Does Political Party Matter? Evidence from Close Races for *Mais Médicos para o Brasil*[*]

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Abstract

Does the federal government prioritize its local's allies on the provision of public resources? Using a regression discontinuity design in close elections and data of the *Projeto Mais Médicos para o Brasil* − an ongoing program from the Brazilian Ministry of Health that targets the provision of basic health services and the increase of the physicians per capita rate by transferring professionals to the Brazilian municipalities −, this paper assesses the impact of the political alignment between federal and local governments on the number of physicians transferred to municipalities and the municipalities' probability of participation. The results suggest that the current federal government does not prioritize same-party municipalities nor penalizes the ones governed by the opposition parties. Evidence also indicate poor targeting of the program and the existence of party alignment effect on municipal participation among municipalities governed by second term mayors.

JEL Codes: D72, D78, H77.

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Introduction

There is a body of evidence on the benefits of decentralization of health services. Programs that lead primary care to local communities have contributed to the inclusion of a large number of poor households to the public health system. This type of intervention is often low cost and relieves traditional mechanisms of provision of health services, such as public hospitals. Chen et al. (2004) and Anand and Bärnighausen (2004), for example, found a positive correlation between the density of medical and health outcomes with a cross-country analysis. For Brazil, Rocha and Soares (2010) present evidence on the effectiveness of the *Programa Saúde da Família* (Family Health Program), which aims to provide primary care teams in the various communities. According to the authors, the program from Ministry of Health affects the communities in which it was implemented via the reduction of infant mortality, increased adult labor supply and school enrollment.

On July 8, 2013 it was launched the *Projeto Mais Médicos para o Brasil* (More doctors for Brazil), program also from the Ministry of Health that aims to increase medical density (ratio medical/inhabitants) in Brazilian municipalities. The program was based on the diagnosis that there is a huge disparity in the distribution of physicians throughout Brazil (Brasil, 2013). To address the problem, the project made a public call for primary care physicians to transfer them to the public health systems of Brazilian municipalities, constitutionally responsible for basic care health provision.

With its announcement, however, the medical associations and part of the Brazilian public opinion were against the program claiming both its ineffectiveness as its political use by the federal government. Opposition parties were against importing Cuban doctors (63 % of program participant doctors)[1]. Even extreme arguments as the implementation of a communist agenda in the interior of Brazil through the doctors came to be published in the media.

In this work, I delimit the Program More Doctors as an intergovernmental in-kind transfer and try to assess whether there is a political use of the program. The transfer of the doctor to the municipality, at bottom, is a limiting case of conditional transfers. That is, rather than transferring a monetary resource conditioning it to a specific expenditure, it transfers the public good to be offered. The political use of intergovernmental transfers is a subject already widely discussed by fiscal federalism literature and several works that seek both to model and to estimate such use. A strategy that has been used in the literature to give a measure to the political use of transfers is to estimate the effect of a receiving location to be

[1]Table A.2 presents the nationality of most of the physicians from the program.

governed by the same party of the grantor, that is, estimating the effect of party alignment. This paper therefore proposes to estimate this effect for the *Mais Médicos* program.

I use a Regression Discontinuity Design (RDD) approach in close elections, an increasingly adopted strategy because of its milder assumptions and the fact that it explores a more credibly exogenous source of data variation than traditional methodologies. The data used in the research involves information of the Program More Doctors, municipal elections data and general characteristics of municipalities and elected officials.

The obtained results indicate that the federal government does not favor aligned municipalities transferring more doctors and also does not punish municipalities governed by opposition transferring fewer doctors, common results in the literature of politically motivated transfers. Moreover, it is shown that the participation of municipalities in the program is not impacted by the party in power in the city government.

By analyzing heterogeneous effects of partisan alignment for different municipalities of the sample, the study shows that for municipalities governed by the incumbent party, medical density leads to an increase in the average amount of transferred doctors, signaling a problem of lack of focus in the program. Moreover, among the municipalities with candidates in 2nd term, being aligned to the federal government increases participation in the program by at least 15.8 percentage points (p.p.), while among the municipalities governed by other parties, being in 2nd term reduces participation in at least 16.5 p.p..

The rest of the paper is organized as follows. The first section discusses the literature in witch this article is part and the contributions made in this paper. The second section deals with the institutional aspects of the program. In the third section it is presented the database and the methodology adopted. They still discuss the assumptions and estimates to be made. The fourth section discusses the results obtained. Finally, it is made some final remarks, completing the paper.

1 Literature Review

Intergovernmental transfers are part of the daily life of any federation and its allocation is a permanent issue in fiscal federalism literature. We will then have a brief review of the approaches given to the subject before discussing specifically the type of problem that this work is part of: estimate the impact of partisan alignment on the level of intergovernmental transfers.

The first systematic approaches given to allocation of intergovernmental transfers in a federation use the theoretical and normative tools of welfare analysis and postulate that government transfers should be determined by criteria of efficiency and equity. Transfers from central government to local governments guarantee the provision of different public goods to heterogeneous populations (efficiency) and a minimum level of basic services in different jurisdictions (equity) (Oates, 1972, 1999; Musgrave, 1959). Besides, the centralized taxation along with the regional redistribution of resources reduces typical inefficiencies caused by the local tax collection: free-rider behavior and fiscal war (Inman and Rubinfeld, 1996).

Despite its power of public policy prescription, empirical evidence shows that such normative approaches have little explanatory power. Inman (1989), for example, shows that the allocation of federal transfers between the states in the United States do not seem consistent with such prescriptions.

More recent studies move the problem from the normative field to the positive one by incorporating typical political economy frameworks. Specifically, it is removed the implicit assumption in the traditional models of the existence of a benevolent central planner. Policymakers are now agents maximizing an objective function. Political parties, for example, can act opportunistically, seeking to maximize their chance of re-election or the number of votes received.

To characterize the existing political incentives in the allocation of transfers, several studies used electoral competition models in order to test such effects. Works such as Case (2001), Strömberg (2002) and Johansson (2003) test the hypothesis that central governments allocate more transfers to locations where there is a larger share of voters not associated with any party (swing-voters), a result derived from Lindbeck and Weibull (1987) and Dixit and Londregan (1998). Dahlberg and Johansson (2002) further test this hypothesis against an alternative one: the candidates, risk averse, end up prioritizing their core supporters, a result from Cox and McCubbins (1986). According to the authors, the evidence supports the theory that candidates use tactically transfers prioritizing swing-voters. Such studies, however, do not address a fundamental question of a federations' routine: municipalities have their own administration and may therefore have governments with non aligned parties.

There are at least two reasons to believe that the allocation of intergovernmental transfers will be higher for municipalities governed by aligned parties. On the one hand, the party in power in the central government has incentives to punish municipalities governed by opposition parties (decreasing transfers) and reward municipalities aligned ones (increasing transfers). On the other hand, voters may not know from whom the resource is coming: whether the central or local government. Under this hypothesis, the grantor may get little

or no political credit for it and end up transferring more resources to aligned municipalities. However, if the central goverment is able to get the electoral credit for the transfer, it may be profitable to distribute resources to the municipalities governed by opposition parties.

In an attempt to estimate an effect of partisan alignment on the level of transfers, the strategy adopted by many of the early studies was what is commonly known as the hypothesis of selection on observables. Grossman (1994) and Levitt and Snyder (1995) present evidence to the United States that controlling for socioeconomic characteristics and state policies, the partisan alignment in the state government impacts the amount of incoming transfers. For Australia, Worthington and Dollery (1998) examine the distribution of transfers comparing propositions from the traditional models (Oates, 1972, 1999) and the politically oriented models (Grossman, 1994). The authors also find evidence of tactical use of resources.

More recent studies use panel data methods, controlling the estimates by fixed effects of location and unobservable variables that are time-invariant. Berry et al. (2010), for example, use estimators of fixed effects for US data and show evidence that districts where lawmakers are the chairman of the party receive more resources. For data of Spain, Solé-Ollé and Sorribas-Navarro (2008) make use of estimators of differences in differences in time and levels of government and give evidence that municipalities aligned with the two tiers of government (state and central) receive more transfers than non aligned ones.

It is possible, however, that there are still time-varying unobservable factors that could bias the estimates obtained with such methodologies. To solve this problem, some novel studies have used discontinuous regression models to estimate the impact of partisan alignment on the level of intergovernmental transfers.

In fact, the use of Regression Discontinuity method has become an increasingly recurrent tool as an identification strategy and has proved to be effective on solving endogeneity problems. In the political economy field, for instance, several studies have used this methodology to identify the effect of the incumbent political party on policy variables (Lee et al., 2004; Lee, 2008; Pettersson-Lidbom, 2008; Ferreira and Gyourko, 2009; Troustine, 2011; Gerber and Hopkins, 2011; Albouy, 2013). This strategy makes use of the *quasi-experiment* generated by elections won by small margins of votes, as will be discussed later in the text.

For Brazil, there are two papers that dialogue directly with the above literature. Ferreira and Bugarin (2007) analyze the effect of partisan alignment on intergovernmental transfers associated with political budget cycles. According to the authors, there is a political bias in voluntary transfers, which are partly explained by political identification between the mayor of the municipality and the state and/or federal governments. Sakurai and Theodoro

(2014) apply the model developed by Solé-Ollé and Sorribas-Navarro (2008) to Brazil, taking advantage of the fact that both Brazil and Spain have a federation with three levels of government. The authors find evidence that partisan alignment positively influences the decision of allocation of capital transfers to municipalities.

There are two papers we consider to be particularly similar to ours in this literature, since both use RD to estimate the effect of partisan alignment between central and local governments on intergovernmental transfers. Migueis (2013) uses data from Portuguese municipalities from 1992 to 2005 to estimate the effect of party alignment on the level of discretionary federal transfers to municipalities. The author presents the result that aligned municipalities receive on average 19% more discretionary transfers than unaligned municipalities. Brollo and Nannicini (2012) do the same type of exercise for Brazil. The authors use data of voluntary transfers from the central government to municipalities and find evidence that the federal government penalizes municipalities governed by opposition coalition parties in pre-election years.

An additional literature with which we dialogue presents the trade-offs between in-kind transfers and in-cash transfers. Currie and Gahvari (2008) make a good review of the main explanations for the existence of transferring of goods directly. For our study, it seems that the thesis of Paternalism, first suggested by Musgrave (1959) explains the existence of the intergovernmental in-kind transfer: the federal government, by transferring a primary care doctor assumes to know better than their local countepart the municipality's needs.

Our work gives two contributions to the literature discussed. The first contribution comes from the fact that we analyze a limit case for most of the models of intergovernmental transfers (Brollo and Nannicini, 2012; Solé-Ollé and Sorribas-Navarro, 2008; Arulampalam et al., 2009) when we evaluate an in-kind transfer. As already raised, depending on the knowledge of voters about the source of the transfer, it may be convenient to the grantor (Federal Government) to transfer more resources to align municipalities (voter does not distinguish between transfers and other local revenues) or to ignore which party governs the municipality (voter knows that the resource comes from the central government). In our case, the intergovernmental transfer is in-kind (a medical service is transferred) and the program received wide publicity, which beforehand allows us to assume that the federal government reaps political/electoral outcomes from the transfer. Moreover, as already suggested, there's an open research agenda on the possible trade-offs between intergovernmental in-cash and in-kind transfers, subject, in our knowledge, hitherto unexplored.

The second contribution of our work is to analyze the intergovernmental transfer from the local government's point of view (the transfer receiver). The municipalities have to enroll

in the program to receive doctors for their health system. We can therefore analyze how the party in charge of the municipal government influences its decision of participanting in the program.

2 Institutional Background

In this section I discuss relevant institutional aspects of the research. Firstly, I present some elements of the Brazilian political system. Then, some aspects of the *Mais Médicos* program.

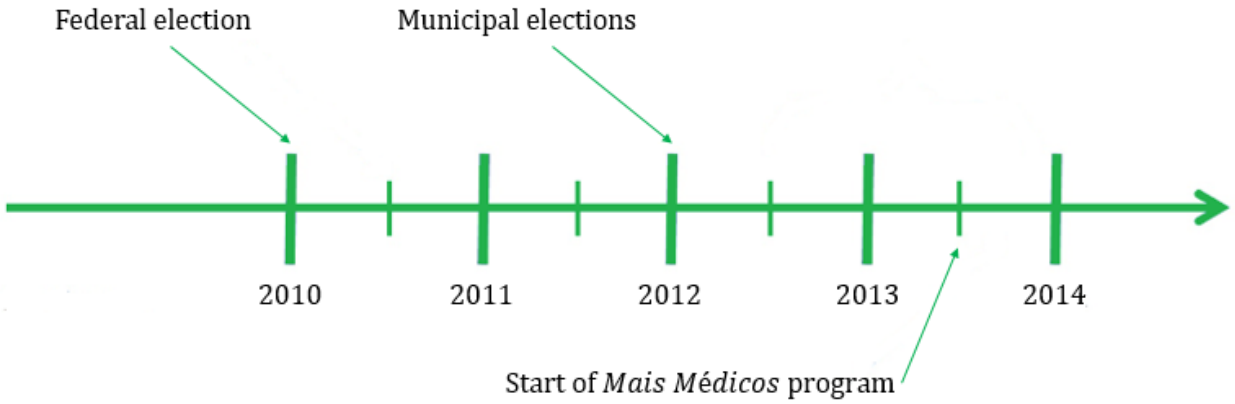
2.1 Brazilian Political System

Brazil is a federation with three levels of government (federal, state and municipal) and has one of the most decentralized systems of provision of public goods in the world (Ferraz and Finan, 2011). The taxation system, on the other hand, is highly centralized and therefore there is in Brazil high levels of intergovernmental transfers. In 2014, for example, approximately R$ 205 billion[2] were transferred from the federal government to local governments.

The Brazilian territory is divided into 5,570 municipalities, which are subjected to simultaneous elections for mayors every four years. Elections of the federal government and state governments also take place every four years, with two years difference to the municipal elections. The Figure 1 below shows a timeline of relevant events to our research. In October 2010 Dilma Vana Rousseff was elected president for the *Partido dos Trabalhadores* (Worker's Party). The last municipal elections previous to *Mais Médicos* took place in October 2012. The program starts in mid-2013.

[2]Data from Brazilian National Treasury. In US dollars, $62 billion.

Figure 1: Timeline of electoral cycles and *Mais Médicos* program



Brazil has a highly fragmented party system, currently with 33 parties. However, few of these are presented as strong parties on the national scene. Since 1994 only two parties elected presidents of the republic. In 1994 and 1998 the *Partido da Social-Democracia Brasileira*, PSDB (Party of Brazilian Social Democracy) elected Fernando Henrique Cardoso. In 2002 and 2006 PT elected Luiz Inácio Lula da Silva and in 2010 and 2014 PT also elected Dilma Vana Rousseff, the current president.

Power and Zucco (2009) argue that PT x PSDB polarization in elections is not a reflection of an actual ideological polarization. After all, according to the authors, PT is traditionally associated with the left platforms, while PSDB with a center-left platform. Table 1 below shows the ideological distribution of some of the major Brazilian parties, as defined by the authors.

Table 1: Aproximate ideological distribution of brazilian parties

Left	Center	Right
PCdoB PT	PSDB	PL⋆
PSTU PCB* PDT	PMDB	PTB PFL*⋆ PRN*⋆
PSOL PSB		PDC*

Notes: Table extracted from Power and Zucco (2009). ∗ Non-existent parties. ⋆ PFL (Liberal Front Party) was renamed DEM (Democrats) in 2007 and PRN (Party of National Reconstruction) was renamed PTC (Christian Labour Party) in 2000. The names of the above parties from left to the right are **Left:** PCdoB: *Partido Comunista do Brasil* (Communist Party of Brazil); PT: *Partido dos Trabalhadores* (Workers's Party) PSTU: *Partido Socialista dos Trabalhadores Unificado* (United Socialist Workers' Party); PCB: *Partido Comunista Brasileiro* (Brazilian Communist Party); PDT: *Partido Democrático Trabalhista* (Democratic Labor Party); PSOL: *Partido Socialismo e Liberdade* (Socialism and Freedom Party); PSB: *Partido Socialista Brasileiro* (Brazilian Socialist Party). **Center:** PSDB: *Partido da Social Democracia Brasileira* (Brazilian Social Democracy Party); PMDB: *Partido do Movimento Democrático Brasileiro* (Brazilian Democratic Movement Party). **Right:** PL: *Partido Liberal* (Liberal party); PTB: *Partido Trabalhista Brasileiro* (Brazilian Labor Party); PFL: *Partido da Frente Liberal* (Liberal Front Party); PRN: *Partido da Reconstrução Nacional* (Party of National Reconstruction); PDC: *Partido Democrata Cristão* (Christian Democratic Party).

Although PSDB is traditionally associated with a central platform, since 1994 their candidacy are supported by PFL, currently DEM, right-wing party, opposed to forming candidatures of PT. Also according to Samuels (2006), brazilians in general say they identify with PT or with PSDB. So, from now on PSDB and DEM will be reffered as the oposition coallition.

2.2 The *Mais Médicos* Program

Mais Médicos was launched by the Federal Government on 08 July 2013, with the main objective of increasing the number of basic care doctors in areas of high social vulnerability of the country, and follow the path already started by the Family Health Program to establish a health system focused on primary care, giving priority to prevention and faster detection of diseases.

The implementation of the program was motivated by a statistical portrait of the Brazilian health system that shows, among other things, low medical density in the country. As the note published by the Ministry of Health (Brasil, 2013) shows, the index for Brazil, 1.8 doctors/thousand inhabitants is lower than in neighboring countries. Argentina and Uruguay

each have a ratio of 3.2 and 3.7 doctors/thousand inhabitants. Although the World Health Organization do not establish a benchmark to this indicator, the federal government uses UK's rate of 2.7 doctors/thousand inhabitants as a goal. UK's health system is considered one of the best public health systems focused on primary care.

The program works on two major fronts, a long-term and a short-term:

(a) Improvement in the structure of federal universities and the expansion of the number of undergraduate vacancies in medicine and residency via joint work of the Ministries of Health and Education. The effects of this measure are longer term.

(b) Public Call of Brazilian and foreign medical professionals to compose the basic health workforce in *Sistema Único de Saúde*'s (Health Unique System) priority regions. The federal government is committed to transfer doctors to municipalities.

The Short-term measure of the program − that is, the allocation of doctors in municipalities − functions as a in-kind transfer from the federal government to the municipalities, as I argued. Following the taxonomy of Boadway and Shah (2007), the program can be classified as a conditional matching grant. Conditionality comes from the fact that the program defines the type of good or public service that can be offered from the transferred resources (medical service of basic health). The counterpart that the municipality must offer, in this case, is the minimum primary care health infrastructure. The doctor's participation can still be interpreted as a subsidy to primary care services of municipal health. This type of subsidy has two effects on local public finances: an income effect and a substitution effect. The transfer gives the recipient municipality more resources and part of it is used for better delivery of basic health services (income effect). At the same time, the subsidy reduces the relative price of health services for a given budget (substitution effect).

The goal of this study is to evaluate from a political point of view the second front of the program. The remainder of the section makes a description of the accession mechanisms within the program, either medical and municipal, defined by the Interministerial Ordinance No. 1369 of July 8, 2013.

2.2.1 Accession of municipalities

For registration of the municipalities in the program were opened 5 membership notices: SGTES Notice / MS No. 38 of July 8, 2013; Notice SGTES / MS No. 50 of August 1, 2013;

Notice SGTES / MS No. 22, of March 31, 2014; Notice SGTES / MS No. 01 of January 15, 2015 and Notice SGTES / MS No. 09 of July 3, 2015.

In its official website, the Ministry of Health informs that all municipalities are able to sign up. For priority purposes in the allocation of professionals, profiles were created for municipalities, as shown in Table A.1. Still, municipalities with profiles 1 to 5 have priority over the profile 6. Confirming the Ministry of Health information, according to the data of the National Council of Health Secretaries (CONASS), all municipalities are eligible for the program. Profiles work, in fact, only to classify the enrolled municipalities.

By entering the program, municipalities request a number of physicians to compose their basic health network. Once the registration is done, the federal government transfers them to municipalities. At last notice (Notice SGTES / MS No. 09 of July 3, 2015) all vacant jobs requested by the municipalities have been fulfilled, so that currently the number of doctors requested and received by municipalities is the same.

Table 2 shows some descriptive statistics of the program: approximately 73% (4050 municipalities) of Brazilian municipalities enrolled in the project. The average number of doctors transferred to municipalities is 4.41. The median of doctors transferred was 2. In total, 18,240 physicians were transferred to participating municipalities.

Table 2: Summary statistics of the program

	(1)	(2)	(3)	(4)
	Mean	Median	Standard deviation	Total
Participant municipalities	0.73	-	0.44	4,050
Doctors transferred in the program	4.41	2	9.79	18,240

Notes: Data from da Access to Information Act.

2.2.2 Accession of Doctors

The opportunity to participate in the program is offered to physicians graduated in Brazilian institutions, with revalidated degree in the country or foreign institutions through international medical exchange. The selection and occupation of the vacancies offered are carried out respecting the following order of preference of the types of doctors:

1. Graduated in Brazilian institutions or revalidated degree in Brazil;

2. Brazilians graduated in foreign institutions with qualification to work abroad;

3. Foreigners with authorization to work abroad.

The registration of the physician is held by public call. In total, they were published 7 medical call notices for joining the Program: SGTES Notice / MS No. 39 of July 8, 2013; Notice SGTES / MS No. 49 of August 16, 2013; Notice SGTES / MS No. 63, of November 27, 2013; Notice SGTES / MS No. 04 of 16 January 2014; Notice SGTES / MS No. 21 of April 1, 2014; Notice SGTES / MS No. 02 of January 15, 2015 and Notice SGTES / MS No. 10 of 10 July 2015. According to CONASENS, on 09/02/2013 began the activities of Brazilian doctors in the cities. Foreign doctors began working on 09/18/2013. Table A.2 shows the distribution of doctors in the program according to their nationality.

The participant physicians can stay in the program up to three years, extendable by three more, and receive a training stipend of R$ 10,000. Moreover, they can receive an allowance for installation in the amount of up to 3 training stipends, determined according to the region which they will be allocated:

a. R$ 30,000 to the Legal Amazon region, border or indigenous;

b. R$ 20,000 to the Northeast, Midwest or Jequitinhonha Valley-MG;

c. R$ 10,000 to capitals, metropolitan areas, Federal District or other municipalities not mentioned.

In practical terms, therefore, every doctor transferred can be seen as an annual transfer of R$ 130,000.00 R$ 150,000.00 from the federal government to local governments[3]. Regarding the medical allocation, it is performed an electronic process that respects the following priority/tiebreakers:

i) Applicants who graduated, revalidated her diploma or was born in the state where the municipality is located;

ii) Date and time of selection's confirmation in the system; and

iii) Applicants who are older.

After the publication of the results, the selected physician has a period of two days to approve her participation. If not confirmed, her registration and selection is canceled without prejudice the achievement of a new application.

[3]In US Dollars, the annual transfer per doctor ranges from $39 thousand to $45 thousand.

3 Data and Empirical Strategy

3.1 Data

The information collected for this research comes from various sources. Microdata of 2012 municipal elections were extracted from Election Data Repository of Superior Electoral Court[4]. This database compiles information on the number of votes for each candidate, their parties, age, sex, education and whether the candidate is in his second term.

Data on *Mais Médicos* program were obtained from two sources. Enrollment information of municipalities and doctors, number of doctors transferred to municipalities and the nationality of the professionals were obtained by request in the *Lei de Acesso à Informação*, LAI (Access to Information Act)[5]. Information on the eligibility of municipalities to the program were obtained by both LAI and the National Council of Health Secretaries (CONASS).

In addition to information about the program and the municipal elections of 2012, I also used data from both the health network and socioeconomic and demographic information of the municipalities. These were taken from the 2010 Census, published by the Brazilian Institute of Geography and Statistics (IBGE). Although IBGE update such information through the National Research by Household Sample (PNAD's), Census information are used for two reasons. First, the data predate both the municipal elections and the Program More Doctors, which ensures that they are not outcome variables. Second, Census data are more accurate than those of the National Household Survey, as Census provides information of the population. Information on municipalities' health system (number of physicians, number of teams from the Family Health Program, among others) were extracted from the Integrated System of the Ministry of Health Information (DATASUS).

3.2 Empirical Strategy

This work aims, as already explained, to identify the possible existence of partisan alignment in a specific type of intergovernmental transfer. Using data from the More Doctors program, the immediate question that I try to answer is this: the party ahead of local

[4]http://www.tse.jus.br/eleicoes/estatisticas/repositorio-de-dados-eleitorais

[5]LAI is a law created in 2011 that allows any individual, without the need of further reason, the receipt of public information from government's organs and entities. The Act applies to the three branches of government: the Federal Government, States, Federal District and Municipalities, including the Account Courts and Public Prosecution. Private non-profit organizations are also required to publicize information on the receipt and allocation of public resources received by them.

government matters to the results of (i) number of doctors transferred and (ii) municipal participation in the program?

Identify such effects is a challenging task. The naive comparison between municipalities with governments of different parties hides some endogeneity problems. For example, public health indicators of a municipality may be correlated with the chance that a party wins the local elections. Or the ideological heterogeneity of the voters can be correlated with support for transfer programs. Such correlations can, basically, generate biased estimates of the party's role in the indicators of interest.

3.2.1 Identification: Regression Discontinuity

To address the above problems of endogeneity I use a Regression Discontinuity Design (RD) in elections defined by a small margin of votes, identification strategy that follows Lee (2008). As discussed by the author, elections won by a small margin of votes act as a lottery of municipalities for disputing parties, exploiting the fact that the party affiliation of a mayor abruptly changes depending on the voting percentage received by the candidates.

In other words, it becomes more likely that the results of tight elections are determined by idiosyncratic factors and not municipal (structural) characteristics that could also affect the indicators of participation and number of *Mais Médicos* program professionals. These factors lead us to believe that elections lost by a small margin are in practice very similar to elections won by a small margin.

To formally characterize the strategy, I'll use the link created by Hahn et al. (2001) between the Potential Outcomes Model, developed in Rubin (1974), and the RD. I also discuss the assumptions necessary to the proposed identification. The review made here follows Lee and Lemieux (2010).

However, before characterizing the model to be estimated, the construction of the variable margin of victory (W) will be described. This variable is defined as follows:

$$W_i^{PT} = \begin{cases} (V_i^{PT} - V_i^2)/V_i^T > 0, \text{ if PT's candidate won} \\ (V_i^{PT} - V_i^1)/V_i^T < 0, \text{ if PT's candidate got in 2nd place} \end{cases}$$

where V_i^{PT} is the number of votes received by the PT's candidate in the municipality i, V_i^1 and V_i^2 are the votes received by the most voted candidate and second most voted candidate in the municipality i, respectively. V_i^T is the total valid votes cast in the municipality i[6].

[6]The variable margin of victory for the opposition is constructed analogously.

Note that W_i^{PT} is only set to municipalities where PT candidates were in 1st or 2nd places in the elections. In fact, only municipalities in which the PT candidate almost won the elections act as a good counterfactual for municipalities in which the PT candidate almost lost.

Let $Y_i(0)$ and $Y_i(1)$ be a pair of potential outcomes, where $Y_i(1)$ is the result of the municipality i when ruled by the same party of the federal government and $Y_i(0)$ when ruled by another party. We are interested in estimating the average impact of partisan alignment, that is, $E[Y_i(1) - Y_i(0)]$. However, we never observe $Y_i(1)$ and $Y_i(0)$ for a given municipality. Taking $D_i = \{0, 1\}$ as a dummy variable that defines whether the municipality i is aligned ($D_i = 1 \equiv W_i > 0$) or not ($D_i = 0 \equiv W_i < 0$), we can write the observable results as $Y_i = (1 - D_i) \cdot Y_i(0) + D_i \cdot Y_i(1)$.

The naive comparison between cities where the PT won with ones in which the PT lost, that is, $E[Y_i(1)|D_i = 1] - E[Y_i(0)|D_i = 0]$ suffer from endogeneity problems, as already described. What the methodology proposes is to analyze this mean difference in the discontinuity neighborhood (see Table 3 below). In our case, in the vicinity of $W_i = 0$:

$$\tau = \lim_{\epsilon \downarrow 0} E[Y_i|W_i \leqslant \epsilon] - \lim_{\epsilon \uparrow 0} E[Y_i|W_i \geqslant \epsilon]$$

where τ captures the local effect of the PT winning the municipal elections on program indicators (effect of partisan alignment). Table 3 shows comparisons of $E[Y_i|W_i \geqslant \epsilon]$ (odd columns) and $E[Y_i|W_i \leqslant \epsilon]$ (even columns) for some values of ϵ and some indicators of the program in the municipalities where a PT candidate disputed elections and came in 1st or 2nd places[7]. Columns (1) and (2) report averages for $\epsilon = 100\%$, columns (3) and (4) report averages for $\epsilon = 5\%$ and columns (5) and (6) for $\epsilon = 2.5\%$.

Table 3: Comparison of means of program indicators for municipalities in which the PT disputed elections

	(1)	(2)	(3)	(4)	(5)	(6)
	Full Sample		Margin of victory up to 10%		Margin of victory up to 5%	
	PT lost	PT won	PT lost	PT won	PT lost	PT won
Sum of municipalities	593	614	138	141	72	83
% of participant municipalities	0.74	0.84	0.80	0.83	0.81	0.82
Average number of doctors transferred by the program	3.28	4.65	2.55	3.85	2.29	2.51
	(5.50)	(7.70)	(3.39)	(6.21)	(2.22)	(3.30)

Notes: This table compares the indicators of the program among municipalities where the PT candidate won the municipal elections with elections in which she ranked second. Columns (1) and (2) report averages using the full sample of municipalities avaliable. Columns (3) and (4) restrict the sample to elections defined by margins of victory up to 10% and columns (5) and (6) to elections defined by margins up to 5%. The odd columns present statistics for municipalities where the PT candidate was in 2nd place and the even columns show statistics for cities where the PT candidate was elected.

[7]Table A.3, which is in Appendix A shows similar exercise for municipalities where the opposition disputed elections and had candidates who ranked 1st or 2nd places.

3.2.2 Estimation

There are at least two approaches to estimate the average treatment effect discussed (τ). The first estimates a local linear regression restricting the sample to municipalities where $w_i \in [-h, +h]$ (local RD), as proposed in Table 3. The equation to be estimated is:

$$Y_i = \alpha_1 + \tau D_i + \delta X_i + \gamma Z_i + \varepsilon_i \tag{1}$$

where

$$D_i = \mathbb{1}\{W_i \geqslant 0\}$$

Y_i is the outocome of interest in the municipality i. D_i is a binary variable that equals 1 if PT's candidate won the election (0 otherwise), W_i is the margin of votes in the municipality i. For some specifications covariates are added. X_i is a vector of local characteristics and Z_i represents a set of characteristics of the winning candidate in city i. Control variables are not necessary for identification of our coefficient of interest (τ), but it improves the accuracy of the estimates.

To set the value of h, I use the mean square error minimization criteria developed by Imbens and Kalyanaraman (2011) (hereinafter, IK). I also report estimates for alternative values of h, in order to ensure transparency of the results.

The second approach tries to model the functional form of $E[Y_i|w_i]$ using polynomials $f(W_i)$. I will use polynomials up to 3rd degree. The parametric regression with flexible polynomials (global RD) to be estimated is:

$$Y_i = \alpha + \tau D_i + f_1(W_i) + D_i \times f_2(W_i) + \delta X_i + \gamma Z_i + \varepsilon_i \tag{2}$$

where

$$\begin{cases} f_1(W_i) = \theta_1 W_i + \theta_2 W_i^2 + \theta_3 W_i^3 \\ f_2(W_i) = \theta_4 W_i + \theta_5 W_i^2 + \theta_6 W_i^3 \end{cases}$$

In addition to easing the $E[Y_i|W_i]$, I allow (by equation 2) that $E[Y_i(0)|W_i]$ and $E[Y_i(1)|W_i]$ assume distinct functional forms.

RD literature is recently converging to combine the two specifications shown (local and global RD) (Hahn et al., 2001; Lee and Lemieux, 2010). Thus, Ipresent our results in es-

timates that analyze relevant subsamples (local RD) and allow nonlinearities in $E[Y_i|W_i]$ (global RD).

3.2.3 Model assumptions and validation tests

RD methodology is also advantageous for its milder assumptions when compared to other models. There are basically two assumptions to be validated. First, it is necessary that all relevant factors beyond treatment vary smoothly close to the threshold.

Formally, this assumption proposes that both $E[Y_i(0)|W_i = w]$ and $E[Y_i(1)|W_i = w]$ are continuous on the threshold. This hypothesis is to ensure that, in fact, the cities where the PT candidate lost by a small margin act as a good counterfactual of the municipalities in which she won by a small margin.

To check the plausibility of the hypothesis, Table 4 compares 15 socioeconomic and health system characteristics of municipalities as well as characteristics of the respective mayors in municipalities where elections were defined by a winning margin of up to 5 percentage points. Column (1) reports the average value of each of the municipalities characteristics in which the PT candidate came second in the election, the column (2) does the same for cities where the PT candidate won. Column (3) reports the difference (2)-(1) and the column (4) shows the p-value of the t statistic of the average difference. None of the tests shows significant differences (5% or even 10%), which provides evidence that the observable variables are balanced for the sampled municipalities.

Table 4: Comparison of means of covariates for municipalities where PT disputed elections

	(1)	(2)	(3)	(4)
	Margin up to 5%			
	PT lost	PT won	Difference of averages	P-value
Municipal Characteristics				
Infant mortality per thousand births	18.54	18.79	0.25	0.82
Gini's index	0.49	0.49	0.00	0.75
% of extremely poor	11.15	10.51	-0.64	0.72
Per capita income	523.21	486.90	-36.30	0.32
% of the pop. in households with bathroom and running water	82.14	82.63	0.49	0.88
% of households with water and sewage	9.23	8.44	-0.79	0.70
% of urban population	0.61	0.60	-0.01	0.76
Total population	17187.76	16981.24	-206.52	0.96
Total doctors	19.48	22.09	2.60	0.82
Number of teams of *saúde da família* program	1.21	1.17	-0.04	0.89
Mayoral Characteristics				
Proportion of women mayors	0.15	0.12	-0.03	0.56
Proportion of re-elected candidates in 2012	0.18	0.18	0.00	1.00
Mayor's age	48.00	47.83	-0.17	0.92
Proportion of mayors with higher education	0.54	0.63	0.08	0.29
Proportion of mayors who are doctors	0.04	0.10	0.05	0.19
Observations	72	83		

Notes: This table presents a comparison of average socioeconomic characteristics of the municipality and the mayor where the PT won or lost by a margin of votes up to 5%. Column 1 reports the average for municipalities in which the PT lost. Column 2 reports the average for the cities where the PT won. Column 3 reports the mean difference. Column 4 reports the p-value of a t test for the difference of means.

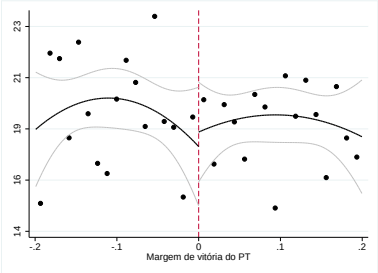
Also, Table 5 reports RD estimates for each of the characteristics of municipalities and mayors elected in 2012 using the specifications presented in equations 1 and 2. Columns (1) and (3) report estimates of equation 1 for elections defined by margins (h) up to 5% and 10% respectively. Columns (4), (5) and (6) report estimates of equation 2 with linear, quadratic and cubic polynomials respectively. Column (2) reports estimates of the combination of equations 1 and 2. It lays down elections analyzed by margins of votes up to 5 % with cubic polynomials. Finally, Figures 2 and 3 show graphs comparing cities where the PT won with municipalities in which the PT lost for each of the socioconomic and mayoral characteristics.

Table 5: Effect of partisan alignment on covariates (RDD)

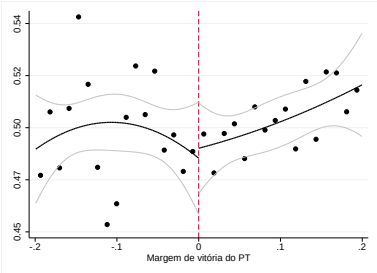
	(1)	(2)	(3)	(4)	(5)	(6)
	Local regression			Full sample		
	Margin de 5%	Margin up to 5% with cubic polynomial	Margin de 10%	Linear polynomial	Quadratic polynomial	Cubic polynomial
Municipal Characteristics						
Infant mortality	2.75	2.35	2.22	-0.36	-0.65	-0.46
per thousand births	(2.41)	(4.93)	(1.56)	(0.65)	(0.89)	(1.11)
Gini's index	0.012	0.063	0.003	0.004	0.002	-0.004
	(0.02)	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)
% of extremely poor	1.70	11.21*	1.27	-0.80	-1.63	-2.48
	(3.60)	(5.14)	(2.50)	(1.07)	(1.47)	(1.85)
Per capita income	-88.23	-127.86	-107.60	-4.79	20.34	13.84
	(72.91)	(132.98)	(52.21)	(22.48)	(30.10)	(38.00)
% Of the population in households	0.01	-18.32*	-3.25	2.84	4.88	4.11
with bathroom and running water	(6.30)	(9.97)	(4.41)	(1.91)	(2.63)	(3.32)
% of households with	0.96	11.40*	1.81	-1.03	-2.98*	-2.29
water and sewage	(4.09)	(6.36)	(2.92)	(1.19)	(1.65)	(2.12)
% of urban population	0.01	-0.29**	-0.04	0.001	-0.01	0.01
	(0.07)	(0.14)	(0.05)	(0.02)	(0.03)	(0.04)
Total population	-1.28	-11960.64	-4946.59	-4034.63	1213.24	11923.55
	(7789.29)	(12137.79)	(6330.69)	(7696.79)	(6466.18)	(10399.64)
Total doctors	7.01	-21.38	-10.81	-24.52	5.95	61.92
	(25.77)	(25.45)	(18.45)	(33.06)	(18.65)	(41.03)
Number of teams of	-0.23	0.73	-0.37	-0.42	0.19	1.15
saúde da família program	(0.58)	(0.69)	(0.43)	(0.72)	(0.44)	(0.86)
Mayoral Characteristics						
Proportion of	0.02	0.11	-0.06	-0.03	-0.07	-0.02
women mayors	(0.11)	(0.28)	(0.08)	(0.03)	(0.04)	(0.05)
Proportion of re-elected	-0.11	-0.40*	0.01	0.01	-0.01	-0.04
candidates in 2012	(0.12)	(0.22)	(0.09)	(0.04)	(0.05)	(0.07)
Mayor's age	-5.83*	-10.02*	-0.30	-2.09**	-1.58	-1.53
	(3.14)	(5.50)	(2.24)	(0.87)	(1.21)	(1.59)
Proportion of mayors	0.05	0.32	0.04	0.08*	0.08	0.10
with higher education	(0.16)	(0.34)	(0.11)	(0.05)	(0.06)	(0.08)
Proportion of mayors	0.01	0.22	0.06	0.01	0.01	0.02
who are doctors	(0.10)	(0.17)	(0.06)	(0.02)	(0.03)	(0.04)
Observations	155	155	279	1211	1211	1211

Notes: This table presents RDD placebo estimates using municipal and mayoral indicators. Columns (1), (2) and (3) provide estimates of local regressions reducing sample set elections for up to 5% and 10%. In column (2) are added third-degree polynomials. Columns (4), (5) and (6) use the full sample avaliable using first, second and third degree polynomials respectively.

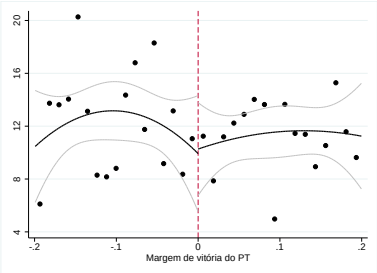
Figure 2: Effect of partisan alignment on municipal characteristics



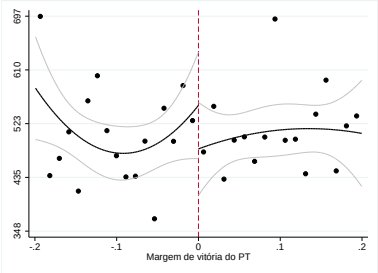
(a) Infant mortality per thousand births



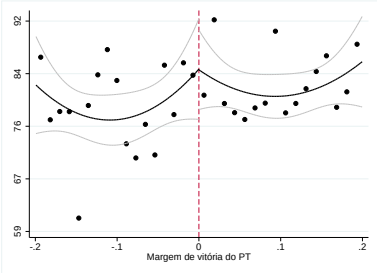
(b) Gini's index



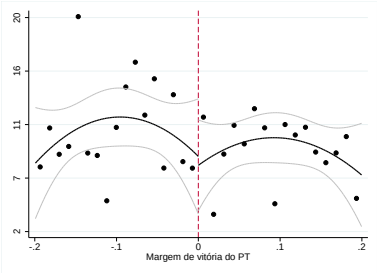
(c) % of extremely poor



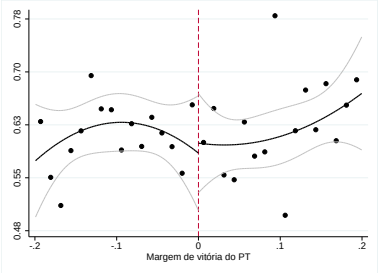
(d) Per capita income



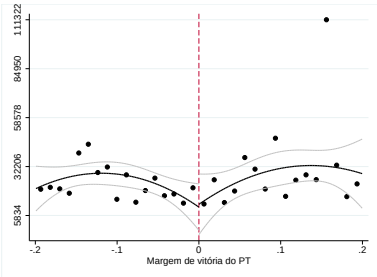
(e) % of the pop. in households with bathroom and running water



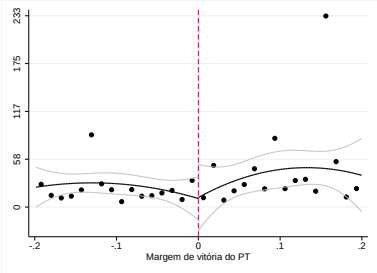
(f) % of households with water and sewage



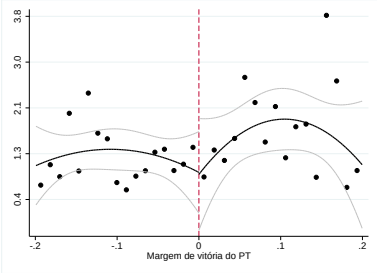
(g) % of urban population



(h) Total population

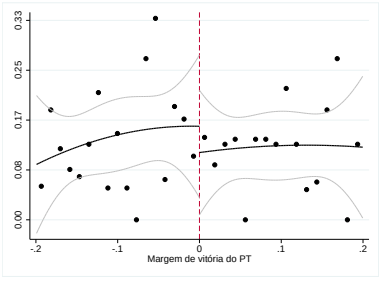


(i) Total doctors

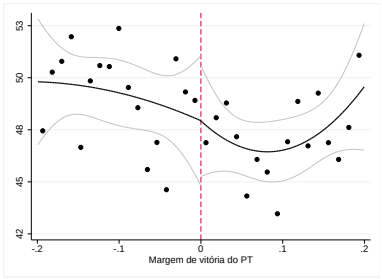


(j) Number of teams of *saúde da família* program

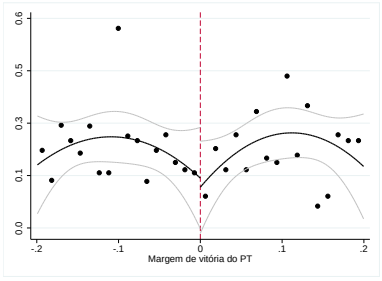
Figure 3: Effect of partisan alignment on mayoral characteristics



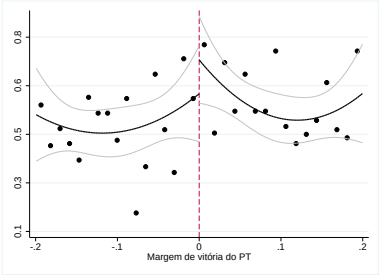
(a) Proportion of women mayors



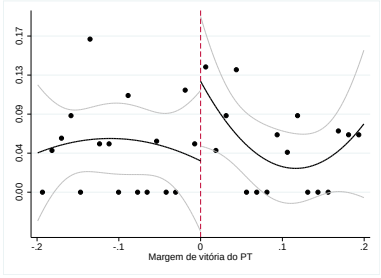
(b) Mayor's age



(c) Proportion of re-elected candidates in 2012



(d) Proportion of mayors with higher education



(e) Proportion of mayors who are doctors

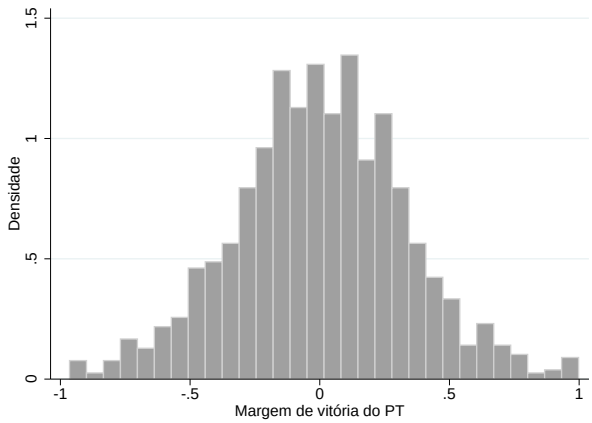
The test results show that, indeed, municipalities where the PT candidate came second in the elections act as a good counterfactual for cities where the PT candidate was elected. From Table 5, we see that few regressions presented estimates for τ statistically different from zero. None of the coefficient characteristics proved to be stably nonzero.

The second assumption is that parties and candidates have inaccurate control over the number of votes they receive in the elections. This hypothesis can not be tested directly (the margin of victory and the result of the municipality for election are only observed once). Alternatively, you can test if the aggregate distribution of our assignment variable (in this case, the margin of victory) is discontinuous. After all, a combination of continuous density functions is itself a continuous density function (Lee and Lemieux, 2010).

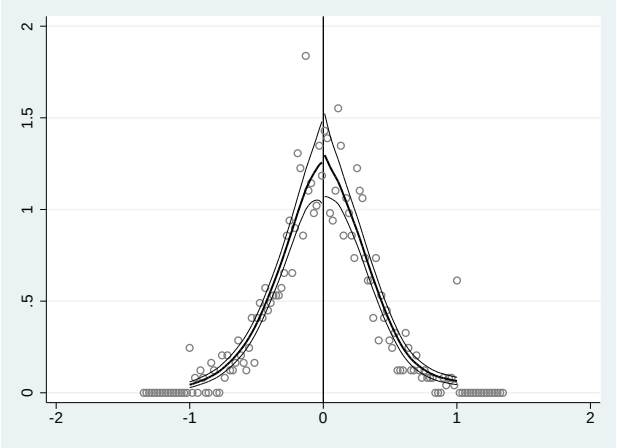
To test if there is manipulation of the selection rule Figure 4 presents a histogram of PT's victory margin in the distribution of municipalities in which the PT candidate took 1st or 2nd place and a McCrary (2008) test for PT's victory margin (our running variable)[8].

[8]The test is a simple exercise in two stages. First, it divides the assignment variable in equally spaced groups and calculates the number of observations for each group. Then it takes the number of observations as a dependent variable in a local linear regression and plots the estimated density.

Figure 4: Tests for manipulation of elections



(a) Histogram of PT's margin of victory



(b) McCrary test

The results show that the aggregate density of the winning margins doesn't have discontinuities. These figures document evidence that neither the PT nor its opponents can consistently win tight elections. In order to have a manipulation consistent with the results of Figures 4a and 4b, it is necessary that the number of rigged elections in favor of PT equals the number of rigged elections in favor of opponent parties. An unlikely scenario.

4 Results

This section presents and discusses the main results obtained in the research. As shown in the literature review, the papers that most closely match ours present two types of results. Migueis (2013) find evidence that Portuguese municipalities governed by the same party of the federal government (in our case, PT) receive higher levels of discretionary transfers. Brollo and Nannicini (2012), nonetheless, show evidence that in Brazil the federal government punishes municipalities governed by opposition parties (in our case, the PSDB and DEM) reducing the level of capital transfers in pre-election years. I test hypotheses about these two types of result for *Mais Médicos* program.

I also analyze if the alignment/oppostion of the party in charge of the municipal government towards the party head of the federal goverment influences the decision of the municipality itself to participate in the program. This way, I assess these effects by looking to two program's outcome indicators:

(i) Number of doctors transferred to municipalities through the program;

(ii) Likelihood of participation of municipalities.

In (i) we have the typical indicator used in the literature of politically motivated intergovernmental transfers. For our case, the number of doctors is the amount of resources transferred by the federal government to municipalities[9]. Indicator (ii) is a binary variable that equals 1 when the municipality enrolls in the program and 0 otherwise[10]. Still, (i) deals with the intensive margin of the program. That is, it reflects the decision of the federal government of how many doctors to transfer given the city's enrollment in the program. Indicator (ii), in turn, relates to the decision of the municipality to participate or not the program − extensive margin.

In addition to the above analysis, I also implemented heterogeneity analysis of the effect of partisan alignment on program results. I allow heterogeneous effect of alignment for two different purposes:

(a) Municipalities that have high density of doctors in their health system;

(b) Municipalities where the mayor elected in 2012 is in her second term.

In (a) I analyze if the density of doctors in the city − main indicator that motivated the existence of the program according to the Health Ministry − alters the results of the effect of partisan alignment. In (b) I test if the effect of partisan alignment is different for municipalities in which the mayor is more skilled and/or experienced.

For the sake of a better organization, the results are separated in order to dialogue more clearly with the literature. Firstly are presented results for the effect of partisan alignment on the above proposed indicators comparing municipalities where the PT candidate became mayor in 2012 with municipalities where the PT candidate was 2nd in the election. Secondly are shown estimates to test if there is any kind of punishment (transfer of fewer doctors) to municipalities governed by opposition parties and if there's boycott of the program (lower participation of municipalities governed by opposition parties). Finally, I analyze the existence of heterogeneous effects of partisan alignment in the program.

[9]As already discussed, the doctor receives a monthly stipend of R$ 10,000.00 plus benefits ranging from R$ 10,000, 00 R$ 30,000.00. Then, We can see the transfer of the doctor as an annual transfer of R$ 130,000.00 to R$ 150,000.00.

[10]This variable takes into account only the municipalities eligible for the program. As discussed and affirmed by the Ministry of Health and the CONASS, all municipalities are eligible to participate, just changing the frame profile in the program.

4.1 Effect of partisan alignment on the program

Table 6 shows the RD estimates of the effect of partisan alignment on the number of doctors transferred to municipalities through the program. This table, as said, shows the traditional exercise done by the literature of politically motivated intergovernmental transfers. 12 specifications (columns 1 to 12) that combine the equations 1 and 2 are implemented varying intervals of margin of victory ($[-h+h]$) and polynomial orders ($f(W_i)$). In addition, estimates without controls are shown in Panel A and estimations controlled by characteristics of municipalities and regional dummies are in Panel B. For this and every table in the chapter I use bandwidths for the margin of victory up to 2.5%, 5%, 10% and optimal ones set by the algorithm of Imbens and Kalyanaraman (2011). For each, I present linear, quadratic and cubic polynomials.

The results in Table 6 show evidence that the federal government does not favor municipalities governed by PT. In the vast majority of the specifications used, it was not possible to reject the hypothesis that there is no effect of partisan alignment on the average number of transferred doctors. Furthermore, the signs of the coefficients associated with such effect are positive or negative, depending on the specification, which suggests that there's no problem of lack of estimation accuracy due to a limitation of the sample.

Table 6: Effect of partisan alignment on the number of doctors transferred

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Regressions without covariates												
PT wins	0.414	0.181	-0.597	-0.689	0.720	-0.413	0.458	-0.0526	0.820	-0.752	3.284*	-0.0426
	(0.614)	(0.743)	(1.078)	(0.835)	(1.141)	(1.337)	(0.810)	(1.167)	(1.543)	(1.244)	(1.788)	(2.255)
Obs.	560	560	560	279	279	279	155	155	155	81	81	81
R^2	0.029	0.037	0.038	0.075	0.081	0.084	0.012	0.017	0.033	0.057	0.151	0.182
Panel B: Regressions with covariates for municipal characteristics and regional dummies												
PT wins	0.838*	-0.200	-0.0965	-0.137	0.407	0.284	0.836	0.691	1.969	1.550	5.416**	5.539**
	(0.462)	(0.655)	(0.846)	(0.727)	(0.860)	(1.130)	(0.759)	(1.084)	(1.367)	(1.143)	(2.089)	(2.724)
Obs.	498	498	498	252	252	252	138	138	138	72	72	72
R^2	0.655	0.659	0.659	0.678	0.681	0.682	0.502	0.504	0.518	0.654	0.704	0.712

Notes: The table is divided into two panels. In panel A, estimates are presented without any covariates. Panel B presents estimates controlled by municipal characteristics and regional dummies. Columns (1), (2) and (3) show estimates with a sample restricted by the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (19.7%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10% 5% and 2.5% respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. The statistical significance of the results is represented by: *** Statistically significant at 1% ** Statistically significant at 5% * Statistically significant at 10%.

The mentioned results show that the federal government does not favor aligned municipalities on transferring doctors in the program. You can get some explanations. As already discussed, the literature of intergovernmental transfers usually considers the recognition and the electoral credit given by the voters to the grantor or transfer receiver as fundamental to the existence of partisan alignment. In this case, it is transferred a public good[11] that much more easily receives a "stamp" of the Federal Government. In addition, the program had enough publicity and gained notoriety on account both of the opposing position of medical professional associations such as the importation of foreign doctors, which reinforces the idea that the federal government could take ownership of the electoral dividends of the program. Such features enables the party in power of the Federal Government (PT) to use criteria of efficiency and equity to allocate doctors, as suggested by the classical literature of intergovernmental transfers (Oates, 1972, 1999; Musgrave, 1959). In any case,I do not test here if, in fact, the federal government makes good use of such criteria.

When analyzing the effect of the PT being the head of the municipal government on the decision of the municipality to participate in the program in Table 7, we see that on average aligned municipalities participate in the program as does not aligned municipalities. In only 4 of the 24 specifications used it was obtained an effect significant at 10%, all making use of polynomials of second or third degree. Moreover, the sign of coficientes is instable, rangin from positive to negative.

Since the decision to enroll in the program is taken by the local ruler, this result shows evidence that the program generates clear benefits to the municipality. After all, the doctor of the program is transferred to the municipal heath system at no additional cost to the municipality[12].

[11]The doctor transferred provides the public service of basic care in the municipal health system.

[12]It is assumed here that the city already has infrastructure to receive the doctor, condition established by the program itself.

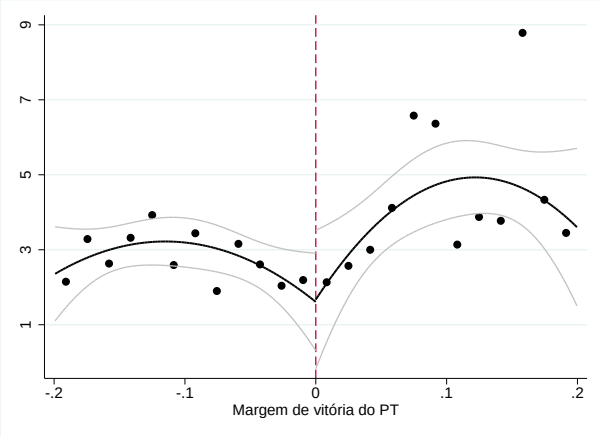
Table 7: Effect of partisan alignment on the municipalities' participation in the program

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Regressions without covariates												
PT wins	0.00644	0.0153	0.0341	0.0263	0.117	0.330*	0.114	0.376*	0.511*	0.277	0.649**	0.199
	(0.0585)	(0.0856)	(0.115)	(0.0906)	(0.139)	(0.188)	(0.131)	(0.192)	(0.260)	(0.192)	(0.285)	(0.416)
Obs.	708	708	708	279	279	279	155	155	155	81	81	81
R^2	0.027	0.029	0.029	0.002	0.005	0.018	0.009	0.033	0.037	0.028	0.069	0.111
Panel B: Regressions with covariates for municipal characteristics and regional dummies												
PT wins	0.0185	0.000962	-0.00777	0.0330	-0.0153	0.129	0.00607	0.166	0.216	0.124	0.345	0.0984
	(0.0585)	(0.0824)	(0.111)	(0.0902)	(0.132)	(0.180)	(0.121)	(0.153)	(0.206)	(0.200)	(0.265)	(0.403)
Obs.	629	629	629	252	252	252	138	138	138	72	72	72
R^2	0.131	0.131	0.131	0.108	0.110	0.116	0.195	0.206	0.209	0.207	0.227	0.296

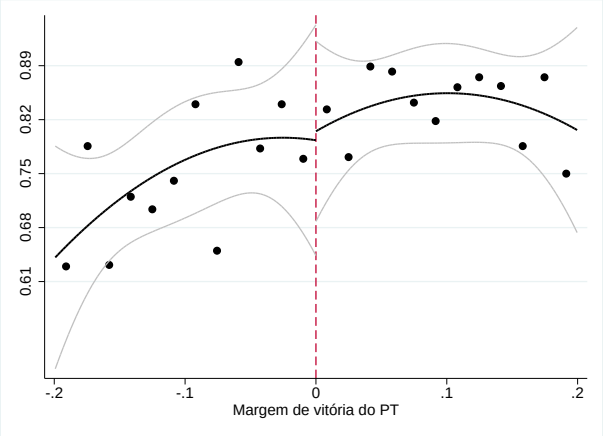
Notes: The table is divided into two panels. In panel A, estimates are presented without any covariates. Panel B presents estimates controlled by municipal characteristics and regional dummies. Columns (1), (2) and (3) show estimates with a sample restricted by the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (26%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10% 5% and 2.5% respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. The statistical significance of the results is represented by: *** Statistically significant at 1% ** Statistically significant at 5% * Statistically significant at 10%.

Figure 5 presents graphs for the results shown in Tables 6 and 7 using a sample of municipalities with elections defined by a margin of victory up to 20% and with 2nd degree polynomials. I present local average values of program results (dots) and the estimated values of such results by a quadratic function, with confidence intervals of 95% (black and gray lines, respectively). The roll of presenting these graphs have two points. It is possible to visualize our estimate of τ (effect of partisan alignment) and observe the shape of the relationship between the indicators used and the level of competition in the elections. Looking at it, it is evident that there is no effect of partisan alignment on program results. In both figures there is no discontinuity in the average of the results of the program conditional on the margin of victory.

Figure 5: Partisan alignment and *Mais Médicos* program



(a) Number of doctors transferred



(b) Municipal participation probability

4.2 Effect of being opposition on the program

Below I analyze the argument raised by Brollo and Nannicini (2012) that the federal government can punish opposition parties by transferring less resources to the municipalities in which they govern. As discussed, I'll use PSDB and DEM as the opposition coaltition. Then, I compare municipalities where opposition parties almost lost the elections to municipalities where they almost won, in order to isolate the effect of being opposition on program results.

Table 8 shows the effect of an opposition party ruling the city on the number of doctors transferred through the program. In Panel A are shown 12 regression estimates without covariates. The coefficient is stably negative and it showed to be significant at 10% in almost half of the specifications (9 of them). By adding control variables to estimates (Panel B), we see that none of the significant estimates in uncontrolled specifications remain so. Additionally, some insignificant coefficients become significant. Looking at Table 8, we can also check the trade-off between bias and variance in RD methodology: as we restrict the sample to municipalities with tighter elections, the standard errors of estimates increase. The reverse occurs as we use municipalities with elections defined by wider margins of victory.

Table 8: Effect of being opposition on the number of doctors transferred

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Regressions without covariates												
Opposition wins	-0.599	-1.150***	-1.221**	-1.166*	-0.777	-1.327	-1.028	-1.204	-2.384**	-1.521	-3.037**	-4.597***
	(0.384)	(0.387)	(0.551)	(0.622)	(0.605)	(0.950)	(0.704)	(0.814)	(1.156)	(1.104)	(1.400)	(1.677)
Obs.	991	991	991	411	411	411	211	211	211	100	100	100
R^2	0.005	0.008	0.009	0.019	0.027	0.029	0.028	0.028	0.041	0.037	0.060	0.190
Panel B: Regressions with covariates for municipal characteristics and regional dummies												
Opposition wins	-0.191	-0.292	-0.123	-0.238	-0.330	-1.605**	-1.129**	-1.284*	-1.675*	-1.716	-1.306	-2.448
	(0.292)	(0.332)	(0.436)	(0.570)	(0.517)	(0.673)	(0.567)	(0.684)	(0.940)	(1.044)	(1.284)	(1.472)
Obs.	868	868	868	356	356	356	183	183	183	88	88	88
R^2	0.604	0.604	0.604	0.559	0.562	0.570	0.582	0.583	0.588	0.701	0.704	0.729

Notes: The table is divided into two panels. In panel A, estimates are presented without any covariates. Panel B presents estimates controlled by municipal characteristics and regional dummies. Columns (1), (2) and (3) show estimates with a sample restricted by the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (25.1%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10% 5% and 2.5% respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. The statistical significance of the results is represented by: *** Statistically significant at 1% ** Statistically significant at 5% * Statistically significant at 10%.

Figure 6 below illustrates the result of the effect of being opposed on the number of physicians transferred in the program. As can be seen, there is no obvious discontinuity in the regression.

In general, we can not reject the null hypothesis that the federal government does not punish opposition parties through the program. In spite of all the estimated coefficients in Table 8 be negative, none of them is consistently significant after adding the covariates for municipal characteristics and regional dummies. Furthermore, Figure 6 illustrates that in the vicinity of the discontinuity the mean values of transferred doctors to municipalities are similar.

Figure 6: Effect of being opposition on the number of doctors transferred

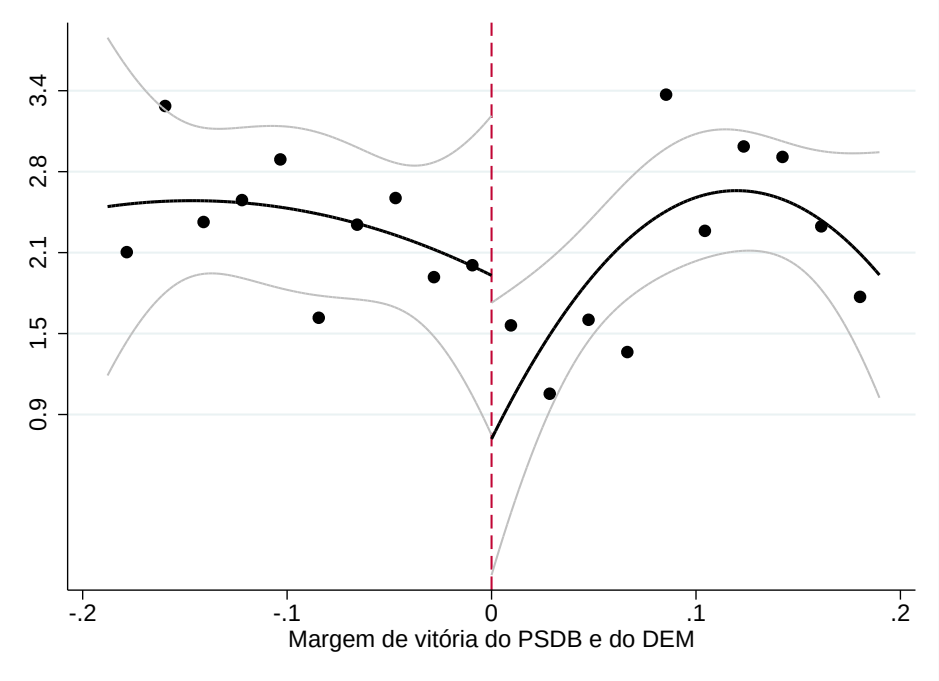


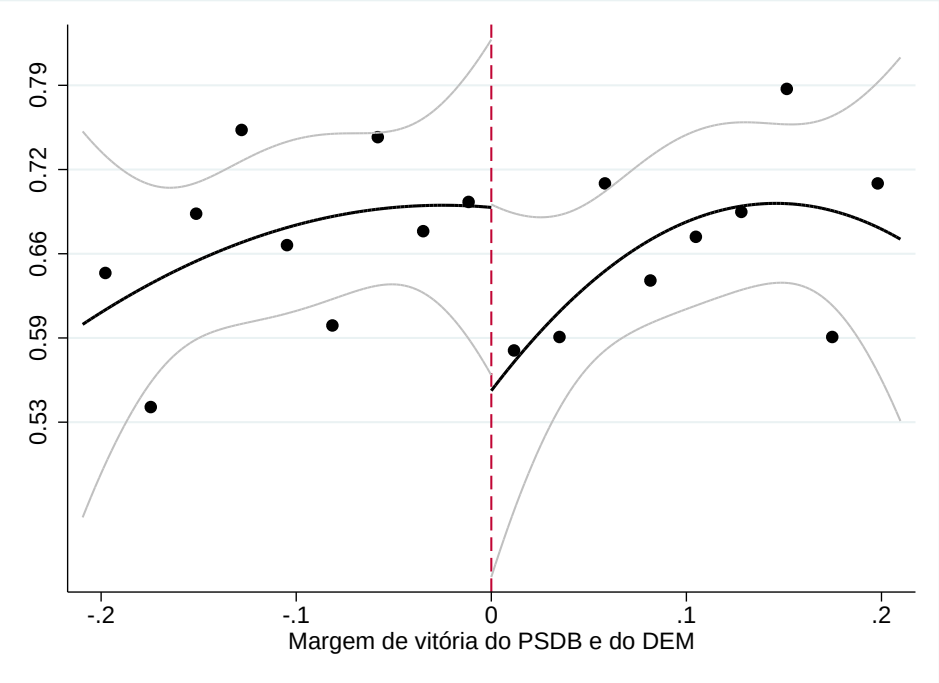
Table 9 evaluates the effect of the party ahead of the municipalities being an opposition party on the rate of participation of municipalities in the program. As can be seen again, the signs of the coefficients associated with that effect are all negative, but only 5 of the 24 specifications show significant estimates at 10%. However, Figure 7 shows a visible difference between the average levels of participation in the program surrounding the cutoff. Also, it is possible to observe a reduction in the share of about 12 percentage points (from $\approx 70\%$ to $\approx 58\%$). In any case, this combination of evidence does not seem enough to reject the hypothesis that the opposition doesn't boycott the program.

Table 9: Effect of being opposition on the municipalities' participation in the program

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Regressions without covariates												
Opposition wins	-0.102	-0.145	-0.103	-0.157*	-0.192	-0.265	-0.145	-0.418**	-0.423*	-0.264	-0.495*	-0.512
	(0.0652)	(0.0882)	(0.110)	(0.0949)	(0.128)	(0.163)	(0.139)	(0.184)	(0.235)	(0.193)	(0.284)	(0.333)
Obs.	857	857	857	411	411	411	211	211	211	100	100	100
R^2	0.003	0.004	0.005	0.008	0.012	0.017	0.014	0.038	0.040	0.036	0.059	0.098
Panel B: Regressions with covariates for municipal characteristics and regional dummies												
Opposition wins	-0.0675	-0.104	-0.0872	-0.148	-0.202	-0.264	-0.210	-0.363*	-0.329	-0.130	-0.102	-0.0403
	(0.0667)	(0.0917)	(0.114)	(0.100)	(0.134)	(0.168)	(0.143)	(0.194)	(0.245)	(0.227)	(0.334)	(0.403)
Obs.	742	742	742	356	356	356	183	183	183	88	88	88
R^2	0.106	0.107	0.107	0.138	0.140	0.143	0.130	0..142	0.142	0.198	0.218	0.223

Notes: The table is divided into two panels. In panel A, estimates are presented without any covariates. Panel B presents estimates controlled by municipal characteristics and regional dummies. Columns (1), (2) and (3) show estimates with a sample restricted by the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (21.4%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10% 5% and 2.5% respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. The statistical significance of the results is represented by: *** Statistically significant at 1% ** Statistically significant at 5% * Statistically significant at 10%.

Figure 7: Effect of being opposition on the municipalities' participation in the program



4.3 Heterogeneous effects of the partisan alignment

As seen in the previous section, the evidence of our model shows that the partisan alignment between federal and local governments does not affect the program's results, either in the number of doctors transferred to municipalities (intensive margin) or the enrollment of municipal governments in the program (extensive margin). To check if this effect exists for different types municipalities of the sample, I will analyze in this section two types of heterogenous effects. First, I allow different effects for municipalities with a high density of doctors in its territory on assessing the amount of doctors transferred through the program. With this, I separate the target municipalities (those with low medical density) of the rest of the municipalities.

After, I allow different effects for municipalities that have mayoral candidates re-elected in 2012 to examine the accession of municipalities to the program. The idea is to separate the municipalities where the mayors are more experienced and/or skilled (re-elected) and do not compete for municipal elections in 2016 from the rest.

For the construction of the variable that defines low or high density of physicians, I cut the sample of municipalities by the median of the variable density of physicians (DM), which in turn was defined as the total number of doctors in the county divided by the total

population. The high density of physicians dummy variable (AD) is then defined as:

$$AD_i = \begin{cases} 1, \text{ se } DM_i \geqslant med(DM) \\ 0, \text{ se } DM_i < med(DM) \end{cases}$$

in wich DM_i is the density of doctors in the municipality i[13] and $med(DM)$ is the median of DM.

Table 10 presents the results of the first exercise proposed, that is, the effect of differential partisan alignment for municipalities that have a high density of physicians ($AD_i = 1$) on evaluating the number of transferred doctors. The coefficients associated with the interaction of the PT winning elections and the high medical density capture the exact effect described above. As can be seen in the table, the differential effect of partisan alignment is positive and predominantly significant at 10%. Besides, all coefficients have a positive sign.

To check from wich part of the sample comes the differential effect described, we can see from the table that among the municipalities with low medical density ($AD = 0$) − priority target of program − being aligned (ΔPT) does not affect the average number of doctors transferred (coefficient associated with the variable PT). Besides, among the non-aligned municipalities ($PT = 0$) larger medical density (ΔAD) seems to reduce the number of doctors transferred (coefficient associated with the variable AD).

On testing whether the sum of the coefficients associated with $PT \times AD$ and AD is different from zero, we see that among the cities with the highest medical density ($AD = 1$), having an aligned government (ΔPT) does not seem to affect the number of transferred doctors. Testing if the sum of the coefficients associated with $PT \times AD$ and PT is nonzero, we also see that for aligned municipalities ($PT = 1$), the higher the medical density (ΔAD), the greater the number of transferred doctors (see Table 12).

This body of results indicates that, in fact, there is no effect of partisan alignment on the average number of doctors transferred even when we allow heterogeneous effects for municipalities expressly target of the program. Moreover, the fact that the number of doctors transferred increases with medical density for municipalities governed by the PT leaves open a problem of lack of targeting in the program.

[13]Data from DATASUS from december 2011.

Table 10: Heterogeneous effect of partisan alignment by medical density of municipalities

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Regressions without covariates												
$PT \times AD$	2.740***	2.885***	2.904***	4.164***	4.056***	4.009***	0.851	0.855	0.814	2.587*	2.600*	3.532**
	(0.867)	(0.880)	(0.880)	(1.209)	(1.163)	(1.164)	(0.898)	(0.890)	(0.891)	(1.432)	(1.422)	(1.676)
PT	-1.051	-1.804*	-2.603**	-3.120**	-1.976	-2.532	-0.0925	-0.587	0.0842	-2.361	1.443	-3.767
	(0.737)	(1.011)	(1.278)	(1.230)	(1.319)	(1.609)	(0.900)	(1.368)	(1.727)	(1.666)	(1.827)	(3.329)
AD	-0.172	-0.198	-0.211	-1.382**	-1.391**	-1.375**	-0.303	-0.300	-0.302	-0.876	-0.818	-0.794
	(0.481)	(0.478)	(0.473)	(0.604)	(0.606)	(0.595)	(0.549)	(0.550)	(0.544)	(0.811)	(0.813)	(0.836)
Obs.	529	529	529	263	263	263	143	143	143	74	74	74
R^2	0.061	0.074	0.075	0.116	0.118	0.119	0.013	0.018	0.031	0.105	0.191	0.256
Panel B: Regressions with covariates for municipal characteristics and regional dummies												
$PT \times AD$	1.027**	1.082**	1.084**	1.029*	0.898	0.854	0.609	0.601	0.634	2.721**	2.787**	3.479***
	(0.521)	(0.526)	(0.527)	(0.582)	(0.585)	(0.617)	(0.762)	(0.774)	(0.791)	(1.045)	(1.068)	(1.106)
PT	0.292	-0.786	-0.795	-0.730	-0.193	-0.169	0.481	0.383	1.688	0.110	3.957**	3.261
	(0.460)	(0.721)	(0.900)	(0.787)	(0.892)	(1.069)	(0.690)	(1.054)	(1.289)	(1.090)	(1.807)	(2.278)
AD	-0.490	-0.466	-0.460	-0.342	-0.310	-0.310	-0.237	-0.237	-0.347	-1.317	-1.487*	-1.639*
	(0.382)	(0.377)	(0.375)	(0.446)	(0.448)	(0.452)	(0.525)	(0.537)	(0.570)	(0.803)	(0.800)	(0.842)
Obs.	498	498	498	252	252	252	138	138	138	72	72	72
R^2	0.657	0.662	0.662	0.681	0.683	0.684	0.505	0.506	0.521	0.685	0.736	0.757

Notes: The table is divided into two panels. In panel A, estimates are presented without any covariates. Panel B presents estimates controlled by municipal characteristics and regional dummies. Columns (1), (2) and (3) show estimates with a sample restricted by the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (19.7%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10% 5% and 2.5% respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. The statistical significance of the results is represented by: *** Statistically significant at 1% ** Statistically significant at 5% * Statistically significant at 10%.

Table 11 shows the results of the second type of exercise proposed in this section. It is made the analysis of the effect of being aligned with the federal government on the probability of municipal participation in the program, allowing different effects for municipalities with mayors re-elected in 2012. As can be seen, the heterogeneous effect of alignment for second term mayors is positive and significant at 1% in 9 of the 12 specifications without controls and positive and significant at 5% in also 9 of the 12 specifications with covariates of municipal characteristics and regional dummies. Estimates of the effect limited to the elections won by margins of victory up to 2.5% maintain the expected sign of the coefficient, but without significance.

On analyzing subgroups of the sample (see Table 13), we have: i) among the municipalities with mayors in 1st mandate, being aligned does not influence the level of participation in the program (coefficient associated with the variable PT); ii) among the non-aligned municipalities, having a 2nd term mayor reduces participation in the program in at least 16.5 percentage points with 1% significance (coefficient associated with the variable 2nd term)[14]; iii) among the aligned municipalities, having a mayor in her second term does not influence the average participation (sum of the coefficients associated with the variable $PT\times$2nd term and 2nd term); iv) among the municipalities with mayors in 2nd term, being aligned to the federal government increases the participation in at least 15.8 percentage points with 10% significance (sum of the coefficients associated with the variable $PT\times$2nd term and PT)[15].

These results demonstrate that mayors in 2nd mandate wich, therefore, can not be re-elected in 2016 react to the effect of partisan alignment. Mayors of non-aligned parties that disputed the elections against a PT candidate participate less in the program than the ones in their 1st term. One possible explanation for this comes from the fact that the mayor in 2nd term won't reap the electoral credit for joining the program in 2016 election. Moreover, it is expected that in future elections PT candidate would use the federal program in her favor. On the other hand, the non-aligned candidate in 1st term could explore the municipalities' enrollment in the program to garner votes.

[14]Estimate restricted to the sample of municipalities with elections defined by margins of victory up to 26% (IK), controlled by local characteristics and regional dummies.

[15]Estimate restricted to the sample of municipalities with elections defined by margins of victory up to 19.7 % margin of victory (IK), controlled by local characteristics and regional dummies.

Table 11: Heterogeneous effect of partisan alignment for re-elected candidates

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Regressions without covariates												
PT× 2nd term	0.282***	0.279***	0.281***	0.323***	0.322***	0.338***	0.474***	0.473***	0.480***	0.183	0.185	0.155
	(0.0744)	(0.0748)	(0.0751)	(0.114)	(0.116)	(0.117)	(0.178)	(0.178)	(0.180)	(0.281)	(0.286)	(0.267)
PT	-0.0498	-0.0349	0.00244	-0.0176	0.0669	0.302	0.0488	0.310	0.422	0.256	0.628**	0.198
	(0.0596)	(0.0853)	(0.114)	(0.0901)	(0.139)	(0.187)	(0.132)	(0.191)	(0.262)	(0.193)	(0.290)	(0.420)
2nd term	-0.223***	-0.223***	-0.225***	-0.200**	-0.195**	-0.209**	-0.328**	-0.327**	-0.323**	-0.0916	-0.0919	-0.0609
	(0.0598)	(0.0599)	(0.0600)	(0.0948)	(0.0956)	(0.0949)	(0.150)	(0.148)	(0.148)	(0.199)	(0.205)	(0.180)
Obs.	708	708	708	279	279	279	155	155	155	81	81	81
R^2	0.055	0.056	0.057	0.032	0.035	0.051	0.068	0.092	0.095	0.035	0.075	0.116
Panel B: Regressions with covariates for municipal characteristics and regional dummies												
PT× 2º mandato	0.178**	0.177**	0.177**	0.248**	0.253**	0.263**	0.385**	0.373**	0.366**	0.0749	0.0564	0.0956
	(0.0764)	(0.0765)	(0.0771)	(0.118)	(0.119)	(0.120)	(0.155)	(0.156)	(0.157)	(0.240)	(0.237)	(0.227)
PT	-0.0205	-0.0324	-0.0285	-0.00554	-0.0489	0.111	-0.0369	0.108	0.140	0.129	0.351	0.121
	(0.0599)	(0.0827)	(0.110)	(0.0907)	(0.131)	(0.174)	(0.119)	(0.152)	(0.202)	(0.204)	(0.277)	(0.417)
2º mandato	-0.165***	-0.165***	-0.165***	-0.150	-0.152	-0.162*	-0.236*	-0.228*	-0.222	0.0299	0.0363	0.0273
	(0.0609)	(0.0608)	(0.0611)	(0.0976)	(0.0973)	(0.0971)	(0.135)	(0.134)	(0.135)	(0.186)	(0.189)	(0.172)
Obs.	629	629	629	252	252	252	138	138	138	72	72	72
R^2	0.146	0.146	0.146	0.125	0.128	0.135	0.231	0.240	0.241	0.212	0.231	0.302

Notes: The table is divided into two panels. In panel A, estimates are presented without any covariates. Panel B presents estimates controlled by municipal characteristics and regional dummies. Columns (1), (2) and (3) show estimates with a sample restricted by the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (26%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10% 5% and 2.5% respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. The statistical significance of the results is represented by: *** Statistically significant at 1% ** Statistically significant at 5% * Statistically significant at 10%.

Table 12: Auxiliary hypothesis tests for Table 10

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A:	$H_0 : coef(PT) + coef(PT \times AD) = 0$											
No covariates	2.10	1.51	0.06	1.06	2.02	0.87	0.82	-0.41	-0.03	-0.14	3.18	0.32
	(0.02)	(0.11)	(0.97)	(0.31)	(0.16)	(0.59)	(0.44)	(0.77)	(0.99)	(0.92)	(0.15)	(0.92)
With covariates	1.67	0.47	0.33	0.30	0.66	0.35	1.32	0.90	2.64	3.37	6.73	6.90
	(0.01)	(0.54)	(0.73)	(0.73)	(0.51)	(0.79)	(0.24)	(0.54)	(0.13)	(0.04)	(0.00)	(0.01)
Panel B:	$H_0 : coef(AD) + coef(PT \times AD) = 0$											
No covariates	3.11	3.32	3.34	3.47	3.35	3.34	0.65	0.65	0.59	1.79	1.81	2.79
	(0.000)	(0.000)	(0.000)	(0.004)	(0.003)	(0.004)	(0.41)	(0.41)	(0.46)	(0.16)	(0.15)	(0.06)
With covariates	0.75	0.90	0.92	1.03	0.91	0.89	0.41	0.38	0.27	1.37	1.37	1.95
	(0.05)	(0.03)	(0.03)	(0.07)	(0.10)	(0.13)	(0.45)	(0.49)	(0.61)	(0.18)	(0.20)	(0.06)

Notes: In columns (1), (2) and (3) estimates are presented with sample restricted to the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (19.7%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10%, 5% and 2.5%, respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. In parentheses are the p-values of the F tests.

Table 13: Auxiliary hypothesis tests for Table 11

	Optimal bandwidth (IK)			Margin up to 10%			Margin up to 5%			Margin up to 2.5%		
	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial	Linear Polynomial	Quadratic Polynomial	Cubic Polynomial
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A:	$H_0 : coef(PT) + coef(PT \times 2ndterm) = 0$											
No covariates	0.232	0.244	0.284	0.305	0.389	0.640	0.523	0.783	0.903	0.439	0.813	0.354
	(0.01)	(0.02)	(0.03)	(0.03)	(0.03)	(0.004)	(0.01)	(0.004)	(0.01)	(0.22)	(0.05)	(0.46)
With covariates	0.158	0.145	0.149	0.242	0.204	0.375	0.348	0.482	0.505	0.204	0.408	0.216
	(0.07)	(0.16)	(0.26)	(0.07)	(0.24)	(0.08)	(0.07)	(0.03)	(0.06)	(0.54)	(0.30)	(0.67)
Panel B:	$H_0 : coef(2ndterm) + coef(PT \times 2ndterm) = 0$											
No covariates	0.059	0.056	0.056	0.123	0.127	0.128	0.146	0.146	0.157	0.092	0.093	0.094
	(0.18)	(0.21)	(0.22)	(0.05)	(0.05)	(0.06)	(0.12)	(0.14)	(0.12)	(0.64)	(0.64)	(0.63)
With covariates	0.013	0.012	0.012	0.098	0.101	0.101	0.149	0.146	0.144	0.105	0.093	0.123
	(0.77)	(0.80)	(0.80)	(0.13)	(0.13)	(0.14)	(0.11)	(0.13)	(0.15)	(0.60)	(0.64)	(0.52)

Notes: In columns (1), (2) and (3) estimates are presented with sample restricted to the optimal bandwidth algorithm of Imbens and Kalyanaraman (2011) (26%). In the columns (4), (5) and (6), (7), (8) and (9) and (10), (11) and (12) the sample is restricted to the localities where the election was defined by a margin of victory up to 10%, 5% and 2.5%, respectively. In columns (1), (4), (7) and (10) it is used a linear function of the margin of victory for the estimates. In the columns (2), (5), (8) and (11) and (3), (6), (9) (12) are used quadratic and cubic functions, respectively. In parentheses are the p-values of the F tests.

Conclusion

The literature of politically motivated transfers have brought several evidences of privileges given to municipalities governed by parties aligned to the party of the federal government. This effect has been found either via higher levels of transfers to aligned municipalities (Grossman, 1994; Solé-Ollé and Sorribas-Navarro, 2008; Migueis, 2013) or lower levels to municipalities governed by opposition (Brollo and Nannicini, 2012).

To contribute to this literature, this paper evaluated the existence of political motives both in the allocation of doctors by the Federal Government and on the municipalities' participation in the program *Mais Médicos para o Brasil* using a methodology that explores more credibly exogenous variations (quasi-experimental) with milder assumptions − the RD. Using tight elections, it was possible to explore the effect of the party in power of a city's government on the number of doctors transferred and on the probability of participation of municipalities.

The econometric evidence of the paper shows that the federal government does not favor aligned municipalities (governed by PT) and does not punish municipalities governed by the opposition parties (PSDB and DEM). Allowing different effects for municipalities with less medical density, it was possible to note the lack of targeting of the program. The results also show that the party in power of local government only affects the level of participation of municipalities between mayors in second term.

Of course, this work does not exhaust the subject. Notwithstanding, it helps bringing evidence to the literature of politically motivated intergovernmental transfers to analyze a specific type of transfer that is in kind. A next step on this reaserch agenda is to theoretically model the allocation of doctors of program by incorporating the fact that the transfer is a good/public service. Another possibility for future research is to further analyze the program from equity/efficiency criteria since there is some evidence of poor targeting.

References

Albouy, D. (2013). Partisan representation in congress and the geographic distribution of federal funds. *The Review of Economics and Statistics 95*(1), pp. 127–141.

Anand, S. and T. Bärnighausen (2004). Human resources and health outcomes: cross-country econometric study. *The Lancet 364*(9445), 1603 – 1609.

Arulampalam, W., S. Dasgupta, A. Dhillon, and B. Dutta (2009). Electoral goals and center-state transfers: A theoretical model and empirical evidence from india. *Journal of Development Economics 88*(1), 103 – 119.

Berry, C. R., B. C. Burden, and W. G. Howell (2010). The president and the distribution of federal spending. *The American Political Science Review 104*(4), pp. 783–799.

Boadway, R. and A. Shah (2007). *Intergovernmental Fiscal Transfers : Principles and Practice*. Number 7171 in World Bank Publications. The World Bank.

Brasil (2013). Pacto nacional pela saúde: mais hospitais e unidades de saúde, mais médicos e mais formação. Technical report, SUS, Ministério da Educação e Ministério da Saúde.

Brollo, F. and T. Nannicini (2012). Tying your enemy's hands in close races: The politics of federal transfers in brazil. *American Political Science Review 106*, 742–761.

Case, A. (2001). Election goals and income redistribution: Recent evidence from albania. *European Economic Review 45*(3), 405 – 423.

Chen, L., T. Evans, S. Anand, J. I. Boufford, H. Brown, M. Chowdhury, M. Cueto, L. Dare, G. Dussault, G. Elzinga, E. Fee, D. Habte, P. Hanvoravongchai, M. Jacobs, C. Kurowski, S. Michael, A. Pablos-Mendez, N. Sewankambo, G. Solimano, B. Stilwell, A. de Waal, and S. Wibulpolprasert (2004). Human resources for health: overcoming the crisis. *The Lancet 364*(9449), 1984 – 1990.

Cox, G. W. and M. D. McCubbins (1986). Electoral politics as a redistributive game. *The Journal of Politics 48*, 370–389.

Currie, J. and F. Gahvari (2008). Transfers in cash and in-kind: Theory meets the data. *Journal of Economic Literature 46*(2), pp. 333–383.

Dahlberg, M. and E. Johansson (2002). On the vote-purchasing behavior of incumbent governments. *The American Political Science Review 96*(1), pp. 27–40.

Dixit, A. and J. Londregan (1998). Fiscal federalism and redistributive politics. *Journal of Public Economics 68*(2), 153–180.

Ferraz, C. and F. Finan (2011). Electoral accountability and corruption: Evidence from the audits of local governments. *American Economic Review 101*(4), 1274–1311.

Ferreira, F. and J. Gyourko (2009). Do political parties matter? evidence from u.s. cities. *The Quarterly Journal of Economics 124*(1), pp. 399–422.

Ferreira, I. F. S. and M. S. Bugarin (2007). Transferências voluntárias e ciclo político-orçamentário no federalismo fiscal brasileiro. *Revista Brasileira de Economia 61*, 271 – 300.

Gerber, E. R. and D. J. Hopkins (2011). When mayors matter: Estimating the impact of mayoral partisan on city policy. *American Journal of Political Science*.

Grossman, P. J. (1994, March). A political theory of intergovernmental grants. *Public Choice 78*(3-4), 295–303.

Hahn, J., P. Todd, and W. V. d. Klaauw (2001). Identification and estimation of treatment effects with a regression-discontinuity design. *Econometrica 69*(1), pp. 201–209.

Imbens, G. and K. Kalyanaraman (2011). Optimal bandwidth choice for the regression discontinuity estimator. *The Review of Economic Studies*.

Inman, R. P. (1989). Federal assistance and local services in the united states: The evolution of a new federalist fiscal order. NBER Working Papers 2283, National Bureau of Economic Research, Inc.

Inman, R. P. and D. L. Rubinfeld (1996). Designing tax policy in federalist economies: An overview. *Journal of Public Economics 60*(3), 307 – 334. {ISPE} Conference on Tax Reforms and Tax Harmonization: Public choice versus public finance.

Johansson, E. (2003). Intergovernmental grants as a tactical instrument: empirical evidence from swedish municipalities. *Journal of Public Economics 87*(5–6), 883 – 915.

Lee, D. S. (2008). Randomized experiments from non-random selection in u.s. house elections. *Journal of Econometrics 142*(2), 675 – 697. The regression discontinuity design: Theory and applications.

Lee, D. S., D. S. Lemieux, T. MLee, and M. J. Butler (2004). Do voters affect or elect policies? evidence from the u. s. house. *The Quarterly Journal of Economics 119*(3), pp. 807–859.

Lee, D. S. and T. Lemieux (2010). Regression discontinuity designs in economics. *Journal of Economic Literature 48*(2), 281–355.

Levitt, S. D. and J. Snyder, James M. (1995). Political parties and the distribution of federal outlays. *American Journal of Political Science 39*(4), pp. 958–980.

Lindbeck, A. and J. Weibull (1987). Balanced-budget redistribution as the outcome of political competition. *Public Choice 52*(3), 273–297.

McCrary, J. (2008). Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of Econometrics 142*(2), 698–714.

Migueis, M. (2013). The effect of political alignment on transfers to portuguese municipalities. *Economics & Politics 25*(1), 110–133.

Musgrave, R. (1959). *The theory of public finance: a study in public economy*. International student edition. McGraw-Hill.

Oates, W. (1972). *Fiscal Federalism*. The Harbrace series in business and economics. Harcourt Brace Jovanovich.

Oates, W. E. (1999). An essay on fiscal federalism. *Journal of Economic Literature 37*(3), 1120–1149.

Pettersson-Lidbom, P. (2008). Do parties matter for economic outcomes? a regression-discontinuity approach. *Journal of the European Economic Association 6*(5), 1037–1056.

Power, T. J. and C. Zucco (2009). Estimating ideology of brazilian legislative parties, 1990-2005: A research communication. *Latin American Research Review 44*(1), pp. 218–246.

Rocha, R. and R. R. Soares (2010, September). Evaluating the impact of community?based health interventions: evidence from brazil's family health program. *Health Economics 19*(S1), 126–158.

Rubin, D. B. (1974). Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of educational Psychology 66*(5), 688.

Sakurai, S. N. and M. I. A. Theodoro (2014). Alinhamento político e transferências governamentais: Novas evidências para os municípios brasileiros. Anais do XLI Encontro Nacional de Economia [Proceedings of the 41th Brazilian Economics Meeting] 076, ANPEC - Associação Nacional dos Centros de Pós-graduação em Economia.

Samuels, D. (2006). Sources of mass partisanship in brazil. *Latin American Politics and Society 48*(2), 1–27.

Solé-Ollé, A. and P. Sorribas-Navarro (2008). The effects of partisan alignment on the allocation of intergovernmental transfers. differences-in-differences estimates for spain. *Journal of Public Economics 92*(12), 2302 – 2319. New Directions in Fiscal Federalism.

Strömberg, D. (2002). Optimal campaigning in presidential elections: The probability of being florida. CEPR Discussion Papers 3372, C.E.P.R. Discussion Papers.

Troustine, J. (2011). Evidence of a local incumbency advantage. *Legislative Studies Quarterly 36*(2), 255–280.

Worthington, A. and B. Dollery (1998, March). The political determination of intergovernmental grants in australia. *Public Choice 94*(3), 299–315.

Appendix

A.1 - Municipal profiles within the program

Table A.1: Municipal profiles within the program

Profiles	Description
PROFILE 1	Areas relating to 40% (forty percent) of census tracts with the highest percentages of population in extreme poverty in Capitals, following Brazilian Institute of Geography and Statistics (IBGE);
PROFILE 2	Areas relating to 40% (forty percent) of census tracts with the highest percentages of population in extreme poverty in municipalities placed on metropolitan regions, following Brazilian Institute of Geography and Statistics (IBGE);
PROFILE 3	Areas relating to 40% (forty percent) of census tracts with the highest percentages of population in extreme poverty in municipalities that are between the one hundred (100) municipalities with more than 80,000 (eighty thousand) inhabitants, with the lowest levels of public revenue per capita and high social vulnerability of its inhabitants;
PROFILE 4	Municipality with 20% (twenty percent) or more of the population living in extreme poverty, based on data from the Ministry of Social Development and Fight against Hunger (MDS), available at the website www.mds.gov.br/sagi;
PROFILE 5	Municipality which is situated in area of operation of Special Indigenous Sanitary District (DSEI / SESA / MS);
PROFILE 6	Areas relating to 40% (forty percent) of census tracts with the highest percentage of population in extreme poverty of other municipalities, following Brazilian Institute of Geography and Statistics (IBGE).

A.2 - Nationality of the doctors

Table A.2: Nationality of the doctors

Nationality	Number of professionals	Percentage	Cumulative percentage
Cuba	11429	62.66%	62.66%
Brazil	6098	33.43%	96.91%
Venezuela	149	0.82%	97.71%
Argentina	147	0.81%	98.08%
Uruguay	66	0.36%	98.40%
Bolivia	60	0.33%	98.70%
Spain	53	0.29%	98.84%
Others	238	1.16%	100.00%
Total	18240		

A.3 - RDD validity tests on the PSDB and DEM elections

Table A.3: Comparison of means of program indicators for municipalities in which the opposition disputed elections

	(1)	(2)	(3)	(4)	(5)	(6)
	Full Sample		Margin of victory up to 10%		Margin of victory up to 5%	
	Opposition lost	Opposition won	Opposition lost	Opposition won	Opposition lost	Opposition won
Sum of municipalities	854	859	216	195	117	94
% of participant municipalities	0.68	0.67	0.68	0.64	0.69	0.59
Average number of doctors transferred by the program	2.56	2.38	2.29	1.97	2.10	1.33
	(4.93)	(4.18)	(3.87)	(3.27)	(2.78)	(1.65)

Notes: This table compares the indicators of the program among municipalities where the opposition candidate won the municipal elections with elections in which she ranked second. Columns (1) and (2) report averages using the full sample of municipalities avaliable. Columns (3) and (4) restrict the sample to elections defined by margins of victory up to 10% and columns (5) and (6) to elections defined by margins up to 5%. The odd columns present statistics for municipalities where the opposition candidate was in 2nd place and the even columns show statistics for cities where the opposition candidate was elected.

Table A.4: Comparison of means of covariates for municipalities where the opposition disputed elections

	(1)	(2)	(3)	(4)
	Margin up to 5%			
	PSDB ou DEM lost	PSDB ou DEM won	Difference of averages	P-value
Municipal Characteristics				
Infant mortality per thousand births	18.69	19.06	0.37	0.69
Gini's index	0.49	0.47	-0.02	0.01
% of extremely poor	10.31	9.28	-1.03	0.48
Per capita income	489.19	493.67	4.48	0.88
% of the pop. in households with bathroom and running water	82.74	84.74	1.99	0.47
% of households with water and sewage	8.33	7.10	-1.22	0.47
% of urban population	0.65	0.67	0.02	0.41
Total population	18213.77	12347.89	-5865.88	0.10
Total doctors	23.47	11.98	-11.49	0.21
Number of teams of *saúde da família* program	0.82	0.64	-0.18	0.40
Mayoral Characteristics				
Proportion of women mayors	0.14	0.19	0.05	0.28
Proportion of re-elected candidates in 2012	0.22	0.17	-0.05	0.35
Mayor's age	46.39	49.31	2.92	0.05
Proportion of mayors with higher education	0.44	0.45	0.00	0.97
Proportion of mayors who are doctors	0.02	0.01	-0.01	0.70
Observations	117	94		

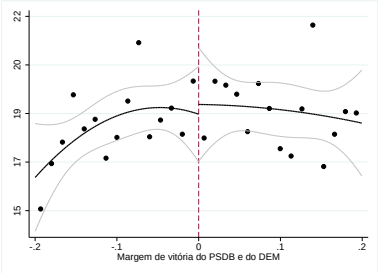
Notes: This table presents a comparison of average socioeconomic characteristics of the municipality and the mayor where the opposition parties won or lost by a margin of votes up to 5%. Column 1 reports the average for municipalities in which the opposition parties lost. Column 2 reports the average for the cities where the opposition parties won. Column 3 reports the mean difference. Column 4 reports the p-value of a t test for the difference of means.

Table A.5: Effect of being opposition on covariates (RDD)

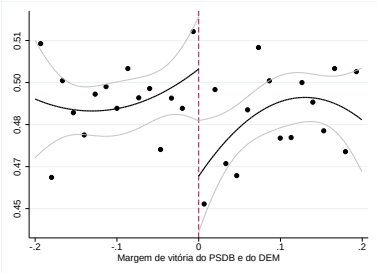
	(1)	(2)	(3)	(4)	(5)	(6)
	Local regression			Full sample		
	Margin de 5%	Margin up to 5% with cubic polynomial	Margin de 10%	Linear polynomial	Quadratic polynomial	Cubic polynomial
Municipal Characteristics						
Infant mortality	-0.54	-3.60	-0.16	0.49	0.93	-0.10
per thousand births	(1.99)	(2.80)	(1.36)	(0.48)	(0.61)	(0.75)
Gini's index	-0.05***	-0.09***	-0.04***	-0.01**	-0.01*	-0.02**
	(0.02)	(0.03)	(0.01)	(0.005)	(0.01)	(0.01)
% of extremely poor	-3.38	-13.11**	-1.70	0.34	0.82	-0.88
	(3.35)	(5.30)	(2.23)	(0.80)	(1.00)	(1.23)
Per capita income	-23.16	63.20	3.56	-21.76	-29.72	16.91
	(57.83)	(79.13)	(41.52)	(16.91)	(20.80)	(25.08)
% Of the population in households	3.56	24.59***	3.60	-0.66	-1.40	0.75
with bathroom and running water	(6.19)	(8.97)	(4.07)	(1.45)	(1.82)	(2.23)
% of households with	-3.90	-17.50***	-3.03	0.39	0.48	-0.97
water and sewage	(3.96)	(5.87)	(2.52)	(0.93)	(1.13)	(1.35)
% of urban population	-0.01	0.03	0.03	0.004	-0.01	0.01
	(0.06)	(0.10)	(0.04)	(0.02)	(0.02)	(0.02)
Total population	-4916.38	-7014.25	-10055.42*	-2602.86	-7332.38*	8117.48
	(6884.73)	(8997.60)	(5461.93)	(3915.74)	(3923.26)	(6112.76)
Total doctors	-20.13	-17.33	-19.35	-9.24	-16.48**	19.72
	(19.75)	(18.16)	(13.74)	(9.24)	(8.07)	(16.82)
Number of teams of	-0.23	0.18	-0.39	-0.03	-0.45	0.41
saúde da família program	(0.36)	(0.53)	(0.38)	(0.23)	(0.28)	(0.37)
Mayoral Characteristics						
Proportion of	0.08	-0.05	0.06	0.01	0.02	0.03
women mayors	(0.12)	(0.21)	(0.07)	(0.03)	(0.04)	(0.04)
Proportion of re-elected	-0.05	-0.27*	-0.08	0.004	0.01	0.05
candidates in 2012	(0.12)	(0.16)	(0.08)	(0.03)	(0.04)	(0.05)
Mayor's age	5.40*	13.59**	3.64*	1.62**	2.31**	1.58
	(3.03)	(5.47)	(2.12)	(0.77)	(1.01)	(1.22)
Proportion of mayors	-0.11	-0.09	-0.03	0.03	-0.004	0.04
with higher education	(0.15)	(0.25)	(0.10)	(0.04)	(0.05)	(0.06)
Proportion of mayors	-0.01	-0.001	0.000	0.004	0.002	-0.01
who are doctors	(0.06)	(0.10)	(0.03)	(0.01)	(0.02)	(0.02)
Observations	211	211	411	1716	1716	1716

Notes: This table presents RDD placebo estimates using municipal and mayoral indicators. Columns (1), (2) and (3) provide estimates of local regressions reducing sample set elections for up to 5% and 10%. In column (2) are added third-degree polynomials. Columns (4), (5) and (6) use the full sample avaliable using first, second and third degree polynomials respectively.

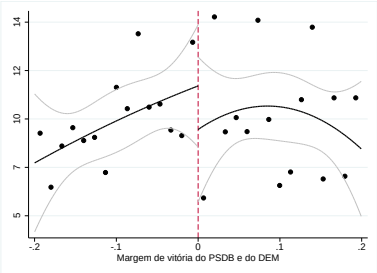
Figure A.1: Effect of being opposition on municipal characteristics



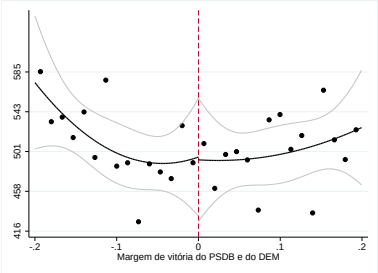
(a) Infant mortality per thousand births



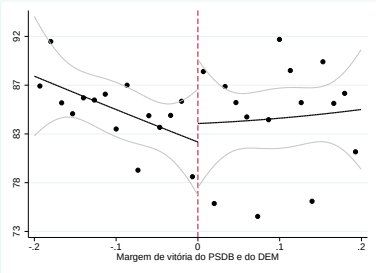
(b) Gini's index



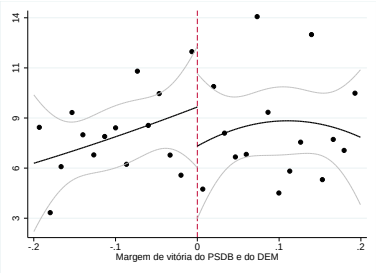
(c) % of extremely poor



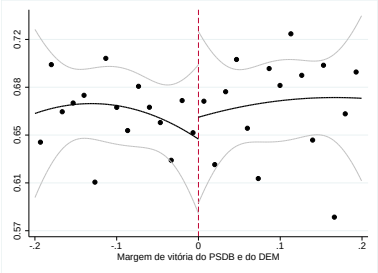
(d) Per capita income



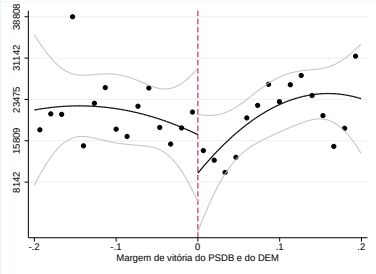
(e) % of the pop. in households with bathroom and running water



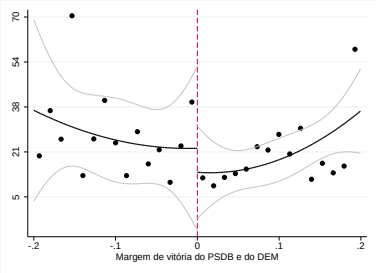
(f) % of households with water and sewage



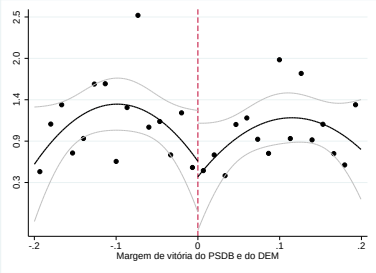
(g) % of urban population



(h) Total population

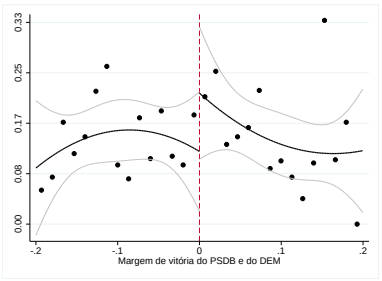


(i) Total doctors

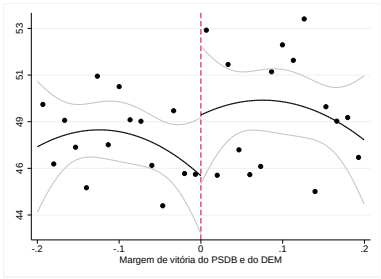


(j) Number of teams of *saúde da família* program

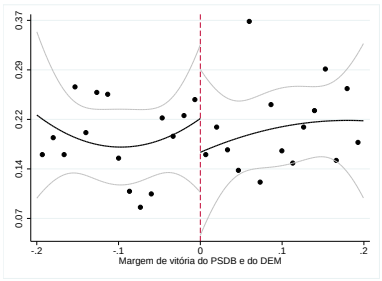
Figure A.2: Effect of being opposition on mayoral characteristics



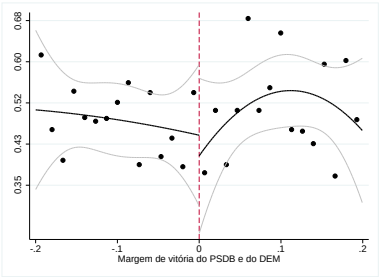
(a) Proportion of women mayors



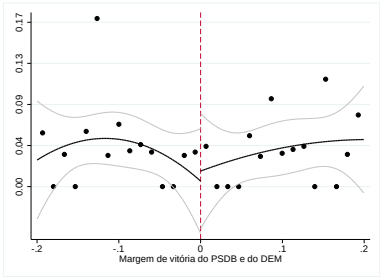
(b) Mayor's age



(c) Proportion of re-elected candidates in 2012

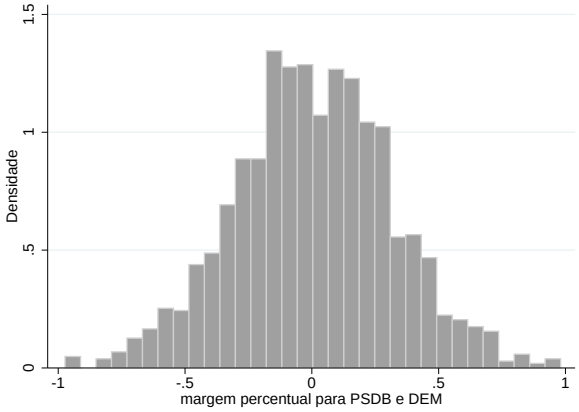


(d) Proportion of mayors with higher education

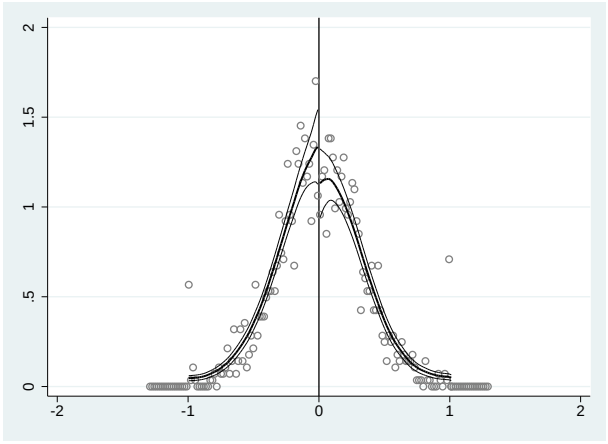


(e) Proportion of mayors who are doctors

Figure A.3: Tests for manipulation of elections



(a) Histogram of opposition's margin of victory



(b) McCrary test