

# The Effect of Council Size on Municipal Expenditures: Evidence from Italian Municipalities

Marco Alberto De Benedetto

*Department of Economics, Mathematics and Statistics, Birkbeck College, London*

*Department of Economics, Università degli Studi di Messina, Italy*

## Abstract

*I analyze the effect of Council size on municipal expenditures by using a rich data set providing information on Italian municipal budgets. The Italian Law establishing that Council size is a step function of population size allows me to estimate the effect of Council size by implementing a Sharp Regression Discontinuity Design. I find a negative relationship between local government size, as measured by total expenditures per capita, and the Council size: increasing the number of members within the Council leads to a greater ability to control bureaucrats and consequently to a higher level of productivity in the public administration. Similar results are found when we consider expenditures that are more directly under control of bureaucrats, such as current expenditures per capita. Finally, I test the "law of 1/n" on pork barrel policies, finding again a negative effect of Council size on capital expenditures per capita.*

*Keywords: Government Size; Legislature Size; Law of 1/n; Natural Experiment; Sharp RDD.*

## 1. Introduction

A common issue in modern democracies is whether politicians allocate resources efficiently. A conspicuous body of literature has tried to understand how politicians make decisions, especially in terms of budget choices and how executive fragmentation (i.e. the number of spending legislators) affects governments' budgets (see Kontopoulos and Perotti, 1999; Persson and Tabellini, 2000; Baqir, 2001; Bradbury and Stephenson, 2003; Perotti and Kontopoulos, 2002; Per-Petterson-Lidbom, 2012; Besley and Case, 2003).

According to the fiscal common theory (Tullock, 1959; Buchanan and Tullock, 1962), politicians, in order to obtain a greater electoral support, try to satisfy the needs of particular groups of constituencies to the detriment of the general community. In fact, government spending typically benefits a narrow segment of the population, whereas taxes are distributed broadly. In line with this

theoretical approach, Weingast, Shepsle and Johnsen (1981) propose a model in which the appropriation of government spending for localized projects (secured essentially to bring money to a representative's district - pork barrel -) plays an important role in explaining the relationship between legislature size and government size. They show that government spending increases with the number of legislative districts: since politicians try to benefit well-defined groups, such as voters in the electoral district, at general community expense, pork barrel spending as well as other distributive policies will lead to an increase in total government spending. Each legislator (or district) internalizes all the benefits related to the implementation of a particular project but, on the other hand, he (it) only internalizes a fraction of the cost (taxes are spread across districts).

This result, often referred to "Law of  $1/n$ ", finds support in a number of empirical analyses showing a positive relationship between legislature size and government size. In particular, Gilligan and Matsusaka (2001) study the relationship between legislature size and government size by using data on States in the US in the first and second half of the 20<sup>th</sup> Century. They find that expenditures increase with the state upper chamber size, but they are not affected by the state lower chamber size. Del Rossi and Inman (1999) examine spending decisions for the American Congress and highlight how the support provided by legislators in order to finance public expenditures is negatively correlated to the specific cost borne by every single constituency. Bradbury and Crain (2001), using US data, find a positive relationship between legislature size and spending within the States considered, even though the effect tends to be stronger in unicameral legislatures. Bradbury and Stephenson (2003) empirically test "Law of  $1/n$ " by using a sample of Georgia's counties. After controlling for many factors that may affect local expenditures, they find the number of county commissioners to be positively correlated to the county expenditures.

However, the idea according to which an increase in council size leads to an increase in government outflows has been criticized from both a theoretical and an empirical point of view. Primo and Snyder (2005) show that results found by Weingast et al. (1981) are not robust to alterations of the standard model. In particular, they demonstrate that the positive relationship between spending

and legislature size is based on several factors, such as the type of good being provided, the costs of raising revenues, whether the local government has to share in the project's cost with the central government etc. Once these factors are taken into account the relationship between total spending and legislature size might reverse and become instead negative (reverse law of  $1/n$ ).

Furthermore, the empirical analysis supporting the idea of a positive relationship between council size and government spending may not identify causal effects, for example, because of reverse causality problems (government size may affect legislature size: a large public sector might require a large number of individuals involved in the budget-decision-making process).

Recently some empirical studies have undertaken estimation strategies able to handle these problems. Nevertheless, results obtained are not univocal. Egger and Koethenbueger (2010) and Hirota and Yunoue (2012), by considering municipalities in the German state of Bavaria and in Japan respectively, implement a Regression Discontinuity Design and find a positive relationship between public expenditures and legislature size. The same econometric strategy is adopted by Per-Petterson-Lidbom (2012), who instead finds a negative causal effect of legislature size on local government expenditures both for Finnish and Swedish municipalities: the larger the number of legislators the lower government expenditures are.

In this paper I present new evidence regarding the impact of council size on government spending using a rich data set on Italian municipal budgets over the period 2001-2007. To solve endogeneity problems, I rely on the exogenous variation in legislature size induced by the Italian law, establishing that Council size is a deterministic step function of population size. This law introduces a discontinuity in municipal Council size around some known thresholds of a continuous variable (population size), allowing me to implement a Sharp Regression Discontinuity Design to identify the casual effect of Council size on local government spending. Unfortunately, the number of legislators within the Municipal Council is not the only policy that changes around the population thresholds: also Mayors and Executive Committee members' wage varies discontinuously around the same thresholds that generate a discontinuity in the Council size.

Since the wage earned by Italian Mayors in each municipality is not observed I handle the mentioned issue by adding some more control variables that provide information on the quality and experience of elected politicians. I find a negative and statistically significant effect of Council size on total expenditures. If the Council size increases by 1 unit, the total municipal expenditures per capita decrease by 1 percent. Similar results emerge when I consider as dependent variables current expenditures per capita and capital expenditures per capita. One possible interpretation for these findings is that an increase in the number of Councilors leads to a better monitoring of bureaucrats in terms of spending, mitigating the agency problems and heightening the efficiency of the entire local public administration.

My results are robust to different specifications of my main equation. In particular, my findings are similar when I consider only data in small neighborhoods around the discontinuity points (optimal bandwidths as suggested by Imbens and Kalyanaraman, 2012 and by Calonico et al., 2014a respectively), by choosing different polynomials of the forcing variable (Local Linear Regression).

The paper is structured as follows. In Section 2 I present the institutional framework and the data I use. Section 3 presents the methodology. In Section 4 the validity of the empirical methodology is tested. In section 5 the main results are presented. Section 6 presents some robustness checks, whereas Section 7 concludes.

## ***2. Institutional Setting and Data Description***

In Italy, municipal administrations are involved in a number of important functions such as the management of public utilities (local roads, water, sewage and garbage collection), the provision of public housing, transportation and nursery schools, and the assistance of elderly people. Since these services have a great impact on citizens' daily lives, voters are generally very interested in the composition and in the performance of Municipal Councils.

The main bodies within municipalities are the Executive Committee (Giunta Comunale) and the Municipal Council (Consiglio Municipale). The executive authority is assigned to a Mayor (Sindaco) heading an Executive Committee, while the Municipal Council is endowed with legislative power. The Municipal Council's main functions are to supervise (with majority rule) the legislative activity of the Mayor and to endorse policies, such as the Municipal Development Plan, the Plan of Public Works as well as the Budget.<sup>1</sup>

As shown in Table 1, the Italian law (Legislative Decree n. 267/2000) establishes that the Municipal Council is composed by the Mayor and by a variable number of Councilors, which is a *deterministic* function of the municipal population size.

**Table 1: Council Size for Italian Municipalities- Legislative Decree no. 267/2000**

<b>Population Size</b>	<b>Council Size</b>
Less than 3,000	12
3,000 +10,000	16
10,000 +30,000	20
30,000 +100,000	30
100,000 +250,000	40
250,000 +500,000	46
500,000 +1,000,000	50
Above 1,000,000	60

The Municipal Budget (Bilancio di Previsione) is the main instrument used to plan the economic and financial management of local governments in which all of the information on total inflows and outflows (Spese ed Entrate Totali) can be found. Total inflows are essentially divided into Current Inflows (Entrate Correnti), including Tax Revenues (Entrate Tributarie), Non-Tax Revenues (Entrate Extra-Tributarie) and Transfers (Entrate per Trasferimenti) and Capital Inflows (Entrate in Conto Capitale), including Transfers of Funds for Investment projects (Trasferimenti di Fondi per Investimenti) and Mortgages (Assunzione di Mutui e Prestiti Obbligazionari). Current Inflows are usually used to finance Current Outflows (Spese Correnti), including expenses borne for a day-to-

<sup>1</sup> Since 1993, Mayors have been subject to a two-term limit (4 years each), while members of the Executive Committee and of the Municipal Council can be re-elected indefinitely.

day municipalities' management, whereas Capital Outflows (Spese in Conto Capitale) are usually financed through Capital Inflows.

My empirical analysis is based on a panel data set on municipalities' budgets, provided by the Italian Ministry of the Internal Affairs, of approximately 8,100 local governments, over the period 2001-2007. There is information on both Inflows and Outflows.

Moreover, I have information on the identity, gender, age, education attainment and previous jobs of the elected Mayors, the Executive Committee Members and the Municipal Councilors as well as on the number of Assessors and Councilors within the main municipal bodies.<sup>2</sup>

To control for municipalities' demographic characteristics, I use the 2001 Italian Census of Population (Censimento della Popolazione Italiana). I observe the size of resident population, the average level of employment, the education attainment of the population, the proportion of people aged 65 or over and the size of each municipality area.

By merging these data sets, a sample of 42,381 observations for 7,070 Italian municipalities (from 2001 to 2007) has been obtained. Table 2 presents the descriptive statistics for the variables used in the empirical analysis.

**Table 2: Descriptive Statistics**

<b>Variables</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Total Expenditures per capita (ln)	6.70	0.46	1.17	11.26
Current Expenditures per capita (ln)	6.33	0.38	0.85	9.83
Capital Expenditures per capita (ln)	3.77	1.34	0.06	11.14
Council Size	14.85	4.79	12	60
Population Size	7,062.5	40,581.9	31	2,775,250
Employment	0.25	0.14	0.02	0.85
Education of Population	7.30	0.82	1.86	12.57
Municipal Area	37.14	50.07	1	1,499
Income per capita	4,919.19	5,662.43	0.17	310,085.6
Elderly People (>=65)	0.20	0.07	0.04	0.64
Dual Ballot	0.09	0.29	0	1
Executive Committee Members' Age	42.79	4.04	27	73
Executive Committee Members' Education	12.26	1.7	5	18
Mayor's Age	48.2	9.48	21	83
Mayor's Education	14.24	3.56	5	18

Source: Local Administrators Data set (1985-2011), Italian Ministry of Internal Affairs; Italian Census of Population (2001).

<sup>2</sup> Anagrafe degli amministratori Locali, Ministero dell'Interno <http://amministratori.interno.it>.

The first three variables reported in Table 2 are used as dependent variables in my empirical analysis and give me information on the local government size, as measured by Total Expenditures per capita (with a mean of 6.70), Current Expenditures per capita (with a mean of 6.33) and Capital Expenditures per capita (3.77 on average) in log terms.

As regards to the number of members within each Municipal Council, on average Councilors are 15 with a standard deviation of 4.79. The quite small average council size highlights the small-medium size of Italian municipalities (a mean of 7,062 inhabitants and average area size of 37.14 square kilometers).

The average years of education in the population are 7, the ratio between the number of employed individuals and the total number of inhabitants is about 25% and the share of population aged more than 65 is 20%. Finally, roughly 9% of municipalities in the sample have a population size above 15,000 inhabitants and in turn, elections in these cities are held using a dual ballot system.

As far as the Mayor and the Executive Committee members' characteristics are concerned, I consider variables that provide information about their quality and experience (education attainment and age)<sup>3</sup>. In particular, the average age among Executive Committee members is 43, whereas Mayors in the sample are 42 years old on average. Further, Mayors seem to be more educated than Executive Committee members: the average years of education of Mayors (14) are higher than those of Executive Committee members (12).

### ***3. Methodology***

In this section I discuss the methodology implemented for my empirical analysis. Since the number of Councilors within the municipal apparatus is a *deterministic* function of a continuous variable, i.e. the population size, I can implement a Sharp Regression Discontinuity Design (RDD).

---

<sup>3</sup> Similar measures of quality are used in De Paola and Scoppa (2011) and Baltrunaite et al. (2012).

The idea behind the Sharp RDD is to compare municipalities just above the threshold to municipalities just below it: unobservable characteristics should not vary discontinuously around the cutoff and then the cutoff rule provides exogenous variations in the treatment “as good as a randomized experiment” (Lee, 2003).

There are different ways to implement a Sharp RDD. I could estimate the effect of Council size on government size at each of the 7 cutoffs established by the Italian law and obtaining in turn 7 different effects. However, this methodology would require a lot of data around the cutoffs. As a consequence, I use, as in Per Petterson-Lidbom (2012), a model allowing me to determine just one estimate for the effect of the Council size. More precisely, in my main analysis, I will use all the available data, and estimate the following model:

$$[1] \log(\text{Municipal Expenditures}_{it}) = \beta_0 + \beta_1 \text{Council Size}_{it} + g(\text{pop}_{it}) + X_{it} + \mu_p + \mu_t + Z_{it} + \varepsilon_{it},$$

where the dependent variable,  $\log(\text{Municipal Expenditures}_{it})$ , is a measure of government size in logarithmic terms (I use three different measures of municipal expenditures: Total Expenditures per capita, Current Expenditures per capita and Capital Expenditures per capita),  $\text{Council Size}_{it}$  is a linear function of the number of observed Councilors within the Municipal Council, and  $g(\cdot)$  is a polynomial function for population size.

Moreover, I add  $X_{it}$  that is a vector of controls at the municipal level, including the area size in square kilometers of each municipality, the number of employed workers divided by the population size, the proportion of elderly people (i.e. people aged 65 or above), the average education attainment of resident citizens, measured in terms of years of schooling.<sup>4</sup> I also consider province and year dummies  $\mu_p$  and  $\mu_t$  respectively.  $\varepsilon_{it}$  is the error term of my model.

---

<sup>4</sup> I also control for income per capita in some specifications that I decided to not report in the paper, because I observe this variable over the period 2001-2006 only and consequently, I lose observations for the year 2007. However, the magnitude and the sign of the effect of Council size on local expenditures tend to be very similar.



A potential issue related to the implementation of my methodology is related to the fact that in Italy, as stated by the Legislative Decree n. 267/2000, the number of legislators within the Municipal Council is not the only policy that changes around the population thresholds. Also Mayors and Executive Committee members' wage varies discontinuously around the same thresholds that generate a discontinuity in the Council size.

If there is another policy that depends on population size and shares the same population threshold, the effect of the Council size is confounded with the effect of this other policy and might not be identified. Paying higher salaries to politicians, according to the efficiency wage theory, may affect the way they manage public finance by increasing the incumbent's payoff from being reelected and by increasing the quality of elected officials (attracting more skilled individuals). An opposite prediction emerges from the model of Messner and Polborn (2004) and Matozzi and Merlo (2008) where an increase in the salary a politician receives while in office decreases the average quality of individuals who become politicians.

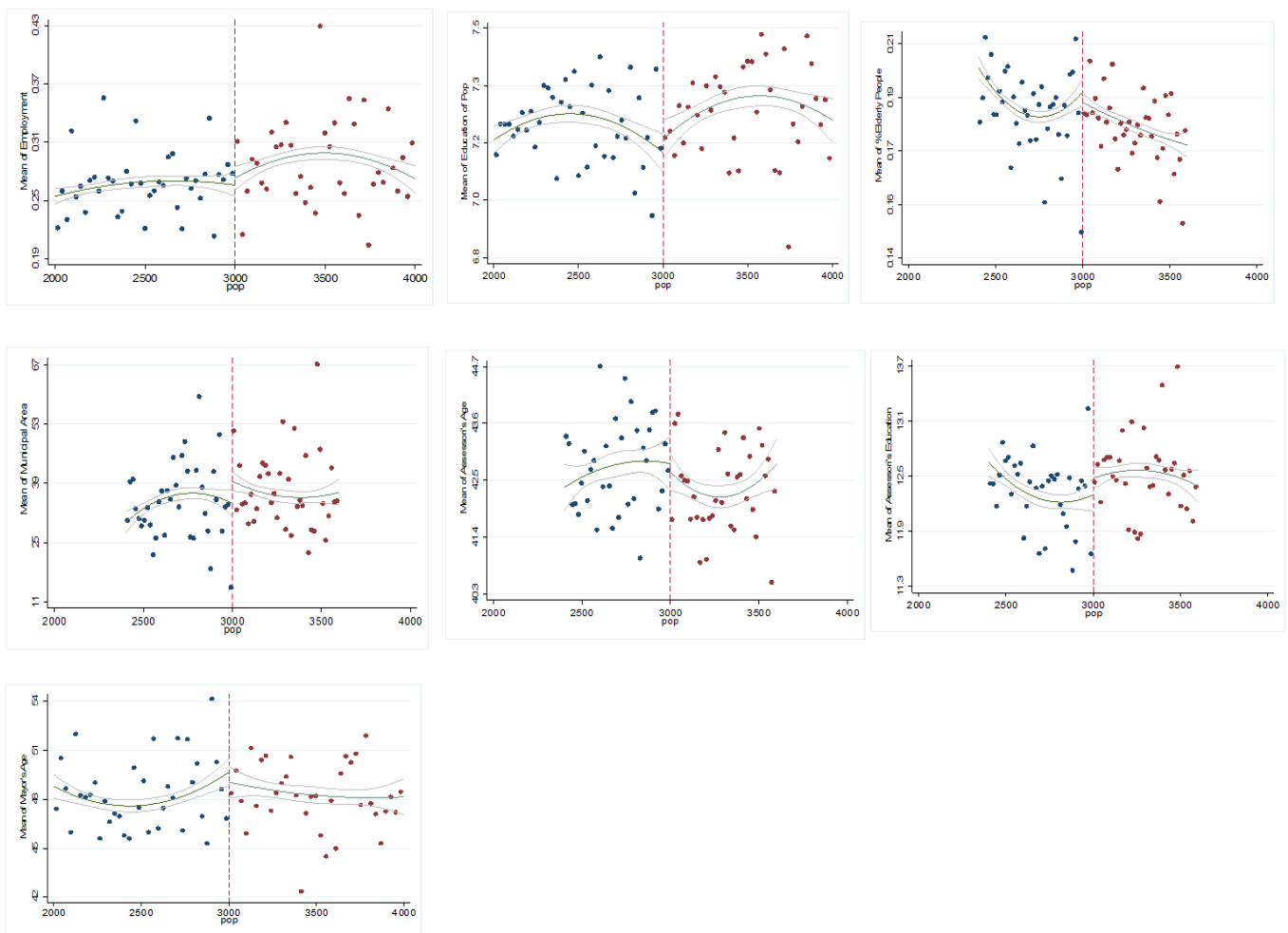
Since the wage earned by Italian mayors in each municipality is not observed and in order to take into account the potential identification issue mentioned above, I add another control vector  $Z_{it}$ , that provides information on the quality and experience of elected politicians, such as the age and education attainment (measured by years of schooling) of mayors, as well as the average age and education level of the elected Executive Committee members for each municipality. These variables should capture any selection effects on observable characteristics, as shown by Ferraz and Finan (2011)<sup>5</sup>.

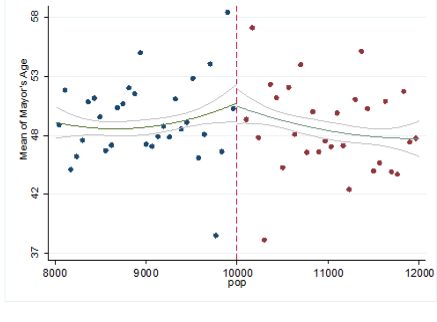
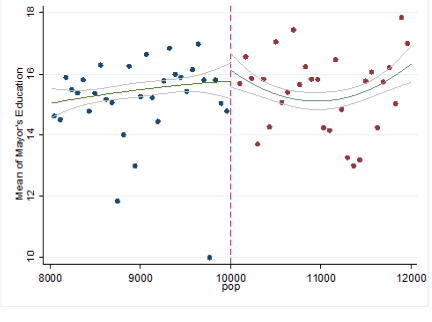
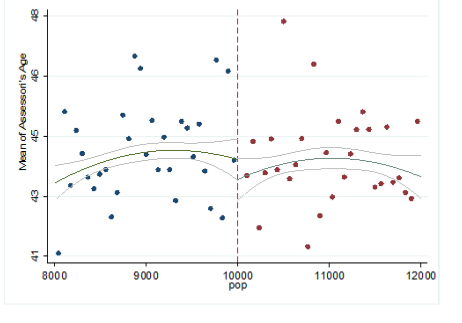
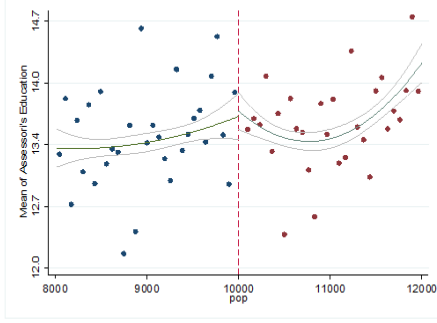
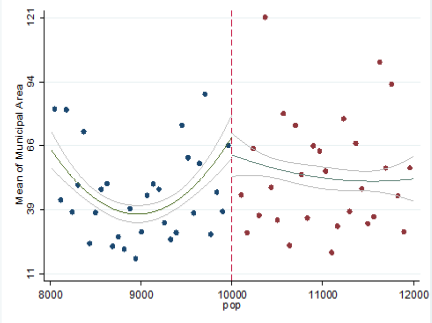
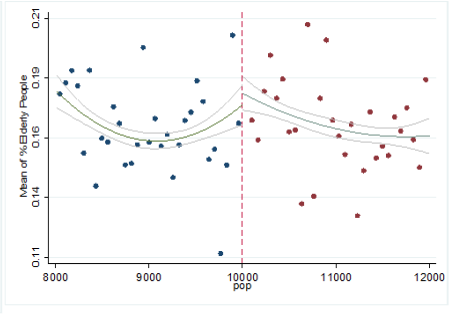
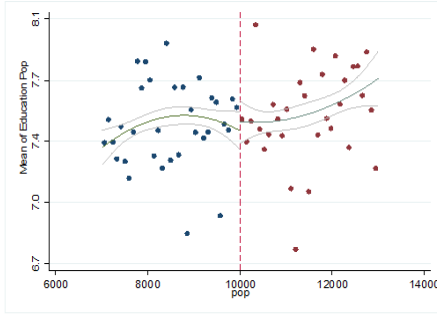
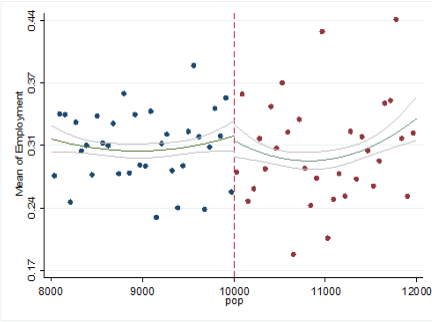
---

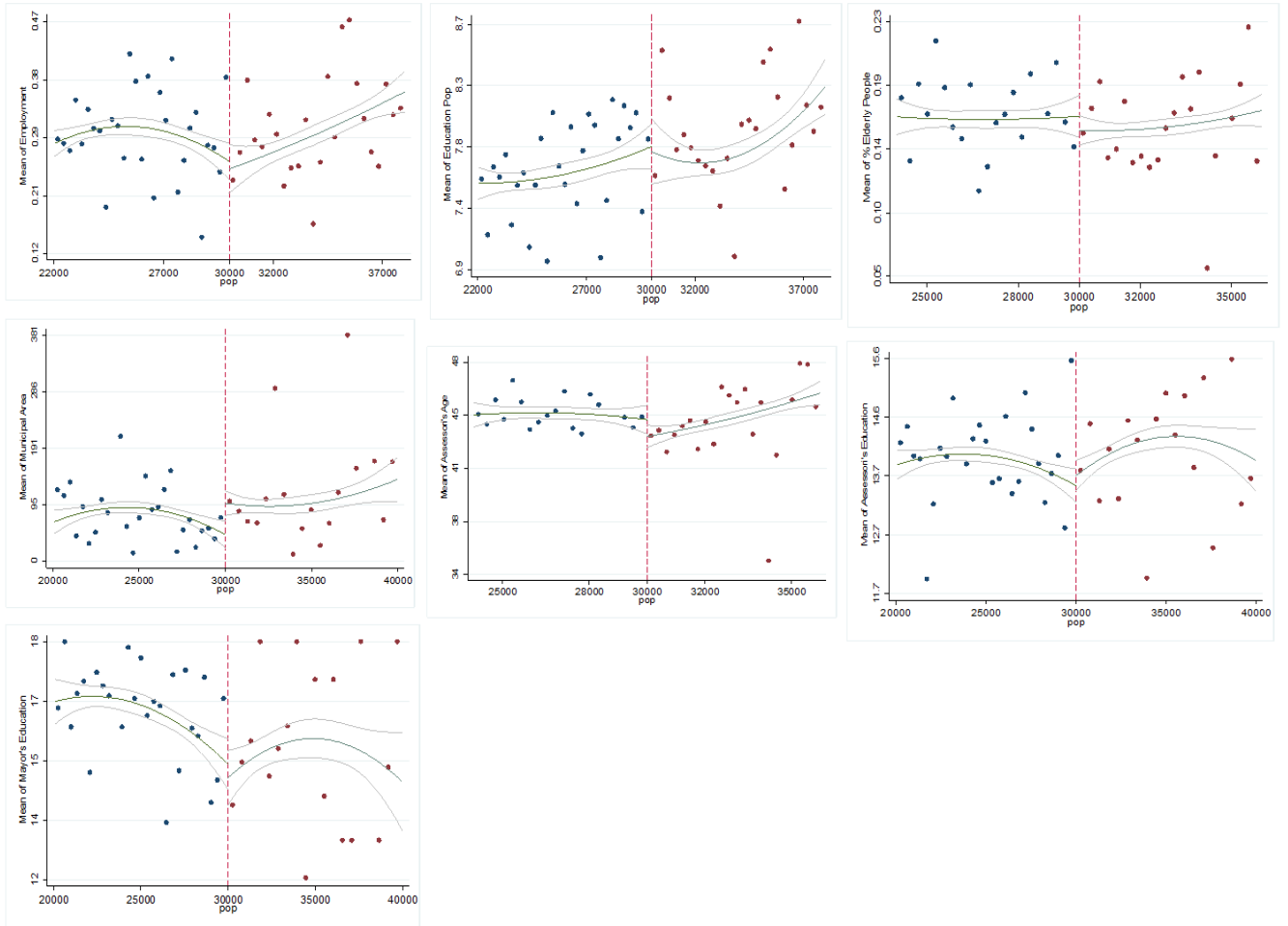
<sup>5</sup> Ferraz and Finan (2011) examine whether higher wages attract better quality politicians and improve political performance using exogenous variation in the salaries of local legislators across Brazil's municipal governments. The analysis exploits, like in my paper, discontinuities in wages across municipalities induced by a constitutional amendment defining caps on the salary of local legislatures according to municipal population. Since both the size of the legislature and the amount of block grant a municipality receives vary according to the population cutoffs, they take into account these potential confounds, by adding the amount of block grant and the legislature size as further control variables in their main specification.

#### 4. Smoothness Condition and other Potential Confounds

The general concern with my identification strategy is the possibility that some other determinants of expenditures also exhibits a stepwise function or are discontinuous at the various cutoff points. The main assumption underlying my approach is that unobserved characteristics do not change discontinuously around population thresholds, i.e. the pre-determined characteristics of municipalities just above and below the thresholds are the same. Since information about unobserved characteristics of municipalities is not available, the focus is on observed characteristics, such as the average population's level of education, the employment rate, the municipal area, the proportion of people aged 65 or above, the educational attainment and age of mayors and Executive Committee members. Figure 1 presents these municipal characteristics plotted against population close to the first three cutoff points.







**Figure 1:** Discontinuity in the Pre-determined Characteristics

Another potential threat to my research design comes from the possibility that other government policies are discontinuous at the same cutoffs. Although I find no evidence that other characteristics of the municipalities change discontinuously at these cutoff points, the amount of grants transferred to Italian municipalities by State and Regions might vary according to the population size, as established by the Italian law (Legislative Decree n. 267/2000). In Table 4, I present the results of an OLS regression, in which I regress the capital and current transfers (per capita) received by central government and regions on the population cutoffs<sup>6</sup> and I control for municipal characteristics and for quadratic and cubic population polynomials. Again I find that the amount of grants provided to municipalities does not change discontinuously around the population cutoffs used in my analysis.

<sup>6</sup> I take into account only those cut-offs where the Council size varies discontinuously, based on the Italian law.

**Table 4: Discontinuity in State and Region Capital and Current Grants- OLS Results**

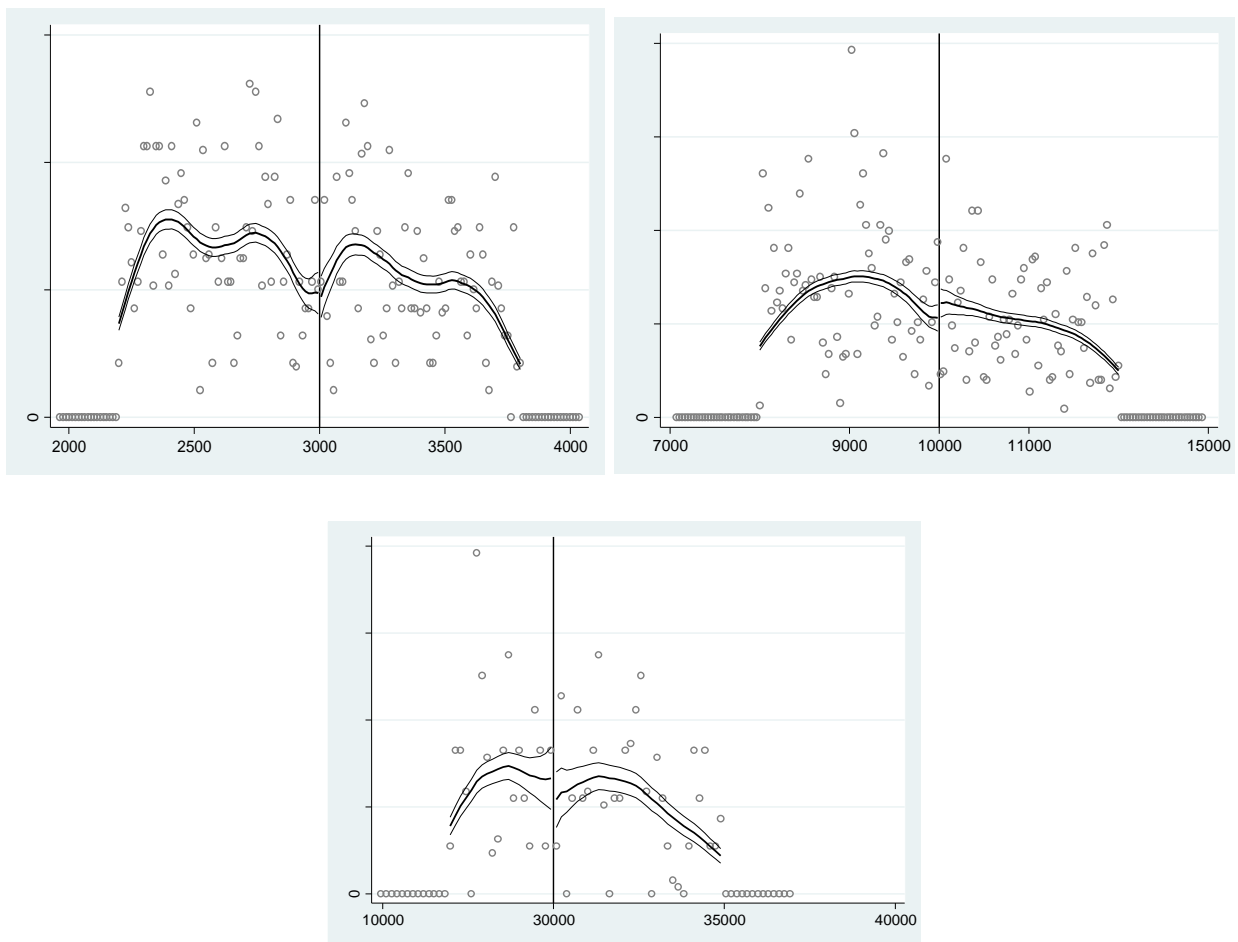
	Capital Transfers (State and Regions)		Current Transfers (State and Regions)	
	(1)	(2)	(3)	(4)
Threshold_3,000	-23.882 (15.477)	-23.612 (15.853)	-143.201 (114.766)	-137.586 (114.546)
Threshold_10,000	9.2028 (10.004)	10.059 (11.144)	8.664 (72.975)	26.536 (72.662)
Threshold_30,000	20.710 (14.734)	22.909 (17.997)	120.185 (108.743)	165.916 (114.521)
Threshold_100,000	55.369 (34.050)	57.942 (38.678)	446.248 (330.610)	499.338 (349,741)
Threshold_250,000	82.465 (70.709)	74.468 (55.968)	556.395 (399.134)	588,607 (380,201)
Threshold_500,000	129.691 (136.548)	48.630 (119.926)	1,245.027 (818.999)	-249,699 (1,178,134)
Threshold_1,000,000	56.203 (70.633)	-9.837 (136.945)	679.114 (533.614)	-700,650 (958.512)
Population Polynomial	Second	Third	Second	Third
Municipal Controls	Yes	Yes	Yes	Yes
Ex. Com and Mayors' Controls	Yes	Yes	Yes	Yes
Year and Province dummies	Yes	Yes	Yes	Yes
Observations	48,306	48,306	48,669	48,669
R-squared	0.007	0.007	0.018	0.018

Notes: The dependent variable is indicated on the top of each column. Standard errors, corrected for heteroskedasticity and adjusted for potential clustering at the municipal level, are reported in parenthesis. The symbols \*\*\*, \*\*, \* indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level.

Each figure depicts population cell means of the municipal characteristic for the first three population thresholds (which represents 96 percent of the observations) along with the fitted values of a locally weighted regression calculated within each segment. The other cutoffs are excluded for presentational purposes. However, including these additional observations does not affect the results. In general, the figures do not show any statistically significant differences at each threshold point, and this reassures me about the random assignment around the threshold points (Imbens and Lemieux, 2008).

As a last specification test of our design, I present in Figure 2 a McCrary test that is performed by running a kernel local linear regressions of the log of the density separately on both sides of the threshold (McCrary, 2008). If there are any discontinuities in the density function of the forcing variable at the cutoff points, one might be concerned that population size may be manipulated, or in

other words if individuals have a great deal of control over the assignment variable and if there is a perceived benefit to a treatment, one would certainly expect municipalities on one side of the threshold to be systematically different from those on the other side. As Figure 2 shows, the log-difference between the frequency to the right and to the left of the thresholds is not statistically significant at conventional levels.



**Figure 2:** McCrary Test

### ***5. Empirical Results: Sharp RDD Estimates***

In Table 5 I report the Sharp RDD estimates, in which local expenditures are measured by Total Expenditures per capita and Current Expenditures per capita in logarithms respectively.

In order to choose the correct specification of  $g(\cdot)$ , data has been analyzed and a linear or quadratic polynomial generally provides a good approximation. However, in Table 5 to check the robustness of the results, different polynomial trends have been used, from the first to the fourth order.

In all the specifications, I control for municipalities' characteristics, Mayor and Executive Committee members' characteristics and year and province dummies. Standard errors are robust to heteroskedasticity and allowing for clustering at the municipality level to account for possible serial correlation in the errors within municipalities, as suggested by Bertrand et al. (2004).

In column (1) in which I consider a first order polynomial for population size, I find a negative and statistically significant effect of Council size on total expenditures. If the Council size increases by 1 unit, the total municipal expenditures decrease by 1 percent.

Results displayed in columns (2), (3) and (4), in which I add a second, third and fourth order polynomial of population size respectively, are consistent with those found in column (1). Moreover, the magnitude and the sign of the Council size effect on total expenditures do not change dramatically across the specifications<sup>7</sup>.

I can justify my findings in this way: an increase in the number of Councilors within the apparatus leads to a decrease in the municipal expenditures, since the local administration becomes more efficient. This is the case when, for example, a conflict between legislatures and bureaucrats rises about the level of expenses: bureaucrats usually tend to prefer higher level of expenses than politicians. The idea behind this agency problem is that elected legislators cannot make all policy decisions because of time constraints (it is sufficient to think that some members of Municipal Council can work in the private sector too) and consequently, they must delegate some decisions to the administrative officials (see for example, Weingast and Moran, 1983). The activity of monitoring and control of bureaucrats is costly and usually time-consuming. Thus, increasing the number of legislators may lead to a better control of the public administration and to an increase in its efficiency

---

<sup>7</sup> The results tend to be the same as those shown in Table 5, even when I control for population polynomials of order higher than four.

(Per Petterson-Libdom, 2011). Furthermore, legislators are the custodians of the “public purse”, and they become more efficient at their task as the degree of specialization in the legislature increases (Crain et al., 1985).

**Table 5: Local Expenditures and Council Size- Sharp RDD**

	Total Expenditures per capita (ln)				Current Expenditures per capita (ln)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Council Size	-0.009*** (0.001)	-0.014*** (0.001)	-0.015*** (0.002)	-0.012*** (0.002)	-0.009*** (0.001)	-0.013*** (0.001)	-0.013*** (0.001)	-0.011*** (0.002)
Population Polynomial	First	Second	Third	Fourth	First	Second	Third	Fourth
Municipal Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ex. Com and Mayors' Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Province dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	42,381	42,381	42,381	42,381	42,381	42,381	42,381	42,381
R-squared	0,34	0,34	0,34	0,34	0,39	0,39	0,39	0,39

Notes: The dependent variable is indicated on the top of each column. Standard errors, corrected for heteroskedasticity and adjusted for potential clustering at the municipal level, are reported in parenthesis. The symbols \*\*\*, \*\*, \* indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level.

In order to understand this agency conflict and consequently, how the efficiency of the local administration may be affected by the executive fragmentation, from column (5) to (8), I replicate the same specifications as those presented in columns (1) to (4), but I measure the local government size by expenses that are more directly under control of bureaucrats, i.e. Current Expenditures per capita (as mentioned before they refer to expenses borne for a day-to-day management of municipalities) including, among others, operating expenditures. It would have been interesting to investigate the effect of Council size on operating expenditures, but no detailed information on specific items that are part of current expenditures is available in my dataset. To the best of my knowledge, it is highly likely that bureaucrats have a higher decision-making authority on current expenditures than on capital expenses.



Also in this case, the results show that the effect of the legislature size on Current Expenditures per capita is negative and statistically significant at 1 percent level (see column (5)). The Current Expenditures per capita decrease by 1 percent in case of an increase in the Council size by 1 unit.

All in all, it can be concluded that the number of members within the Municipal Council is relevant to explain the variation in Current Expenditures per capita: an increase in the number of Councilors leads to a better monitoring of bureaucrats in terms of spending, mitigating the agency problems and heightening the efficiency of the entire local public administration.

Furthermore, Table 6 focuses on the theory proposed by Weingast et al. (1981) in which pork barrel plays an important role in explaining the relationship of interest. Hence, legislators, following the logrolling and trying to obtain some benefits in terms of re-election, tend to implement large investment projects granting an advantage to some specific groups of citizens to the detriment of the general community. In fact, under the logrolling hypothesis, Councilors can use in a wrong way municipal inflows to build private roads, to fix sewage systems or to open new recreation grounds at the request of a particular group of constituencies. For this reason, in order to test the prediction of Weingast et al. (1981) model on the oversupply of public projects, Capital Expenditures per capita has been used as a dependent variable for two main reasons: first, this variable is widely considered in the literature as a good proxy for the size of public projects; and second, expenses related to operations of maintenance and implementation of public works are included in Capital Expenditures.

As in the previous analysis, in column (1) I consider a linear function of the Council size and I control for a linear polynomial of population size, whereas in column (2) to (4) I add different population polynomials from the first to the fourth order.

The coefficient of the Council size is negative and statistically significant at 1 percent level for the specification in column (1): an increase by 1 unit in the legislature size leads to a decrease in the capital expenses by 2 percent. These results, suggesting that there is no pork barrel politics in Italian Municipalities, are in contrast with those predicted by the Weingast's model.

**Table 6: Pork Barrel Policies and Council Size- Sharp RDD Results**

	Capital Expenditures per capita (ln)			
	(1)	(2)	(3)	(4)
Council Size	-0.024*** (0.004)	-0.033*** (0.004)	-0.033*** (0.004)	-0.028*** (0.005)
Population Polynomial	First	Second	Third	Fourth
Municipal Controls	Yes	Yes	Yes	Yes
Ex. Com and Mayors' Controls	Yes	Yes	Yes	Yes
Year and Province dummies	Yes	Yes	Yes	Yes
Observations	40,882	40,882	40,882	40,882
R-squared	0,15	0,15	0,15	0,15

Notes: The dependent variable is indicated on the top of each column. Standard errors, corrected for heteroskedasticity and adjusted for potential clustering at the municipal level, are reported in parenthesis. The symbols \*\*\*, \*\*, \* indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level.

## 6. Robustness Checks

In this section I check the robustness of my results. Firstly, I consider only data in neighborhoods around the discontinuity points (Local Linear Regression). Secondly, I offer some additional evidence on the fact that my estimates are not affected by the change in the Mayor's wage varying at the same thresholds defining the Council size.

### 6.1 Regression with Discontinuity Samples

As a first robustness check, I re-estimate my original model by narrowing the sample close to the treatment thresholds and choosing an optimal bandwidth as suggested by Imbens and Kalyanaraman (2012) and by Calonico et al., (2014a) respectively. Table 7 reports the Sharp RDD results for the discontinuity samples.

In columns (1), (2) and (3), I use Imbens et al.'s optimal bandwidth above and below the population thresholds, and I choose a second order polynomial for the forcing variable. Again I find that the effect of Council size on total expenditures per capita is negative and statistically significant at 1 percent level. Similar results are obtained in columns (2) and (3), where the outcome variable is now measured by current spending per capita (column 2) and capital spending per capita (column 3) respectively. As in the previous section, I find again the same significant effect of the Council size

on my dependent variables. Moreover, in columns (4) to (6) Calonico et al.'s bandwidth is used, and all in all, I find that the effect of Council size tends to be negative and stable across the specifications.

**Table 7: Sharp RDD Results for Discontinuity Samples**

	Total Exp (ln)	Current Exp (ln)	Capital Exp (ln)	Total Exp (ln)	Current Exp (ln)	Capital Exp (ln)
	(4)	(5)	(6)	(7)	(8)	(9)
Council Size	-0.006** (0.002)	-0.005** (0.002)	-0.11* (0.006)	-0.005** (0.002)	-0.004** (0.002)	-0.12* (0.006)
Population Polynomial	Second	Second	Second	First	First	First
Municipal Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ex. Com and Mayors' Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year and Province dummies	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth	Imbens et al.			Calonico et al.	Calonico et al.	Calonico et al.
Observations	11,682	11,682	11,411	9,039	9,039	8,821
R-squared	0.320	0,38	0.160	0.338	0.401	0.158

Notes: The dependent variable is indicated on the top of each column. Standard errors, corrected for heteroskedasticity and adjusted for potential clustering at the municipal level, are reported in parenthesis. The symbols \*\*\*, \*\*, \* indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level.

## 6.2 Exogenous Variation in the Council Size: Mayor's Wage Threat

As stated before, the Council size is not the only policy that varies discontinuously around the population thresholds. Also Mayors and Executive Committee members' wages change around the same cutoffs. To take into account this problem in previous estimates I have controlled for the experience and quality of elected Mayors and Executive Committee members.

Unfortunately there are no thresholds at which only the Council size varies. However there are some thresholds at which there is no change in the Council size but only a change in Mayor and Executive Committee members' wage. Hence, as a final robustness check, to enforce my idea that the impact of Council size on the municipal expenditures is not confounded with the effect produced by the Mayor and Executive Committee members' salary, I focus close to the only three population

thresholds<sup>8</sup> that uniquely identify a wage increase, i.e. 1,000, 5,000 and 50,000. In particular, I use a Local Linear Regression (LLR) with Canonico et al.'s optimal bandwidth above and below the thresholds, where I regress all the measures of the municipal expenditures on dummy variables taking a value equal to 1 if the observations are above the thresholds and 0 otherwise, and I control for municipality characteristics, Mayors and Executive Committee members' characteristics as well as for a first order population polynomial. However, since the LLR, as stated by Lee (2003), usually requires very large sample sizes around the thresholds, I decide to not consider the 50,000 threshold because of observations lack in the neighborhood of the cutoff. Table 8 presents the results.

**Table 8: The Effect of Mayors Wage on Municipal Expenditures: LLR Results with Optimal Bandwidth**

	Total Expenditures per capita (ln)	Current Expenditures per capita (ln)	Capital Expenditures per capita (ln)
	(1)	(2)	(3)
Threshold_1,000	-0.021 (0.023)	-0.027 (0.019)	0.064 (0.057)
Threshold_5,000	-0.046 (0.042)	-0.014 (0.019)	0.238*** (0.063)
Population Polynomial	First	First	First
Municipal Controls	Yes	Yes	Yes
Ex. Com and Mayors' Controls	Yes	Yes	Yes
Year and Province dummies	Yes	Yes	Yes
Observations	10,184	10,184	9,889
R-squared	0.460	0.495	0.216

Notes: The dependent variable is indicated on the top of each column. Standard errors, corrected for heteroskedasticity and adjusted for potential clustering at the municipal level, are reported in parenthesis. The symbols \*\*\*, \*\*, \* indicate that coefficients are statistically significant, respectively, at the 1, 5, and 10 percent level.

I find that the coefficients on the cutoff indicators, that estimate the effect of the increase in wage at each threshold point, are not statistically significant for almost all the specifications<sup>9</sup>. I found just a significant effect of the increase in the wage on Capital Expenditures per capita around the 5,000 threshold. Moreover, the effect tends to be positive, so the higher the salary earned by Mayors and Executive Committee members, the larger the municipal expenditures. This gives support to the idea

<sup>8</sup> The results are the same also when I choose Imbens et al.'s optimal bandwidth. Data is available upon request.

<sup>9</sup> The coefficient on the cutoff indicators is always statistically insignificant also when I choose different bandwidths around the population thresholds.

that the negative effect on municipal expenditures is due uniquely to an increase in the number of legislators within the municipal Council.

## ***7. Concluding Remarks***

A large body of literature has concentrated on how politicians make decisions, and how the number of legislators affects governments' budgets. The general results in the literature have shown a positive effect of legislature size on government size, although the source of variation used in the empirical works is likely to be endogenous (see Baqir, 2001; Bradbury and Crain, 2001; Bradbury and Stephenson, 2003; and Gilligan and Matsusaka; 1995, 2001. The only exceptions are the analysis of Egger and Koethenbuerger (2010), Hirota and Yunoue (2012) and Per-Petterson-Lidbom (2012), which find however mixed results. In this way, not only the theoretical model proposed by Weingast, Shepsle and Johnsen (1981), but also the causal interpretation of results presented in the previous papers have been questioned.

In this paper I have empirically investigated the causal effect of legislature size on local expenditures for Italian municipalities over the period 2001-2007 using a Sharp Regression Discontinuity Design. I find a negative relationship between Council size and municipal expenditures, as measured by Total Expenditures per capita, i.e. increasing the number of members within the Council apparatus leads to a greater ability to control bureaucrats and consequently to a higher level of productivity in the public administration.

There are strong reasons to believe that these results are internally valid, i.e. Council size is causally correlated to municipal expenditures, since the source of variation used to identify the effect of the variable of interest is exogenous. I find similar results when some discontinuity samples are used, choosing different bandwidth around population thresholds.

As robustness check, I test the Weingast et al. model (1981) on pork barrel policies, focusing on Capital Expenditures per capita. Again I highlight a negative and statistically significant effect of

Council size on capital expenditures, used as a proxy for the size of projects implemented by legislators, showing that there is no pork barrel politics at the municipal level in Italy, and in turn, casting some doubts on the Weingast et al. model (1981). Furthermore, in order to reinforce the hypothesis that an agency problem in terms of spending could rise between legislators and bureaucrats, I have focused on expenditures that are more directly under control of bureaucrats, i.e. Current Expenditures per capita, showing again a negative effect of legislature size on government size at the municipal level in Italy.

## References

- Baqir, R., (2001), "Districting and Government Overspending," *Journal of Political Economy*, 110, 1318-1354.
- Bertrand, M., Duflo, E., and Mullainathan, S., (2004), "How Much Should We Trust Difference-in-Differences Estimates", *Quarterly Journal of Economics*, 119, 249-275.
- Besley, T., and Case A., (2003), "Political Institutions and Policy Choices: Empirical Evidence from the United States", *Journal of Economic Literature*, 41, 7-73.
- Bradbury, C., and Crain, M., (2001), "Legislative Organization and Government Spending: Cross-Country Evidence," *Journal of Public Economics*, 82, 309-325.
- Bradbury, J., and Stephenson, F., (2003), "Local Government Structure and Public Expenditures," *Public Choice*, 115, 185-198.
- Buchanan, J., and Tullock, G., (1962), "The Calculus of Consent: Logical Foundations of Constitutional Democracy", Ann Arbor: The University of Michigan Press.
- Baltrunaite, A., Bello, P. and Casarico, A., "Gender Quotas and the Quality of Politicians", CESifo Working Paper Series No. 3734.
- Calonico, S., Cattaneo, M.D., Titiunik, R., (2014), "Robust nonparametric confidence intervals for regression-discontinuity designs", *Econometrica* 82 (6): 2295–2326.
- Crain, W., M., and Tollison, R., D., (1980), "The Sizes of Majorities", *Southern Economic Journal*, 46, 726-734.
- Crain, W., M., Tollison, R., D., Goff, B., L., and Carlson, D., (1985), "Legislator Specialization and the Size of Government", *Public Choice*, 46, 3.
- DelRossi, A., F., and Inman, R., P., (1999), "Changing the Price of Pork: The Impact of Local Cost Sharing on Legislator's Demands for Distributive Public Goods", *Journal of Public Economics*, 71, 247-273.
- De Paola, M., and Scoppa, V., (2011), "Political Competition and Politician Quality: Evidence from Italian Municipalities", *Public Choice*, 148, 3-4, 547-559.
- Egger, P., and Koethenbueger, M., (2010), "Government Spending and Legislative Organization: Quasi-experimental Evidence from Germany". *American Economic Journal: Applied Economics*, 2, 200–212.
- Ferraz, C., and Finan, F., (2011), "Motivating Politicians: The Impacts of Monetary Incentives on Quality and Performance", NBER Working Paper.
- Fiorino, N., and Ricciuti, R., (2007), "Legislature Size and Government Spending in Italian Regions: Forecasting the effects of a Reform", *Public Choice*, 131, 117-125.
- Gilligan, T., and Matsusaka, J., (2001), "Fiscal Policy, Legislature Size, and Political Parties: Evidence from State and Local Governments in the First Half of the 20<sup>th</sup> Century," *National Tax Journal*, 35, 57-82.
- Hirota, H., and Yunoue, H., (2012), "Local Government Expenditure and Council Size: Quasi-Experimental Evidence from Japan", MPRA Working Paper.
- Kontopoulos, Y., and Perotti, R., (1999), "Government Fragmentation and Fiscal Policy Outcomes: Evidence from OECD Countries". NBER Chapters, in: *Fiscal Institutions and Fiscal Performance*, pp.81–102 National Bureau of Economic Research, Inc.
- Imbens, G., Kalyanaraman, K., (2012), "Optimal bandwidth choice for the regression discontinuity estimator", *Review of Economic Studies* 79 (3), 933-959.

- Lee, D., (2003), "Randomized Experiments from Non-random Selection in U.S. House Elections," mimeo, UC Berkeley.
- Lemieux, T., and Imbens, G., (2008), "Regression Discontinuity Designs: A Guide to Practice", *Journal of Econometrics*, 142, 2.
- Lind, J.,T., and Mehlum, H., (2010), "With or Without U? The Appropriate Test for a U-Shaped Relationship", *Oxford Bulletin of Economics and Statistics*, 72, 1.
- Matozzi, A., and Merlo, A., (2008), "Political Careers or Career Politicians?" *Journal of Public Economics*, 92, 597–608.
- McCrary, J., (2008), "Manipulation of the running variable in the regression discontinuity design: a density test", *Journal of Econometrics* 142, 698–714.
- Messner, M., and Polborn, M.,K., (2004), "Paying Politicians", *Journal of Public Economics*, 88, 2423–2445.
- Per Petterson-Libdom, (2012), "Does the Size of the Legislature Affect the Size of Government? Evidence from Two Natural Experiments", *Journal of Public Economics*, 96, 269-278.
- Perotti R., and Kontopoulos, Y., (2002), "Fragmented Fiscal Policy," *Journal of Public Economics*, 86, 191-222.
- Persson, T., and Tabellini, G., (2000), "Political Economics: Explaining Economic Policy". Cambridge: MIT Press.
- Primo, D., and Snyder, J., (2005), "Public Goods and the Law 1/n," mimeo, MIT.
- Tullock, G., (1959), "Problems of Majority Voting", *Journal of Political Economy*, 67, 571-579.
- Weingast, B., and Moran, M.,J., (1983), "Bureaucratic Discretion or Congressional Control? Regulatory Policymaking by the Federal Trade Commission", *Journal of Political Economy*, 91, 765-800.
- Weingast, B., Shepsle, K., and Johnsen, C., (1981), "The Political Economy of Benefits and Costs; A Neoclassical Approach to Distributive Politics," *Journal of Political Economy*, 89, 642-64.