

Decentralization and Governmental Transfers in Developing Countries. The Case of Paraguay*

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Abstract

This paper presents evidence on the effects of intergovernmental transfers on financial outcomes of local governments in Paraguay. By incorporating census adjustments that affected the overall volume of transfers to local municipalities, I construct two treatment arms and a control group. Municipalities with a 15% or greater decrease in transfers increased their tax revenues by 14 %, whereas those with a 15% or greater increase in transfers decrease their tax revenues by 26%. Furthermore, total expenditures in the first group increased, particularly in infrastructure and social assistance, but decreased in the latter. The results are consistent with recent findings in the literature: the way local governments are being financed plays a role in the quality and quantity of their expenditures.

JEL: H71, H72, I22, R51.

*The author would like to thank Kelly Bedard, Alisa Tazhitdinova, Gonzalo VazquezBare, UCSB reading group, Micah Villarreal, Richard Uhrig for their insightful discussion and comments on previous versions of the manuscript. All errors are my own.

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1 Introduction

Efforts of developing countries to decentralize authority and empower local governments have been increasing over the last decades. Intergovernmental funds play a key role in this process, by providing resources to officials which theoretically would design and implement policies that benefit local populations. Although the allocation of transfers can help alleviate the financial burden of public services and goods provided by local authorities, it also provides a perverse incentive to diminish efforts in their own generating revenue.

The empirical literature covers substantially the case for developed countries, where the evidence supports that the impact of intergovernmental grants tends to increase expenditures rather than cutting taxes, a phenomenon known as the “fly paper effect”¹ (Card and Payne (2002), Dahlberg et al. (2008))

The evidence is highly dependent on the developed status of the country, where sound institutions provide the ideal scenario for a responsible and sustainable use of funds. The literature falls short on developing economies, with some exceptions such as Brazil.

Litschig and Morrison (2013) captures the effect on development and political outcomes in Brazil in the 1980s, finding that the unrestricted nature of the grants led to higher schooling and literacy rates and income (lower poverty rates). Increases of 20% in local public spending per capita, without crowding out own revenue sources align with the flypaper effect. Using the same dataset and a discontinuity regression design, Brollo et al. (2013) finds that larger transfers translates to increased observed corruption and lower education of candidates for mayor, calling it a “political resource curse”. Monteiro and Ferraz (2010) examines the oil royalties distribution to municipalities in Brazil, focusing on the political economy mechanisms related to resource abundance and economic development. They find that royalty payments are associated with large increases in the number of municipal employees, without evidence of improvements in household infrastructure, education or health supply. The main contribution of their research is to stress the importance of a democratic system in order to avoid negative effects of resource abundance, at the same time that the current institutions in Brazil are not sufficient to translate natural resource wealth into economic development.

Oyarzo and Paredes (2019), using panel data for 345 Chilean municipalities between 2008 and 2017, find how resource windfalls from mining taxes crowd out local collected revenue, mainly through residential and a commercial property tax. Also in Chile, but a decade before, from 1990 to 2007, Bravo (2011) finds a negative effect on local revenues from an increase in intergovernmental grants.

In the African continent however, Masaki (2018) finds an opposite effect. Using quarterly data from municipalities in Tanzania, the findings suggest that intergovernmental transfers actually helps raising local revenues rather than eroding it (crowding in effect). Pointing in the opposite direction, Mogues et al. (2009) does find a crowding out of sub-national own revenue associated with an increase in external transfers in Ghana.

Paraguay offers a unique setting to study fiscal decentralization for two reasons. First, it has been historically a highly centralized form of government, coming from 35 years of

¹Money sticks where it hits. As explained in Shah (2006), who reviews the theoretical and empirical literature, money received by local governments for particular programs tends to result in disproportionate increases in spending on these programs.

dictatorship² and first establishing formal and non discretionary laws for intergovernmental funds in 2000. Second, there is a discernible elevation in the municipalities' dependence on these funds, particularly evident post-2011, marked by a threefold increase in allocation. In 2015, the median municipality had 60% of their revenues coming from intergovernmental transfers.

In this paper, I exploit a census shock in the population counts and projections, which led to plausibly exogenous changes in the allocation of funds from the central government to all municipalities in the country. The pre-established formula, unchanged since 2010, dictates that each municipality receives a certain amount of funds from the central government, based on their proportion of population relative to other similar municipalities. The 2012 Census provided population counts and projections adjustments in 2015, after years of poor administration and a flawed organization. This led to significant adjustments in the transfers starting in 2016, for all municipalities in the country. This variation allows me to exploit a unique setting, where I can observe municipalities facing lower and higher than expected transfers for the coming years. I proceed by creating 2 treatment groups and a comparison group of municipalities. 174 municipalities comprise the comparison group, defined as those who had an adjustment in their transfers by less than 15% in absolute terms. 37 municipalities fit in the "higher transfers treatment" group, defined as those who had a population increase that led to at least 15% increase in their expected transfers. Finally, 31 municipalities are part of the "lower transfers treatment" group, which correspond to those who had a population decrease that led to at least a 15% decrease in their projected transfers.

This division allows me to capture both the effect of receiving less and more transfers and be able to augment the literature by being the first paper to simultaneously analyze the symmetry of the effects in a non federal developing country³.

I find that municipalities with a 15% or greater decrease in transfers increased their tax revenues by 14%, whereas municipalities with a 15% or greater increase in transfers decrease their tax revenues by 26%. Overall, the increase in all revenues is of 18.5% for the low treatment group and the decrease in all revenues is of 11.5% for the high treatment group, suggesting that the perverse incentives of intergovernmental grants are present in the Paraguayan context. All the effects are statistically significant at the 5% level and the event study regressions suggest that the parallel trends assumption holds. Furthermore, total expenditures in the low treatment group increased by 12.5% and in the high treatment decreased by 11.5%. Particularly, in the low treatment group, the effects are driven by expenditures in infrastructure and social assistance. Back of the envelope calculations shows that, per each dollar decreased in intergovernmental transfers, municipalities react by increasing 1.5 dollars in non transfers revenues, increasing 0.37 dollars in infrastructure and increasing 0.32 dollars in social assistance, suggesting a similar conclusion explained in [Gadenne \(2017\)](#) and [Martínez \(2023\)](#): how governments are being financed matters when it comes to the quality and quantity of their expenditures.

²1989 marks the begging of the democratic era, with a new constitution being created in 1992 establishing the guidelines for a more decentralized form of governance. Paraguay is a unitary state with a centralized form of government, where the central government holds significant power and local governments usually have a lower degree of autonomy when compared to a federal nation.

³[Samal \(2020\)](#) is the closest paper, who found asymmetries in the flypaper effect in India, using panel regressions and 2SLS.

The rest of the paper is structured as follows. Section 2 presents a brief background and institutional context on the broad political economy of Paraguay. Section 3 describes the data sources. In Section 4, I present the empirical strategy and define the treatment groups and the untreated group. Section 5 contains the results and plausible mechanisms. In Section 6 I provide alternative analysis and robustness checks. Section 7 concludes.

2 Background

3 Data

4 Empirical Strategy

5 Results

5.1 Revenues: Substitution between sources

Table 3 shows the result of Eq (??) on revenues outcomes. The first column uses the logarithm of total revenues as the dependent variable. Although the “lower transfers” municipalities are receiving less than expected intergovernmental grants, the overall effect is an increase of 18.49% in their total revenues. As for the “higher transfers” municipalities, I estimate a decrease of 11.51% in their total revenues. Both effects are statistically significant at the 1% level, suggesting that intergovernmental transfers have a relevant and sizable effect in the revenue generation of municipalities.

Column (2) shows how much of that increase in revenues comes from non transfers revenues. Taking into account that the lower transfers group had on average a decrease of 19% in the expected transfers for 2016, there is surprisingly an increase of 34.84% in the non transfers revenues, significant at the 1% level. This result suggest an overcompensation of the initial decrease of the transfers. As for the higher transfers group, the average increase in the expected transfers was of 27% for 2016, suggesting an almost perfect crowd out (a coefficient of -26.31% , significant at the 5% level) of non transfers revenues. Continuing with the decomposition of the effects on revenues, Column (3) suggests that municipalities are not adjusting their non tax revenues (non significant coefficients). Considering that sources of income in this category are activities such as garbage collection, donations, assets sales or rents, it seems natural to expect little to no change there.

The estimated effects on total revenues and on non tax revenues can be interpreted as causal for both treatment arms. Figure 8 and Figure 10 provide the evidence of a pre-trend for these two outcomes, whereas Figure 9 shows the relevant event study plots for the outcome non transfers revenues. As for the high transfers group, panel (b) of Figure 9 shows a pre-trend, in particular in the later years of the pre treatment period, potentially suggesting some anticipatory effects of the municipalities in the higher group.

Column (4) focuses exclusively in tax revenues, showing an almost perfect substitution for the higher transfers group. An average increase of 27% of intergovernmental grants causes an average decrease of 26.05% in tax revenues over the period of 2016 – 2021. A smaller

effect is measured for the lower group, with an increase of almost 14% in tax revenue. Both effects are statistically significant at the 5% level, and Figure 11 provides the evidence of no pre-trends prior to the treatment year.

These results speaks to the moral hazard mentioned in [World Bank \(2007\)](#): The increase of the intergovernmental transfers may result in municipalities relaxing their own “genuine” revenue collection efforts.

There is evidence that a mechanism that plays a role in the decrease of the tax revenue collection for the municipalities with higher transfers is the property tax collection. The lack of granular data for this category of revenue before 2014 makes the results of column (5) harder to interpret as conclusive. Nevertheless, it shows municipalities in the higher transfers group decreased this source of revenue by 31.5%. A small and non significant increase of 8.64% for the lower transfers group suggests that this group focused on other tax revenue sources. For completion, the event study plots in Figure 12 show the dynamic treatment effects, although these coefficients should be interpret with caution, given the missing years that make impossible to evaluate the pre-trend assumption.

5.2 Expenditures: Where the funds come from matters

As explained in [Gadenne \(2017\)](#), the way local governments finance themselves matter for the quantity and quality of their expenditures. Similarly as in the revenues subsection, I analyze the effects of intergovernmental transfers on total expenditures and the main subcategories of expenditures.

Table 4 shows the result of (??) for expenditures outcomes.

The first column of Table 4 shows the overall effect in expenditures. Municipalities in the lower transfers group increase their total expenditures by 12.49%, whereas for municipalities in the higher transfers group the effect is a decrease of 11.43%. Both effects are statistically significant at the 1% level. The estimated effects can be interpreted as causal, as suggested by the absence of pre-trends in Figure 13.

Across almost all subcategories of expenditures, I estimate a statistically significant (10% level) increase of expenditures for the lower transfers group. Personal services is the only outcome with a precise null effect, suggesting that municipalities in the lower group were not hiring new employees neither disproportionately increasing salaries and wages to their existing workforce. Non personal services increased by 16%, Goods and Services 18.43% and Infrastructure by 14.02%. Social Assistance presents an increase of 25.55%, significant at the 5% level. Figures ??, ??, ??and ?? in the appendix show the event study plots, supporting the causal interpretation of the estimated effects.

As for the effect on the higher transfers group of municipalities, only personal services presents a significant effect (1% level), and the rest of the effects on expenditures (Columns (3) to (6)) are statistically not significant at traditional levels. The event study plots for the rest of the expenditures for the higher transfers group can be found in the Appendix.

Back of the envelope calculations are presented in Table 5. Per each extra unit of local currency (Guaranies, from now on GS) received as transfers, municipalities in the high group decrease their tax revenues by 0.78 GS and in particular the property tax collection in 0.31 GS. The expenditures in infrastructure decrease 0.72 GS and 0.27 GS in social assistance. As for the lower group, a decrease in 1 unit of transfers increases the tax revenue collection

by 0.35 GS, increasing the expenditures in infrastructure in roughly the same amount 0.37 GS and by 0.32 in social assistance.

5.3 Heterogeneity Analysis

As explained in the last subsections, intergovernmental transfers in Paraguay present a perverse incentive for municipalities. It is possible however that for some municipalities in the higher group, the extra grants did improve the tax collection or generated an increase in expenditures, as shown in Masaki (2018). At the same time, I should not immediately rule out that perhaps a subset of lower transfers municipalities were negatively affected in their revenue collection by diminishing their expected transfers. I use heterogeneity analysis to investigate whether the effect of higher and lower transfers vary by several municipalities characteristics.

A group of particular concern could be municipalities with a high percent of their population living in poverty. In 2012, the Technical Secretary of Planning (STP) released the results of a survey breaking down the percentage of households living in poverty by district⁴. I group the municipalities into two groups: those with more than 25% of their households living in poverty and those with less than 25% of their households living in poverty. Table 6 displays the results. I find that the effects on tax reliefs for the high transfers group is strongest among the poorest municipalities, although the coefficient for property tax is not significant at traditional levels. The rest of the estimates are fairly similar in magnitude and statistical significance as in the main results, with the exception of total non transfers revenues, that is largely driven by the effects on the poorest municipalities (non significant for municipalities with poverty rates below 25%).

Another relevant division of the sample is based on the dependency of the transfers for municipalities. More than 50% of municipalities in 2015 had more than 60% of their revenues coming from intergovernmental transfers, as can be seen in Figure ???. Breaking down municipalities in two groups, below and above 60% of their revenues coming from transfers, Table 7 shows the results. A clear pattern emerges: for those municipalities that heavily depend on transfers, measured by having more than 60% of their revenue sources coming from grants, the extra funds received makes them decrease their tax revenues further more (by 31.25%, significant at the 1% level). The negative effect on tax collection is 3 times larger for this group when compared to the municipalities that had less than 60% of their revenues coming from grants. As for the lower transfers group, those municipalities that heavily depend on transfers increase their tax revenues by 16%, statistically significant at the 5% level, 7 percentage points more than the municipalities that had a lower dependence on transfers, that only increased their tax revenues by 9%, although not statistically significant. The results in Table 7 speaks to the moral hazard mentioned before, where the intergovernmental transfers seemed to have a create a climate of “fiscal laziness” among municipalities.

A third potentially heterogeneous effect might have to do with the size of the population of the municipalities. Table 8 breaks down municipalities into 3 groups or population bins: Those with a population below 10000 people, those with population between 10000 and 300000 and those with more than 300000 people. The main takeaway comes from the 3rd row

⁴Poverty classification based on unsatisfied basic needs index.

of the table. Smaller municipalities that saw an increase in their transfers seem to be the ones adjusting their tax revenues the most. Both the decreases in tax revenues and property tax are bigger in magnitude than for the other population groups.

Other divisions of the sample, based on political characteristics are presented in the Appendix, with similar results to the main specification in Tables 3 and 4 both in magnitude, sign and statistical significance.

6 Robustness Checks

7 Conclusion

This paper takes advantage of a flawed census, that affected the estimation and projection of the population of all municipalities in Paraguay. These adjustments led to considerable changes in the intergovernmental transfers from the central government to local governments, affecting the structure of their finances and allowing me to study the effects in their genuine revenue generation. Results suggest that the perverse incentives of intergovernmental transfers are at play, as exogenous increases in government grants crowd out tax revenues, a phenomena also known as fiscal laziness. Symmetrically, I find that exogenous decreases in grants lead to increases in tax revenue.

Furthermore, the tax relief for municipalities with higher transfers mainly comes as a relaxation of the property tax collection and leads to a more than proportional decrease of the expenditures, particularly in infrastructure and social assistance. As for the lower transfers group, the tax increase does not seem to come from property tax, presumably due to the politically unpopular effect this could have on the authorities, but rather from other less salient local taxes. The increase in taxes is followed with a proportional increase in government expenditures, particularly in the areas of public infrastructure and social assistance, a result that aligns with recent literature.

While the paper remains silent on long-term effects, it offers valuable insights with immediate policy relevance. A stronger fiscal decentralization could be achieved by designing and implementing grants specifically geared towards boosting tax collection. The precise mechanism could be further explored in future research, albeit previous literature and the result in this paper point out that increases in local taxes tend to be followed with increases in public expenditures, most likely because they are being heavily scrutinized by the citizens, given that the funds originate from their own labor.

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8 Tables and Figures

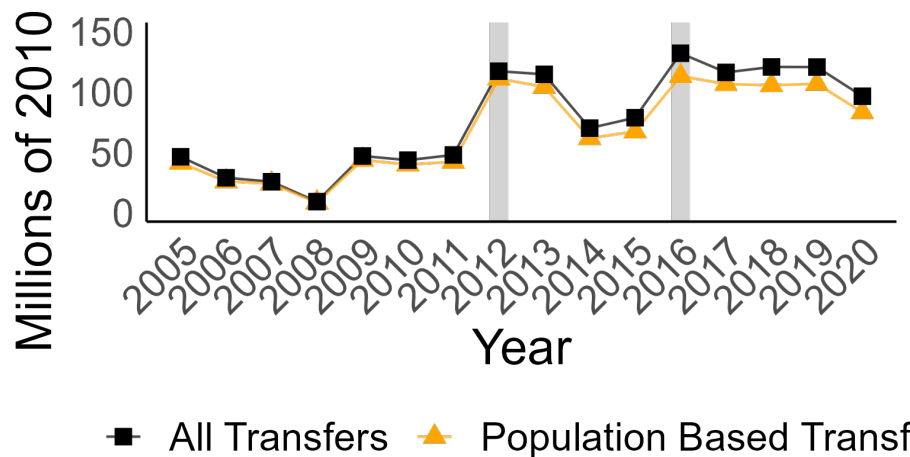


Figure 1: Evolution of Intergovernmental Transfers, 2005-2020.

Notes: Vertical bars: 2011, renegotiation with Brazil of the Itaipu treaty. 2016, world record for annual production in Itaipu: 103,098,366 MWh (megawatt-hour)

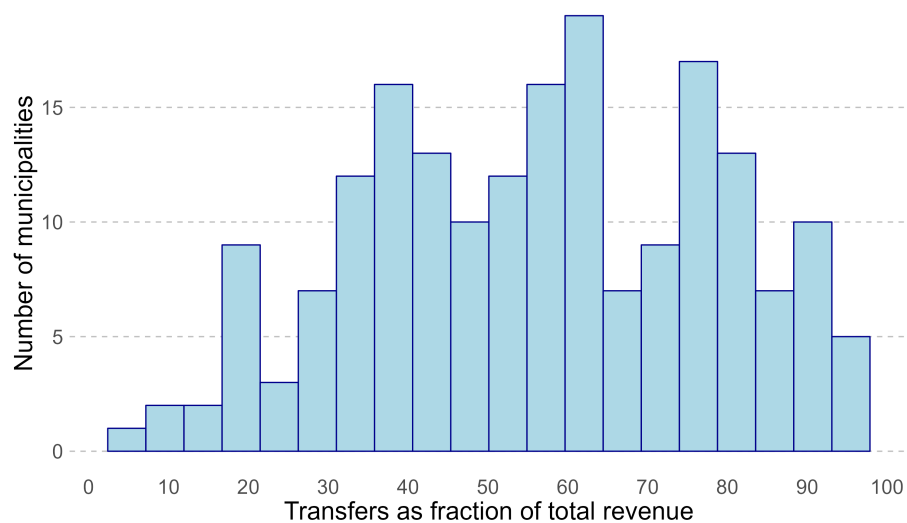


Figure 2: Transfers as fraction of total revenues, 2015.

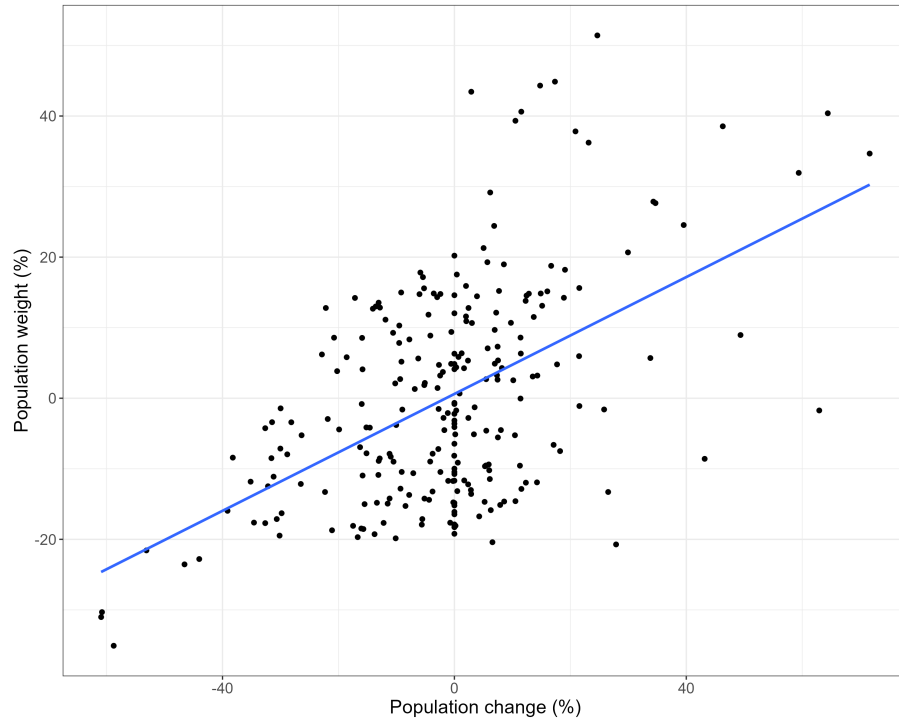


Figure 3: Scatterplot of Adjustments in Population Weights(%) and Adjustments in Population (%)

Table 1: Sample of Municipalities

Municipality	Population Adjustment (%)	Population Weights Adjustment (%)
DESMOCHADOS	-5.87	17.81
GUAZU CUA	-5.43	17.16
HUMAITA	-5.24	15.58
ISLA UMBU	-9.18	14.99
SAN ESTANISLAO	-3.56	14.85
GENERAL DIAZ	-2.41	14.77
LAURELES	-6.02	14.75
MAYOR MARTINEZ	-2.97	14.32
CAPIATA	-17.16	14.22
LA PAZ	-13.07	13.55
...
...
DOCTOR BOTRELL	6.56	-20.41
ITANARA	0.19	-18.07
VILLA OLIVA	4.28	-16.75
ANTEQUERA	6.28	-15.86
TEBICUARYMI	7.9	-15.13
NUEVA LONDRES	5.21	-14.69
MACIEL	8.59	-14.64
YATAITY	10.53	-14.59
LA COLMENA	2.89	-13.57

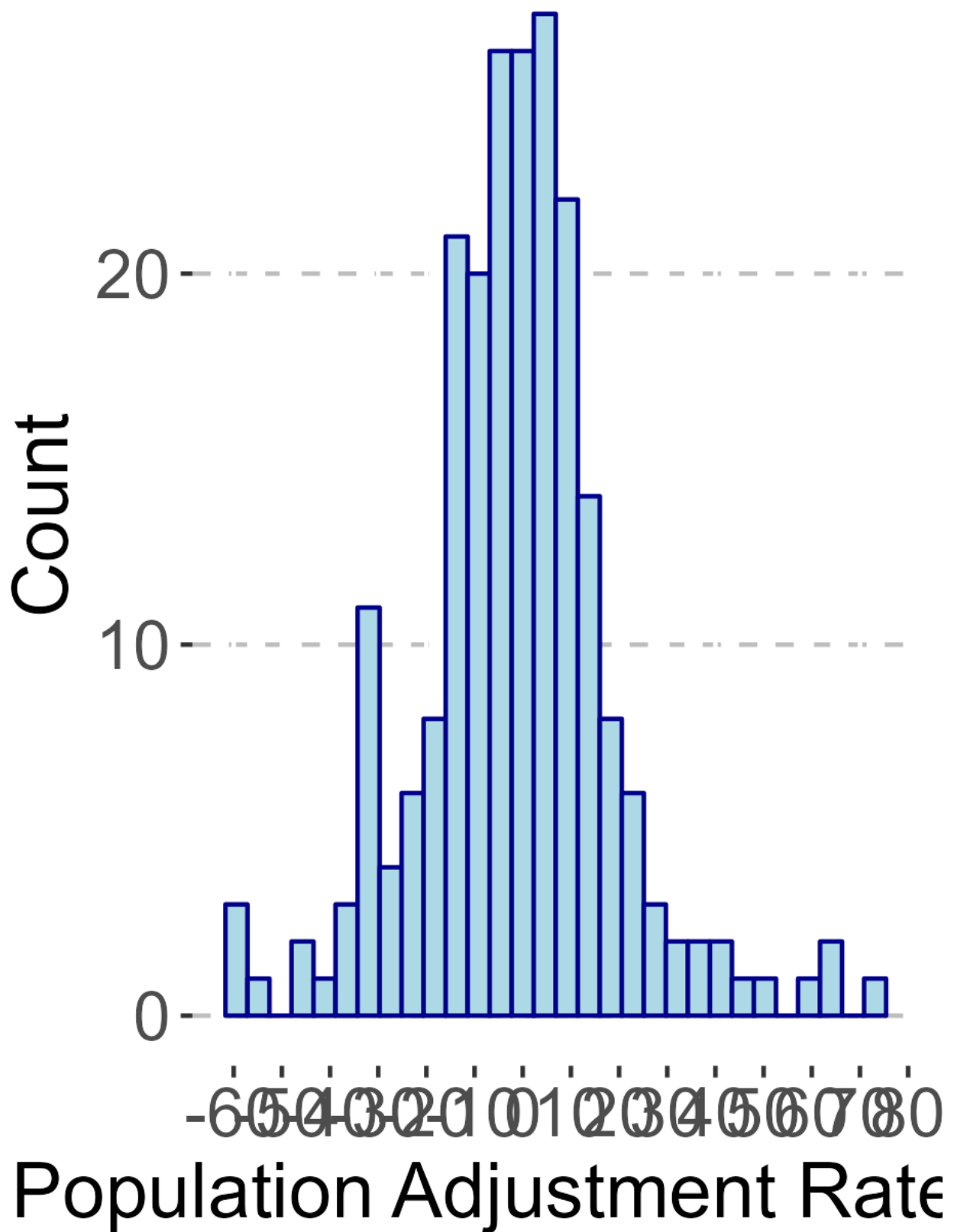


Figure 4: Relative to the 2002 estimates, some districts saw their population estimates being adjusted in more than 60%.

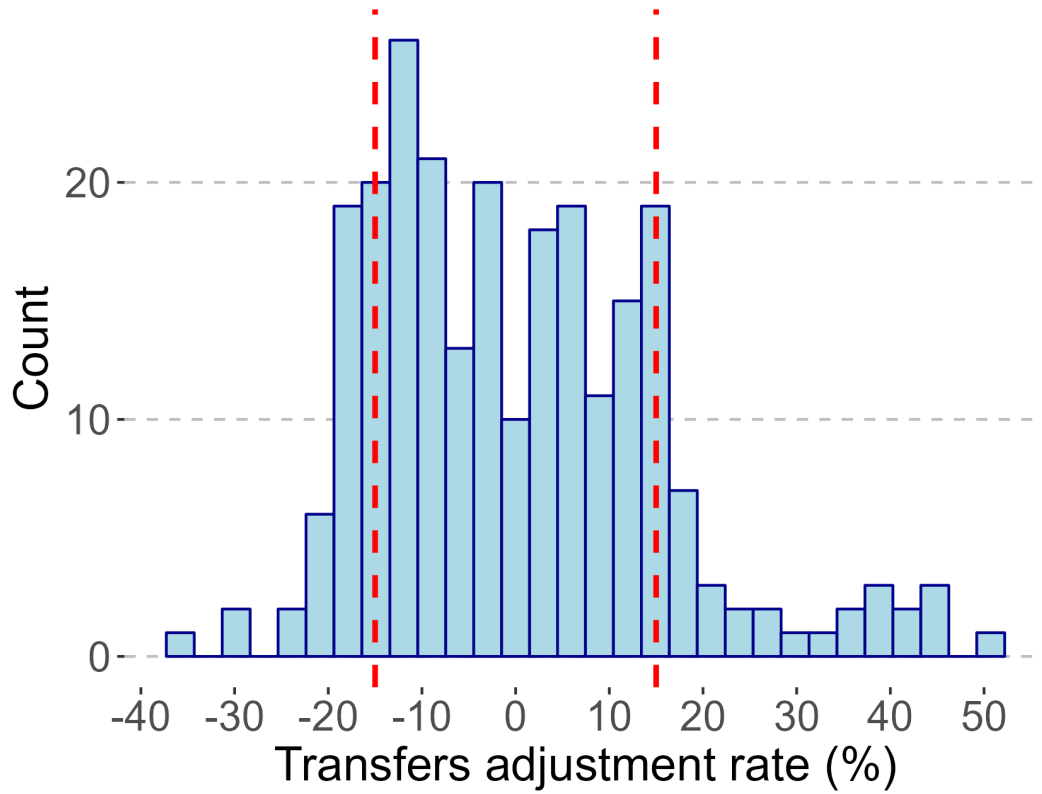


Figure 5: The vertical red lines indicate an arbitrary threshold to define treatment and comparison groups, resulting in: 174 municipalities in the comparison group, 37 in the Higher Transfers Treatment group and 31 in the Lower Transfers Treatment group.

Table 2: Municipalities characteristics, by treatment groups

	Control Group (Mean)	High Transfers (Mean)	Low Transfers (Mean)	(2) - (1)	(3) - (1)
	(1)	(2)	(3)	(4)	(5)
City Council Seats	10.47 (1.50)	11.23 (1.33)	9.89 (1.39)	0.76*** (0.27)	-0.57** (0.26)
Flooded (%)	0.33 (0.47)	0.39 (0.50)	0.08 (0.28)	0.06 (0.10)	-0.25*** (0.06)
Governability (%)	0.60 (0.49)	0.39 (0.50)	0.68 (0.47)	-0.21** (0.10)	0.08 (0.09)
Mayor's Age	43.79 (9.86)	42.52 (10.37)	46.43 (12.09)	-1.28 (2.01)	2.64 (2.12)
Mayor's Gender = Male	0.91 (0.29)	0.97 (0.18)	0.84 (0.37)	0.06 (0.04)	-0.07 (0.07)
Poor Households (%)	28.96 (12.59)	22.40 (9.44)	26.05 (10.67)	-6.56*** (1.95)	-2.91 (2.00)
Population Density	123.65 (470.34)	305.23 (701.59)	20.22 (17.53)	181.58 (140.41)	-103.43*** (38.68)
Red Party (%)	0.59 (0.49)	0.65 (0.49)	0.68 (0.47)	0.06 (0.10)	0.09 (0.09)
Surface(Km2)	920.35 (1916.77)	688.00 (722.52)	4683.80 (8743.75)	-232.36 (209.74)	3763.44** (1721.97)
Tax Revenue	938.28 (1893.33)	2669.30 (3220.26)	955.07 (2160.85)	1731.02*** (596.12)	16.80 (392.75)
Total Revenues	2053.72 (3229.49)	4966.84 (5971.21)	1735.60 (3155.45)	2913.13** (1100.37)	-318.11 (587.47)

Note:

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. The variable flooded refers to a binary variable taking the value of 1 if the municipality is treated as affected according to the legislation and hence receive a proportionately larger amount of intergovernmental funds. Governability is a binary variable taking the value of 1 in case that the majority of the council seats party coincides with the mayor's party. Poor Households measures the fraction of households living under the poverty line according to the STP survey in 2012.

Table 3: DiD Estimates for *Revenues*

	<i>Total Revenue</i>	<i>Non Transfers Revenue</i>	<i>Non Tax Revenue</i>	<i>Tax Revenue</i>	<i>Property Tax</i>
	(1)	(2)	(3)	(4)	(5)
Lower Transfers	0.1919*** (0.0420)	0.3301*** (0.0951)	-0.1215 (0.4501)	0.1418** (0.0630)	0.0787 (0.1040)
Higher Transfers	-0.1197*** (0.0422)	-0.2682** (0.1330)	0.3266 (0.3447)	-0.2838*** (0.0588)	-0.2495*** (0.0855)
Num.Obs.	2786	2786	2786	2786	1818
Mean DV High	11305	7158	717	3089	1012
Mean DV Low	3357	1694	119	991	320

Note:

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: DiD Estimates for *Expenditures*

	<i>Total Expenditures</i>	<i>Personal Services</i>	<i>Non Personal Services</i>	<i>Goods and Services</i>	<i>Infrastructure</i>	<i>Social Assistance</i>
	(1)	(2)	(3)	(4)	(5)	(6)
Lower Transfers	0.1581*** (0.0383)	0.0155 (0.0670)	0.1881** (0.0901)	0.1621* (0.0907)	0.1118 (0.0680)	0.2382*** (0.0819)
Higher Transfers	-0.1402*** (0.0513)	-0.1746** (0.0788)	-0.1885 (0.1209)	-0.2037* (0.1069)	-0.0668 (0.0928)	-0.1268 (0.0896)
Num.Obs.	2786	2786	2786	2786	2786	2786
Mean DV High	26085	12349	1599	1410	6429	2124
Mean DV Low	3012	895	192	210	1062	497

Note:

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the municipality level. The dependent variable is in logs but the mean is reported as non-transformed (Constant prices 2010). All regressions include municipality and years fixed effects, and the following controls: population, mayors initial age, gender dummy (male =1), and a dummy equal to 1 if the majority of the city council members party coincides with the mayor's party.

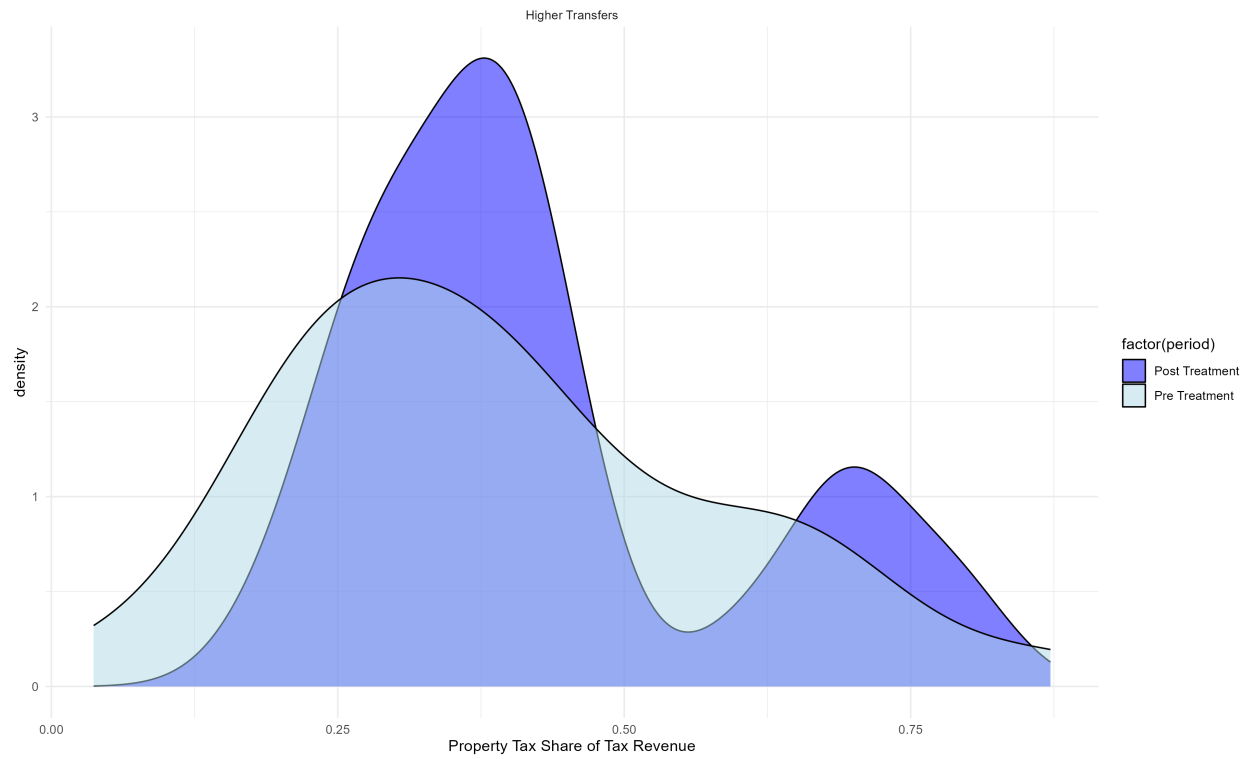


Figure 6: Municipalities with higher transfers.

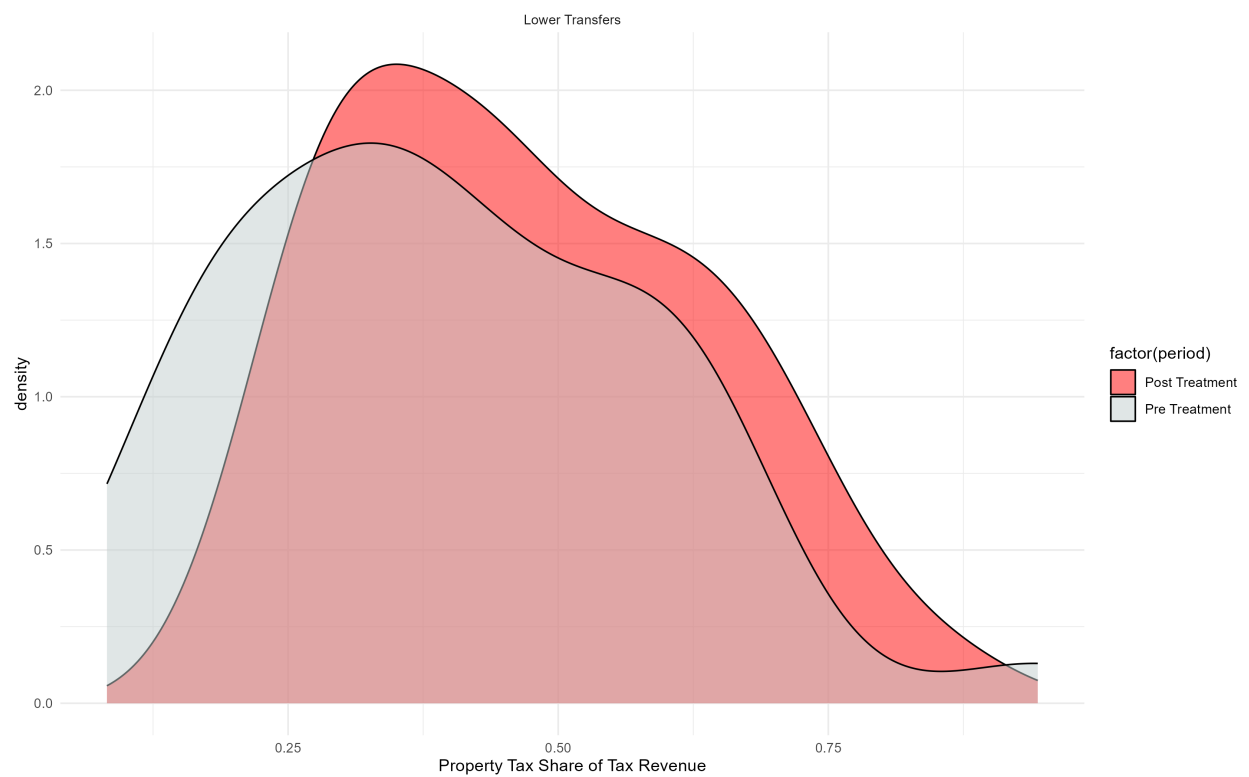
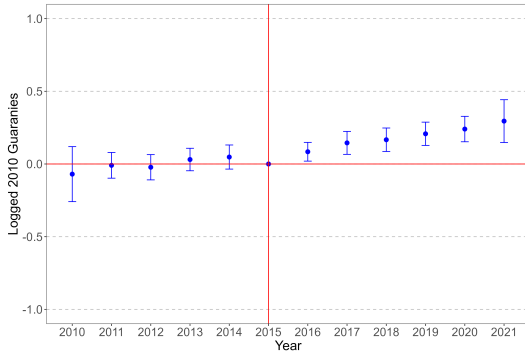
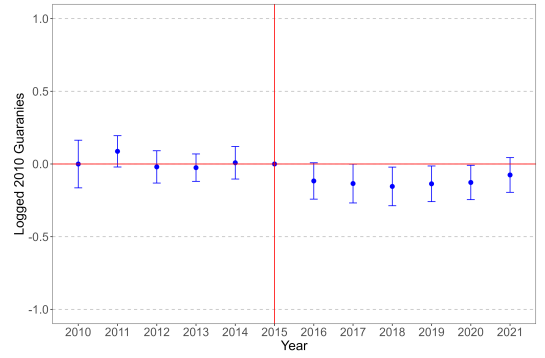


Figure 7: Municipalities with lower transfers.

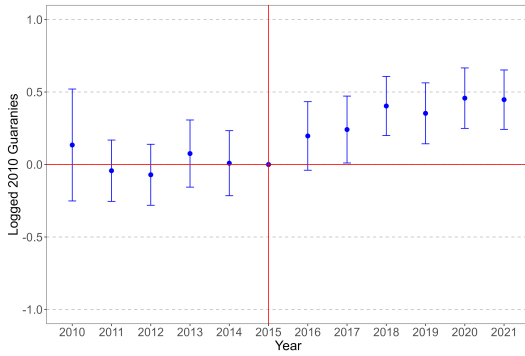


(a) Low Transfers Municipalities

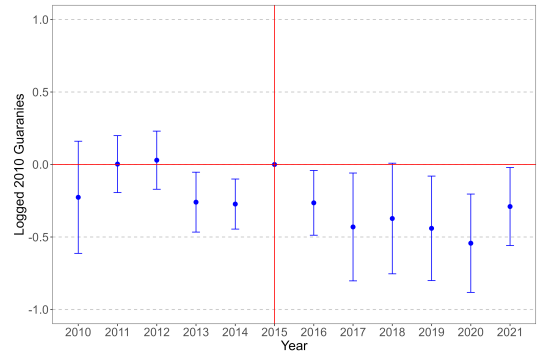


(b) High Transfers Municipalities

Figure 8: Event Study: Total Revenues

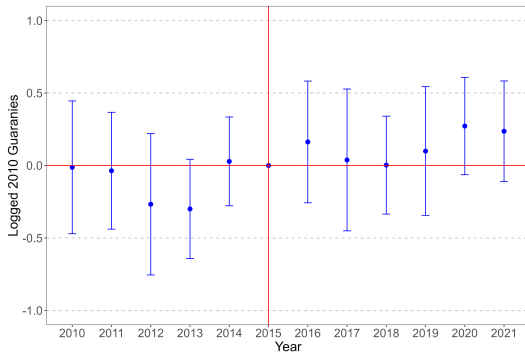


(a) Low Transfers Municipalities

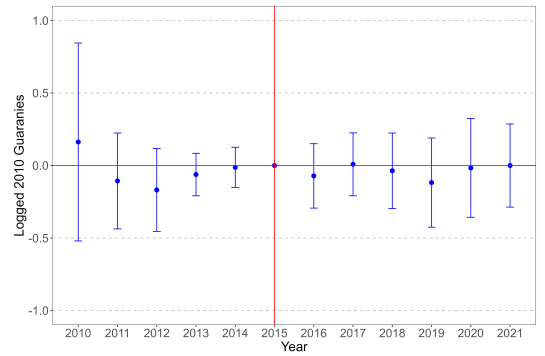


(b) High Transfers Municipalities

Figure 9: Event Study: Non Transfers Revenues

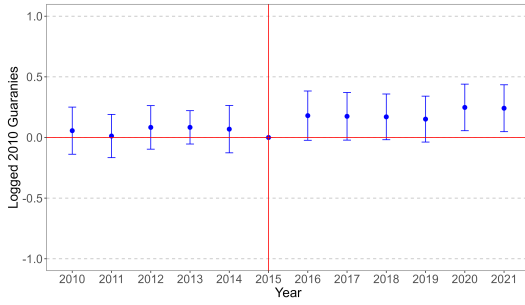


(a) Low Transfers Municipalities

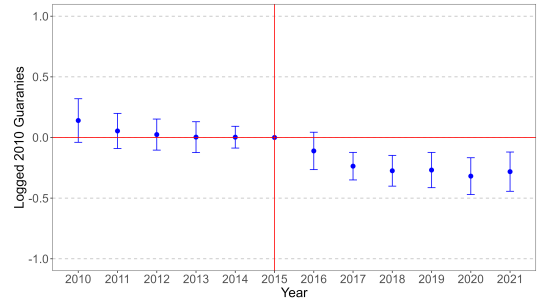


(b) High Transfers Municipalities

Figure 10: Event Study: Non Tax Revenues

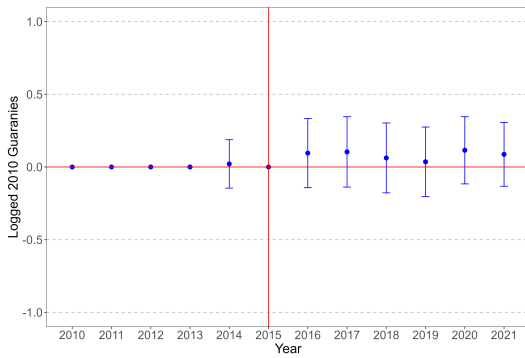


(a) Low Transfers Municipalities

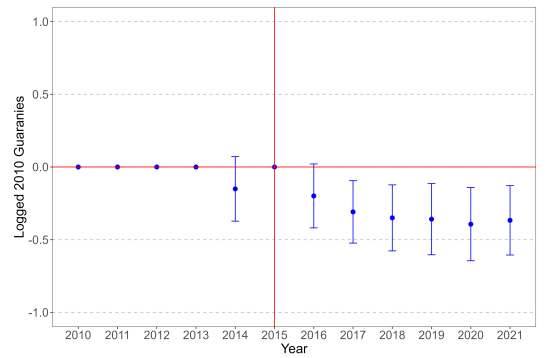


(b) High Transfers Municipalities

Figure 11: Event Study: Tax Revenues

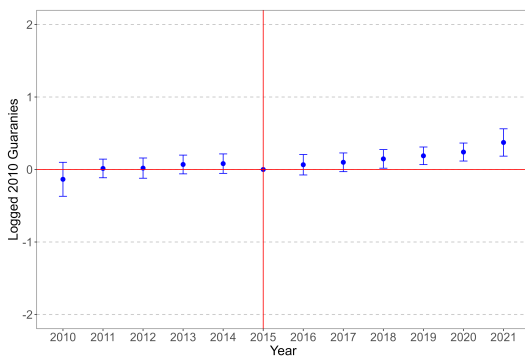


(a) Low Transfers Municipalities

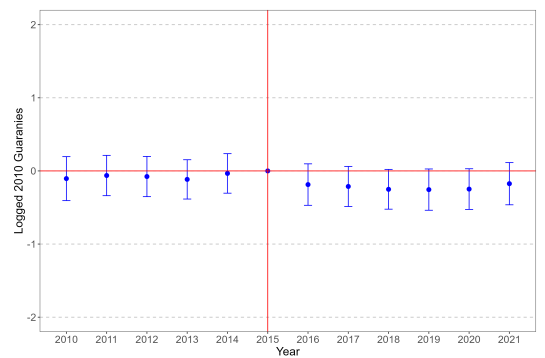


(b) High Transfers Municipalities

Figure 12: Event Study: Property Tax Revenues



(a) Low Transfers Municipalities



(b) High Transfers Municipalities

Figure 13: Event Study: Total Expenditures

Table 5: Average per capita effects on main outcomes, per unit of transfers increased or decreased

Outcome	High Treatment	Low Treatment
Tax revenue	-0.7850824	0.3495306
Property tax	-0.3112106	0.0699504
Infrastructure	-0.7218024	0.3764294
Social assistance	-0.2727400	0.3214216

Table 6: Heterogeneity by % of Poor Households

Sample	Treatment	<i>Non Transfers Revenues</i>	<i>Tax Revenues</i>	<i>Property Tax</i>	<i>Total Expenditures</i>	<i>Infrastructure</i>	<i>Social Assistance</i>
Below 25% n = 1267	Low	0.3193*** (0.1164)	0.1083 (0.0805)	0.2897* (0.1609)	0.2572*** (0.0614)	0.1572 (0.1243)	0.2672** (0.105)
	High	-0.1113 (0.1426)	-0.1025 (0.0691)	-0.1787** (0.0815)	-0.0949* (0.048)	0.0016 (0.1142)	-0.0348 (0.1031)
Above 25% n = 1429	Low	0.3553*** (0.1894)	0.1576* (0.0765)	-0.0824 (0.1909)	0.1635*** (0.0502)	0.0811 (0.2637)	0.1913 (0.2285)
	High	-0.5566*** (0.1894)	-0.4142*** (0.0765)	-0.2924 (0.1909)	-0.1948*** (0.0502)	-0.2361 (0.2637)	-0.3648 (0.2285)

Note:

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the municipality level. All regressions include municipality and years fixed effects, and the following controls: population, gender dummy (male =1), and a dummy equal to 1 if the majority of the city council members party coincides with the mayor's party.

Table 7: Heterogeneity by Dependency of Transfers Pre Treatment

Sample	Treatment	<i>Non Transfers Revenues</i>	<i>Tax Revenues</i>	<i>Property Tax</i>	<i>Total Expenditures</i>	<i>Infrastructure</i>	<i>Social Assistance</i>
Below 60%	Low	0.2843*** (0.0963)	0.0933 (0.0659)	0.1365 (0.1755)	0.2289*** (0.0543)	0.1538 (0.1813)	0.0599 (0.142)
n = 1130	High	-0.2067* (0.1159)	-0.1187* (0.0693)	-0.2034* (0.1086)	-0.1442*** (0.0521)	-0.2069 (0.2324)	-0.1646 (0.125)
Above 60%	Low	0.3848*** (0.1016)	0.1606** (0.0796)	0.0547 (0.122)	0.2009*** (0.0604)	0.1192 (0.0917)	0.3709*** (0.1411)
n = 1581	High	-0.1931 (0.2683)	-0.3125*** (0.0948)	-0.3435** (0.158)	-0.0379 (0.0486)	0.0766 (0.0872)	0.0803 (0.1852)

Note:

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the municipality level. All regressions include municipality and years fixed effects, and the following controls: population, gender dummy (male =1), and a dummy equal to 1 if the majority of the city council members party coincides with the mayor's party.

Table 8: Heterogeneity by Population Groups

Sample	Treatment	<i>Non Transfers Revenues</i>	<i>Tax Revenues</i>	<i>Property Tax</i>	<i>Total Expenditures</i>	<i>Infrastructure</i>	<i>Social Assistance</i>
Below 10k	Low	0.3227*** (0.1109)	0.132 (0.0813)	0.0209 (0.1366)	0.2293*** (0.0558)	0.1773 (0.1377)	0.4172** (0.194)
n = 1118	High	-0.373 (0.3113)	-0.2634*** (0.0956)	-0.3732** (0.1479)	-0.0682 (0.0626)	0.1207 (0.1845)	0.2218 (0.2303)
10k-30k	Low	0.321** (0.0897)	-0.0285 (0.1024)	0.1287 (0.1843)	0.1767** (0.0533)	-0.0211 (0.1476)	0.4066 (0.3159)
n = 1131	High	-0.1941** (0.0897)	-0.1638 (0.1024)	0.1001 (0.1843)	-0.1581*** (0.0533)	0.0931 (0.1476)	-0.4772 (0.3159)
30k+	Low	0.3427*** (0.1074)	0.121 (0.119)	0.1774 (0.1597)	0.257*** (0.0692)	0.1554 (0.1703)	0.5323** (0.1745)
n = 462	High	-0.226** (0.1074)	-0.2248* (0.119)	-0.3224* (0.1597)	-0.1365* (0.0692)	-0.2806 (0.1703)	-0.1353 (0.1745)

Note:

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the municipality level. All regressions include municipality and years fixed effects, and the following controls: population, gender dummy (male =1), and a dummy equal to 1 if the majority of the city council members party coincides with the mayor's party.

Table 9: DiD Estimates for *Mayors*

	<i>Prob Reelection</i>	<i>Prob 2nd Term</i>	<i>Prob College</i>
	(1)	(2)	(3)
Lower Transfers	-0.0480 (0.0746)	0.0135 (0.0787)	0.2022** (0.0852)
Higher Transfers	0.0324 (0.0813)	0.0685 (0.0929)	-0.1324 (0.0927)
Num.Obs.	1162	1162	873
Mean DV High	0.17	0.51	0.54
Mean DV Low	0.21	0.55	0.44

Note:

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

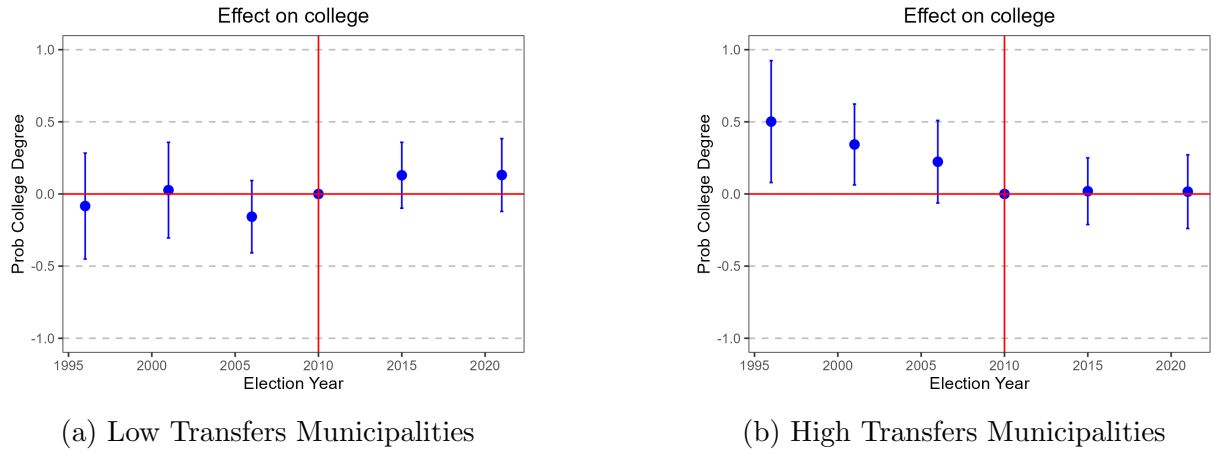
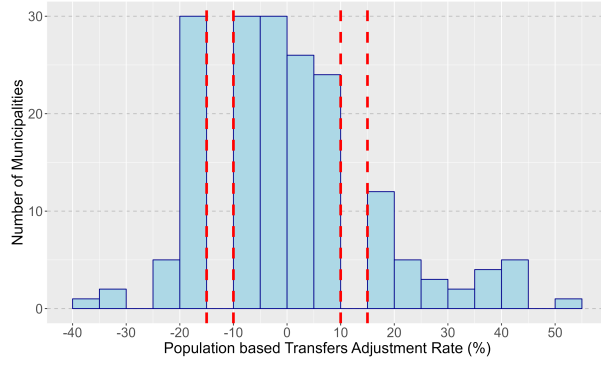


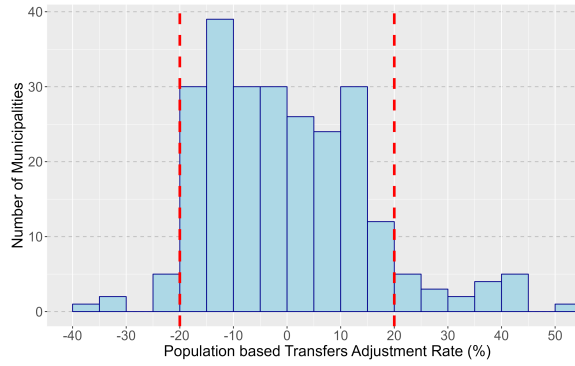
Figure 14: Event Study: Mayors College Degree



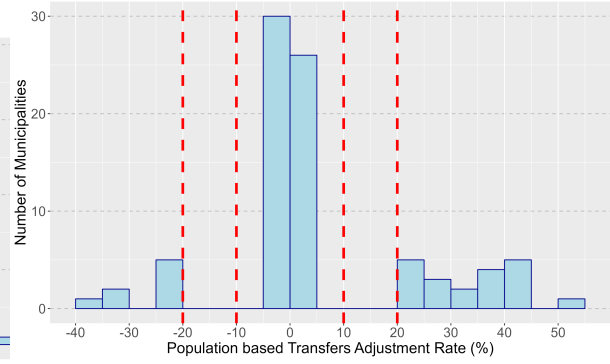
(a) Alternative comparison group: 10%



(b) Alternative comparison group: 5%



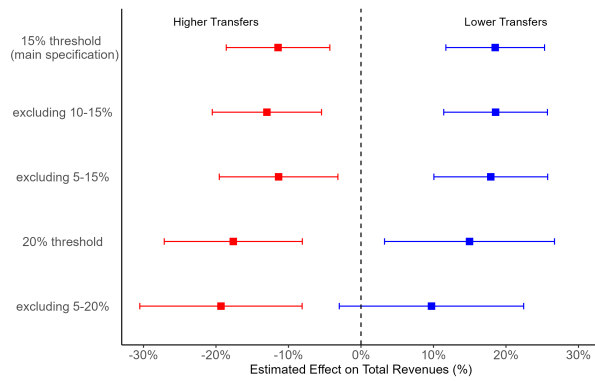
(c) Alternative treatment: 20% threshold



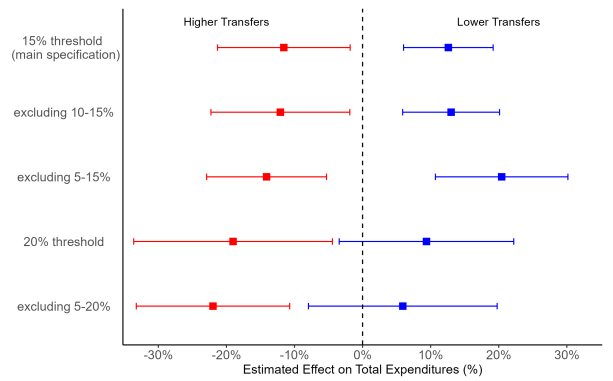
(d) Alternative comparison group: 5% and alternative treatment: 20%

Figure 15: Robustness checks: alternative treatments and comparison groups

9 Robustness Checks Figures

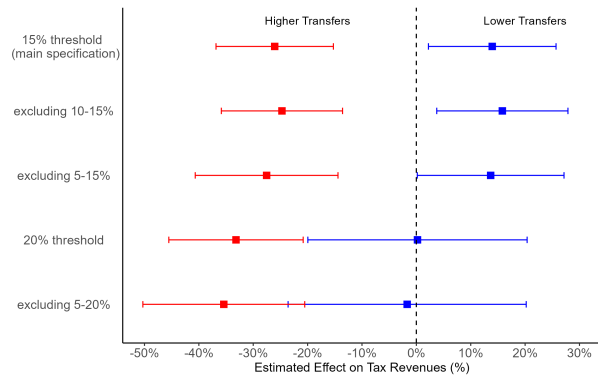


(a) Effect on total revenues

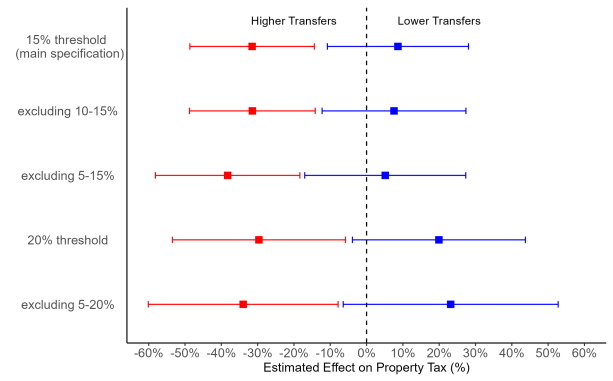


(b) Effect on total expenditures

Figure 16: Alternative specifications



(a) Effect on tax revenues



(b) Effect on property tax

Figure 17: Alternative specifications, effects on taxes