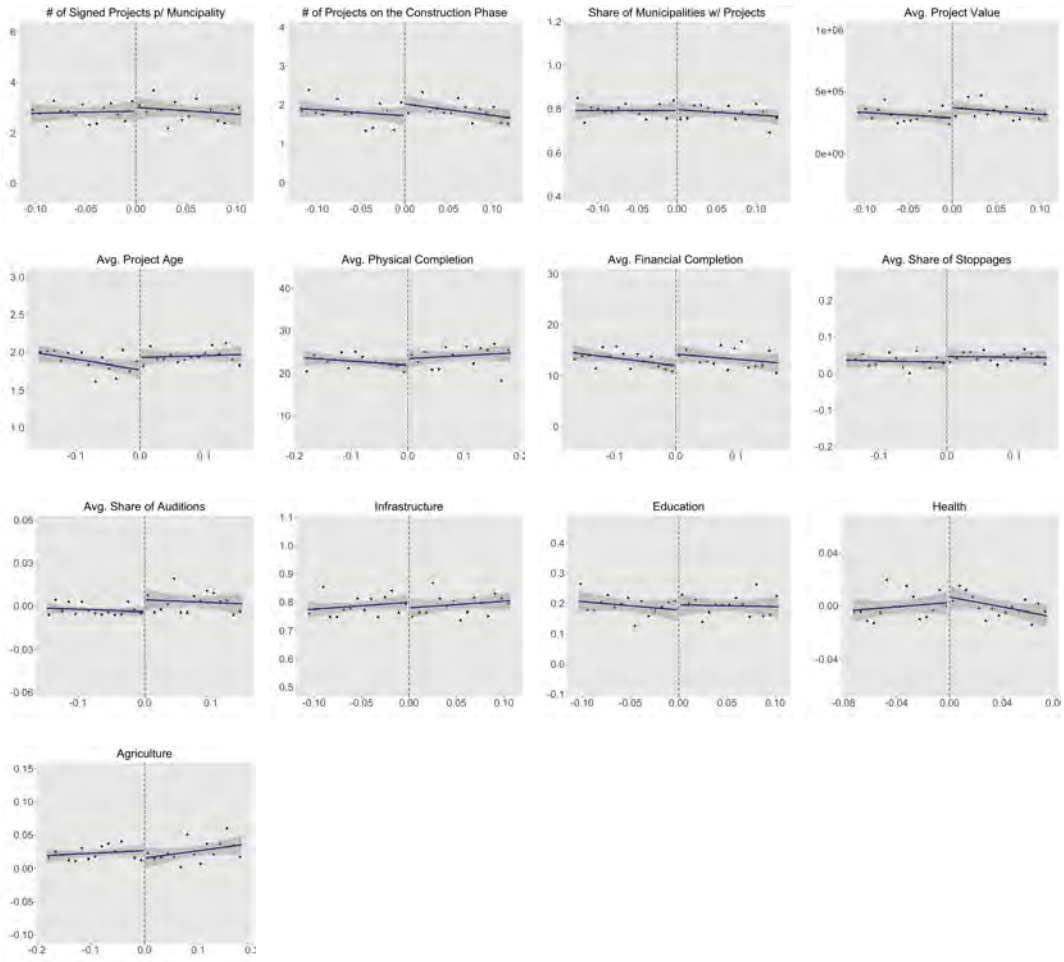
Notes: These figures plot the composition of the pool of administered projects in municipalities with party turnover vs. municipalities with party reelection. Each color represents a project condition as described in the legend. The upper panel exhibits this characteristics of administered projects for the term elected in 2012 and the lower panel for the 2016 elected mandate.

Figure 9: Placebo Tests on Political Characteristics



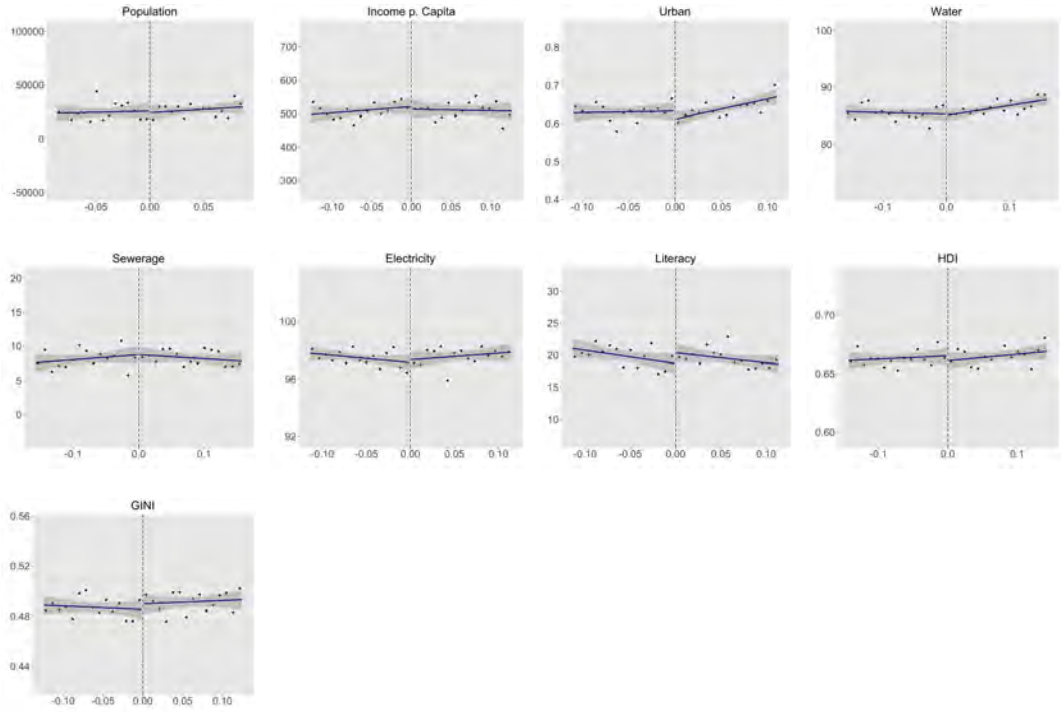
Notes: These figures plot the results of RD regressions of previous incumbent parties' indicators on the margin of victory of the challenger (the running variable). Each dependent variable (y axis) is a dummy indicating if the previous mayor was from the respective party. In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 10: Placebo Tests on Project Characteristics



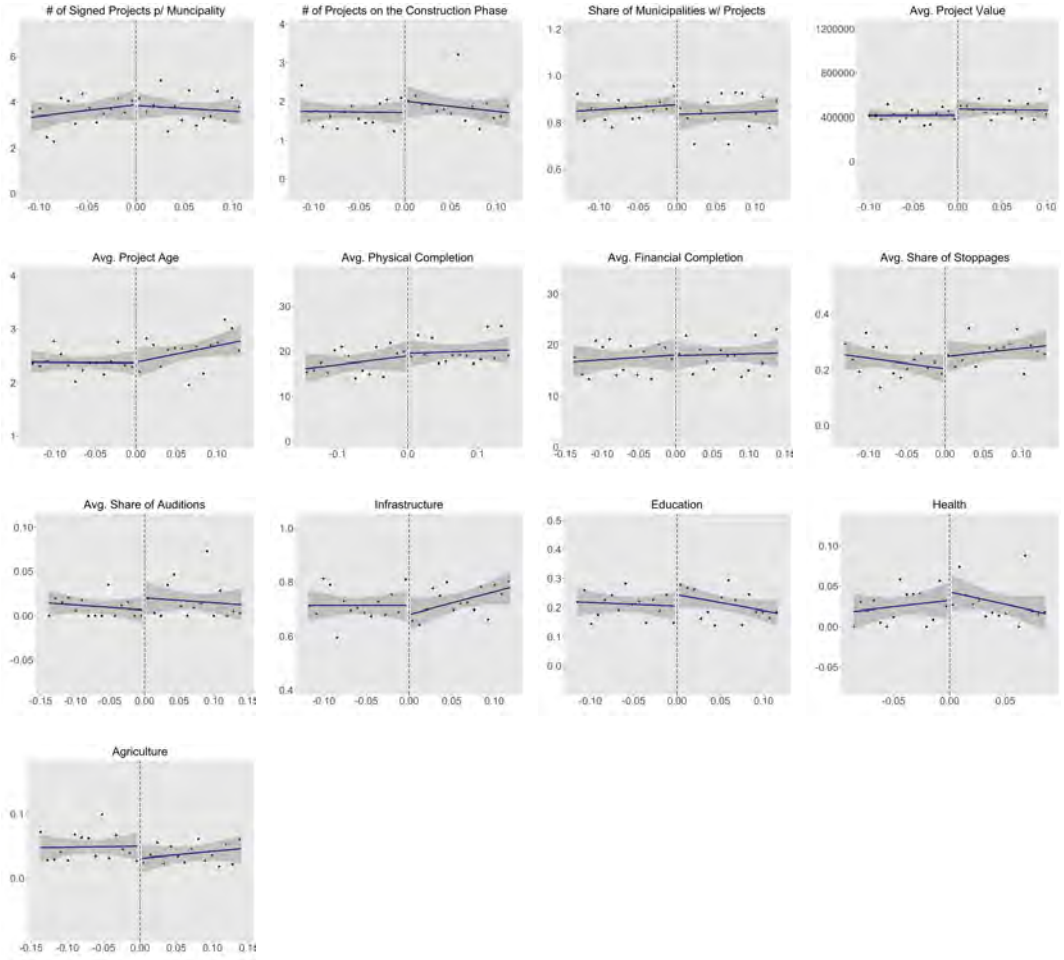
Notes: These figures plot the results of RD regressions of various lagged project characteristics on the margin of victory of the challenger (the running variable). The dependent variables are the ones described on the notes of Table 2 and they are computed on the beginning of the electoral year due to data limitations. Refer to Figure 12 for a placebo check on variables right before elections for 2016. In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 11: Placebo Tests on Socio-demographic Characteristics



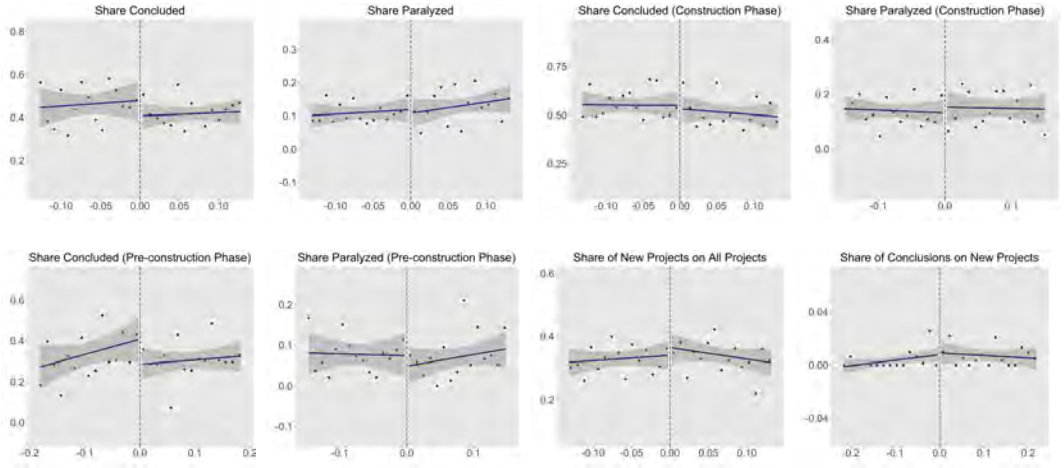
Notes: These figures plot the results of RD regressions of various socio-demographic characteristics on the margin of victory of the challenger (the running variable). The dependent variables are the ones described on the notes of Table 1, Panel C. In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 12: Placebo Tests on Project Characteristics (2016 only)



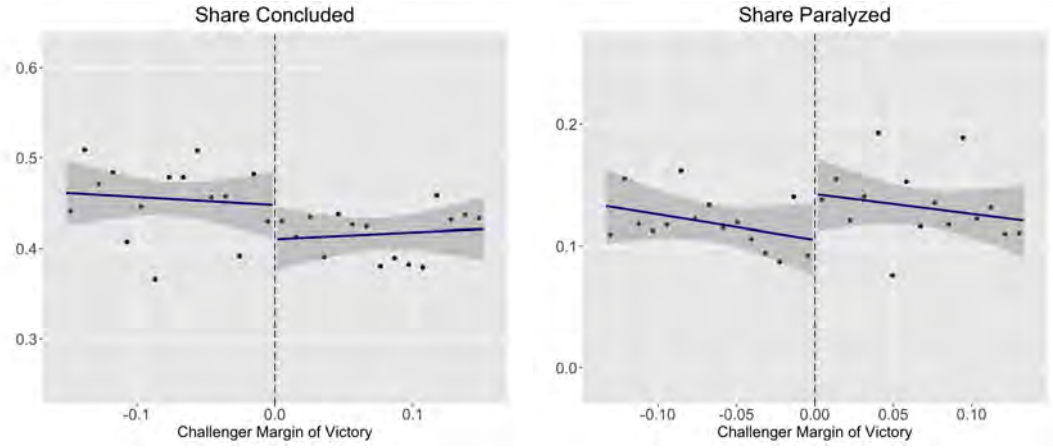
Notes: These figures plot the results of RD regressions of various lagged project characteristics on the margin of victory of the challenger (the running variable). The dependent variables are the ones described on the notes of Table 2 and is computed using the last quarter before 2016 elections (3rd quarter of 2016). In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 13: Placebo Tests - 2016 Elections on 2012 Outcomes



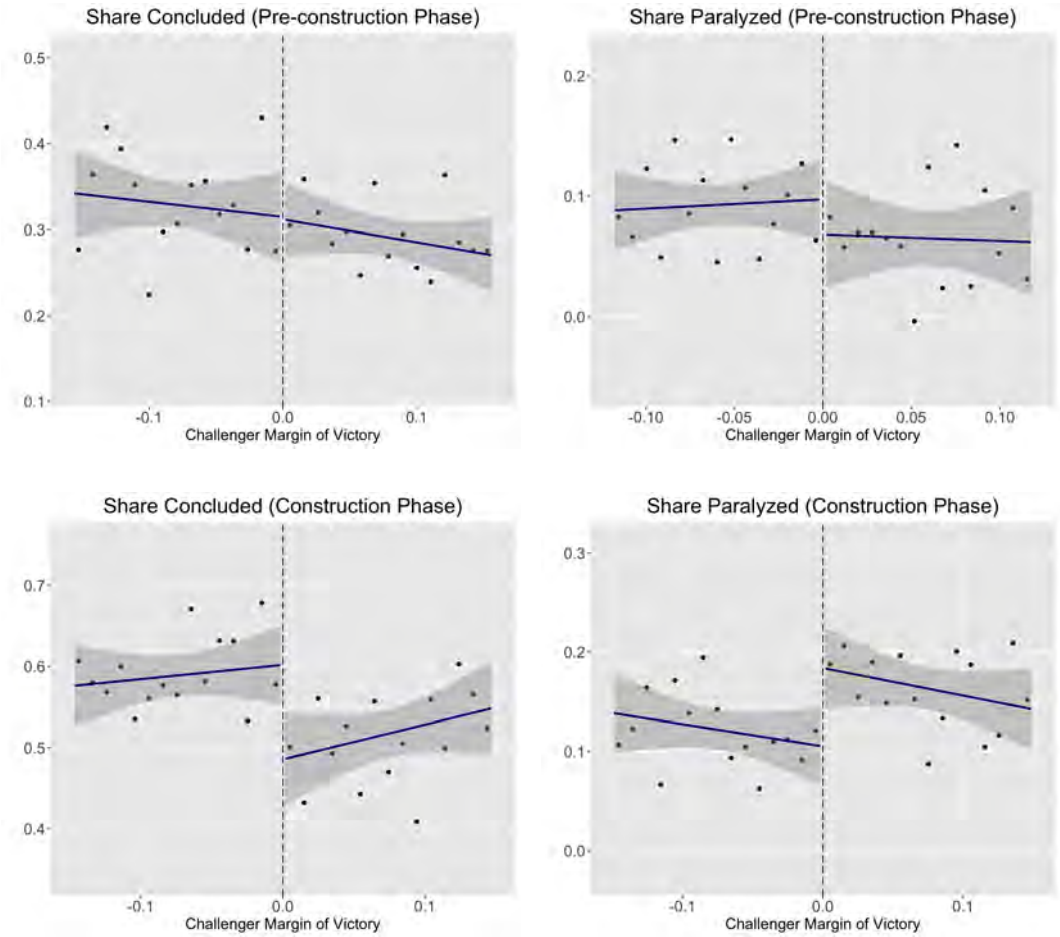
Notes: These figures plot the results of RD regressions of various lagged project characteristics on the margin of victory of the challenger (the running variable). The dependent variables are the ones described on the notes of Table 2. In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 14: Discontinuities on Inherited Projects



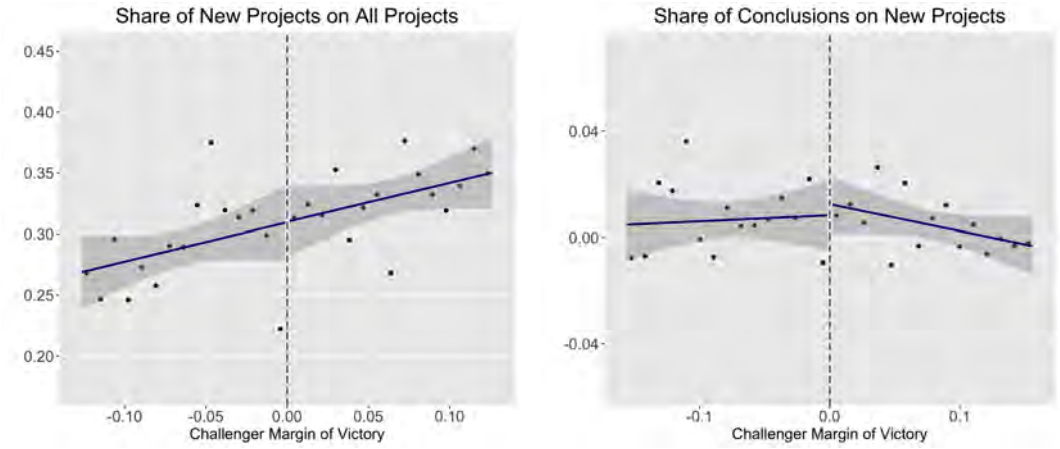
Notes. These figures plot the results of RD regressions of the share of inherited projects which are concluded/paralyzed on the margin of victory of the challenger (the running variable). In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 15: Discontinuities on Inherited Projects - Construction vs. Pre-construction



Notes. These figures plot the results of RD regressions of the share of inherited projects which are concluded/paralyzed on the margin of victory of the challenger (the running variable). The upper panel only considers projects inherited on a pre-construction phase, while the lower panel analyzes projects inherited on the construction phase. In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

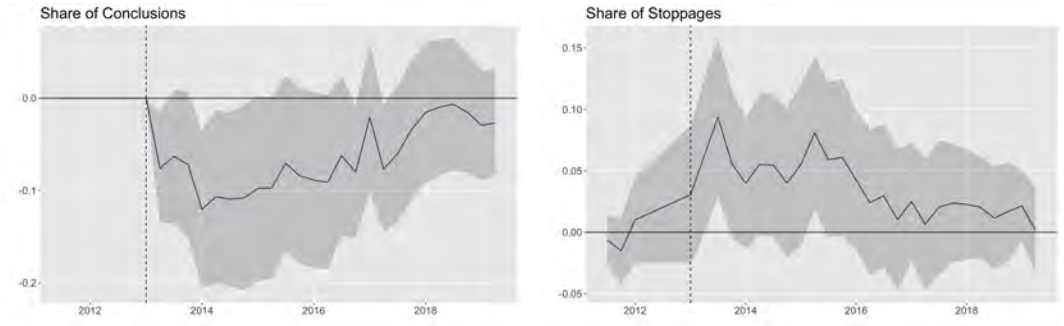
Figure 16: Discontinuities on New Projects



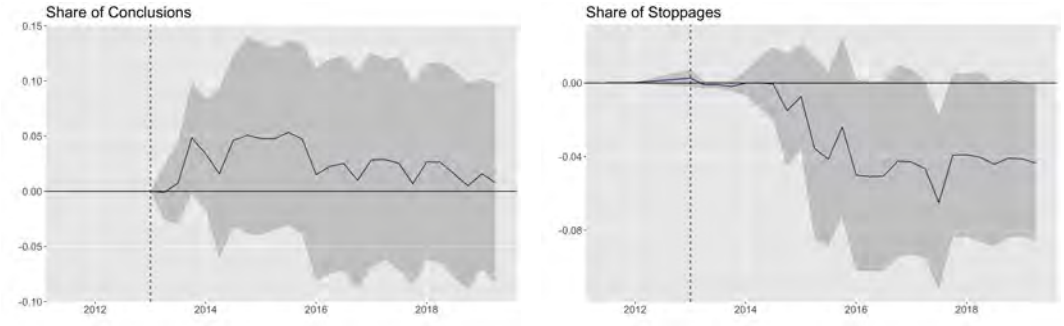
Notes. These figures plot the results of RD regressions of the share of all (new) projects which are new (concluded) on the margin of victory of the challenger (the running variable). In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 17: 2012 Elections Turnover Impact Dynamics

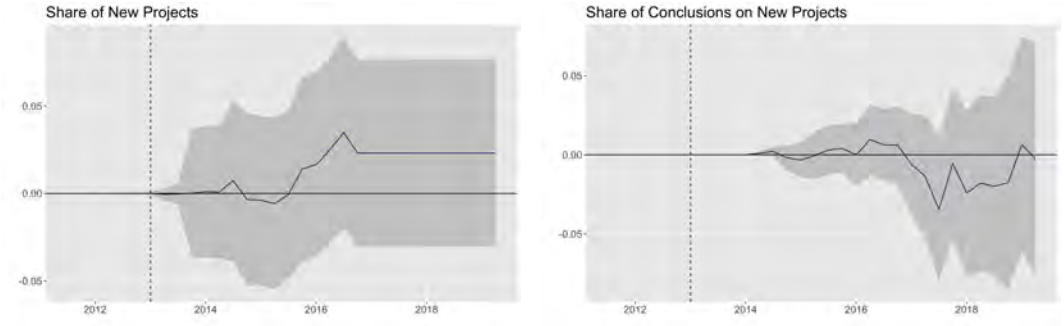
Projects Inherited in a Construction Stage



Projects Inherited in a Pre-construction Stage



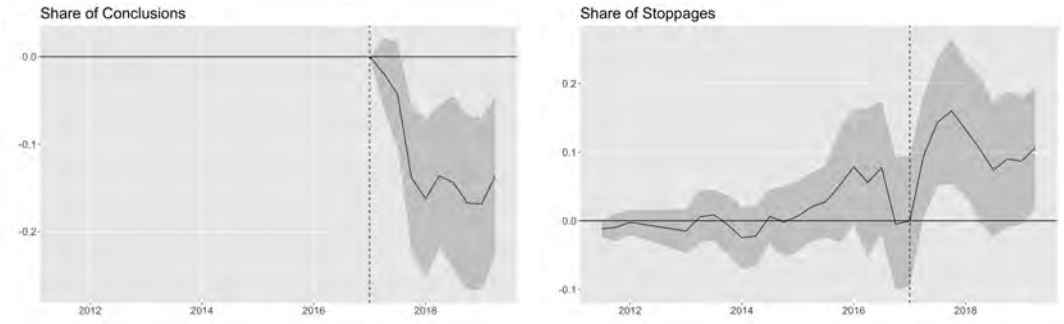
Projects Signed in the New Mandate



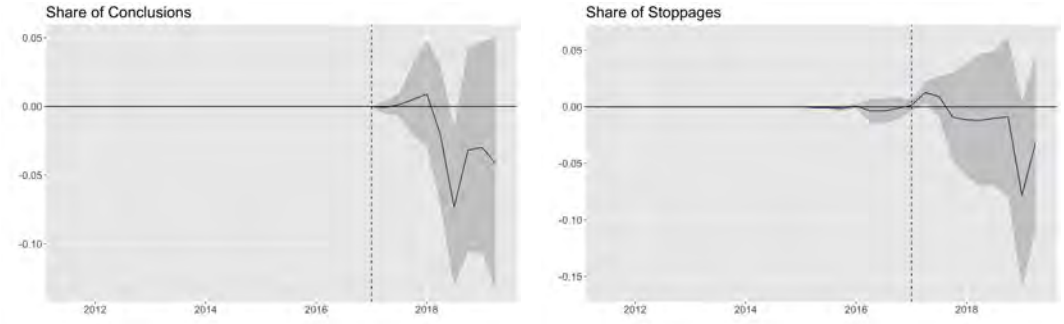
Notes. These figures plot the CCT local-linear estimates of the turnover impact (equation 15) on six measures of project delivery of the mandate elected in 2012. On the first panel we exhibit: (i) the share of conclusions on projects inherited in a construction stage; (ii) the share of stoppages on projects inherited in a construction stage. On the second panel: (iii) the share of conclusions on projects inherited in a pre-construction stage; (iv) the share of stoppages on projects inherited in a pre-construction stage. On the third panel: (v) the share of signatures signed in the current mandate on all managed projects; (vi) the share of conclusions on projects signed in the new mandate. The black line corresponds to the point estimate of the coefficient and the shadows correspond to the confidence interval.

Figure 18: 2016 Elections Turnover Impact Dynamics

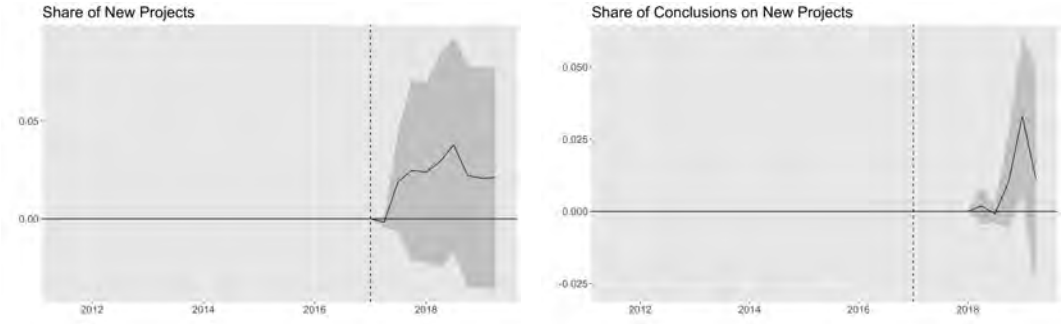
Projects Inherited in a Construction Stage



Projects Inherited in a Pre-construction Stage



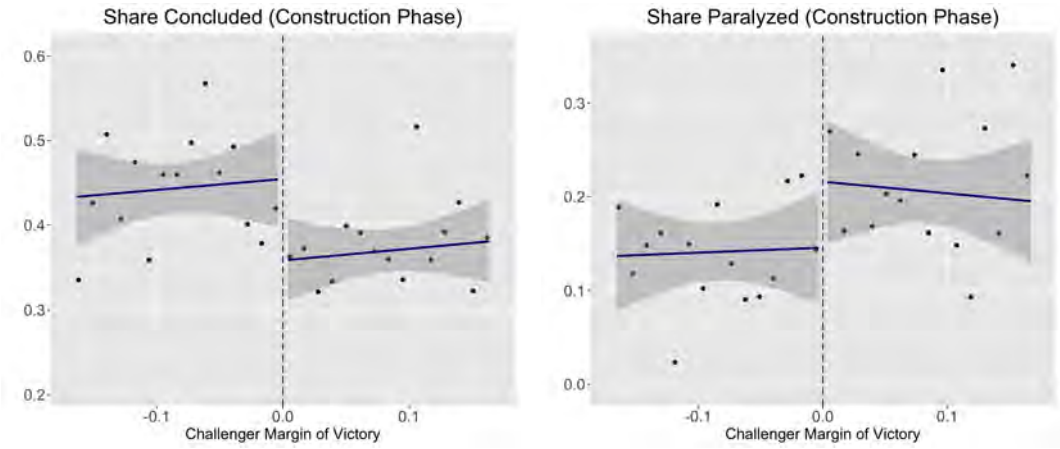
Projects Signed in the New Mandate



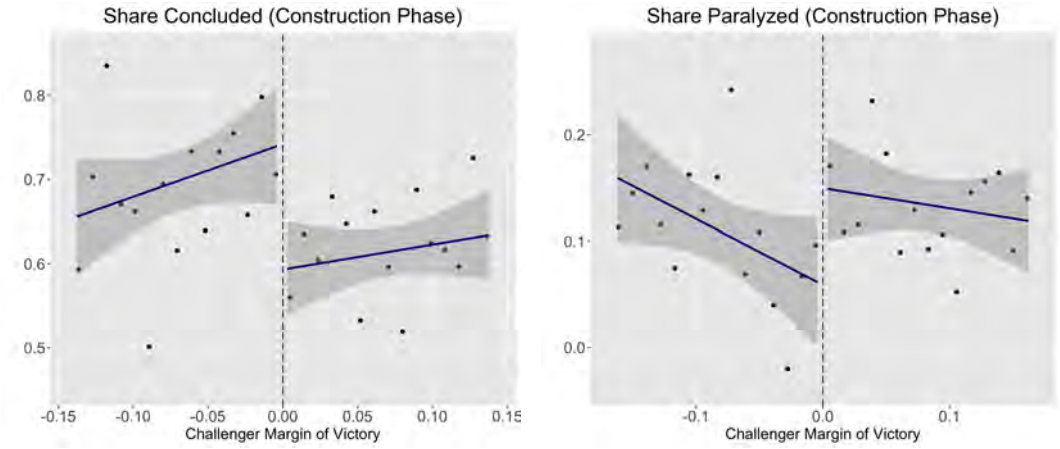
Notes. These figures plot the CCT local-linear estimates of the turnover impact (equation 15) on six measures of project delivery of the mandate elected in 2016. On the first panel we exhibit: (i) the share of conclusions on projects inherited in a construction stage; (ii) the share of stoppages on projects inherited in a construction stage. On the second panel: (iii) the share of conclusions on projects inherited in a pre-construction stage; (iv) the share of stoppages on projects inherited in a pre-construction stage. On the third panel: (v) the share of signatures signed in the current mandate on all managed projects; (vi) the share of conclusions on projects signed in the new mandate. The black line corresponds to the point estimate of the coefficient and the shadows correspond to the confidence interval.

Figure 19: Discontinuities on Inherited Projects - Preliminary vs. Advanced

Projects Inherited in a Preliminary Stage



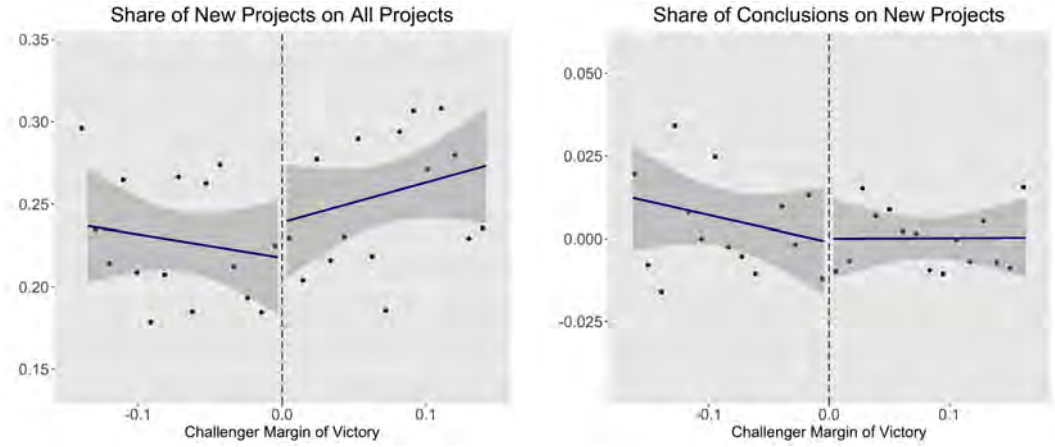
Projects Inherited in an Advanced Stage



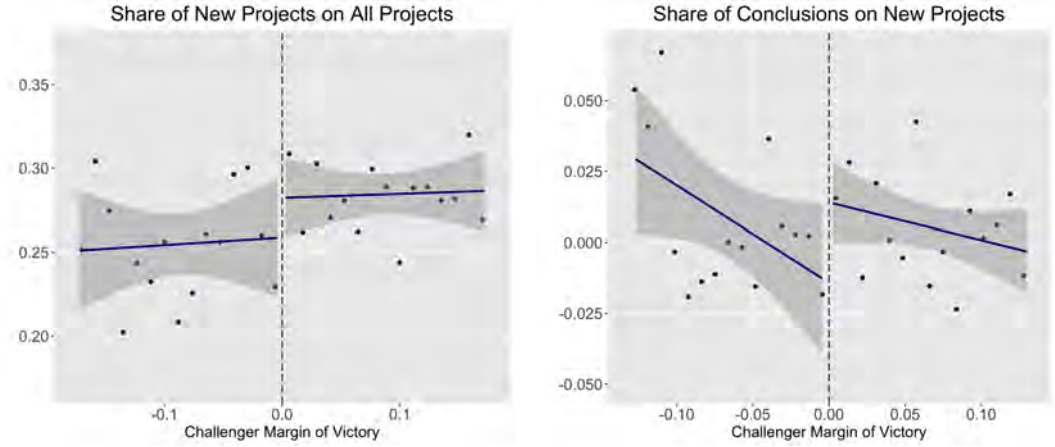
Notes. These figures plot the results of RD regressions of the share of inherited projects which are concluded/paralyzed on the margin of victory of the challenger (the running variable). The upper panel only considers municipalities with equation (16) index below the median sample (i.e. mun. which inherited a preliminary pool of projects), while the lower panel analyzes municipalities with an index above the median (i.e. mun. which inherited an advanced pool of projects). In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014) (calculated in the full sample). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

Figure 20: Discontinuities on New Projects - Preliminary vs. Advanced

Projects Inherited in a Preliminary Stage



Projects Inherited in an Advanced Stage



Notes. These figures plot the results of RD regressions of the share of all (new) projects which are new (concluded) on the margin of victory of the challenger (the running variable). The upper panel only considers municipalities with equation (16) index below the median sample (i.e. mun. which inherited a preliminary pool of projects), while the lower panel analyzes municipalities with an index above the median (i.e. mun. which inherited an advanced pool of projects). In each graph, a local linear regression is estimated on each side of the discontinuity using the optimal bandwidth choice as in Calonico et al. (2014) (calculated in the full sample). Each point denotes the sample-average within a bin. The number of bins is chosen optimally according to Calonico et al. (2015).

A1
Data Cleaning

Data Gathering

CAIXA provided us access to two data sources:

- The administrative files from the Federal Government Secretariat (SEGOV).
  - Periodicity: Weekly.
  - Availability: Since 2011 until June 2019. 2012 missing.
  - Variables:
- The administrative files from CAIXA, the trustee of the federal government in transfer contracts.
  - Periodicity: Daily.
  - Availability: From August 2019 until today (February 2020).

All of them were generated by CAIXA accordingly to the necessity of each agent.

Across-time compatibility

The SEGOV raw data is composed by 331 original files, each representing one position of the database. After extraction, due to repeated and broken records, remained 316 positions, which are representative of every quarter from 2013 to 2018. The sample also encompasses the last two quarters of 2011, the first quarter of 2012 and the first two quarters of 2019.

Despite representing positions of the same pool of contracts, the files were not standardized into a single format. Thus, I manually assigned the available data into variables which were common across positions. Also, to the ease of analysis, I collapsed the weekly data into quarterly observations, keeping only the first available observation of each quarter.

Missing leading 0's from contracts' identifiers

The contract identifiers were reported differently across administrative files. The full contract identifier consists of a seven-digit contract number and two verification digits. In some files, these digits were reported together, and in others, they were reported in different fields. In cases where the contract number or the verification number started with 0, these zero's were not

included in the contract identifier. This issue led to a mismatch of contracts across time. For instance, the contract 100653201 was represented by 10065321 in observations in which joining the contract number with the verification digits were required. I resolved that by adding 0's to the second last position of all contracts and checking if the mutated id matched with an existing one. If so, I edited the identifier to the mutated one.

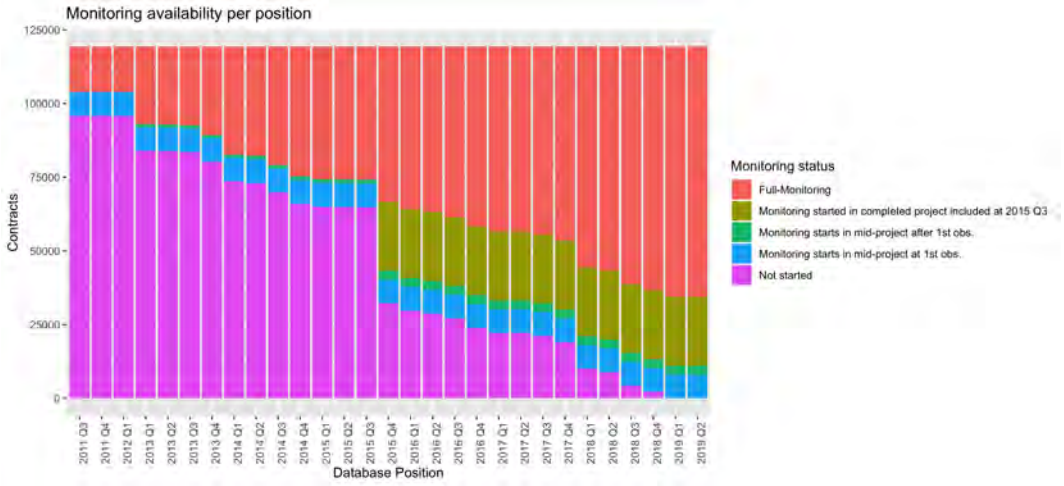
Monitoring beginning in finished contracts

Before the fourth quarter of 2015, only projects with pending transfers were present in the database. From October 2015 and on, SEGOV's files began to report the status of projects with concluded transfers as well. This change led to a discontinuity on the number of finished contracts at this quarter, as contracts that were finished before 2011 suddenly appeared in data with completion rates different than 0.

To deal with this issue, as a first step, I divided projects into two categories: projects with full-monitoring (i.e., the first observation has completion status equals 0) and projects which monitoring started after the project began (i.e., first observation with completion rate different than 0). Nevertheless, not all projects without full-monitoring are projects that suddenly appeared as finished contracts in October 2015. Some are projects which started before the third semester of 2011; thus, monitoring began at the first observation of the panel. Others are projects with a fast start that began construction before the next quarter observation.

Thus, I identified the projects that suddenly appeared in the database in the end of 2015 with a completion rate different than 0 and a signature date earlier than the first observation of the panel. Figure A1.1 presents the monitoring availability of those contracts per panel position. The dark green bar represents the finished contracts that were suddenly incorporated into the database in October 2015; these contracts are not used in the subsequent analysis.

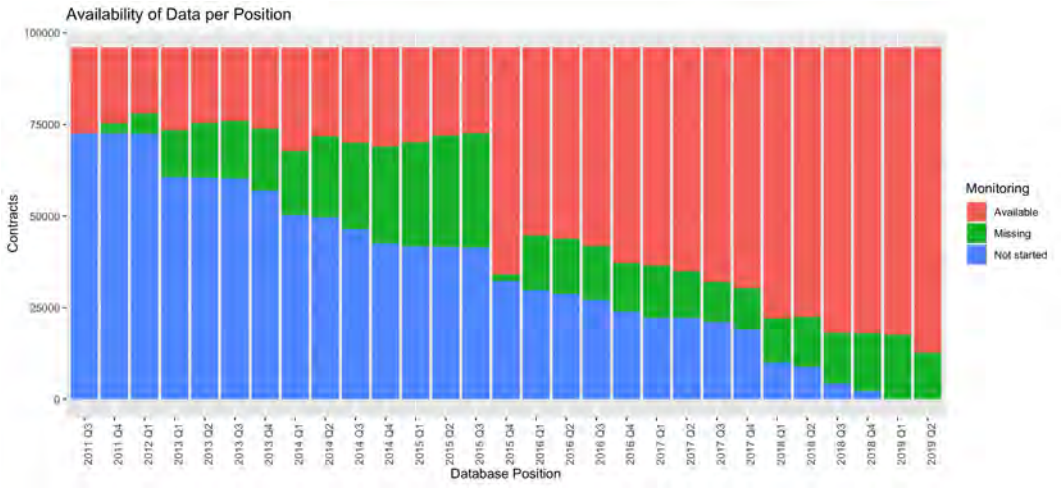
Figure A1.1: Monitoring availability of contracts per position



Missing data

Moreover, the compilation of SEGOV files returned a panel with several missing data points. To tackle this issue, first, I identified which missing points were missing data and which were missing because the monitoring of the contract had not started yet. The missing data felt into two categories: missing data with a non-missing future observation and missing data with all subsequent data missing too. Figure A1.2 reports the availability of data per quarter in SEGOV's files.

Figure A1.2: SEGOV's data availability

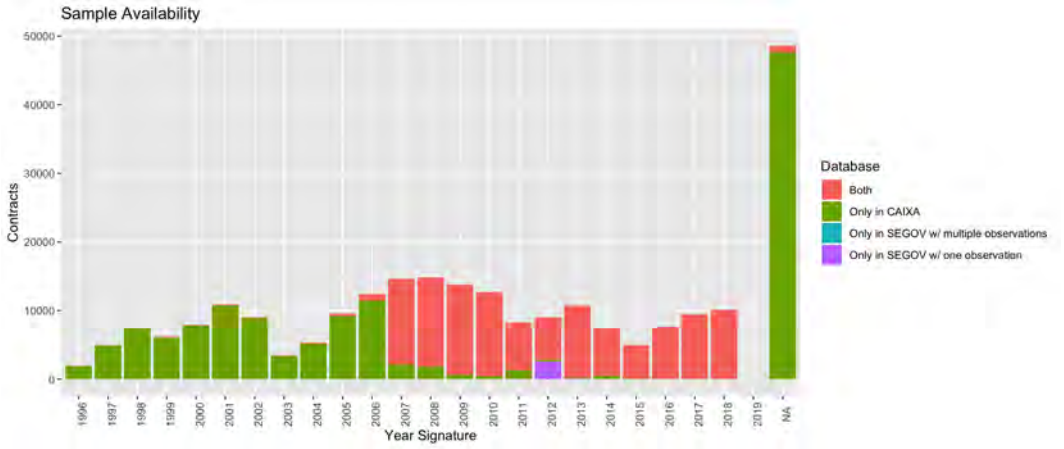


In a first approach to fill the missing observations, I opted to carry forward the last non-missing observation, as it would suffice for contracts that all subsequent data was missing. Nevertheless, this procedure has several flaws and generated undesired properties on the cleaned database. To carry

forward the last observation, one must assume that the change in the status of the work only happens with the next non-missing observation, which is not the case for the data we have. For instance, as mentioned, data before 2015-10-12 encompassed only projects with pending transfers. In these positions, when there is no amount left to be transferred in the contract, that contract becomes unavailable in the database. Thus, when carrying the last non-missing observations forward, all of these contracts suddenly became concluded projects in the third quarter of 2015.

Alternatively, the approach of bringing the next observation backward would not work with missing data with all subsequent data missing too. Thus, I decided to overcome this issue by adding to the panel a new position from CAIXA's administrative files database, dated from August 2019. CAIXA's administrative files contained updated information on the last observation of the panel for contracts that all next observations were missing, as it is information from the 3rd quarter of 2019. Indeed, CAIXA's administrative files encompassed a larger universe of contracts and provided updated information to practically the whole sample of contracts in SEGOV's data[1] [2]. Figure A1.3 reports the availability of contract data in both sources per signature year.

Figure A1.3: Source availability of contracts per year of signature



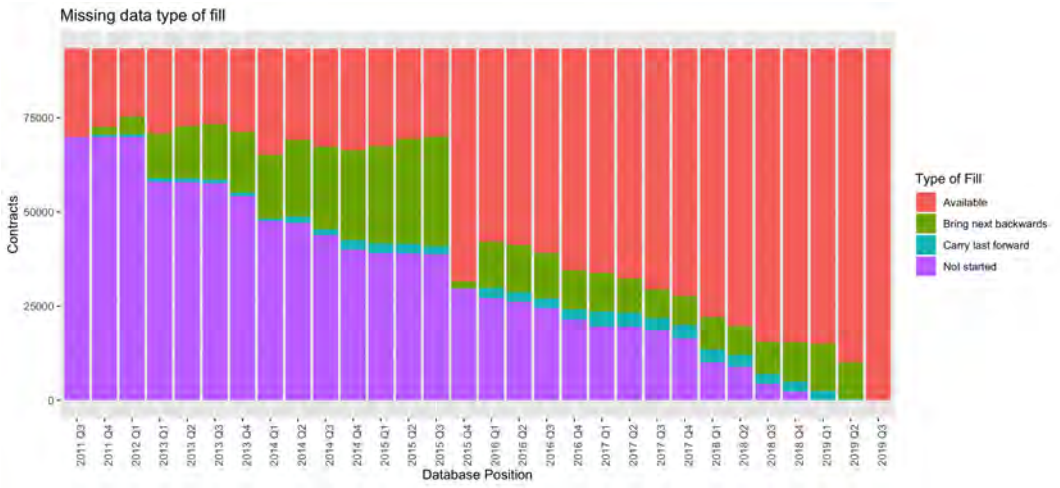
Moreover, CAIXA's administrative files also included the date of the last project inspection. Hence, I can identify when the completion status of the work changed to its last condition and use this information to fill

[1] After adding CAIXA's file to the last observation of the panel, I was able to characterize the final status of all contracts that appeared more than once in SEGOV's data but two: 100259460 and 037336699 from the municipalities of Arapiraca e Igarape-Miri, respectively. I drop these observations from the following analysis.

[2] 2640 contracts from SEGOV files only appeared once in all database positions. 2625 of these observations were signed in 2012 and only appeared in the 2018-03-19 position from SEGOV's database with a reported completion of 0. For the subsequent analysis, I disregard those observations assuming that they had a misreported id.

missing observations. If the missing observation is dated before the date of the last inspection, the previous non-missing observation is carried forward, as CAIXA's administrative files record that the last status was updated only after that date. On the other hand, if the missing observation is dated after the record of final inspection, then the next observation is brought backward. Figure A1.4 reports how missing data were filled following this procedure.

Figure A1.4: Missing data filling



A2
Robustness

Unbalanced variable control

The placebo tests presented on Table 2 suggested an unbalanced sample on the vicinity of the threshold of our close-elections RD design. In particular, we rejected the null hypothesis that the lagged share of conclusions of projects inherited in a pre-construction phase is similar in treatment and control municipalities around the cut-off. The inspection of the RD plot and the reduced sample of this analysis[1] has driven our interpretation that this result is likely being caused by statistical chance and that it does not jeopardizes the validity of our approach.

Still, in Tables (A-1 to A-3), we present our main specification controlling for the problematic variable as a robustness check. Specifically, we perform local linear regressions, which restricts the observations to a narrow margin around the cut-off, i.e. $MV_me \in [-h, +h]$, and estimate the following:

$$\tau_{m,2016} = \alpha + \pi_0 MV_{m,2016} + \pi_1 T_{m,2016} + \pi_2 T_{m,2016} MV_{m,2016} + \beta_0 S_{m,2012} + \beta_1 M_{m,2012} + \epsilon_{m,2016} \quad \text{(A-1)}$$

Where $S_{m,2012}$ is the share of conclusions of projects inherited in a pre-construction phase in the 2012 term, where we replace missing shares (i.e. when no project was inherited) for zero[2], and $M_{m,2012}$ is a dummy indicating if the municipality inherited at least one project on the previous term to account for different zeros (true zeros vs. missing shares). The remaining variables are the same as in the main specification and we are interested in the estimate of π_1.

Therefore, in Tables A-1 to A-3, we exhibit estimates for $\hat{\pi}_1$ with respect to our main outcomes following the equation (A-1) specification. The inspection of the presented coefficients corroborates with the validity of our main results.

[1] We are unable to perform the placebo test for both elections as we lack the lagged data for the 2012 term.

[2] We adopt this approach as, otherwise, we would end up with a drastically reduced sample.

Alternative outcomes

In this subsection, we also reproduce the main results on the: (i) respective share of each outcome weighted by project value; (ii) on the average share of quarterly observations, instead of the single observation on the 10th quarter of the mandate; (iii) on the log of one plus the amount of concluded/paralyzed/new projects of each analyzed outcome, instead of its share. The results presented on Tables A-4 to A-10 corroborates with our main results.

Table A-1: Effect of Having a Party Turnover on Municipality's Inherited Project Conclusion Shares - Covariate Control Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of projects inherited in the pre-construction phase concluded in the subsequent term					
Party Turnover	−0.039**	−0.002	0.023	0.030	0.107
	(0.017)	(0.049)	(0.055)	(0.077)	(0.107)
Mean Dep. Var. (T=0)	0.33	0.349	0.351	0.335	0.337
Bandwidth	–	0.128	0.10	0.05	0.025
Observations	2,104	941	762	427	211
Panel B: Share of projects inherited in the construction phase concluded in the subsequent term					
Party Turnover Turnover	−0.057***	−0.101**	−0.103*	−0.163**	−0.167
	(0.019)	(0.045)	(0.056)	(0.077)	(0.108)
Mean Dep. Var. (T=0)	0.52	0.524	0.538	0.56	0.552
Bandwidth	–	0.172	0.10	0.05	0.025
Observations	1,920	1,131	732	418	207

Notes. This table analyzes the effect of having a party turnover over conclusion measures of infrastructure projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables is the share of concluded projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016, and the incumbent mayor was in his second mandate. Panel A (B) dependent variable is the number of concluded projects on the total number of contracts inherited on the pre-construction (construction) phase. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). Robust standard errors in parenthesis.

Table A-2: Effect of Having a Party Turnover on Municipality's Inherited Project Stoppage Shares - Covariate Control Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of projects inherited in the pre-construction phase paralyzed in the subsequent term					
Party Turnover	−0.026*	−0.034	−0.040	−0.069	−0.178**
	(0.015)	(0.040)	(0.049)	(0.067)	(0.089)
Mean Dep. Var. (T=0)	0.262	0.249	0.254	0.256	0.286
Bandwidth	–	0.148	0.10	0.05	0.025
Observations	2,104	1,067	762	427	211
Panel B: Share of projects inherited in the construction phase paralyzed in the subsequent term					
Party Turnover	0.030*	0.073*	0.066	0.111	0.179*
	(0.018)	(0.043)	(0.054)	(0.073)	(0.101)
Mean Dep. Var. (T=0)	0.325	0.327	0.31	0.304	0.31
Bandwidth	–	0.176	0.10	0.05	0.025
Observations	1,920	1,151	732	418	207

Notes. This table analyzes the effect of having a party turnover over stoppage measures of infrastructure projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables is the share of paralyzed projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016, and the incumbent mayor was in his second mandate. Panel A (B) dependent variable is the number of paralyzed projects on the total number of contracts inherited on the pre-construction (construction) phase. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). Robust standard errors in parenthesis.

Table A-3: Effect of Having a Party Turnover on Municipality's New Projects Shares - Covariate Control Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of total projects which were signed in the subsequent mandate					
Party Turnover	0.060***	0.030	0.035	0.104**	0.091
	(0.011)	(0.029)	(0.034)	(0.046)	(0.062)
Mean Dep. Var. (T=0)	0.427	0.445	0.449	0.457	0.414
Bandwidth	–	0.14	0.10	0.05	0.025
Observations	2,818	1,445	1,095	614	293
Panel B: Share of projects signed in the subsequent mandate which are concluded					
Party Turnover	−0.001	0.016	0.014	0.048*	0.060
	(0.007)	(0.019)	(0.022)	(0.027)	(0.037)
Mean Dep. Var. (T=0)	0.052	0.057	0.056	0.059	0.032
Bandwidth	–	0.13	0.10	0.05	0.025
Observations	2,487	1,178	949	542	259

Notes. This table analyzes the effect of having a party turnover on two measures of project delivery in a municipality : (i) new signatures and (ii) conclusion of new projects. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Contract sample limited to projects which were not completed until the end of the previous term. The dependent variables are the share of new/concluded projects on the 10th quarter of the subsequent term. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016, and the incumbent mayor was in his second mandate. Panel A (B) dependent variable is the number of new projects (concluded projects) on the total number of administered contracts (new projects). Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). Robust standard errors in parenthesis.

Table A-4: Effect of Having a Party Turnover on Municipality's Inherited Projects Conclusion Rates - Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share Concluded (Pre-construction Phase) - Weighted by Project Value					
Party Turnover	−0.039***	0.011	0.013	0.036	0.008
	(0.012)	(0.033)	(0.038)	(0.055)	(0.077)
Mean Dep. Var. (T=0)	0.302	0.319	0.315	0.307	0.316
Bandwidth	–	0.136	0.10	0.05	0.025
Observations	4,099	2,091	1,636	882	443
Panel B: Share Concluded (Pre-construction Phase) - Term Average					
Party Turnover	−0.025***	0.004	0.002	0.007	−0.043
	(0.007)	(0.016)	(0.022)	(0.030)	(0.041)
Mean Dep. Var. (T=0)	0.196	0.204	0.202	0.198	0.204
Bandwidth	–	0.19	0.10	0.05	0.025
Observations	4,099	2,648	1,636	882	443
Panel C: Log 1 + # of Conclusions (Pre-construction Phase)					
Party Turnover	−0.103***	−0.018	−0.010	0.001	−0.038
	(0.012)	(0.030)	(0.036)	(0.049)	(0.067)
Mean Dep. Var. (T=0)	0.354	0.328	0.32	0.302	0.308
Bandwidth	–	0.147	0.10	0.05	0.025
Observations	5,973	3,382	2,501	1,359	684

Notes. This table analyzes the effect of having a party turnover on three alternative measures of project conclusion in a municipality : (i) the value-weighted share of concluded projects on the 10th quarter of the subsequent mandate (panel A); (ii) average share of concluded projects along term quarters (panel B); (iii) and the log of 1 plus the number of conclusions on the 10th quarter of the subsequent mandate (panel C). Contract sample limited to projects which were inherited in a pre construction stage. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. Robust standard errors in parenthesis.

Table A-5: Effect of Having a Party Turnover on Municipality's Inherited Projects Conclusion Rates - Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share Concluded (Construction Phase) - Weighted by Project Value					
Party Turnover	−0.069***	−0.125***	−0.106***	−0.110*	−0.167**
	(0.013)	(0.034)	(0.040)	(0.056)	(0.079)
Mean Dep. Var. (T=0)	0.531	0.553	0.555	0.563	0.543
Bandwidth	–	0.149	0.10	0.05	0.025
Observations	4,070	2,311	1,698	922	468
Panel B: Share Concluded (Construction Phase) - Term Average					
Party Turnover	−0.053***	−0.098***	−0.093***	−0.079**	−0.104*
	(0.009)	(0.023)	(0.027)	(0.038)	(0.054)
Mean Dep. Var. (T=0)	0.384	0.392	0.394	0.397	0.388
Bandwidth	–	0.146	0.10	0.05	0.025
Observations	4,070	2,284	1,698	922	468
Panel C: Log 1 + # of Conclusions (Construction Phase)					
Party Turnover	−0.095***	−0.007	−0.016	−0.094	−0.156*
	(0.015)	(0.038)	(0.042)	(0.059)	(0.085)
Mean Dep. Var. (T=0)	0.522	0.516	0.502	0.477	0.484
Bandwidth	–	0.13	0.10	0.05	0.025
Observations	5,973	3,067	2,501	1,359	684

Notes. This table analyzes the effect of having a party turnover on three alternative measures of project conclusion in a municipality : (i) the value-weighted share of concluded projects on the 10th quarter of the subsequent mandate (panel A); (ii) average share of concluded projects along term quarters (panel B); (iii) and the log of 1 plus the number of conclusions on the 10th quarter of the subsequent mandate (panel C). Contract sample limited to projects which were inherited in a construction stage. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. Robust standard errors in parenthesis.

Table A-6: Effect of Having a Party Turnover on Municipality's Inherited Projects Stoppage Rates - Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share Paralyzed (Pre-construction Phase) - Weighted by Project Value					
Party Turnover	−0.031***	−0.023	−0.033	−0.011	−0.044
	(0.009)	(0.027)	(0.029)	(0.041)	(0.057)
Mean Dep. Var. (T=0)	0.181	0.176	0.174	0.174	0.182
Bandwidth	–	0.116	0.10	0.05	0.025
Observations	4,099	1,854	1,636	882	443
Panel B: Share Paralyzed (Pre-construction Phase) - Term Average					
Party Turnover	−0.011***	−0.015	−0.015	−0.005	−0.002
	(0.004)	(0.010)	(0.011)	(0.014)	(0.021)
Mean Dep. Var. (T=0)	0.078	0.077	0.078	0.075	0.078
Bandwidth	–	0.108	0.10	0.05	0.025
Observations	4,099	1,752	1,636	882	443
Panel C: Log 1 + # of Paralyzed (Pre-construction Phase)					
Party Turnover	−0.074***	−0.046*	−0.056**	−0.051	−0.085
	(0.010)	(0.025)	(0.028)	(0.040)	(0.057)
Mean Dep. Var. (T=0)	0.23	0.198	0.195	0.185	0.196
Bandwidth	–	0.125	0.10	0.05	0.025
Observations	5,973	2,986	2,501	1,359	684

Notes. This table analyzes the effect of having a party turnover on three alternative measures of project stoppages in a municipality : (i) the value-weighted share of paralyzed projects on the 10th quarter of the subsequent mandate (panel A); (ii) average share of paralyzed projects along term quarters (panel B); (iii) and the log of 1 plus the number of stoppages on the 10th quarter of the subsequent mandate (panel C). Contract sample limited to projects which were inherited in a pre-construction stage. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. Robust standard errors in parenthesis.

Table A-7: Effect of Having a Party Turnover on Municipality's Inherited Projects Stoppage Rates - Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share Paralyzed (Construction Phase) - Weighted by Project Value					
Party Turnover	0.045***	0.088***	0.083**	0.057	0.131**
	(0.011)	(0.027)	(0.033)	(0.045)	(0.063)
Mean Dep. Var. (T=0)	0.213	0.209	0.203	0.192	0.212
Bandwidth	–	0.143	0.10	0.05	0.025
Observations	4,070	2,249	1,698	922	468
Panel B: Share Paralyzed (Construction Phase) - Term Average					
Party Turnover	0.046***	0.075***	0.068***	0.073**	0.128***
	(0.008)	(0.021)	(0.023)	(0.031)	(0.044)
Mean Dep. Var. (T=0)	0.237	0.234	0.234	0.237	0.242
Bandwidth	–	0.128	0.10	0.05	0.025
Observations	4,070	2,063	1,698	922	468
Panel C: Log 1 + # of Paralyzed (Construction Phase)					
Party Turnover	0.025**	0.102***	0.085**	0.028	0.025
	(0.012)	(0.031)	(0.035)	(0.048)	(0.068)
Mean Dep. Var. (T=0)	0.231	0.216	0.209	0.192	0.219
Bandwidth	–	0.127	0.10	0.05	0.025
Observations	5,973	3,012	2,501	1,359	684

Notes. This table analyzes the effect of having a party turnover on three alternative measures of project stoppages in a municipality : (i) the value-weighted share of paralyzed projects on the 10th quarter of the subsequent mandate (panel A); (ii) average share of paralyzed projects along term quarters (panel B); (iii) and the log of 1 plus the number of stoppages on the 10th quarter of the subsequent mandate (panel C). Contract sample limited to projects which were inherited in a construction stage. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. Robust standard errors in parenthesis.

Table A-8: Effect of Having a Party Turnover on Municipality's New Projects Rates - Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of New Projects - Weighted by Project Value					
Party Turnover	0.054***	0.008	0.006	0.078**	0.090*
	(0.008)	(0.020)	(0.023)	(0.032)	(0.046)
Mean Dep. Var. (T=0)	0.364	0.375	0.374	0.382	0.349
Bandwidth	–	0.133	0.10	0.05	0.025
Observations	5,874	3,065	2,450	1,332	669
Panel B: Share of New Projects - Term Average					
Party Turnover	0.041***	0.012	0.014	0.059***	0.064**
	(0.005)	(0.013)	(0.015)	(0.020)	(0.029)
Mean Dep. Var. (T=0)	0.249	0.255	0.254	0.26	0.243
Bandwidth	–	0.129	0.10	0.05	0.025
Observations	5,874	2,991	2,450	1,332	669
Panel C: Log 1 + # of New Projects					
Party Turnover	0.087***	0.042	0.026	0.091	0.034
	(0.018)	(0.047)	(0.051)	(0.071)	(0.100)
Mean Dep. Var. (T=0)	1.016	0.974	0.968	0.962	0.943
Bandwidth	–	0.12	0.10	0.05	0.025
Observations	5,973	2,894	2,501	1,359	684

Notes. This table analyzes the effect of having a party turnover on three alternative measures of new projects in a municipality : (i) the value-weighted share of new projects on the 10th quarter of the subsequent mandate (panel A); (ii) average share of new projects along term quarters (panel B); (iii) and the log of 1 plus the number of new signatures on the 10th quarter of the subsequent mandate(panel C). The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. Robust standard errors in parenthesis.

Table A-9: Effect of Having a Party Turnover on Municipality's New Projects Conclusion Rates - Robustness

	(1)	(2)	(3)	(4)	(5)
		Local linear regression			
	OLS	CCT	10 p.p.	5 p.p.	2.5 p.p.
Panel A: Share of Conclusions on New Projects - Weighted by Project Value					
Party Turnover	−0.003	0.001	−0.005	0.011	0.024
	(0.003)	(0.009)	(0.012)	(0.016)	(0.020)
Mean Dep. Var. (T=0)	0.026	0.03	0.028	0.034	0.026
Bandwidth	–	0.17	0.10	0.05	0.025
Observations	4,940	3,046	2,016	1,091	546
Panel B: Share of Conclusions on New Projects - Term Average					
Party Turnover	−0.001	0.004	0.001	0.009	0.013
	(0.001)	(0.004)	(0.005)	(0.007)	(0.009)
Mean Dep. Var. (T=0)	0.014	0.016	0.015	0.016	0.014
Bandwidth	–	0.142	0.10	0.05	0.025
Observations	5,271	2,874	2,167	1,182	589
Panel C: Log 1 + # of Concluded New Projects					
Party Turnover	0.002	0.001	−0.004	0.017	0.010
	(0.005)	(0.012)	(0.014)	(0.018)	(0.024)
Mean Dep. Var. (T=0)	0.045	0.044	0.042	0.05	0.035
Bandwidth	–	0.159	0.10	0.05	0.025
Observations	5,973	3,565	2,501	1,359	684

Notes. Notes. This table analyzes the effect of having a party turnover on three alternative measures of new projects in a municipality : (i) the value-weighted share of conclusions on new projects on the 10th quarter of the subsequent mandate (panel A); (ii) average share of conclusions on new projects along term quarters (panel B); (iii) and the log of 1 plus the number of new projects which are concluded on the 10th quarter of the subsequent mandate (panel C). Contract sample limited to projects which were inherited in a construction stage. The elections covered in the analysis are the 2012 and the 2016 Brazilian mayoral races. Sample includes only the municipalities in which the incumbent party ran for reelection in 2012 and 2016. Party Turnover is a dummy variable that equals one for the municipality where the challenger party was elected and zero for the municipality where the incumbent party was reelected. Column (1) displays simple OLS estimates, following equation (1). Columns (2) to (5) present local linear regression estimates, based on equation (15) and considering alternative bandwidths: optimal bandwidth calculated following Calonico, Cattaneo, and Titiunik (2014) (column (3)), considering observations with margin of victory in the intervals [-0.1;+0.1] (column 4), [-0.05;+0.05] (column (5), and [-0.025;+0.025] (column (6)). Mean dep. var. is the mean of the dependent variable on the control group (reelection municipalities). *, ** and *** denote significance at ten, five, and one percent level, respectively. Robust standard errors in parenthesis.