Fiscal federalism and electoral choice in Brazilian municipalities

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20 de Julho de 2015

Abstract

We estimate the impact of the Municipalities' Participation Fund (Fundo de Participação dos Municípios – FPM), the principal federal transfer to Brazilian small cities, on the local results of presidential elections. In special, we want to test whether the extra resource benefits the central government party, whereas the opposition party may lose votes. The hypothesis is that FPM is a key aspect of Brazilian federalism, as enforcing economic dependence of small cities and central government, it can be a channel of political alignment - it is more hard to a mayor be opposite the federal government when the city is very dependent of resources. The methodology is based on a quasi-experiment to investigate whether FPM affects presidential election - we estimate Regressions in Discontinuity Design around the four population thresholds where there are sharp changes on the transfer. The results show great effect of per capita FPM on votes for central government party and a negative effect to the opposition. The effects are increasing through the last three elections. We control for local spending and the results are stronger and more significant - cities more FPM dependent are more likely to have victories to the central government party. For the last, we estimate the impacts of FPM on municipal elections for mayors and the results show that central government party is again more benefited.

Keywords: Program evaluation, Fiscal Federalism, Political Federalism.
JEL - Classification: H72, H77, D72, C90
Anpec classification: Area 5 - Economia do Setor Público

Resumo

Nós estimamos o impacto do Fundo de Participação dos Municípios, o FPM, o principal recurso federal aos municípios brasileiros, sobre os resultados locais das eleições presidenciais. Em especial, nós queremos testar se o recurso beneficia o partido do governo central, enquanto a oposição pode perder votos. A hipótese é que a maior dependência econômica das cidades pequenas em relação ao governo central pode ser um canal de alinhamento político, pois é mais difícil que um prefeito faça oposição ao governo federal quando depende dele. A metodologia para estimar o efeito causal do FPM sobre as eleições é baseada em um quase-experimento - nós estimamos Regressões em Descontinuidade ao redor dos quatro primeiros limiares populações de mudança de regra institucional do FPM. Os resultados mostram um efeito positivo sobre votos para o partido central e negativo para a oposição. Os efeitos aumentaram nas últimas três eleições, e o impacto é ainda mais significante quando adicionamos o gasto local como controle, o que mostra que o partido central tem mais chances de vencer em cidades mais dependentes do FPM. Por fim, nós estimamos o efeito sobre a votação municipal para prefeito, e novamente o partido do governo central é beneficiado com mais votos, embora dessa vez os resultados são menos significantes, especialmente quando controlamos pela despesa orçamentária.

Palavras-chave: Avaliação de políticas públicas, Federalismo Fiscal, Federalismo Político
Classificação - JEL: H72, H77, D72, C90
Classificação Anpec: Área 5 - Economia do Setor Público

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1 Introduction

In this paper we aim to investigate the effect of the most important federal transfer to Brazilian municipalities, the Municipalities' Participation Fund (Fundo de Participação dos Municípios – FPM), on municipal electors behavior in presidential elections. We contribute to understand the linkages between the fiscal and political federalism systems in Brazil. Our hypothesis is that it is more difficult for local politicians and populations to stand as opposition to the federal government when they are economically dependent of federal transfers.

The estimation method uses a discontinuity in the FPM transference according to population brackets defined by law, which allows the use of Regressions in Discontinuity Design near the population thresholds. The paper that is most close to our approach is Litschig (2012), who uses 1980 data to estimate the effects of FPM on mayor reelection.

Workers' Party (Partido dos Trabalhadores - PT), a left-wing party, is in central government power since 2002, and its electorate is progressively more concentrated on the poorer population. Also, there is a reduction in the votes for PT in the biggest cities, while the margin of victory has risen in small towns on the interior, specially since 2006 election.

One of the main factors explaining this shift is the social program Bolsa Família, which is very concentrated in these small towns. This program, which consists basically in a monetary transfer to poorer families, has strong impacts on the reduction of poverty and represents a direct link between central government and poor people. In this paper, we explore a different explanation for the central party margin of victory in small towns, that is, cities in which the mayor hall are more dependent of federal transfer have more propensity to elect the federal government party.

2 Brazilian federalism system

2.1 Decentralization and Fiscal Federalism

Since the end of Military Dictatorship in the beginning of the 1980s, Brazil started an important process of decentralization. After a long cycle of centralization of power and resources on the federal government the end of the Military dictatorship allowed the political, administrative and fiscal decentralization. The new Constitution approved in 1988 marked the attempt to reduce the centralism of the previous period and promote decentralization.

One of the main results of this process was a transfer of fiscal autonomy to the subnational levels, not only from the federal government to the states, but also from the federal level to the municipalities. Together with revenues the States and municipalities also assumed duties on Health and Education systems administration. (Mora and Varsano, 2001) (Kelly and Gasparini, 2007) (Serra e Afonso, 1999) The mechanism of decentralization used in Brazil privileged constitutional transfers instead of fiscal autonomy for the lower levels of government (Kelly and Gasparini, 2007). The criteria designed for redistribution of central resources was design to reduce regional inequality. The result is that the poorest regions receive proportionally higher amount of the federal transfer Serra and Afonso (1999).

The most important federal transfer for the municipalities is the FPM, which is composed from 23.5% of two federal tributes' - IPI (Industrial Products) and IR (Income Tribute). FPM constitutional distribution criteria changed after 1988 but the main criteria of distribution divides the municipalities on two groups: State capitals and interior municipalities. The State's capitals has 10%, the interior municipalities 86.5% and 3,6% of a reserve. The most important criteria of distribution for fiscal decentralization is the distribution for the interior municipalities. The distribution is based on classes of population arbitrary defined on the legislation (STN, 2012). The main pattern regarding this distribution is that the per capita transference is higher on the small municipalities.

2.2 Political evolution in the last elections

After re-democratization in 1988, Brazil had seven presidential elections in 1989, 1994,1998, 2002, 2006, 2010 and 2014. The dispute for president is done in two rounds if the winner candidate do not earn the dispute with the majority of the valid votes (excluding null votes), and the vote is mandatory for all citizens. Two parties, PT and PSDB, polarize the political national scene. After 1994 these parties together received 70% to 90% of the valid votes. Fernando Henrique Cardoso (PSDB) won in 1994 and 1998 in the first round. All other election for president took two rounds to achieve a final result.

After losing three presidential elections on second place, PT finally won in 2002. It opened a sequence of four victories, the longest sequence of a single party in Brazilian democratic history with the elections of Lula in 2002 and 2006 and Dilma in 2010 and 2014. Along this time, political scientists identified a shift on the socioeconomic profile of the political supporters of PT. Singer (2010) proposed the term Lulism ("Lulismo") to classify this process. Lulism is the set of political forces who supported Lula politically and guaranteed his re-election in 2006. By this time, PT lost votes in the middle class, which historically voted in the party, and got more supported from the poorer families, specially because of the transference of Bolsa Família to these families. Nobre (2010) on other hand pointed that both PT and PSDB, the main opposite party, orbit the center of political center represented by PMDB, the main central party in Brazil. They both agree that lower socioeconomic classes joined Lula in 2006 after rejecting him in the four preceding elections, 1989, 1994, 1998 and 2002, and these groups were very important for PT victories in the 2010 and 2014 elections.

The shift on Lula's electoral base was also explored by a more quantitative approach such as in Zucco (2013), and Peixoto (2007). These authors explore the rule of Bolsa Familia on this process. The income distribution program Bolsa-Familia is a very focused program on the very poor which naturally overlaps with political preference for PT. The role of Bolsa Familia for Lula reelection is widely debated. Most of the studies agree and find significance positive impact of Bolsa Familia in the option for PT on presidential elections. (Shikida et al, 2009; Zucco, 2013; Liccio et all, 2009).

The concentration of votes on PT and its main opposition PSDB correlates with indicators of socioeconomic status such as income and education, while PT base support shifted from urban affluent sectors, with more schooling and income, located in the biggest cities to the poor and mostly of the very poor people. (Singer, 2010). Brazil in this sense became a very politically polarized country divided between rich and the poor, with the poor supporting PT after 2006 and the rich supporting the PSDB, which is the main political rival of PT. This pattern is identified in multiple geographical scales. Inside big metropolitan urban areas as São Paulo, PT supporters are from poorer population concentrated on the periphery of tur urban center, (Carvalho, 2009) but also on national scale, the concentration of supporters from PT is located in the less developed regions of the country, mainly the North and Northeast regions. Geographically the poorest regions in Brazil in the Northeast and in the North are the main political basis for PT after 2006.

The transition of the political supports of PT for the poorest regions of Brazil has some important implications. The difference in votes from the wining candidate compared to the second place is higher on places with higher population size and level of urbanization. This condition implicates that on the smaller municipalities is more difficult for the opposition of the ruling forces to win. Marenco dos Santos (2013) points that the smaller the municipality size, the lower the level of political competition and the higher the alignment with the federal government , as in 2008 election 70% of the mayors elected were align with the ruling coalition of the federal government. The alignment with the federal government constitutes an important electoral capital for the ruling coalition at the national level.

One additional aspect of this shift is the dependence of the regions that are now supporting PT of federal transfers. The fiscal decentralization process in Brazil favored some regions instead

of others and the Northeast was one of the regions most benefited by the fiscal decentralization process in Brazil after 1988 Constitution. Therefore, while the electoral base of PT shifts to the Northeast, it goes to region were the municipalities have a high dependence on the federal transfers. On that sense, the shift in political scene of PT supporters in the poorest Northeast has an interesting overlapping with some remarkable aspects of Brazilian federalism. This process might have electoral implications. In this view, it is hard to separate in which extent the PT shift to the poorer smallest cities or it is a characteristic of Brazilian federalism itself - independently of the party in federal power, it may receive more votes in these areas.

3 Data

The data sets used in the paper came from two sources, fiscal and elections data for the municipal level in Brazil. Fiscal data from the FPM distribution for the municipalities came from STN -National Treasury Secretary. The source of the data from votes on the parties in the national and local elections is from TSE - Superior Electoral Court of Brazil.

Table 1 summarizes some aspects of Brazilian fiscal decentralization. We selected the main sources of revenues for the municipalities. Small cities are more dependent of FPM transfer and of the main state transfer (a share of ICMS, a state tax). The municipal tributes, municipal taxes and other tributes that are municipal responsibility represent only 4% of the revenues of the smallest group. This mean that for small municipalities we find a total dependence on transfers from federal and state level.

[Table 1]

Figure 1 shows the difference on the percentage of votes between PT and PSDB on the first round of presidential elections of 2002, 2006, 2010 and 2014 per classes of population. Two tendencies are clear. First, we can see that PT is progressively increasing his margin of votes in the Northeast. On other hand, PT started also to increase the share of votes in the small municipalities an opposite situation compared to 2002.

Figure 2 shows the spatial distribution of the dependence of the FPM, measured by the percentage of the FPM to the Total revenues available for the municipalities. On the red zones, FPM represents more than 50% of total municipal revenues. The regions with the higher dependence are on the Northeast and state of Minas Gerais.

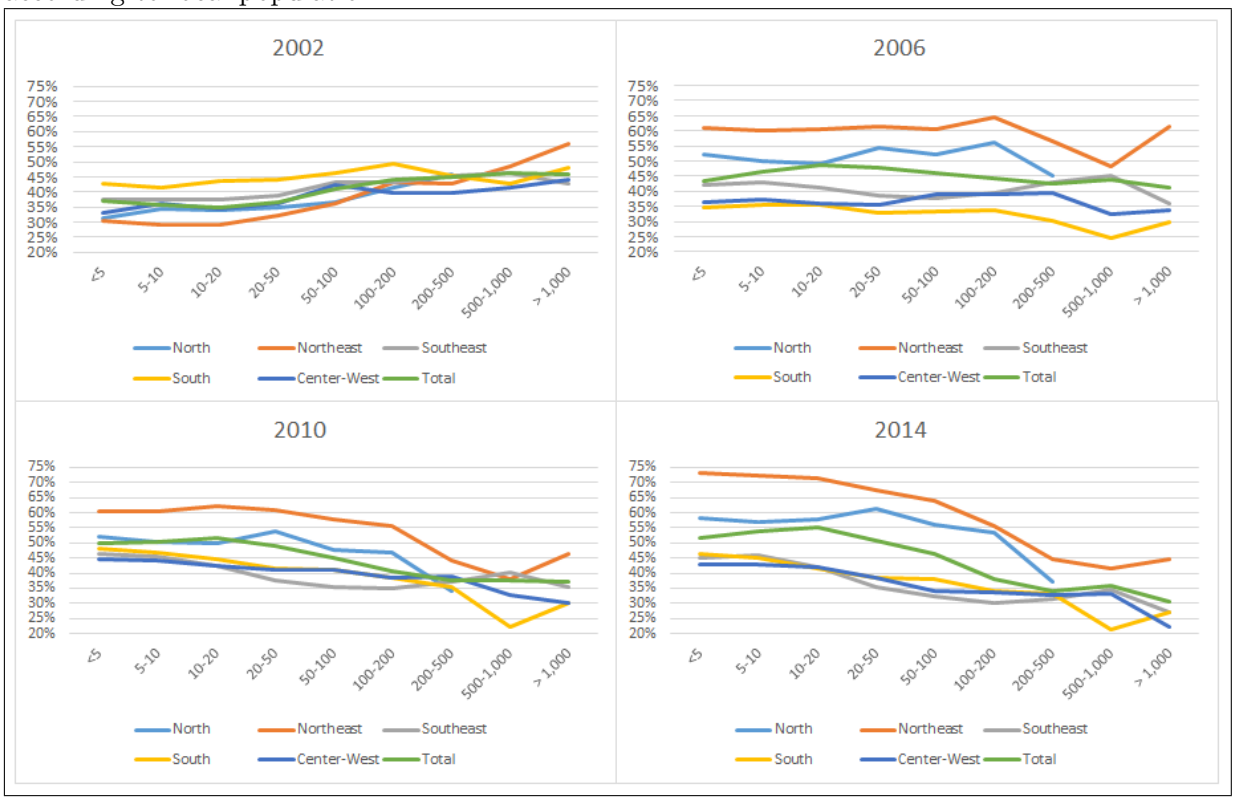
Figure 3 shows the spatial distribution of the proportion of families that receive Bolsa Familia families on total number of families. The Northeast is also the region were the concentration of Bolsa Familia beneficiaries.

Figure 4 shows the relative difference on votes on PT and PSDB. We see a great spatial overlap of votes for PT, Bolsa Família and FPM. The margin in favor of PT is higher on the regions were Bolsa Familia and FPM dependence are higher.

4 Empirical strategy

Our estimation methodology follows closely the literature that uses FPM population thresholds to estimate causal impacts of FPM, in special Listchig (2012), Brollo et al (2013), Avarte et al (2013) and Castro et al (2015). The strategy consists of using FPM law that determines the FPM distribution according to FPM brackets. The principal hypothesis is that the thresholds are exogenous and any difference on potential variables comparing cities immediately on the right and on the left of the threshold are due to the extra FPM given the legal rule. We follow the hypothesis and discussions presented in Castro et al (2015) that guarantees the identification of FPM variation near the thresholds.

Figure 1: Percentage of votes for PT and PSDB on the first round of presidential elections, according to local population



We analyze municipalities that receive an extra FPM given a marginal population variation in the estimation window. Control cities are on the left of the cutoffs and treatment on the right. This is a special case of Regression in Discontinuity Design, which is further explained in Lee and Lemieux (2010).

We use the four FPM thresholds in our population sample range: 10,189; 13,585; 16,891; 22773. We estimate RDD effects using Two-Stage Least Square (2SlS) regressions in regions around the thresholds. According to Angrist (1999), 2SLS consistently estimates the causal impact. The specification of the first stage can be described as:

$$FPM_i = \lambda_0 + \lambda_1 theoricalFPM_i + \lambda_2 p_i + \lambda_3 p_i^2 + v_i$$

where p is the population of the municipality in a given period. In the first stage, we correct for declaration error in FINBRA database, which could bias the results. The estimation of the second stage consists of:

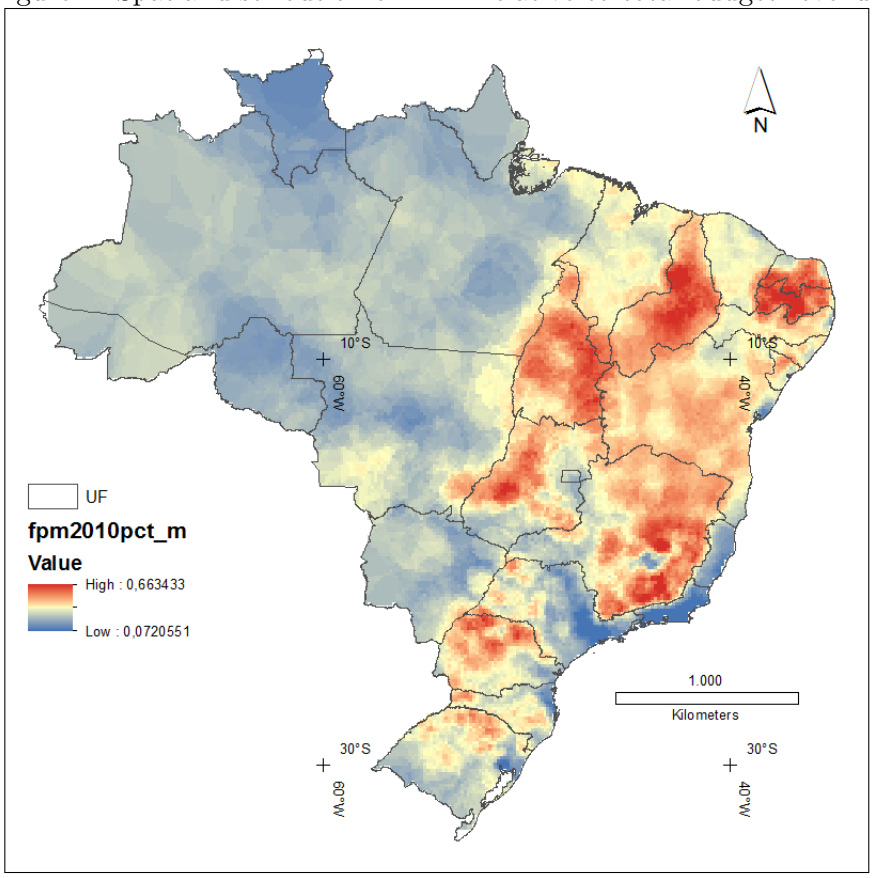
$$V_i = \alpha_0 + \alpha_1 p_i + + \alpha_2 p_i^2 + \tau FPM_i * + \alpha_3 X_i + u_i$$

where V_i is the number of votes for PT candidate (or the margin of victory) and $FPM*$ is the FPM per capita estimated on the first stage. τ_i is the coefficient of interest and X are controls added later. u is the idiosyncratic error term, grouped by cluster of municipalities to fix the variance of each city over time (Wooldrigde, 2002).

We analyze in Figure 5 the balancing between treatment and control groups relative to the size of the electorate. We estimate local polynomial regressions on the right and on the left of the thresholds, and there is no clear impact of FPM on the city number of votes[1]. We conclude

[1] A detailed analysis of the FPM balancing around the thresholds can be find in Castro et al (2015).

Figure 2: Spatial distribution of FPM relative to total budget revenue



that FPM does not influence general propensity to vote, as there are no migration of votes correlated with this transfer.

5 Results

5.1 Estimates with all sample data

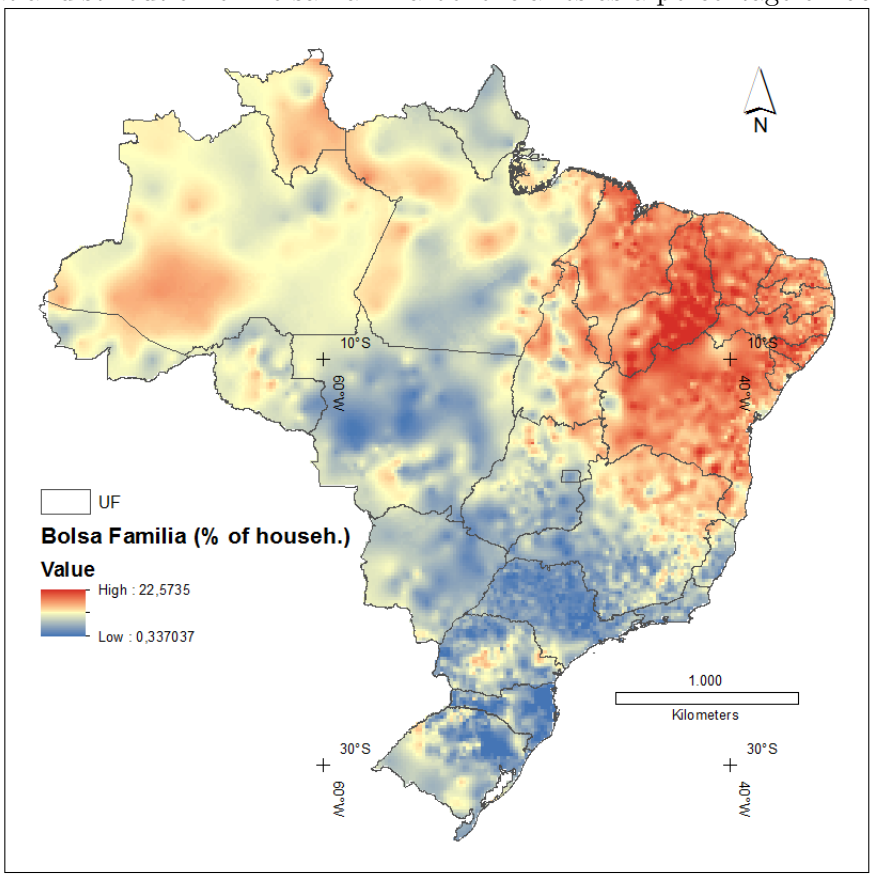
Table 2 shows the estimates using Ordinary Least Square (OLS) and Instrumental Variable (IV) regression, in which we use all Brazilian cities with fewer than 30,000 inhabitants. We use electoral data of number of votes for PT and PSDB in the last 3 presidential elections, and for each one we use fiscal variables of all the years before.

OLS estimates indicate a positive correlation between per capita FPM and votes for PT in first and second round of 2006 elections, but there is no effect in 2010 and even a negative correlation in the first round of 2014. On the same time, votes for PSDB in 2006 have a negative correlation with FPM, but the absolute magnitude reduced through time.

The R^2 of OLS regressions indicates a strong correlation between electors decision, population and FPM transferred to a city, reaching 81% on the 2010 regressions for PT. The IV estimates, with the theoretical FPM as instrument in the first stage, are less significant, but also reveal that the FPM impact on votes for PT has a decreasing trend in the last few elections. These correlations are good as an overall insight of how our variables are related, but they do not necessarily indicate causality. In the next section, we use a more robust estimate of the direct impact of an exogenous FPM variation on votes for PT and PSDB.

[Table 2]

Figure 3: Spatial distribution of Bolsa Família beneficiaries as a percentage of local population



5.2 RDD regressions

For now on, we analyze the impacts estimated by RDD, considering 5000 inhabintants windows around the thresholds. We present in Table 3 the effects on votes for PT on the left and on votes for PSDB on the right; the first column shows the effect using all the thresholds together, and the others the separate effect for each threshold. Also, we separate the effects for votes on each round for the last 3 presidential campaigns: 2006, 2010 and 2014. The left side of Table 3 shows a very little impact of FPM on PT voting, and even a negative effect in the 2014 election. The right side shows no evidence of FPM impacts on PSDB votes.

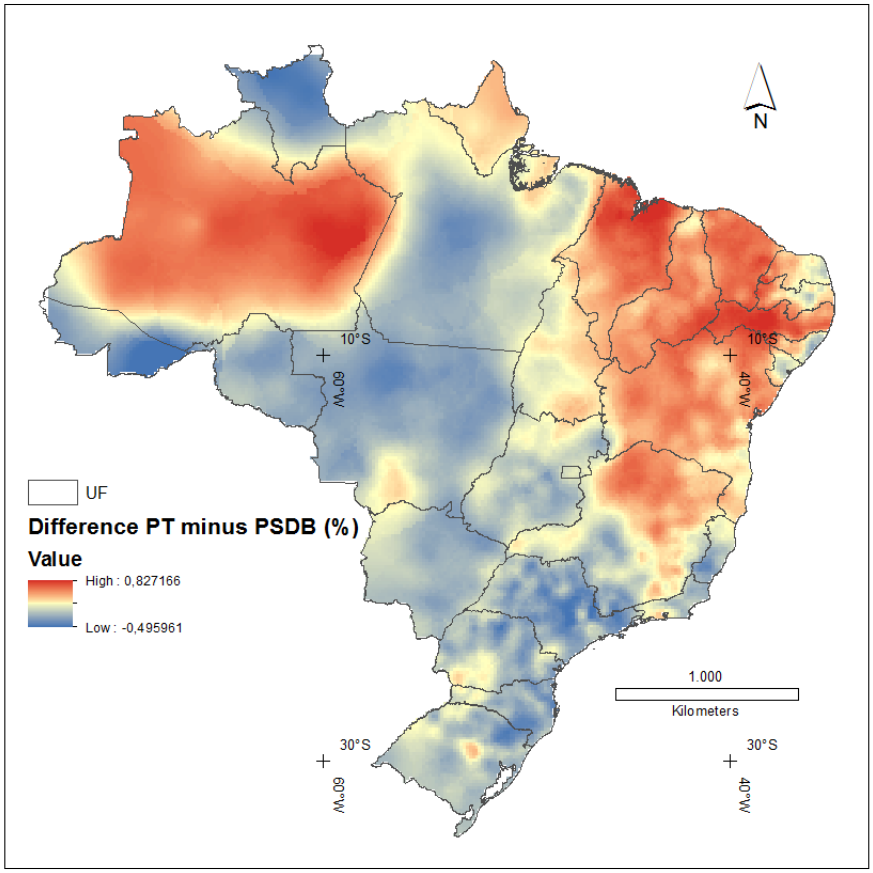
[Table 3]

Table 4 repeats the regressions of Table 3, but we add the local budget expenditure (in logarithm) as control. Although endogenous, controlling for local spending allows us to estimate the impact of the increasing dependence on FPM, as we see the variance in FPM not correlated to spending and naturally to a great portion of revenue and general economic impacts.

We think in this regression as the impact of FPM on elections in cities which FPM has no economic impact. Suppose for example that Bolsa família is the meanly cause driving votes for PT. In this case, if FPM impacts on economics or poverty, it may reduce the program number of beneficiaries and also the votes for PT. Now, controlling for spending, we want to capture the impact of the increasing dependence of FPM relative to the total expenditure, which is very close to the local budget revenue. We take cities that receive an exogenous FPM due to population increase, but keep their expenditures unchanged. In this situation, the FPM economic and social impact should be low.

The left side of Table 4 shows a positive impact of FPM on votes for PT. The biggest impacts

Figure 4: Difference of votes for PT less the votes for PSDB as the share of local electorate



occur in small towns in the 2000 elections, but the impacts increases for the others ranges in recent elections. Comparing Tables 3 and 4, wee see that there are more votes for the central party in the cities most dependents of central transfers. The right side of Table 4 shows a negative impact of FPM on votes for the opposition party, and this effect is increasing over time, including in the biggest cities in our sample.

[Table 4]

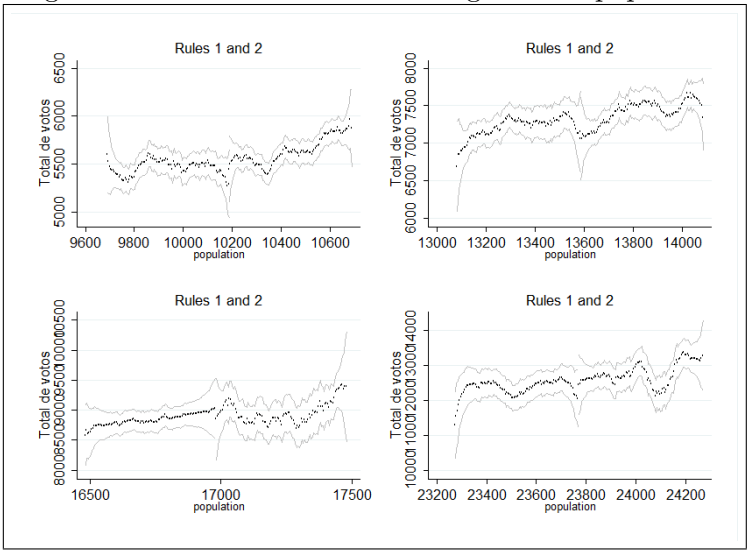
In Table 5, we analyze the FPM impacts on the margin of victory of PT from PSDB, relative to the total side of the electorate[2]. In the left side, in which we do not control for local spending, the effects are small and even negative in some population ranges in 2014 election. The tendency reverses when we control for local spending on the right side. The effects are significant in 2010 and 2014 elections and increase over time. The effects are numerically big, representing an increase of one third of the electorate in the margin of victory due to a 1% increase in FPM.

[Table 5]

Table 6 presents a more robust estimation, in which we use the RDD regressions and the panel of cities along the years. We control for city Fixed Effect, a method to eliminate bias due to local idiosyncratic error constant over time. The Fixed Effect with Instrumental Variable (FE -IV) calculate the effect of changing the FPM coefficient during the sample period due to marginal population growth in the RDD estimation windows. We use again the PT margin of victory relative to the total as dependent variable. We separate the effects to the first round of

[2]We define the dependent variable in this case as $margin = \frac{votesPT - votesPSDB}{totalelectorate}$.

Figure 5: Total of electors according to local population



presidential elections (on the upper part) and to second (on the bottom). The results on the left side, in which we do not control for local spending, shows a positive impacts on the PT relative margin on the first round, whereas this effect becomes negative in the second round. Controlling for local spending on the left shows that increasing FPM dependence impacts positively on PT probability of victory, but this effect is concentrated in the first round when we control for local fixed effect.

[Table 6]

6 Impacts on municipal elections for mayors

In this section, we estimate the impacts of the FPM transference on the probability of a given party win the municipal elections for mayor. Figure 6 shows the distribution of parties among cities with up to 30,000 inhabitants. PT is the party with less representation in this sample, while PMDB has more mayors when the local population is fewer than 15,000 inhabitants. For cities with population ranging from 15,000 to 30,00 inhabitants, PT and PSDB has a similar number of mayors.

We present in Table 7 the regressions estimates correcting for Fixed Effect and using Theoretical FPM as Instrumental Variable. We consider data for the municipal elections in the years 2004, 2008 and 2012. In the upper part of the Table 7, we see the results using all the thresholds together. The impacts are positive on the votes for PT when we do not control for local spending, on the left, and negative on votes for DEM, an opposition party. The impacts on PT are concentrated on threshold 3, while the impacts on DEM are concentrated in smaller towns - cities near the first thresholds. Also, in threshold 3 window, there are negative impacts on votes for PMDB and PSDB.

The results are quite different when we control for local spending on the left of Table 7. Considering all the thresholds, the only impact is a positive increase on votes for DEM. Most of the significant disappear - which is a sign that most of FPM impacts is due to the increase on local budget expenditures - but there is still positive impacts on votes for PT at threshold 3, as well as negative effects on votes for PMDB.

[Table 7]

Figure 6: Distribution of biggest parties on town halls in cities with up to 30,000 inhabitants

Linear polynomial regressions estimates. Confidence interval is omitted but its inclusion does not change the analysis.

7 Conclusions

We analyze a specific channel of interaction among fiscal and political federalism in Brazil, that is, the effect of the a central transfer, the FPM, to municipalities on local elections for central party candidates for president and mayor. Our hypothesis is that, although being an unconditional transfer, politicians and population can associate the extra amount to the federal party. Also, it can be a idiosyncratic characteristic of Brazilian federalist system. In the time that mayors play a central rule in political background and they are very dependent of federal economic support, it's a natural questions to investigate in which extent economic support is transformed into political support, independent of the party in federal power.

We use the legal rule of FPM transference according to population brackets, which allows the use of RDD regressions to identify the exogenous impacts near the first four thresholds. The results indicate very small impacts when we do not control for municipal budget conditions, even a negative effect on votes for PT in 2014 election.

The regressions are very sensitive to the inclusion of local budget expenditures as control. Our intention is separate the impacts on cities which may occur FPM budget and economics impacts, the general case, and cities where FPM does not impact like this. In this latter case, increasing FPM dependence has strong positive impacts on votes for PT presidential candidate and negative impacts on votes for PSDB. Moreover, the impacts seems to be increasing and progressively more significant during the 3 last elections.

We also use the difference of votes for PT and votes for PSDB, relative to the total municipal electorate, as dependent variable, and we observe the same trend - PT margin of victory is bigger when the city receives more per capita FPM, and this effect is bigger when the city is more FPM dependent and when FPM has less economic impacts. Also, the effect increased in the last election. Using a more robust specification, in which we use a panel of cities across the last elections to control for fixed effect, we identify a similar trend, although more evident in the first round.

We estimate the impacts of FPM on municipal elections for mayors, as an extra channel of interaction between FPM and politics. Now, the effects of FPM on votes for PT is bigger when

we do not control for local spending and using all the thresholds, but the impacts at threshold 3 are similar in both cases. Also, the impacts on opposition parties are negative, specially when we do not control for budget expenditures.

In general, the results indicate positive effect of FPM on votes for the central party. Also, the impacts are bigger when the do not control for budget expenditure, that is, extra amount represents more federal money dependence and there are no economic impacts. More FPM dependence increases the margin of victory of PT, and this effect is increasing in the last elections. The impacts on central party mayor candidates are also positive, but the results are not so sensitive to the inclusion of local budget controls.

The results should be analyzed considering Brazilian political, fiscal and economical federalism system. Although very important political players, small cities mayors are almost always very dependent of federal transfers, specially the FPM. Although made automatically each month, this transfers represents a liquid transference from bigger urban centers to small rural towns. Our objective was to present some general impacts, in the case or not of existing budget impacts.

In the next steps, we are analyzing the possible interactions of FPM and another social programs to clarify the FPM impact channels. We want to see the effects of FPM on the city number of Bolsa Familia beneficiaries, the most important federal social program, which is considered as important factor to explain the victory of the central party in the last elections. Some of the electoral FPM impacts may be due to social and economics spillovers, as FPM could for example reduce the poverty and the number of Bolsa Família attenders.

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Table 1: Brazilian municipalities descriptive analysis according to population size

population in 1,000	tax Revenue % of Revenue	FPM % of Revenue	ICMS transfer % of Revenue	per capita FPM in reais (R$)	Number cities
5	4.00	50.20	20.90	1,225.45	1301
5-10	5.40	36.20	22.00	589.77	1212
10-20	5.60	33.30	19.20	468.02	1401
20- 50	8.70	25.70	20.00	351.39	1043
50-100	11.10	18.80	21.70	254.37	325
100- 200	15.30	13.90	23.20	216.1	150
200-500	19.80	9.50	23.40	156.23	95
500-1.000	20.50	7.40	23.50	123.13	23
1.000	34.30	3.90	16.70	78.82	15

Population scaled in 1,000 inhabitants. We use the percentage value of the city FPM and ICMS share, according to the total budget revenue. Per capita FPM is in reais (R

Table 2: Effects of FPM on votes for PT - OLS and IV regressions

	OLS			IV		
	2006	2010	2014	2006	2010	2014
PT 1tr						
FPM	0.10***	-0.01	-0.03**	0	-0.05**	-0.13***
R^2	0.74	0.8	0.7	0.73	0.8	0.7
obs	22065	39338	47817	8794	26067	34546
PT 2tr						
FPM	0.12***	0.03*	0	0.01	0.01	-0.06***
R^2	0.8	0.81	0.75	0.79	0.81	0.75
obs	22065	39338	47817	8794	26067	34546
PSDB 1tr						
FPM	-0.18***	-0.13***	-0.09***	-0.11*	-0.05*	-0.04
R^2	0.52	0.51	0.38	0.52	0.51	0.38
obs	22065	39338	47817	8794	26067	34546
PSDB 2tr						
FPM	-0.16***	-0.14***	-0.09***	-0.09	-0.03	0.01
R^2	0.48	0.55	0.5	0.48	0.55	0.5
obs	22065	39338	47817	8794	26067	34546

Note: $*p < 0.10, **p < 0.05, ***p < 0.01$. We use FPM in level(R$) and total of votes in each party. Covariates omitted.

Table 3: Effects of FPM on presidential elections - RDD regressions

votes for PT						votes for PSDB				
thresholds	1-4	1	2	3	4	1-4	1	2	3	4
2006 1tr										
FPM	1.55	6.08**	1.05	-4.12	17.22	-0.97	-1.83	-9.89	1.33	-13.41
obs	951	348	283	212	108	951	348	283	212	108
2006 2tr										
FPM	1.98	5.41**	-0.84	-1.61	28.01	-0.43	-0.72	-9.69	2.62	-16.15
obs	951	348	283	212	108	951	348	283	212	108
2010 1tr										
FPM	0.18	0.37	0.32	0.4	-1.91	-0.21	0.18	-0.45	-1.32	2.26
obs	2781	1068	801	591	321	2781	1068	801	591	321
2010 2tr										
FPM	1.05***	1.02**	1.08	1.94*	0.25	0.31	0.5	-0.04	-0.06	3.38
obs	2781	1068	801	591	321	2781	1068	801	591	321
2014 1tr										
FPM	-0.78***	-0.34	-0.23	-2.19***	-1.13	-0.33	0.21	-0.84	-0.46	-3.07
obs	3813	1487	1079	807	440	3813	1487	1079	807	440
2014 2tr										
FPM	0.06	0.11	0.44	-0.46	1.77	0.13	0.42	-0.27	0.42	-0.88
obs	3813	1487	1079	807	440	3813	1487	1079	807	440

Note: $*p < 0.10, **p < 0.05, ***p < 0.01$. We use variables in level and the city's total votes for each party. Covariates omitted.

Table 4: Effects of FPM on presidential elections controlling for local expenditures - RDD regressions

votes for PT						votes for PSDB				
thresholds	1-4	1	2	3	4	1-4	1	2	3	4
2006 1tr										
FPM	3.06*	7.50***	2.18	-0.45	18.82	-4.63**	-5.02*	-12.93*	-6.85	-20.46
obs	951	348	283	212	108	951	348	283	212	108
2006 2tr										
FPM	3.17**	6.44**	0.13	1.75	27.05	-4.11**	-4.01	-12.51*	-5.3	-24.05
obs	951	348	283	212	108	951	348	283	212	108
2010 1tr										
FPM	1.34***	1.26***	1.47*	2.32**	0	-2.45***	-1.30***	-2.71***	-5.05***	-2.56
obs	2781	1068	801	591	321	2781	1068	801	591	321
2010 2tr										
FPM	2.20***	1.94***	2.22***	3.81***	2.36	-2.33***	-1.15**	-2.62***	-4.27***	-3.17
obs	2781	1068	801	591	321	2781	1068	801	591	321
2014 1tr										
FPM	0.96***	1.10***	1.56**	0.43	1.88	-2.88***	-1.61***	-3.54***	-4.53***	-8.66***
obs	3812	1486	1079	807	440	3812	1486	1079	807	440
2014 2tr										
FPM	1.72***	1.52***	2.13***	2.18**	4.74**	-2.90***	-1.68***	-3.41***	-4.36***	-7.75***
obs	3812	1486	1079	807	440	3812	1486	1079	807	440

Note: $*p < 0.10, **p < 0.05, ***p < 0.01$. We use variables in level and the city's total votes for each party. We add the logarithm of total budget spending as control. Covariates omitted.

Table 5: Effects on voting to president by election and round

control: budget spending	without					with control				
thresholds	1-4	1	2	3	4	1-4	1	2	3	4
2006 - 1tr										
FPM per capita	0.57*	-0.22	-0.51	-1.49*	-2.09	-0.08	0.21	0.13	-0.59	-1.06
obs	950	348	283	211	108	950	348	283	211	108
2006 - 2tr										
FPM per capita	-0.57*	-0.35	-0.52	-1.39*	-1.4	-0.08	0.13	0.1	-0.5	-0.46
obs	950	348	283	211	108	950	348	283	211	108
2010 - 1tr										
FPM per capita	-0.06	-0.08	0.09	-0.16	-0.29	0.22***	0.18**	0.41***	0.19	0.02
obs	2719	1042	784	579	314	2719	1042	784	579	314
2010-2tr										
FPM per capita	-0.04	-0.04	0.11	-0.18	-0.29	0.26***	0.24***	0.44***	0.18	0.07
obs	2719	1042	784	579	314	2719	1042	784	579	314
2014-1tr										
FPM per capita	-0.08**	-0.11*	0.08	-0.23**	-0.05	0.26***	0.23***	0.47***	0.19*	0.30*
obs	3742	1457	1060	794	431	3741	1456	1060	794	431
2014-2tr										
FPM per capita	-0.07	-0.09	0.07	-0.22**	-0.05	0.29***	0.27***	0.48***	0.22*	0.33**
obs	3742	1457	1060	794	431	3741	1456	1060	794	431

Note: $*p < 0.10, **p < 0.05, ***p < 0.01$. We use logarithms of declared FPM and theoretical FPM. We use per capita budget spending as control, in logarithm. The dependent variable is the percentual difference of votes for PT less the votes for PSDB as a share of local electorate. Covariates omitted.

Table 6: Effects on voting to president by round - FE

control: budget spending	without					with control				
thresholds	1-4	1	2	3	4	1-4	1	2	3	4
round 1										
FPM per capita	0.21***	0.19***	0.24***	0.26***	0.23***	0.18***	0.18***	0.28***	0.24**	0.13
obs	3742	1457	1060	794	431	3741	1456	1060	794	431
round 2										
FPM per capita	-0.11***	-0.09***	-0.13***	-0.12***	-0.18***	-0.08**	-0.06	-0.08	-0.13	-0.27*
obs	3742	1457	1060	794	431	3741	1456	1060	794	431

Note: $*p < 0.10, **p < 0.05, ***p < 0.01$. We use logarithms of declared FPM and theoretical FPM. We use per capita budget spending as control, in logarithm. Covariates omitted.

Table 7: Effects on mayor elections voting by party

	PT	PSDB	PMDB	DEM	PTB	PP	PT	PSDB	PMDB	DEM	PTB	PP
thresholds 1-4												
FPM per capita	0.06***	-0.03	0	-0.14***	0	-0.01	0.06	0.07	-0.07	0.13**	0.03	-0.02
obs	4397	4397	4397	4397	4397	4397	4273	4273	4273	4273	4273	4273
thresholds 1												
FPM per capita	0.04	0.08	-0.03	-0.20***	0.14***	-0.06	0.06	0.29**	-0.18	0.08	0.1	-0.09
obs	1687	1687	1687	1687	1687	1687	1635	1635	1635	1635	1635	1635
thresholds 2												
FPM per capita	0.08*	-0.06	0.05	-0.11*	-0.05	0.06	0.1	-0.02	0.14	0.07	0.06	0.09
obs	1296	1296	1296	1296	1296	1296	1262	1262	1262	1262	1262	1262
thresholds 3												
FPM per capita	0.19***	-0.16**	-0.18***	-0.07	-0.07	-0.05	0.25***	-0.11	-0.39**	0.15	0.03	-0.18
obs	919	919	919	919	919	919	899	899	899	899	899	899
thresholds 4												
FPM per capita	-0.02	-0.19*	0.1	-0.03	-0.20**	0.1	-0.07	-0.27	0.24	0.26	-0.24	0.08
obs	495	495	495	495	495	495	477	477	477	477	477	477

Note: $*p < 0.10, **p < 0.05, ***p < 0.01$. We use logarithms of declared FPM and theoretical FPM. We use per capita budget spending as control, in logarithm. Data from 2000-2008. Covariates omitted.