Cold Bacon: Co-Partisan Politics in Brazil

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Abstract

This paper provides evidence of alignment effects between the executive and legislative branches of the central government. We use detailed data on Brazilian intergovernmental grants whose allocations are determined by legislators. The executive branch cannot interfere with the destiny and volume of grants, but it can control the transfer pace. We group the data into municipalities and estimate the effects of the share of aligned legislators associated with a municipality on the average time to receive grants. We show that legislators politically aligned to the executive branch transfer resources to their constituencies nine months faster than unaligned legislators. To achieve a causal interpretation of these results, we use an exogenous variation in the share of elected aligned legislators caused by the phased-in introduction of electronic voting. Our findings regarding how political alignment affects the speed of transfer are consistent across different periods and alternative definitions of the dependent variable.

Keywords: Alignment effects; Pork barrel; Electronic voting; Fiscal federalism
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1 Introduction

Theories of fiscal federalism predict efficiency gains from the provision of public goods by local authorities rather than central authorities (Oates, 1972). However, inefficiencies arise when political motives guide the allocation of intergovernmental grants. For example, instead of direct resources to regions that can spend the money more efficiently, politicians often favor electoral supporters, local political allies, and even their hometowns (Evans, 2011; Arulampalam et al., 2009; Hodler and Raschky, 2014). The literature on this topic is vast and provides extensive evidence of these mechanisms. However, it usually concentrates on the amount of grants transferred from central to local offices.

In this paper, we reveal an alternative mechanism by which politicians manipulate intergovernmental grants to support co-partisans. Specifically, we provide strong evidence that federal representatives in Brazil who are politically aligned to the executive branch transfer their discretionary grants more quickly than their politically unaligned counterparts. Whereas legislators use these discretionary grants as *pork* to reward their voters (Firpo et al., 2015), the executive branch can either assist them by expeditiously delivering the *pork*, or hinder it by delaying the transfer. Our novel contribution is to highlight the timing to transfer grants as a tool to support aligned politicians.

Our empirical analysis uses detailed data on discretionary transfers authorized by federal legislators but executed by the executive branch, i.e., the ministries. The information lets us identify the time between the authorization of each project and the date at which the funds for the project were transferred from the central to the local administration. We use this gap as the dependent variable in our analysis. The data does not identify the exact legislators who assigned the grant to a given region. However, we can group our data by municipalities and use the average time to transfer as our dependent variable. We show that the share of aligned legislators associated with a municipality explains this transfer time. The results are estimated using a two-way fixed effect model applied to a panel of 4880 municipalities in 1998 and 2002.

The main challenge we face in our empirical analysis is the potential bias introduced by omitted variables. For instance, municipalities in which voters strategically elect aligned mayors aiming to increase the volume of resources they receive are likely to elect aligned legislators as

well.[1] If this is the case, an ordinary regression of time to transfer on political alignment provides an over-estimated coefficient. To avoid any confounding variables related to the alignment between the executive and federal legislative politicians, we use the phased-in introduction of electronic voting (EV) as an exogenous source of variation in the share of aligned legislators. Specifically, we exploit the enfranchisement of illiterate voters due to EV as an exogenous leftwards ideological shift of the median voter. Although it seems to convey a drastic change in the entire political scene, EV exclusively facilitated voting for legislative candidates (Schneider and Senters, 2018) enfranchising close to 33% of total voters in legislative elections (Fujiwara, 2015).[2] Therefore, we can exclude any confounding effects related to changes in the executive branch of the government.

However, other factors, such as the behavior of elected legislators and the selection of EV users, must be taken into account. An essential change in the behavior of the legislators induced by EV is the increase in the volume of intergovernmental transfers (Schneider et al., 2020). Additionally, since the introduction of EV is determined by the size of the electorate, the number of voters may be an omitted variable correlated to EV. Therefore, we add the number of voters and the volume of transfers as control variables such that the exclusion restriction is conditional on them. Finally, exploiting the fact that EV was first introduced in a given set of municipalities in 1998 – the treatment group – and then used by all of them in 2002, we show that the effect of using EV in the treatment group is similar to the effect in the control group. Therefore, it is unlikely that any precondition associated with EV usage is omitted in the error term.

The results provide strong evidence of alignment effects within the central branch of the government. Specifically, aligned legislators transfer grants approximately nine months earlier than unaligned legislators. A 9-months delay on *pork* transfers is politically important for legislators seeking reelection. The results are robust to the extension of the sample to include 1994, alternative measures of time-to-transfer, and to the use of weights to account for the aggregation of data into municipalities. The results suggest that the central executive rewards politicians in the

[1] Although possible, this type of endogeneity is less of an issue as voters do not know the party of the executive central government before they elect their federal legislators since all politicians comprising the central government are elected simultaneously in Brazil.

[2] Voters had to write the name or number of their legislative candidates on the old paper ballot, but for executive elections they only had to make a mark close to the candidates' names that were already printed on the ballot, the new voting system, by requiring voters to type the number of their preferred candidate in a machine, did not affect vote for executive candidates.

same coalition by speeding up the *pork* sent to their core constituencies.

Politically-motivated transfers of federal grants are a known feature of Brazilian politics.[3] The supportive relationship between aligned politicians at federal and local levels of government is well-documented (Brollo and Nannicini, 2012; Bugarin and Marciniuk, 2017; Sakurai and Theodoro, 2018; Azulai, 2018). We add to this literature in two ways. First, we provide evidence of an additional mechanism by which politicians support allies. Previous research has focused on the volume of transfers, and our paper reveals favoritism in the time to transfer grants. Second, we explore alignment effects within the federal level of government, which has been less explored when compared to alignment effects between government tiers.[4] Although empirically unexplored, this form of exchange between the executive and legislative exists in practice, as highlighted by President Michel Temer's reward of legislators who blocked a corruption charge against him in 2017. The legislators who voted to block these allegations had twice as many grants *executed* as those who voted to continue with the charges (Modzeleski, 2017). We provide empirical evidence of the extent of political motivation behind the time to execute grants.[5]

Our paper is also related to the well-established literature analyzing politically-motivated intergovernmental transfers. This research shows that political alignment between higher and lower levels of government explain discretionary intergovernmental transfers. Theoretical foundations are provided by Arulampalam et al. (2009) and Bracco et al. (2015) together with empirical evidence from India and Italy, respectively. There is also evidence of alignment effects from Spain (Solé-Ollé and Sorribas-Navarro, 2008), Portugal (Migueis, 2013), and Germany (Baskaran and Hessami, 2017). Papers providing evidence of alignment effects in Brazil include Brollo and Nannicini (2012) who show that, in close elections, mayors aligned with the president received more funds than unaligned mayors; Ferreira and Bugarin (2007) and Sakurai and Theodoro (2018) who provide evidence of co-partisan assistance at the gubernatorial level; and Azulai (2018), who shows that political connection between ministers – rather than the president – and mayors are important for the volume of grants transferred.

[3]For example, Finan and Mazzocco (2016) estimate that 26% of legislators' funds in Brazil are misallocated, compared to the social planner allocation. It suggests that politicians allocate public funds for political benefits.

[4] Rodden and Arretche (2005) is an example.

[5]In an interview conducted in Brasília, a bureaucrat working at the *Confederação Nacional de Municípios*, branch of the government responsible for the execution of projects, confirmed that they have instructions to speed up the process for legislators belonging to the same coalition as the president.

Our paper also contributes to the literature investigating mechanisms by which central governments reward aligned political agents at lower levels of public administration. Nearly all papers investigating whether political motivation explains the allocation of public resources consider the volume of intergovernmental grants. An exception is Borcan (2020) who discusses the usage of electoral fraud as an alternative tool to reward aligned politicians. Borcan provides suggestive evidence that local government in Romania assisted the central executive via turnout buying and ballot stuffing in supporting districts. We provide evidence of another mechanism to reward political alignment, establishing that the time to transfer discretionary grants is also politically motivated.

Our paper does not provide direct evidence of *pork barrel* politics *per se*, but it suggests an interplay between party alignment and pork provision. As Firpo et al. (2015) show, intergovernmental grants allocated by legislators are used to reward their core constituencies. Our results suggest that the executive branch of the government also *delays* the *pork* sent by unaligned politicians. In this way, our paper contributes to the vast literature on pork-barrel politics. In a seminal contribution, Cox and McCubbins (1986) argue that risk-averse politicians should favor their "core constituencies" to maintain political coalitions.[6] Examples of recent supporting evidence include Porto and Sanguinetti (2001) for Argentina, Albouy (2013) for the United States, Firpo et al. (2015) for Brazil, and Kauder et al. (2016) for Germany.

2 Institutional Background

Brazil is a federal republic composed of three tiers of government: central, gubernatorial, and municipal. Each level contains executive representatives – president, governors, and mayors, respectively – and legislative representatives. Politicians have four-year mandates – except for senators who serve for eight years. Elections in Brazil are staggered with local elections two years apart from central and gubernatorial elections.

A critical feature of the Brazilian political system is that central legislators are elected by large districts – the states – so that many legislators represent one state. This multi-member district

[6] A competing theory with seminal contributions by Lindbeck and Weibull (1987) and Dixit and Londregan (1998) suggests that politicians should target "swing voters" to maximize votes. This hypothesis was successfully tested for many countries, e.g., Australia (Worthington and Dollery, 1998) and Sweden (Dahlberg and Johansson, 2002; Johansson, 2003).

system makes the link between federal representatives and municipalities nontrivial. We use the definition of associated candidates created by Firpo et al. (2015) to link representatives to their core constituencies. This approach identifies the municipalities essential to each representative and, therefore, to which the legislators would direct resources to reward voters.

After the re-democratization in 1985, Brazil held direct general elections for the first time in 1989 in a two-round system. Fernando Collor – a right-wing politician – was elected in a close contest with the left-wing candidate Luiz Inácio da Silva – known as Lula. Right-wing parties controlled the federal executive for more than a decade with the election of Fernando Henrique Cardoso in 1994 and his reelection in 1998. In 2002, Brazilians elected Lula, who started a long period of left-wing dominance until 2016, when Dilma Rousseff was removed from office. We exploit the change in the political ideology of the president between the political cycles of 1999-2002 and 2003-2006 when the control of the federal executive moves to left in the political spectrum.[7] This aggregate change affected all municipalities but is not plausibly exogenous.

2.1 Electronic voting

The phased-in introduction of electronic voting (EV) in Brazil is an essential feature for our study. As we argue, EV lets us compare two groups of municipalities that differ only in the variation of the political alignment of the representative with the federal executive. This lets us identify the causal effect of alignment on the readiness to transfer resources.

EV was introduced in 1998 in municipalities with more than 40,500 registered voters and in all municipalities of the states of Rio de Janeiro, Alagoas, Amapá and Roraima.[8] It encompasses 524 municipalities out of 5395. Before EV, voters cast their votes in a paper ballot. To do so, voters marked the ballot close to their most preferred candidates names for all positions, except for local, state, and federal representatives. Due to a large number of candidates, printing their names on the ballot was impractical. Therefore, to cast a vote for legislators at all levels, voters

[7] Although this feature helps to understand the mechanism behind our empirical strategy, it is not necessary. As we show in Table 4, results extend when we include the reelection of Cardoso in 1998 to our sample.

[8] The choice of the cutoff (40,500 voters) was based on the number of voting machines available in Brazil at the time. The number of registered voters in 1996 was used to determine the cutoff to avoid manipulation of the electorate in response to EV. Finally, the selection of the four states to use EV was based on geography (remote locations with difficult access, i.e., Amapá and Roraima) and military reasons (states with military bases, i.e., Rio de Janeiro and Alagoas) to test both the ability of electoral authorities to access remote places and to use military assistance to implement EV (Fujiwara, 2015).

had to write their candidates respective numbers or names accurately. As Hidalgo (2012) argue, this was a nontrivial task for an electorate in which one-third of the voters was illiterate. After the introduction of EV, voters had to type their candidate's number in a keypad similar to the ones regular telephones have. This change helped voters, especially illiterates, to cast their ballots for legislators, increasing the share of valid votes to turnout ratio for federal representatives by almost 33%.

Importantly, the introduction of EV *de facto* enfranchised low-income voters in the legislative elections, moving the median voter toward the left in the political spectrum (Fujiwara, 2015; Schneider et al., 2019).[9] The rise in enfranchisement among low-income voters should favor left-wing parties that support redistributive policies. Fujiwara (2015) finds suggestive evidence that EV increased support for state representatives representing left-wing parties. Our analysis, considering only associate federal representatives and the sample of municipalities using EV, also suggests that the new voting system benefited leftist candidates. Fig. 1a shows that municipalities using EV in 1998 provided broader support to left-wing associated federal representatives.[10] Our results also suggest that in 2002, places that used EV for the first time in 1998 also gave more extensive support for left-wing candidates than localities using EV for the first time in 2002.

To reconcile these findings with theory, we consider not only the enfranchisement of low-income voters but also the existence of left-wing parties available to be selected. As Montero (2012) argue, after the military dictatorship, Brazil was dominated by right-wing parties supporting the previous government. With the help of local brokers, they created political machines, especially among poor voters, to maintain control of congress. Left-wing parties had a disadvantage against the former military government and were forced to build more disciplined and ideologically-consistent parties (Montero, 2012). Unlike right-wing parties that could rely on patronage politics and never had to worry about building party organization from the ground up, left-wing parties needed to be highly organized and rely on rank-and-file members to compete.

[9] Fujiwara (2015) shows that this enfranchisement was exceptionally high among illiterates and that the consequence of this enfranchisement was an increase in state expenditure in public healthcare, which improved health outcomes. Schneider et al. (2019) construct a theoretical model showing that as electronic voting disproportionately enfranchised low-income voters, policymakers increased public goods provision from which low-income voters cannot be excluded but pay a relatively smaller share of the tax revenue collected for their provision. The authors show empirical evidence at the municipality level that there was an increase in local taxation and public provision of health, education, and public employment corroborating their empirical model.

[10] We use Montero (2012) definition of left-wing parties as being one of the following: PT, PDT, PCB, PPS, PCdoB, PSB, PSTU, PV, PSOL, PCO.

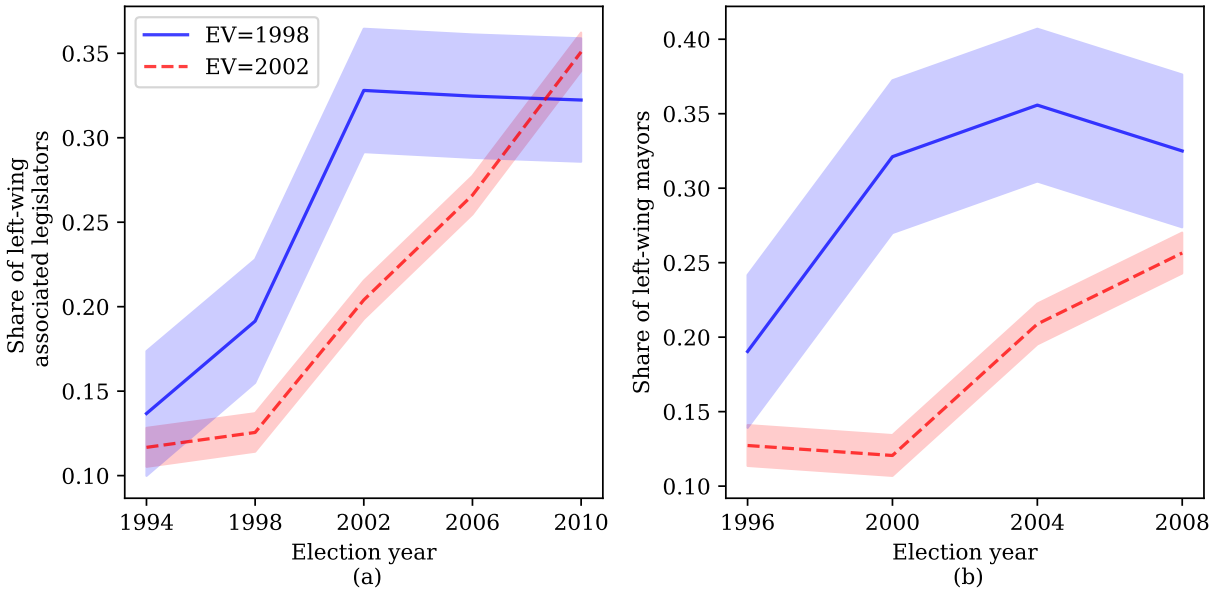

Figure 1: Evolution of Left-Wing Parties in Brazil

Note: Each line shows, with a 99% confidence interval, the linear trend of support for left-wing candidates. Panels (a) and (b) consider, respectively, associate federal representatives and elected mayors. The treatment (control) sample only considers the places (not) using EV in 1998.

Therefore, when the EV introduction in 1998 allowed left-wing parties to win seats in congress, which *de facto* represented municipalities that used EV (Ames, 2001), it also helped left-wing parties develop on organized structures and gain executive power in these municipalities.

Fig. 1b shows that places using EV in 1998 were more likely to elect a left-wing mayor in the 2000 local elections. As Novaes (2018) argues, mayors are vote brokers for federal representatives and help the latter to be selected in exchange for discretionary grants. Thus, both the fact that left-wing parties are more institutionalized and mayors help federal representatives to win elections underlie why in 2002 places that used EV for the first time in 1998 had even broader support for left-wing candidates than areas using EV in federal elections for the first time in 2002. Our argument is reinforced by the fact that the places using EV for the first time in 2002 experienced the same increase in support for left-wing federal representatives, followed by a more significant number of leftist mayors winning local elections in 2004. Finally, in the central and local elections of 2006 and 2008, there was a convergence of ideological alignment between the treatment and control groups, as observed in 1994, when all voters used paper ballots. Our results for federal and local elections establish a pattern explaining how left-wing parties penetrated Brazilian

politics in the 2000s.

We exploit the introduction of EV by using it as an exogenous variation in the share of aligned legislators in municipalities that used EV for the first time. The two-step introduction of EV makes our strategy possible. In 1998, only 10% of municipalities featured EV in their elections, while the remaining municipalities had introduced EV in 2002. As we show, the introduction of EV reduces the share of aligned legislators by 25 percentage points.

2.2 Intergovernmental grants

As in many federal democracies, the Brazilian central government transfers resources towards local levels. There are several types of grants. Grants can be either rule-based or discretionary and allocated either by the executive branch or by the legislative. For example, one crucial rule-based fund transferred by the executive branch towards local governments based on population size is the *Fundo de Participação dos Municípios* (FPM), studied by Brollo et al. (2013).

Our paper focuses on a discretionary grant allocated by legislators called *convênio*. The grants earmark funds toward infrastructure projects developed by local administrations that can assign them in several areas, such as education, health, and tourism. Typically, the municipality contributes a share of the total expenditure. After agreeing on the project finance, members of congress submit it to the central government evaluation, which then approves the outlines and transfers them.

The municipality must first be selected to be part of the federal government budget allocation to local authorities to have a project approved. This selection happens through a federal budget amendment, allocating part of the annual federal budget to the municipalities. Thus, the municipality needs to have a legislator willing to allocate part of her yearly budget amendments to that location. As each representative has a limited number of budget amendments,[11] they have incentives to assign grants strategically. Empirical evidence shows that legislators allocate their budget amendments to reward core supporters, suggesting retrospective behavior (Ames, 2001; Firpo et al., 2015).

Legislators select the volume and targets of such grants. However, quite crucially, the exec-

[11]Currently, each federal representative has available close to $4 million per year to be allocated into, at most, 25 different budget amendments.

utive branch is responsible for transferring the funds to the municipalities. Although the law regulates the time it takes for the executive branch to move the grants to local authorities, there is informal evidence that the executive can manipulate the processing time of projects.[12] For example, in July of 2017, in the week when the House would vote for further investigations over President Michel Temer that could lead to impeachment, the president announced the processing of a large amount of funds to representatives. The amount allocated in two weeks exceeded that for the previous six months.[13] Our results provide evidence that such manipulation was used to help aligned legislators.

3 Empirical strategy

3.1 Conceptual Framework

This paper seeks to determine whether the executive branch of the government favors legislators from the same political group. Let Y_{imt} be a benefit granted to legislator i, associated with municipality m, at period t by the President. We are interested in the causal effect of the indicator variable S_{imt} on Y_{imt}. $S_{imt} = 1$ when the legislator i, associated with municipality m is aligned with the President in period t. We consider a linear relationship

$$Y_{imt} = \alpha_0 + \beta_0 S_{imt} + \eta_m + \phi_t + e_{imt}, \tag{1}$$

where β_0 is the parameter of interest, η_m is a fixed effect of municipality, ϕ_t is a time fixed effect, and e_{imt} is the error term. As noted by Rodden and Arretche (2005), we can extend the idea of retrospective behavior proposed by Cox and McCubbins (1986) to this scenario. In this case, the president rewards politicians who supported her during the election. If so, we must find $\beta_0 > 0$. Alternatively, consistent with Dixit and Londregan (1998), the president may assist swing legislators instead of current supporters. That could lead to $\beta_0 < 0$.

We do not observe Y_{imt} at the legislator level, we only observe the benefits transferred to

[12] On January 15th, 1997, the normative instruction number one of the Brazilian National Treasury Secretariat established on chapter six, article 21, that the grant to be allocated to the public projects should be transferred obeying the schedule that was previously proposed and approved by the central government.

[13] See, for example, Modzeleski (2017).

municipalities. Therefore, we group our variables at the municipality level to estimate

$$\bar{Y}_{mt} = \alpha_0 + \beta_0 \bar{S}_{mt} + \eta_m + \phi_t + \bar{e}_{mt}, \tag{2}$$

where $\bar{Y}_{mt}$ is the average benefit across legislators associated with the municipality m at time t, $\bar{S}_{mt}$ is the share of legislators associated with region m at period t who are aligned to the President, and $\bar{e}_{mt}$ is the grouped error term. The estimates of Eq. (2) yield the same coefficients as the estimation of Eq. (1) as long we weigh the observations by the number of legislators in each municipality.[14] Note that any omitted variable in Eq. (1) is grouped within $\bar{e}_{mt}$. Then, an ordinary estimation of Eq. (2) could lead to biased estimates as confounding variables may be omitted. For example, the political engagement of the voters may affect both the share of aligned legislators elected and the time to receive transfers. We estimate a two-stage least squares (2SLS) to avoid such bias. The first step is

$$\bar{S}_{mt} = \alpha_1 + \beta_1 EV_{mt} + \eta_m + \phi_t + \epsilon_{mt}, \tag{3}$$

where EV_{mt} indicates whether municipality m used Electronic Voting (EV) technology in year t. Since our main results are estimated using only two years, the two-ways fixed effect model in Eq. (3) is equivalent to a difference-in-difference model. Our simultaneous equation model is

$$\begin{aligned} \text{[Second Stage]} \quad & \bar{Y}_{mt} = \alpha_0 + \beta_0 \bar{S}_{mt} + \bar{X}'_{mt}\gamma + \eta_m + \phi_t + \bar{e}_{mt}; \\ \text{[First Stage]} \quad & \bar{S}_{mt} = \alpha_1 + \beta_1 EV_{mt} + \bar{X}'_{mt}\gamma + \eta_m + \phi_t + \epsilon_{mt}, \end{aligned} \tag{4}$$

where $\bar{X}_{mt}$ is a vector of controls such that the conditional independence assumption

$$cov(\bar{e}_{mt}, EV_{mt} | \bar{X}_{mt}) = 0,$$

holds. We discuss the validity of this assumption below.

In sum, Eq. (2) provides a naïve model since it does not account for omitted variables bias. Eq. (4) corrects for such problems and gives us the causal relationship between political alignment

[14] See Angrist (1991) and Lleras-Muney (2005) for examples of grouped data estimates.

and political benefits.

In Section 5, we extend our main estimates to include information from 1994. In this case, we also estimate Eq. (2) in differences to avoid the influence of the municipalities fixed effect such that

$$\Delta \bar{Y}_{mt} = \alpha_t + \beta_0 \Delta \bar{S}_{mt} + \nu_{mt}, \tag{5}$$

where $\alpha_t = \Delta\phi_t$ and $\nu_{mt} = \Delta\bar{e}_{mt}$. Thus, changes in the average benefits received by legislators are caused by changes in the share of aligned associated legislators. We also estimate a 2SLS using the equations in difference such the simultaneous equations model is

$$\begin{aligned} \text{[Second Stage]} \quad & \Delta \bar{Y}_{mt} = \alpha_t + \beta_0 \Delta \bar{S}_{mt} + \Delta \bar{X}'_{mt}\gamma + \nu_{mt}; \\ \text{[First Stage]} \quad & \Delta \bar{S}_{mt} = \alpha_d + \beta_1 \Delta EV_{mt} + \Delta \bar{X}'_{mt}\gamma + \nu_{mt}. \end{aligned} \tag{6}$$

3.2 Data

Data on candidates' affiliation and the number of voters for our primary sample, containing the election years of 1998 and 2002, was collected from the *Tribunal Superior Eleitoral* (TSE). Our principal analysis omits 1994 for two reasons. First, the data regarding the legislator's affiliation is available only for ten states out of 27. Moreover, the period between 1994 and 1998 is relatively unstable in what regards fiscal federalism. The main reason for that is the partitioning of many municipalities: Between 1994 and 1997, 533 new municipalities were created in Brazil, representing 10% of municipalities in 1997. In contrast, only 54 municipalities were created between 1998 and 2001. We still perform the analysis using 1994 information in Section 5. The results are unchanged.

The information regarding both the time to transfer and the volume of *convênios*, in Brazilian Reais (BRL), is from the Comptroller General of Brazil (CGU), a branch of the Brazilian government responsible for public audits, internal control, and other activities aimed at avoiding corruption. The data details the date a project was approved, the total amount of money it needed, whether it was finished or not, the days it took to be completed, and the date the municipality received the transfer from the central government.

Dependent Variable

As discussed previously, we use the readiness in transferring funds to measure the benefits provided by the executive branch towards legislators. We use the average time to transfer relative to the deadline to finish the project such that

$$\bar{Y}_{mt} = \frac{1}{P_{mt}} \sum_{p=1}^{P_{mt}} \frac{\text{number of days to transfer grants}_{pmt}}{\text{number of days to finish the project}_{pmt}},$$

where P_{mt} is the amount of grants transferred to municipality m in period t. The period encompasses the four years legislators are accountable for the grants, which are the three last year of their mandates plus the following year. For example, for the electoral cycle whose election happened in 1998, we set $t = 1998$ and construct the dependent variable using grants starting in between 2000 and 2003. We exclude the first year because grants executed in the first year were approved by the legislators elected in the previous electoral cycle.[15]

We use the ratio of time-to-transfer to the deadline because it lets us weigh the transfer's readiness on the complexity of the project. It may take longer to transfer funds for more complex projects since it may take more time to review the application. Such projects also take more time to complete. The ratio controls for this variation in the time that is not related to the legislator's party. Note that we average the ratio on the number of projects instead of the number of associated legislators. This choice maintains the interpretation of the ratio as an average over projects.[16]

Explanatory Variable

The variable of interest is the share of legislators associated with a municipality who are politically aligned with the president. However, assigning associated legislators for each city is challenging since each state acts as a multi-member district. Therefore, *de jure*, each legislator should represent their state, not distinguishing between municipalities within it. Nonetheless, because electoral campaigns are costly, it is uncommon for legislators to seek votes throughout

[15] We obtain the same conclusions when we exclude the last year from the construction of the dependent variable. The results are presented in the online appendix.

[16] We also estimate the models using the average number of days to transfer. The results are unchanged and are available in the online appendix.

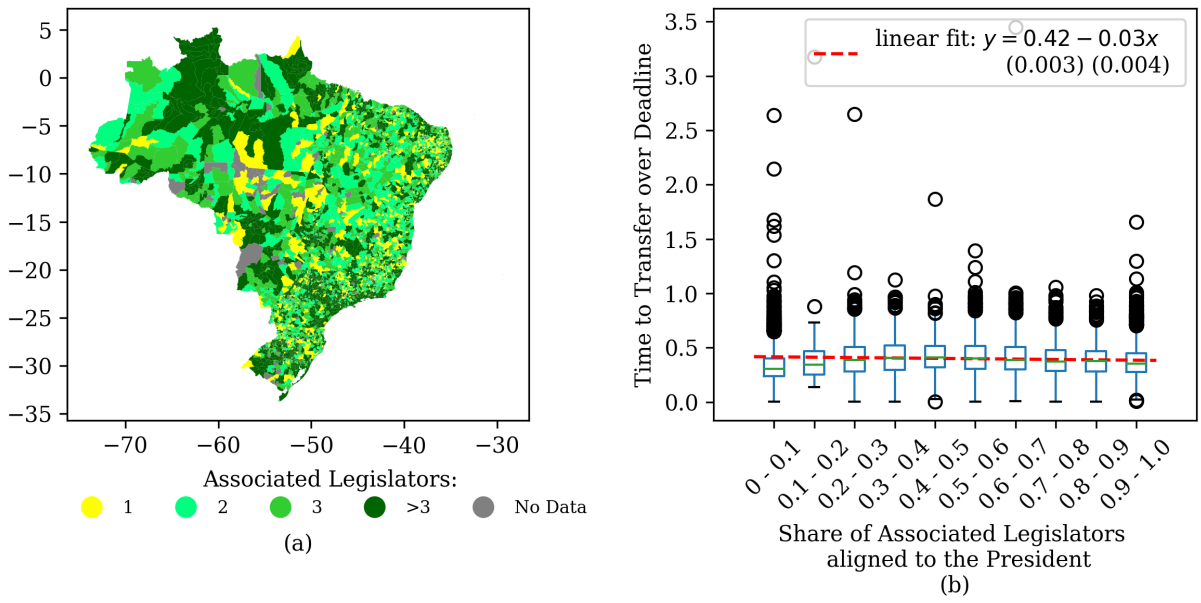

Figure 2: Spatial distribution of associated legislators and the correlation with time to transfer

the state. They mostly concentrate campaigning efforts in some municipalities within their states, which become their *de facto* constituencies (Ames, 1995, 2001). As shown by Firpo et al. (2015), these are the areas that they *de facto* represent, and so they allocate to them their discretionary part of the federal budget.

Following Firpo et al. (2015), we assign to each municipality their respective associated candidates.[17] A crucial detail is that, in Brazil, what matters for co-partisanship is the coalition rather than the party. A coalition is a group of parties that support executive candidates. Therefore, we define a legislator to be aligned if he or she is in the coalition that supports the president (Brollo and Nannicini, 2012).[18]

Fig. 2 depicts both the spatial distribution of associated legislators and their correlation with the time to transfer in 1998. All municipalities had at least one associated candidate. 16.2% of municipalities had one associated legislator. Municipalities with two associated candidates account for the largest share (26%) followed by municipalities with three associated legislators (22.2%). Given a large number of municipalities with less than four associated legislators, we

[17] Firpo et al. (2015) defines associated candidates, for municipality m in election year t, as the representatives elected in year t and which rank in the city m and election year t is smaller than the number of effective candidates in municipality m and election year t.

[18] The coalition that supported the president elected in 1998 was formed by the following political parties: PSDB, PMDB, PFL, PPB, PTB, PSD. The following parties built the coalition that supported the president elected in 2002: PT, PDT, PPS, PV, PL, PCdoB, PMN, PCB, PPB, PTB.

observe clusters in the share of aligned legislators in 0, 0.33, 0.5, 0.66, and 1. Concerning the funds, there were only 29 projects whose grants were overdue.[19] On average, grants are transferred after 38% of the days to the deadline. A linear fit suggests a negative correlation between the share of associated legislators aligned and the time to transfer. That supports the hypothesis that the executive branch of the government favors co-partisan politicians.

3.3 Identification Strategy

We use the introduction of electronic voting (EV) as an exogenous shock to the share of aligned associated legislators. EV positively impacted the support for left-wing candidates. Next, we argue that the EV impact on ideological choice also changed the alignment between the legislative and executive branches.

Fig. 3 provides visual evidence of the effects of EV on the political alliance. We group it into two groups, the municipalities that had EV in 1998 – which we call treatment group – and the remaining ones – the control group. Between 1994 and 1998, there was a strong trend toward alignment since the incumbent president was running for reelection. However, the municipalities that introduced EV in 1998 elected more unaligned legislators than the control group. In 2002, the trend was towards decreasing alignment, since the worker's party had a candidate elected for the first time in history. However, again, the group using EV for the first time in 2002 exhibits larger misalignment relative to the other group. In 2006, the trend was towards alignment since the incumbent president was running once again. Importantly, starting in 2006, the share of aligned associated legislators is similar between the groups.

A formal relationship between the percentage of aligned associated legislators and the introduction of EV is presented in Table 1. It pertains to the first stage regression of our main specification. Namely, we consider two electoral cycles – 1998 and 2002 – and observations are weighted by the number of associated legislators. An ordinary least squares regression shows that the introduction of EV reduced the share of aligned legislators in 36.2%. The effect is milder but still substantial when we include fixed effects of election year and municipalities. The coefficient is unchanged when we control for the volume of grants and the size of the electorate. The F statistic of the excluded instrument reinforces the instrument's relevance given that it is far

[19] We omit the few projects with negative times to transfer.

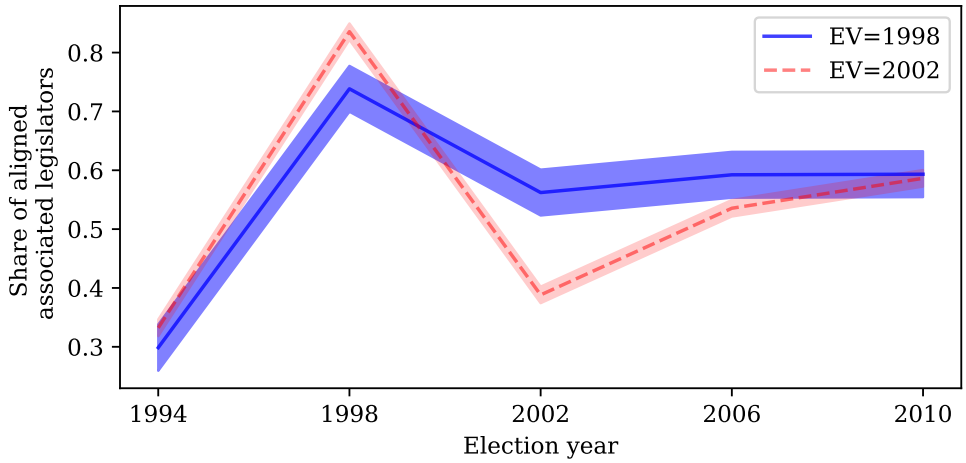

Figure 3: Evolution of Aligned Legislators

Note: Each line represents an estimation of the time trend of the share of aligned associate with a 99% confidence interval. The blue line only includes the sample of municipalities using EV for the first time in 1998, while the red line includes the remaining municipalities.

above the rule-of-thumb of 10.

Fig. 3 and Table 1 provide strong evidence in favor of the inclusion restriction. Next, we discuss the exclusion restriction. A valid instrument requires EV_{mt} to be uncorrelated with any omitted variable in $\bar{e}_{mt}$. Although the introduction of EV is a largely exogenous event and it is implausible that it would affect the time to transfer directly, its adoption in 1998 was determined by the size of the electorate. Therefore, if the number of voters explains the time to transfer resources, EV is correlated with the error term. To avoid such bias, we add the log of the number of voters per associated legislator as a control variable. Additionally, Schneider et al. (2020) show that the introduction of EV increased the volume of grants sent from the federal government to local branches. Therefore, we control for the average size of grants per associated legislator (in log).

The size of the electorate and the volume of grants are added as controls to safeguard the conditional independence assumption. In fact, the estimates show that adding these variables to our regressions changes the coefficient of interest only slightly. One may think that the introduction of EV represented a drastic change in Brazilian politics, and there must be other dimensions through which EV_{mt} correlates to $\bar{e}_{mt}$. However, it is important to recall that EV only affects the election of legislators since casting a vote for executive candidates using the old paper ballot

Table 1: First Stage Regression

	OLS	FE	FE
Dependent Variable: Share of Aligned Legislators			
Used EV (Yes=1; No=0)	−.362***	−.252***	−.255***
	(.005)	(.016)	(.016)
Controls	No	No	Yes
Observations	9760	9760	9760
F Statistics (Excl. Inst.)		249.930	255.100
States	26		
Municipalities		4880	4880
Electoral Cycles		2	2

Robust standard errors in parentheses. FE models include electoral year and municipalities fixed effects and clustered errors at the municipality level. OLS includes state fixed effects. Control variables are the value of grants and the number of voters per associate legislator in log. All models weigh observations by the number of associated legislators. $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

required only checking a box beside the candidate's name and code. Therefore, EV does not impact the median voter of the executive elections. That is what creates the shock in political alignment in the first place. By adding the volume of grants, we control for a change in the behavior of elected legislators that could potentially impact the time to transfer resources. Given the literature on EV introduction in Brazil, this is the central aspect that could violate the exclusion restriction.

We still need to guarantee that the usage of EV in 1998 is not correlated with any precondition that makes these municipalities more likely to be unaligned with the central government. In other words, we need to provide evidence that municipalities in the treatment and control groups are comparable. Ideally, we would show that the trends of treatment and control groups are parallel over time. However, there is no data available before 1994, which makes the analysis of parallel trends unfeasible. Nonetheless, the fact that the control group was treated in 2002 lets us produce evidence against the existence of confounding preconditions.

We separate our 2SLS analysis into three periods: 1998, 2002, and 2006, considering each year individually. Table 2, column 1, shows that the treatment group had a smaller share of aligned legislators elected in 1998 compared to the control group. In the second column, however, we find that these same municipalities had a larger share of aligned legislators elected in 2002 relative to the control group. The absolute value of both coefficients is similar, which represents

Table 2: Treatment, Control, and Placebo

	1998	2002	2006
Dependent Variable: Share of Aligned Legislators			
Used EV (Yes=1; No=0)	−.108***	.109***	.007
	(.011)	(.014)	(.013)
Controls	Yes	Yes	Yes
Observations	3936	3936	3936
F Statistics (Excl. Inst.)	91.810	62.710	.250
States	26	26	26

Robust standard errors in parentheses. All years contain state fixed effects. Control variables are the value of grants and the number of voters per associate legislator in log. All models weigh observations by the number of associated legislators. $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

a bouncing-back effect. This effect mitigates concerns about variables other than EV itself that could be causing a shift in the share of aligned legislators. Moreover, as a placebo, we analyze the 2006 elections when all municipalities had already *de facto* enfranchised all voters in legislative elections. We find no difference in the share of aligned legislators across municipalities caused by treatment status in 2006. These findings reinforce our argument that municipalities in the treatment and control groups are comparable.[20]

4 Results

Results are presented in Table 3. For all models, estimates give more weight to observations with more associated legislators.[21] The table presents the evaluation of β_0 for four different models. Column 1 shows OLS estimates. From Columns 2 to 4, all models control for time and municipality fixed effects. Column 2 pertains to our naïve model that neglects omitted variable bias. Columns 3 and 4 use EV as an instrumental variable for the share of aligned legislators. Column 4 is identical to Column 3 except for the fact that it controls for the volume of grants and the size of the electorate.

All columns are estimated using a sample of 4880 municipalities with all data available for

[20]Still, a concern may arise from the fact that the treatment group includes the largest cities of the country. We perform the empirical exercise restricting the sample to municipalities with less than 50,000 voters in 1996. The results are qualitatively identical.

[21]The conclusions stand when we perform the analysis assuming the same weights for all municipalities. The results are presented in the online appendix.

Table 3: The effect of alignment on the time to transfer

	OLS	FE	IVFE	IVFE
Dependent Variable: Time to Transfer				
Share of Aligned Legislators	−.135***	−.060***	−.318***	−.309***
	(.005)	(.007)	(.047)	(.045)
Controls	No	No	No	Yes
Observations	9760	9760	9760	9760
F Statistics (Excl. Inst.)			249.930	255.100
States	26			
Municipalities		4880	4880	4880
Electoral Cycles		2	2	2

Robust standard errors in parentheses. FE and IVFE models include electoral year and municipalities fixed effects, and clustered errors at the municipality level. OLS includes state fixed effects. IVFE models use the share of aligned legislators as instrument. Control variables are the value of grants and the number of voters per associate legislator in log. All models weigh observations by the number of associated legislators. $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

the election years of 1998 and 2002. For the instrumental variables models, we present the F statistic of excluded instruments, which, in our case of a just-identified model, is equivalent to the Kleigerben-Paap F-statistics (Kleibergen and Paap, 2006). The first-stage F statistic exceeds 200 for all instrumental variable models, suggesting that our instrument is quite strong, given that a conservative rule-of-thumb requires F statistics above 10.

The results reveal a robust negative relationship between political alignment and the time it takes to transfer grants. Nonetheless, the naïve model severely underestimates the partisan effects. The naïve model implies that aligned politicians transfer grants sooner, reducing the time to transfer by about 6% of the time to the deadline for transferring funds than unaligned politicians. However, unbiased estimates suggest that these numbers are far higher: Aligned politicians receive grants 30% of the deadline earlier than unaligned politicians.

Our results suggest that attenuation bias due to measurement error reduces the estimated magnitude of our effects; the instrumental variable model corrects this. Our measurement of political alignment is at the legislator level, but we only have information on budget amendments at the municipality level, so we had to aggregate our time-to-transfer data, which imperfectly captures individual legislator effort to execute budget amendments. Note that the inclusion of the controls alters only slightly the estimates. This result is expected due to the constitutional

nature of the grant studied and by the fact that the size of the electorate explains EV introduction only to the extent that the number of machines was limited.

Our findings are politically significant. They suggest a reduction in transfer time to aligned legislators equal to one-third of the time to the transfer deadline, or roughly two standard deviations of the sample used. In 2002, grants were transferred in about 38% of the time to the deadline, while the alignment effect estimated suggests a reduction of about 30% of the deadline. To gain perspective on the findings, we use the fact that for municipalities with only unaligned legislators, on average, it took 46% of the time-to-deadline to transfer funds. Our results suggest that if instead, these municipalities had only aligned politicians, it would only take 16% of the time-to-deadline to transfer funds. Given an average deadline of 860 days to complete the project, the alignment effects are of the magnitude of 258 days or almost nine months.

This 9-month period constitutes about 20% of a legislator's mandate. Such a long time to transfer resources likely hurts legislators' reelection prospects since public projects may not be finished on time for the election. These projects facilitate vote gathering during political campaigns as legislators receive credit. Therefore, quick delivery of funds for public projects constitutes a real benefit for federal representatives. It is also likely that this revealed mechanism harms local regions' development, as municipalities in need of public infrastructure are neglected when politicians are not in the president's coalition. Our analysis highlights how political motives can add inefficiencies to fiscal federalism.

5 Robustness and Interpretation

Extended Sample We can also use information from the electoral cycle of 1994 as robustness to our results. We only have data from 15 states out of 27, and we exclude municipalities create between 1994 and 1998 from the analysis. After the adjustments, there are 2368 municipalities in the extended sample. However, since the time dimension increases, the total observations is now 7104. With three periods, we also present estimates using a first-difference model.

Table 4 presents the results. In general, the conclusion is the same: the larger the share of aligned legislators, the faster the grants are transferred to municipalities. Again, the naïve models underestimate the influence of aligned legislators. Both the two-way fixed effect model

Table 4: The effect of alignment on the time to transfer including 1994

	OLS	FE	FD	IVFE	IVFE	IVFD
Dep. Var.: Time to Transfer						
Share of Aligned Legislators	−.019**	−.045***	−.043***	−.229***	−.242***	−.241***
	(.006)	(.007)	(.008)	(.057)	(.057)	(.056)
Controls	No	No	No	No	Yes	Yes
Observations	7104	7104	4736	7104	7104	4736
F Statistics (Excl. Inst.)				82.240	81.432	82.045
States	15					
Municipalities		2368		2368	2368	
Electoral Cycles		3	2	3	3	2

Robust standard errors in parentheses. FE, IVFE, FD, and IVFD models include electoral year and municipalities fixed effects, and clustered errors at the municipality level. OLS includes state fixed effects. IVFE and IVFD models use the share of aligned legislators as instrument. Control variables are the value of grants and the number of voters per associate legislator in log. All models weigh observations by the number of associated legislators. $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

and the first-difference model suggest a negative effect of around 4%. When we use the EV as an instrument, the coefficients increase to close to 24%. These numbers are also remarkably close to the ones presented in Table 3 such that the estimated political impact is similar between both samples.

Can the executive target mayors instead of legislators? An alternative hypothesis that could hinder our interpretation is that the executive may want to disproportionately hurt mayors of municipalities that used EV for the first time in 1998. In 2000, for the first time since Brazilian re-democratization in the late 1980s, local executive positions were allowed to run for reelection. If municipalities using EV were also places where mayors seeking reelection were more likely to be unaligned with the executive, then our results might capture a punishment of local authorities and not the political misalignment between the executive and legislative politicians at the federal level, as we claim. In this sense, the executive branch would tie the hands of mayors seeking reelection in 2000 by delaying the transfers of grants in that election year. However, splitting our sample within years to capture cyclical behavior in the time to transfer yields inconsistent results with this alternative hypothesis.

Table 5 shows that the delay of transfers is reasonably similar across all years during an electoral term. To construct this table, we transform our dependent variable to include only grants

Table 5: The effect of alignment on the time to transfer - Yearly

	Second Year	Third Year	Fourth Year
Dependent Variable: Time to Transfer			
Share of Aligned Legislators	−.253*	−.303**	−.268***
	(.116)	(.093)	(.068)
Controls	Yes	Yes	Yes
Observations	5900	5642	7442
F Statistics (Excl. Inst.)	140.840	147.330	170.240
Municipalities	2950	2821	3721
Electoral Cycles	2	2	2

Robust standard errors clustered at the level of municipality in parentheses. All models include electoral year and municipalities fixed effects. All models use the share of aligned legislators as instrument. Control variables are the value of grants and the number of voters per associate legislator in log. All models weigh observations by the number of associated legislators. $^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$

starting in either the second, third or fourth year of a legislator's mandate.[22] The results are not driven by any specific year, i.e., there is no electoral cycle in the time to transfer grants. In fact, the effect is similar for all years, suggesting continuous favoritism of aligned legislators. Although the lack of cyclical behavior does not preclude the possibility of hurting local authorities, it certainly weakens it. In particular, the second year of the mandate of federal representatives is a critical electoral year because there were local elections across Brazil, and all municipalities were electing mayors.

[22]Recall that in the first year the grants were approved by the previous legislator holding the chair.

6 Conclusion

Our paper uncovers a novel mechanism by which politicians manipulate intergovernmental grants to support aligned politicians: the speed with which grants are transferred. We investigate a specific type of grant that only legislators have discretionary power over. However, the executive branch is responsible for executing the grants, and it can speed up or slow down the process. Our findings suggest that legislators aligned with the governing party have their grants transferred about 30 percentage points faster relative to the deadline than unaligned legislators. A back-of-the-envelope computation reveals that unaligned legislators transfer grants nine months later than fully aligned legislators.

Our results indicate that the executive branch uses the time to transfer to reward allies and maintain their loyalty to control the majority in congress. In practice in Brazil, the executive needs to worry about keeping aligned politicians loyal, since, as Rodden and Arretche (2005) note, "executive coalitions are frequently different from legislative coalitions, and because their electoral fates are not mutually dependent, legislators – even those sharing the presidents party label – face weak incentives to support the presidents legislative agenda."

From a public finance perspective, our paper stresses inefficiencies that can arise from the decentralized expenditure. The classical trade-off between efficiency and equity is reflected within the option of local vs. central governments' spending of tax revenue. While the former can spend the money more efficiently, the latter can reallocate focusing on more equal distributions of resources across the country. This result relies on the premise that legislators know better the needs of their voters than the executive. However, even if this is true, since political motives alter the allocation of legislators' resources at the local level (Ames, 2001; Firpo et al., 2015; Finan and Mazzocco, 2016), intergovernmental transfers are also biased hindering efficiency. Our findings show that, even if one overcomes the political motivation behind intergovernmental transfers by arguing that local authorities will spend this money more efficiently than the central government, there is always the possibility of additional inefficiency arising from misalignment between the executive and legislators at the federal level. As we show, this political misalignment results in delays of transfers to locales that showed larger political support for unaligned congress members.

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