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# Fiscal rules to tame the political budget cycle: Evidence from Italian municipalities

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## ABSTRACT

The paper provides evidence that fiscal rules can limit the political budget cycle. It uses data on Italian municipalities during the 2000s and shows that: 1) municipalities are subject to political budget cycles in capital spending; 2) the Italian sub-national fiscal rule (Domestic Stability Pact, DSP) introduced in 1999 has been enforced by the central government; 3) municipalities subject to the fiscal rule show more limited political budget cycles than municipalities not subject to the rule. In order to identify the effect, we rely on the fact that the domestic fiscal rule does not apply to municipalities below 5000 inhabitants. We find that the political budget cycle increases real capital spending by about 10–20 percent on average in the years prior to municipal elections and that municipalities subject to the DSP show a pre-electoral increase in capital spending which is only a quarter of the one of municipalities not subject to the rule.

## 1. Introduction

This paper presents evidence suggesting that fiscal rules can help moderate the political budget cycle. The term “political budget cycle” generally refers to increases in government spending or in the deficit, or decreases in taxes, in an election year or pre-election year, which are perceived as motivated by the incumbent's desire for re-election. Fiscal rules can limit the political budget cycle because they reduce the politician incentives to be profligate in order to be re-elected, by increasing the cost of pre-electoral profligacy if elected. The focus of the paper is on Italian municipalities during the 2000s when they have been subject to the sub-national fiscal rule (Domestic Stability Pact, DSP) introduced in 1999.

It is well recognized that the political budget cycle has potentially a number of negative effects. The political budget cycle implies that public spending or taxation policies are tweaked to achieve goals that are different from the social welfare (Alesina, 1987, 1988). It also usually leads to excessive spending and deficits. In the context of sub-national entities, it is important to remind that budget deficits at the national levels can originate at sub-national level of governments.

Recently, the growth of deficit and debt to unprecedented levels in many advanced economies has forced many countries to adopt fiscal rules to contain their further growth. While fiscal rules are usually designed to limit deficits and debts directly, this paper argues that they can also have an effect by reducing politicians' incentives to overspend prior to elections. However, assessing the effects of fiscal rules is not always an easy task. For example, identifying the causal effect of fiscal rules on fiscal aggregates is not simple. The obvious endogeneity problem is that national or subnational governments adopting a fiscal rule

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might be those more fiscally responsible; therefore, the better fiscal outcomes might be due to the voters' preferences, more than to the introduction of a fiscal rule.

This paper identifies the effect of the rule on the political budget cycle leveraging on the fact that municipalities below 5000 inhabitants have been exempted from the rule. Our difference-in-differences estimates suggest that the political budget cycle increases capital spending by about 11 percent (in real terms) on average in the three years prior to municipal elections and that the sub-national fiscal rule reduces these figures by about 80 percent. These results are confirmed by a regression discontinuity analysis: the electoral cycle effect estimated at the 5000 threshold using polynomial regression is about 18 percent, while municipalities subject to the DSP show an increase in capital spending in pre-electoral years 75 percent lower. We also provide evidence that the fiscal rule has been enforced by the central government, at least over the period 2004–2006 for which we have data on the municipalities that have breached the DSP.

A number of recent papers have used Italian administrative municipal data to address an array of political economy issues. Cioffi, Messina and Tommasino (2012) provide evidence of political budget cycle in capital and overall spending, while Alesina and Paradisi (2017) focus on the revenue side by exploiting the introduction of a new real estate tax in 2011. Gagliarducci and Nannicini (2013) study the effect of the wage on the performance of mayors. Alesina, Troiano and Cassidy (2018) show that younger politicians behave more strategically than older ones. Particularly relevant for our purposes is the paper by Grembi et al. (2016), which shows that the relaxation of the DSP for smaller municipalities in 2001 triggered a significant deficit bias.<sup>1</sup>

This paper relates also to three other branches of literature. By assessing how fiscal rules can limit the political budget cycle, our contribution naturally fits in the broad political business cycles literature. See, among many, Rogoff and Sibert (1988), Rogoff (1990), Alesina et al. (1997), Persson and Tabellini (2000), Brender and Drazen (2005, 2008), Shi and Svensson (2006). A number of contributions have assessed empirically the political budget cycle. For a recent one on the political cycle in capital expenditures see Gupta et al. (2015).

Related to our work is also the literature assessing the political budget cycle at the sub-national level. For example, Coelho et al. (2006) and Veiga and Veiga (2007) provide evidence of political cycle at the municipal level in Portugal; Foremny and Riedel (2014) in Germany; Drazen and Eslava (2010) provide evidence on Colombia; Brollo and Nannicini (2012) on Brazil.

Finally, our paper is also connected to the growing literature on national and sub-national fiscal rules (for example, Beetsma and Debrun, 2004, 2007; Debrun, Moulin, Turrini, Ayuso-i-Casals and Kumar, 2008). Burret and Feld (2014) nicely summarize the evidence and the literature regarding the role of sub-national fiscal rules in federations, like the US and Switzerland. In this strand of literature, the recent contribution by Grembi et al. (2016) is the first to propose "a quasi-experimental design" to control for omitted and unobservable factors that may affect previous results and to better establish the causal effect of the introduction of the rule.

Our paper contributes to these different literature in several ways. First, it provides evidence on the existence of a political budget cycle on the expenditure side at the local level in Italy and quantifies its effects. Second, it provides new evidence that the central government has enforced the DSP. The fact that the DSP has been enforced by the central government reduces concerns regarding the endogeneity of the rule, although it still leaves open the possibility that omitted and unobservable factors might affect how municipalities have reacted to the imposition of the rule. The regression discontinuity analysis addresses this issue focusing on the behavior of municipalities around the threshold. Finally, and most importantly, it provides novel evidence that the imposition of the rule has reduced the political budget cycle. We believe this is the first paper providing evidence that sub-national fiscal rules can contain the political budget cycle. Importantly, even when the introduction of a fiscal rule proves effective, in the sense that helps contain the deficit, it is very difficult to assess whether it is welfare improving. On the contrary, a rule that mitigates the political budget cycle, at least in this respect, is welfare improving.

## 2. Institutional setup and the domestic fiscal rule

In Italy, there are three levels of sub-national governments: regions, provinces, and municipalities. The regions are involved primarily in the provision of health services. The provinces perform functions relative to road maintenance and the natural environment, while the municipalities are responsible for a wide range of local services, including managing public utilities, local transports, early education and local public investment and infrastructure activities.

The Domestic Stability Pact (DSP) was introduced in 1999 in order to include sub-national authorities in the efforts to achieve the fiscal targets set at the European level. The operational target of the rule for municipalities (which are about 8000 in Italy) has changed over the years, moving from being defined in terms of a fiscal balance to limits in the growth of total spending. From 2005 the rule has included also capital expenditures. Since our focus is on capital expenditures, we will focus on the period starting in 2005.

Importantly for our analysis, since 2001 smaller municipalities (those with less than 5000 residents) have been exempted from the DSP. The exemption aimed at providing some relief to small municipalities in the presence of economies of scale in managing the municipal government. Starting in 2013 the rule has been extended also to smaller municipalities, leaving exempted only those with a population below 1000 inhabitants. In order to use the 5000-inhabitant threshold for identification

<sup>1</sup> Acconcia et al. (2014) use data on investment expenditure of Italian municipalities to estimate the fiscal multiplier at the local level.

purposes, we will therefore present results using a sample ending in 2012. Finally, in 2015 the DSP has been discontinued and replaced with a budget balance rule for all local authorities.

As for the governance and elections, the decision-making bodies at the municipal level are the mayor (Sindaco), the Executive committee (Giunta comunale), which is appointed and headed by the mayor himself, and the municipal council (Consiglio comunale), endowed with legislative powers. For municipalities with less than 15,000 inhabitants, a single-ballot plurality electoral system applies where each candidate is supported by only one list. Over the 15,000 threshold, a double-ballot rule applies where mayoral candidates may be supported by more than one list and a run-off takes place if none of the candidates win an absolute majority of votes at the first round.

The size of municipal bodies also varies according to population, ranging from 12 to 60 members for the Consiglio and from 4 to 16 members for the Giunta. Since 1993, elections have been held every four years. Since 2000, the duration of the mayoral mandate has been extended to 5 years unless particular circumstances (such as the death of the mayor, ex-post incompatibilities, or criminal charges) trigger an earlier resignation. Elections usually occur during the months of May and June. Table 1 shows the distribution of municipal elections over the period of analysis.<sup>2</sup>

### 3. The data

We have collected annual data on all Italian municipalities budget information from 1999 to 2012, including information on employment levels and hiring. We have combined this information with data on elections at the municipal level, and with information on the mayor (age, education, gender, political party). Table A.1 at the end of the paper reports a description of the variables and sources. A summary of the dataset is reported in Table 2 for all municipalities in ordinary-statute regions over the period 2005–2012.<sup>3</sup> Table A.2 provides descriptive statistics by municipality population. It shows that total spending, in real per-capita terms, is on average 30–40 percent lower in municipalities above 5000 inhabitants with respect to smaller ones, and that capital expenditure is about 60 percent lower, partly because of economies of scale in investment. Larger municipalities are less dependent on transfers from other levels of government, slightly richer in terms of per-capita taxable income, and have lower per-capita debt. As to the age structure of the population, in larger municipalities the proportion of people economically active (aged 15–64) is slightly higher. Turning to the political characteristics, municipalities are roughly balanced in the gender, age and education of mayors, while larger cities tend to have more (national) party affiliated mayors. Municipalities are fairly homogenous across different size classes as to the phase of the electoral cycle: about 67 percent of observations refer to mayors in their first term, and a percentage ranging from 54 to 59 pertains to pre-electoral years.

Based on our data, total spending of municipalities in ordinary-statute regions represented 4 percent of GDP in 2005 (the starting year of our analysis), and declined to about 3 percent by 2012 (Fig. 1). Capital spending represented about 45 percent of total municipal spending in 2005 although it reduced to 33 percent in 2012 (Fig. 2). In real per capita terms, municipalities spent about 600 euros annually in investment in 2005 and reduced this amount to 400 in 2012 (Fig. 3).

Regarding the financing, transfers from the regions and the central government over the period represented about 30 percent of overall revenues, own revenues covered the rest. The main taxes financing municipalities were a real estate tax on home property (Imposta Comunale sugli Immobili, ICI), which provided about 47 percent of municipal tax revenues, and a surcharge on the personal income tax (Imposta sul Reddito delle Persone Fisiche, IRPEF), which amounted to about 9 percent of municipal tax revenues.<sup>4</sup>

In order to have a homogenous sample, our main analysis will focus on the years 2005–2012 for the reasons discussed above and also on the municipalities with less than 15,000 inhabitants. The cutoff at 15,000 is due to the different electoral system for the larger municipalities.<sup>5</sup> An ample literature has shown how different electoral systems can affect fiscal outcomes (for example, Persson and Tabellini, 2000, and Milesi-Ferretti et al., 2002; with specific reference to the Italian context, see Ferraresi et al., 2015) and therefore one needs to be careful in pooling municipalities with different electoral systems as it can lead to bias in the estimates. The municipalities below 15,000 inhabitants are about 400 over a sample of about 5800.

<sup>2</sup> For historical reasons, municipal elections in different municipalities are not held in the same year; this cross-sectional variability allows the identification of the electoral effect as in each year there are municipalities in different phases of the electoral cycle.

<sup>3</sup> We exclude regions with special autonomy (Regioni a Statuto Speciale) as these were allowed to set their own fiscal rules for municipal governments. We also exclude from the analysis 49 municipalities exempted from the DSP in 2009–2010 because hit by the earthquake in Abruzzo in 2009 and also the municipalities under special administration (i.e. managed by a Commissario prefettizio appointed by the Interior Ministry) in any year of the period under investigation, following the removal of the mayor because of criminal charges or financial default, as the spending pattern of these municipalities follows different rules.

<sup>4</sup> Municipalities can borrow for investment purposes.

<sup>5</sup> A relevant issue in analyzing capital spending at the municipal level is that in recent years municipalities have outsourced some capital spending to private companies, usually partially or totally owned by the municipalities itself. This practice sometimes has been instrumental in circumventing the fiscal rule. Unfortunately, information on these companies is extremely scant. One advantage in focusing on small municipalities (with less than 15,000) is that they have outsourced capital spending much less than larger municipalities (Chiades and Mengotto, 2013).

**Table 1**  
Distribution of municipal elections in ordinary-statute regions by year.

Year	Freq.	Percent	Cum.
2005	367	4.0	4.0
2006	1146	12.5	16.5
2007	767	8.4	24.9
2008	423	4.6	29.5
2009	4081	44.6	74.1
2010	441	4.8	78.9
2011	1161	12.7	91.6
2012	766	8.4	100.0

**Table 2**  
Summary statistics (2005–2012).

Variable	Obs.	Mean	S.D.	Median	Min	Max
Capital spending	46,322	479	782	277	0	35,082
Current spending	46,322	784	422	679	13	12,669
Total spending	46,322	1264	1073	982	136	39,656
Total transfers	46,322	597	791	401	4.5	34,406
Total revenues	46,322	1486	1254	1156	321	45,138
Long-term borrowing	46,423	88	199	32	0	10,893
Total outstanding debt	46,096	1421	3921	1052	-18,233	652,402
Taxable income	46,390	12,083	2996	12,344	2422	45,621
Hiring (per 1000-capita)	46,102	.42	1.7	0	0	109
Population (units)	46,423	6982	45,719	2327	31	2,761,477
Population aged 15–64 (%)	46,423	64	4.1	65	29	82
Pre-election years	46,423	.55	.5	1	0	1
Female	45,676	.11	.31	0	0	1
Age	45,671	52	9.9	52	20	88
Education (years)	44,355	14	3	13	5	20
Party affiliated	45,570	.29	.45	0	0	1
First mandate	45,815	.68	.47	1	0	1

Notes: Variables in real per-capita terms (2010 euro). Municipalities in ordinary-statute regions and ordinary administration only.

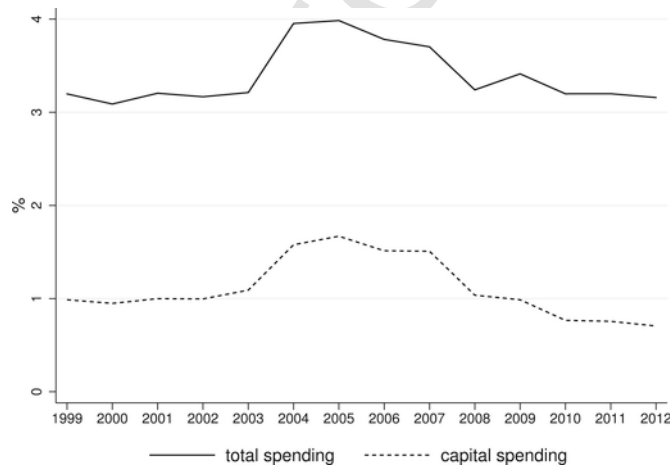


Fig. 1. Total and capital spending of municipalities (share of GDP of ordinary-statute regions).

#### 4. Identification strategy and results

The models originally proposed to explain the political budget cycle could help understand the mechanism through which a fiscal rule can limit it. The first models in this literature (Nordhaus, 1975; Lindbeck, 1976) were based on the premise that voters are myopic and that politicians are able to repeatedly fool them by tweaking policies prior to elections. Later models (for example, Rogoff and Sibert, 1988, and Rogoff, 1990) assumed that voters are rational but do not have full information about incumbents' competence. Voters want to elect the most competent politicians and form rational expectations regarding the incumbent's abilities based on observable current fiscal policy outcomes. A competent administrator is able to provide a given level of

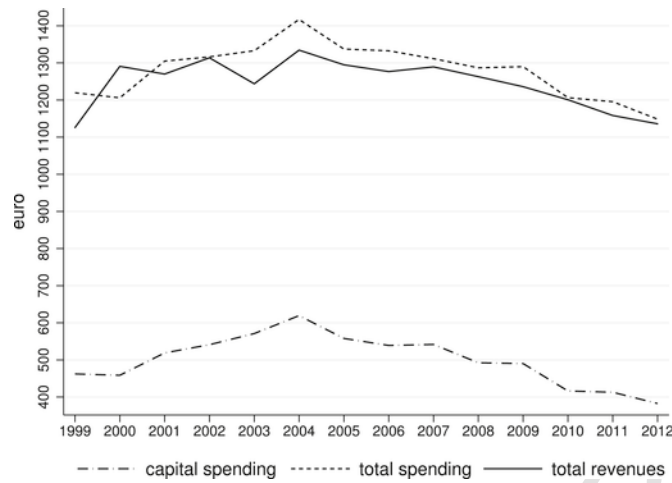


Fig. 2. Per-capita capital spending, total spending and total revenues of municipalities.

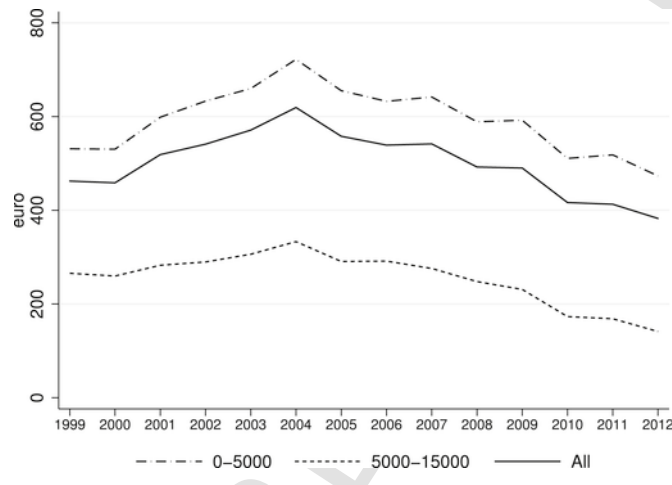


Fig. 3. Per-capita capital spending by municipality size.

public goods at a lower level of taxes than an incompetent one can. The incumbent can signal his/her competence by increasing spending or showcasing new infrastructure projects without at the same time increasing taxes. Before the election, therefore, incumbents will attempt to signal their competence (and thereby increase their chances of re-election) by engaging in expansionary fiscal policy. This leads to a pre-election increase in the government deficit even though competent politicians may be in office. However, even competent politicians that want to signal their higher competence might be reluctant to use all the available fiscal space because in so doing they are likely to remain in office and to have to live with the consequences of this choice. Fiscal rules, as the DSP, indeed might increase the ex-post cost of a pre-election fiscal expansion.

In order to identify this effect in our context we rely on the fact that the DSP does not apply to municipalities below 5000 inhabitants. Therefore, our main specification is a difference-in-difference regression around election dates where the treatment group is comprised by the municipalities above 5000 inhabitants (subject to the DSP) and the control group is composed of municipalities with less than 5000 inhabitants (not subject to the DSP). We will show that indeed municipalities below the threshold, controlling for other characteristics, are subject to a stronger political budget cycle.<sup>6</sup>

First, we present new evidence regarding the political cycle in spending and revenue items at the municipal level. In order to do so, in Table 3 we regress current expenditures, capital expenditures, current revenues, capital revenues and budget balance on a dummy equal to one in the electoral year and in the two preceding years (our political budget cycle variable, on which we will present robustness below), a number of mayors characteristics (gender, age, education measured in years of schooling, affili-

<sup>6</sup> We have also tried to restrict the sample to those municipalities that crossed the 5000 threshold over the period of the analysis. In this way, the sample of municipalities above and below the 5000 inhabitants is comprised of the same municipalities, falling in one or the other category depending on the year. Unfortunately, the number of municipalities that have crossed the threshold is just 102 and only 36 of those have had elections both before and after crossing the threshold, therefore preventing any identification from the time series dimension of the data.

**Table 3**  
Political budget cycle in spending, revenues and budget balance of municipalities by population size.

	≤ 5000					5000–15000				
	Current spending	Capital spending	Current revenues	Capital revenues	Deficit	Current spending	Capital spending	Current revenues	Capital revenues	Deficit
Pre-election years	−1.472 (2.658)	30.736*** (10.155)	0.440 (3.484)	1.249 (9.434)	27.574*** (8.498)	1.139 (2.217)	13.075** (5.278)	3.726 (2.742)	2.108 (5.866)	8.379** (3.628)
Female	−1.633 (7.408)	−7.335 (20.488)	−10.028 (10.657)	−8.663 (21.541)	9.723 (14.284)	1.899 (6.496)	−8.353 (12.963)	4.490 (8.123)	−13.171 (11.586)	2.228 (10.598)
Age	0.805* (0.482)	−1.470* (0.887)	0.529 (0.325)	−1.535* (0.822)	0.341 (0.789)	−0.043 (0.231)	−0.844** (0.394)	0.205 (0.308)	−0.864** (0.378)	−0.229 (0.295)
Education (years)	1.146 (0.927)	1.847 (2.857)	−0.615 (1.467)	0.965 (3.251)	2.643 (2.576)	1.171 (0.922)	−0.881 (1.645)	−0.415 (1.102)	−0.730 (1.502)	1.436 (1.281)
Party affiliated	−3.193 (6.916)	49.420 (31.262)	1.077 (9.746)	15.850 (28.315)	29.300* (15.297)	−4.475 (5.516)	−8.290 (12.779)	−16.702** (7.563)	10.447 (13.347)	−6.510 (9.768)
Right wing	−11.202 (9.643)	−13.635 (36.310)	−25.079** (11.957)	15.289 (30.379)	−15.048 (23.896)	4.438 (6.891)	−6.610 (13.152)	6.288 (8.717)	−10.101 (12.537)	1.640 (10.774)
Taxable income	0.016*** (0.004)	0.037** (0.016)	0.014* (0.006)	0.037** (0.017)	0.002 (0.013)	0.011** (0.005)	0.015** (0.008)	0.022*** (0.008)	0.020*** (0.008)	−0.016* (0.009)
Population aged 15–64 (%)	2.064 (2.052)	−11.315 (10.284)	2.354 (2.289)	−13.126 (10.374)	1.521 (6.480)	−3.467 (2.661)	11.126** (4.994)	−2.887 (3.109)	1.994 (5.046)	8.552** (3.728)
R-squared	0.017	0.008	0.007	0.010	0.002	0.092	0.106	0.066	0.042	0.087
Municipalities	4150	4150	4150	4150	4150	1211	1211	1211	1211	1211
Observations	21,381	21,381	21,381	21,381	21,381	5995	5995	5995	5995	5995

Notes: Variables in real per-capita terms (2010 euro). All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

ation to a national political party and its ideological stance), other time-varying municipalities characteristics (proportion of people aged 15–64, taxable per-capita income), municipalities fixed effects and time effects meant to capture common shocks. The inclusion of taxable per-capita income and of the proportion of working age population are meant to capture the demand side of municipal capital spending, as municipalities characterized by a different age structure or economic dynamics may respond differently to the investment stimulus by local policy makers. The regression equation is:

$$y_{i,t} = \alpha E_{i,t} + \beta' X_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}, \quad (1)$$

where  $y_{i,t}$  is a spending or revenue item of municipality  $i$  in year  $t$ ,  $E_{i,t}$  is the electoral cycle variable,  $X_{i,t}$  is a vector of the time-varying municipality level covariates listed above, including mayor's characteristics,  $\mu_i$  is a municipality fixed effect,  $\lambda_t$  a year effect and  $\varepsilon_{i,t}$  is the idiosyncratic error term. Standard errors are clustered at municipality level.

From Table 3 it emerges that the political budget cycle occurs mainly for capital expenditures.<sup>7</sup> Indeed, the pre-election year dummy for capital spending is significant for both the municipalities below 5000 inhabitants as for those above the 5000 threshold.

Political budget cycle at the municipal level involves mainly capital spending due to the fact that municipalities have retained more room for manoeuvre in how to allocate funds for investment projects. For example, borrowing is allowed only for investment spending (not for current spending). Other spending items, as hiring, have been subject to strict constraints from the central government. Moreover, municipalities do not pay out transfers (as for example unemployment benefits).

Our analysis will therefore focus on capital expenditures. We next report a regression where the log of capital investment is regressed on the same set of regressors as in Table 3, with the difference that now we add two revenues items at the municipal level as controls, total transfers (from the central and regional governments) and total revenues.

Indeed, it could be argued that municipal revenue items should be jointly determined with the spending items, as capital expenditures. However, municipalities can borrow to finance investment projects (but not to finance current spending). This allows some flexibility to municipalities in adjusting capital spending. On the contrary, revenues are rather rigid. First, municipalities resist increasing their tax rates (property taxes and personal income surcharge) ahead of elections. Moreover, transfers from the center and the Regions have been determined mainly by budget constraints at these higher levels of government and not by needs at the municipal level.<sup>8</sup>

<sup>7</sup> We focus on capital spending on a cash basis. In the context of Italian municipalities, there are large discrepancies between cash and accrual data. Based on accrual accounting, the cost for the whole investment project is allocated in the year when the financing sources are identified. Given delays in implementation of the investment projects and the fact that projects might span several years, there are large differences between cash and accrual data (Chiades and Mengotto, 2013). We think that actual payments (cash data) better reflect politician incentives.

<sup>8</sup> In order to check more formally for possible simultaneity bias, we have run the same regression as the one in Table 4 including one-year lag of both transfers and total revenues. Results (available upon request) are essentially unchanged.

Table 4 shows that in pre-electoral years capital spending, in real per-capita terms, is on average 9 percent higher than in the years following elections for the municipalities below 5000 (column 1), while it is about 7 percent higher for municipalities with population between 5000–15,000 (column 3). Looking at other covariates, in larger municipalities a higher taxable income and a higher share of working age population are associated to a larger average capital spending, while party affiliated and older mayors tend to spend less on average.

To check the robustness of our pre-electoral dummy, Table A.3 in the appendix includes four pre-electoral dummies: one for the electoral year and three for the three preceding years. The table indeed shows that the dummies are significant and their size decreases as we move away from the electoral year. As there is mixed evidence that the political budget cycle is operative already three years prior to elections, we decided to use as our baseline pre-electoral variable a dummy equal to one in the electoral year and in the two preceding ones.

Next, we show evidence that the DSP has been enforced. In fact, in order for the DSP to have an effect on the political budget cycle, it is essential that there is a cost from overspending and/or breaching the fiscal rule. There is no clear evidence in the literature on whether the DSP has been generally enforced or not. Grembi and others (2016), for example, estimate whether municipalities have respected the rule using budget data and check whether penalties were subsequently enforced in municipalities that, according to their estimates, did not comply with the DSP over the period 1999–2004. They find suggestive evidence that the DSP penalties were enforced, as there is a correlation between non-compliance (as estimated by the authors) and subsequent punishment.

For the years 2004–2006 we have received from the Italian Interior Ministry the list of municipalities that did not comply with the DSP (we were not able to obtain data for later years), therefore we can test directly whether the DSP has been enforced or not.<sup>9</sup> As discussed, the DSP entails that the municipalities breaching the DSP would face limits on hiring, on spending and on borrowing for investments in the following year.

Figs. 4 and 5 indeed show that hiring and long-term borrowing (accrual definition) have been remarkably lower for the non-complying municipalities in the year following the breach of the DSP as compared to the complying municipalities.<sup>10</sup> For current spending the DSP entailed bringing purchases of goods and services to a level not greater than in the last year in which the pact was respected. The evidence reported in Fig. 6 is consistent, although less striking. Overall, this evidence suggests that indeed breaching the rule carried penalties in terms of fiscal aggregates.

Finally, we show that municipalities subject to the DSP have recorded a more subdued political cycle than municipalities not subject to the rule. We test whether the political budget cycle is stronger for municipalities not subject to the DSP (those with less than 5000 inhabitants) as opposed to those subject to (more than 5000 inhabitants). To do so we enrich specification (1) to include a dummy for the municipalities larger than 5000 inhabitants and its interaction with the pre-electoral years dummy. The latter is the variable of interest, as it measures whether the political budget cycle is milder for the municipalities subject to the DSP. Our baseline difference-in-difference specification is:

$$y_{i,t} = \alpha E_{i,t} + \gamma D_{i,t} + \delta D_{i,t} E_{i,t} + \beta' X_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}, \quad (2)$$

where  $D_{i,t}$  is a time-varying dummy equal to one for municipalities above 5000 inhabitants and  $\delta$  is the difference-in-differences parameter capturing the political budget cycle of municipalities subject to the DSP.

We show in Table 5 results both restricting the sample to municipalities below 15,000 inhabitants (about 90 percent of total municipalities) - as discussed in Section 3, at 15,000 there is a change in the electoral rule for mayors - and for the entire sample. Results show that the cross term coefficient is negative and significant, substantially offsetting the electoral effect for larger municipalities. As to other controls, right-wing mayors tend to spend less on average, richer municipalities in terms of taxable income spend more on average and the elasticity of capital spending to total transfers is, not surprisingly, positive at about 0.5 (column 1 and 3). Overall, other mayors characteristics do not have a strong and significant effect on the average level of spending. Table A.4 shows similar results but restricting the sample closer to the 5000 threshold. We interpret these results as suggestive of the fact that the DSP has indeed made it costlier for mayors to increase capital spending before elections.

## 5. Interpreting the results

So far, our identification strategy has relied on the fact that the political budget cycle appears to be more muted for the municipalities above 5000 inhabitants. However, we have to acknowledge that there are other characteristics (in particular of the mayors) that change as the dimension of the municipality grows and that could affect the result. In particular, mayors tend to be slightly older, more educated and more affiliated with national parties<sup>11</sup> as the dimension of the municipality grows, while there

<sup>9</sup> Interestingly, municipalities that have breached the DSP are rather uniformly distributed across the country. There is not a higher frequency in the center-south of the country.

<sup>10</sup> In the context of Italian municipalities, borrowing is allowed only to finance investment projects. Larger municipalities have generally more access to borrowing than smaller ones. Therefore, differences in credit availability between smaller and larger municipalities cannot explain why larger municipalities show a more muted political cycle.

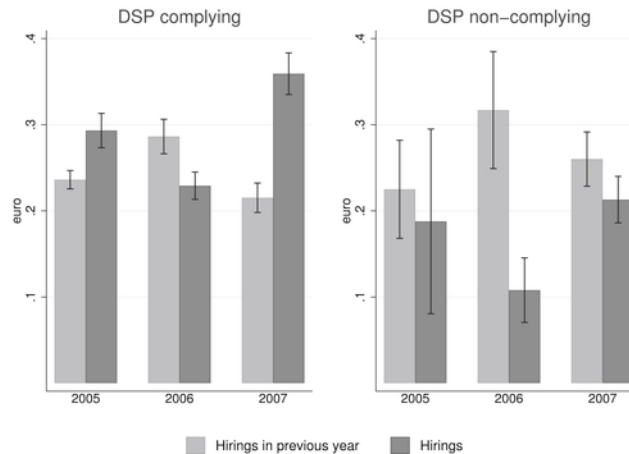
<sup>11</sup> We consider a mayor as not affiliated with a national party if the political list supporting the mayor in election is a “lista civica”, that is a list that does not have a regional or national counterpart.



**Table 4**  
Political budget cycle in log-capital per-capita spending of municipalities by population size.

	≤ 5000		5000–15000	
	(1)	(2)	(3)	(4)
Pre-election years	0.090*** (0.011)	0.078*** (0.010)	0.065*** (0.014)	0.050*** (0.013)
Female	0.020 (0.032)	0.012 (0.027)	−0.008 (0.053)	−0.044 (0.055)
Age	−0.002 (0.001)	−0.002** (0.001)	−0.004** (0.002)	−0.002 (0.001)
Education (years)	0.002 (0.004)	0.001 (0.003)	−0.004 (0.006)	−0.005 (0.006)
Party affiliated	0.071** (0.034)	0.059** (0.029)	−0.079** (0.039)	−0.076* (0.039)
Right wing	−0.024 (0.049)	−0.013 (0.043)	−0.039 (0.050)	−0.021 (0.045)
Taxable income (logs)	0.139 (0.130)	−0.010 (0.125)	0.872** (0.356)	0.691* (0.354)
Population aged 15–64 (%)	−0.010** (0.005)	−0.007 (0.005)	0.055*** (0.015)	0.028** (0.014)
Total transfers (logs)	0.555*** (0.015)		0.567*** (0.027)	
Total revenues (logs)		1.362*** (0.030)		1.390*** (0.059)
R-squared	0.156	0.266	0.353	0.414
Municipalities	4150	4150	1211	1211
Observations	21,379	21,379	5995	5995

Notes: Variables in real per-capita terms (2010 euro). Total transfers (current and capital) include municipalities' share of the personal income tax. All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.



**Fig. 4.** Average hiring of municipalities (per 1000 inhabitants) by DSP compliance in previous year (2005–2007).

is no substantial difference in terms of gender (Table A.2). Therefore, we have to rule out the possibility that mayors in larger municipalities are more fiscally responsible not because of the fiscal rule but because they are more educated, older and/or because they are more affiliated with national parties and therefore abide more to the national party discipline.<sup>12</sup>

As a first step to test whether these different characteristics of the mayors are able to explain our results, we first repeat our baseline difference-in-difference specification (equation (2)) splitting the treatment and control groups not on the basis of the size of the municipality (below or above 5000 inhabitants), but based on whether the mayor has an education above or below the median (Table A.5), an age above or below the median (Table A.6) and whether or not the mayor is affiliated with a national party (Table A.7). The results show that these alternatives are not able to explain our results, especially considering municipalities below 15,000 inhabitants.

<sup>12</sup> By law, also, mayors earn more as the dimension of the municipality grows. We will address this issue in Section 6.

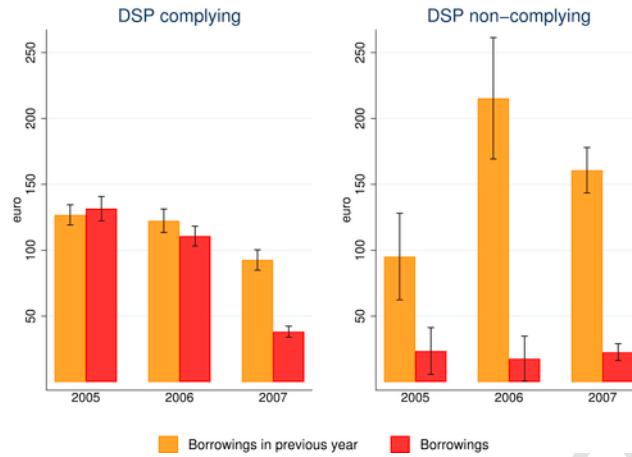


Fig. 5. Mean per-capita long-term borrowing (accrual) of municipalities by DSP compliance in previous year (2005–2007).

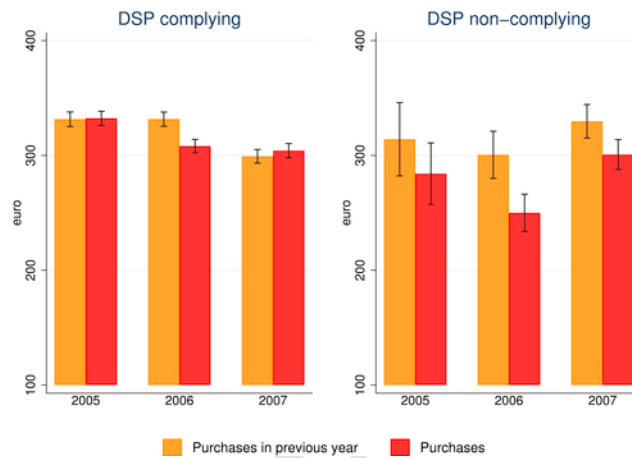


Fig. 6. Mean per-capita purchase of goods and services (cash) of municipalities by DSP compliance in previous year (2005–2007).

On top of the mayors characteristics, we have to take into account also the fact that the wage of the mayor grows with the population size of the municipality. For example, in 2000 the major gross wage was 1291 euro for municipalities below 1000 inhabitants and growing on the basis of the following schedule: up 12% (1446 euro) for municipalities with 1000–3000 inhabitants, another 50% (2169) for the 3000–5000 range, another 28,6% increase (2789 euro) for the 5000–10,000 range and another 11.1% (3099 euro) for the 10,000–15,000 range. This increase in the wage has been shown to be associated with a selection of more educated and competent mayors into the job (Gagliarducci and Nannicini, 2013), and in fact we find that larger municipalities tend to have more educated mayors. Above median education level of the mayor, however, does not seem to explain the more moderate political budget cycle above the 5000 threshold (Table A.5). On the contrary, there is a mild evidence that it exacerbates it, especially when also larger municipalities (above 15,000 inhabitants) are included. In any case, in order to rule out the possibility that the increases in the mayor wage might be related to the political budget cycle, we rerun our difference-in-difference regressions using as threshold also 1,000, 3000 and 10,000 inhabitants. Results, reported in Table A.8, show that at the 1000 and 3000 thresholds the sign of the cross term is positive, while it is negative and marginally significant at the 10,000 one, pointing to the fact that the wage of the mayor per se appears not be an important determinant to contain the political budget cycle.

In the next section, we will present results based on a regression discontinuity analysis in order to approach the issue of the continuity of the controls in a more formal way. As a preview, we find that the controls are broadly continuous at the 5000 threshold and that the mayor's wage increase at 5000 inhabitants is not relevant in explaining the moderation of the political budget cycle above the threshold.

**Table 5**  
Effect of the fiscal rule on political budget cycle in log-capital per-capita spending of municipalities by population size.

	< 15,000		All	
	(1)	(2)	(3)	(4)
> 5000	-0.304*** (0.066)	-0.216*** (0.062)	-0.297*** (0.066)	-0.211*** (0.062)
Pre-election years	0.107*** (0.010)	0.088*** (0.009)	0.110*** (0.010)	0.090*** (0.009)
> 5000 × Pre-election years	-0.098*** (0.015)	-0.073*** (0.014)	-0.087*** (0.013)	-0.065*** (0.012)
Female	0.019 (0.028)	0.006 (0.025)	0.028 (0.027)	0.010 (0.024)
Age	-0.001* (0.001)	-0.002* (0.001)	-0.001 (0.001)	-0.001* (0.001)
Education (years)	0.001 (0.003)	0.001 (0.003)	0.003 (0.003)	0.002 (0.003)
Party affiliated	0.053* (0.027)	0.040 (0.024)	0.061** (0.025)	0.047** (0.022)
Right wing	-0.118*** (0.038)	-0.089*** (0.033)	-0.130*** (0.030)	-0.097*** (0.026)
Taxable income (logs)	0.282** (0.124)	0.103 (0.119)	0.349*** (0.123)	0.139 (0.117)
Population aged 15–64 (%)	0.001 (0.005)	0.000 (0.004)	0.004 (0.005)	0.003 (0.004)
Total transfers (logs)	0.559*** (0.014)		0.554*** (0.013)	
Total revenues (logs)		1.379*** (0.028)		1.366*** (0.027)
R-squared	0.179	0.285	0.185	0.290
Municipalities	5295	5295	5685	5685
Observations	27,374	27,374	29,493	29,493

Notes: Variables in real per-capita terms (2010 euro). Total transfers (current and capital) include municipalities' share of the personal income tax. All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

## 6. Regression-discontinuity analysis

So far our analysis has focused on municipalities below 15,000 inhabitants as these have the same electoral rule for majors. However, one might be concerned that municipalities located away from the DSP threshold (the 5000 inhabitants) have different characteristics that are relevant for capital spending, preventing a correct identification of the effect of fiscal rules on the political budget cycle.

We address this issue by combining the diff-in-diff approach with a regression discontinuity (RD) design, in order to get estimates of the difference in capital spending between pre- and post-electoral years just below and above the 5000 population threshold. Around the 5000 threshold the treatment of being subject to the fiscal constraints of the DSP should be as good as randomly assigned. The treatment changes deterministically at the threshold, while other characteristics should not, setting up a sharp identification scheme. In order to assess the validity of the exogeneity of the threshold, we run a McCrary (2008) density test around the 5000 population threshold. Fig. 7 shows no evidence of statistically significant jumps in the population distribution at the threshold (the evidence is weaker in the last two years of the sample), as it would be the case if mayors managed to keep the population below the 5000 inhabitants in order to avoid the DSP rules.

A choice to be made in a regression discontinuity analysis concerns the use of non-parametric methods, such as local linear regression, in a sufficiently small neighborhood of the threshold, versus polynomial regressions run on the entire working sample (Lee and Lemieux, 2010). We opted for polynomial regression for a number of reasons: 1) it directly provides estimates of the diff-in-diff parameter at the cut-off point; 2) it allows to easily add municipality fixed effects and year effects, which turn out to be important in estimating the effect of the fiscal rules on the political budget cycle; 3) it allows to handle non-linearities through the choice of polynomials of suitable order.<sup>13</sup> Our baseline RD specification for per-capita capital spending  $y_{it}$  is the following:

$$y_{i,t} = \sum_{k=0}^p (\delta_k P_{i,t}^{*k}) + Z_{i,t} \sum_{k=0}^p (\gamma_k P_{i,t}^{*k}) + W_{i,t} \left[ \sum_{k=0}^p (\alpha_k P_{i,t}^{*k}) + Z_{i,t} \sum_{k=0}^p (\varphi_k P_{i,t}^{*k}) \right] + \beta' X_{i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (3)$$

<sup>13</sup> As a robustness check, in this section we present also results based on a linear regression around the threshold.

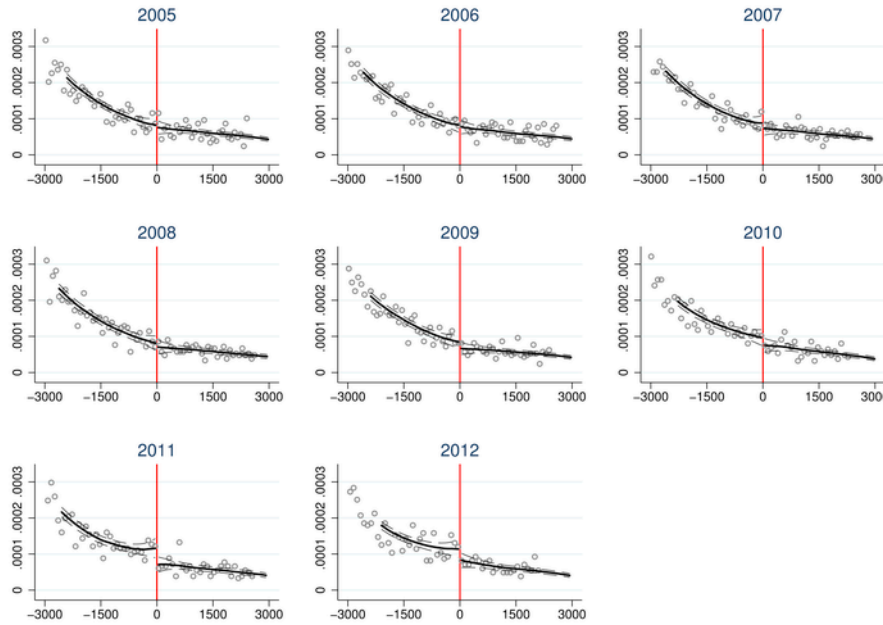


Fig. 7. Checking continuity of the population distribution around the 5000 inhabitant threshold.

which includes polynomials of order  $p$  in the normalized running variable  $P_{i,t}^* = P_{i,t} - P_c$ , where  $P_c$  is the 5000-population threshold, its interactions with the treatment indicator  $Z_{i,t}$ , equal to one for municipalities subject to the DSP and zero otherwise

$$Z_{i,t} = \begin{cases} 1 & \text{if } P_{i,t}^* > 0 \\ 0 & \text{if } P_{i,t}^* \leq 0, \end{cases}$$

and the electoral dummy  $W_{i,t}$ , equal to one in pre-electoral years ( $t = -2, -1, 0$ ), where  $t = 0$  is the year of elections, and zero in post-electoral years ( $t = 1, 2$ ). Additional covariates  $X_{i,t}$ , as in the previous analysis, include mayor's characteristics (gender, age, education, party affiliation, political orientation), total per-capita transfers received by municipalities, the proportion of people aged 15–64 and taxable per-capita income, while  $\mu_i$  and  $\lambda_t$  are municipality fixed effects and year effects, respectively.<sup>14</sup>

Next we plot in Fig. 8 the log-difference at the individual municipal level of pre- and post-election years per-capita capital spending against the municipality population size, to see whether there is a discontinuity around the 5000 threshold. The log-difference of pre- and post-election years per-capita capital spending is defined considering the election year and the two prior ones as pre-election years, while the two years after elections as post-election years. In addition, we fit two (third-order) polynomials in population size, one for the observations below and one for those above the 5000 threshold. The fitted lines suggest that indeed the political budget cycle is higher on the left of the 5000 threshold as compared to the right, where in fact the fiscal rule is active. However, the dispersion of the observations is high and, moreover, by taking the pre- and post-elections difference in capital spending we are reducing the sample size.

Table 6 reports the estimates at the 5000 threshold of the political budget cycle effect (the  $\alpha_0$  coefficient of the electoral dummy  $W_{i,t}$ ) and the fiscal rule effect on the political budget cycle (the coefficient  $\varphi_0$  of the interaction between the electoral dummy and the treatment indicator  $Z_{i,t}$ ) from third-degree polynomial regressions over the 0–15,000 and all population intervals. The local estimates confirm the existence of budget cycle, as capital spending is about 24 percent higher in pre-electoral years, while the fiscal rule proves effective in mitigating the cycle, reducing the political budget cycle by about 75 percent (column 1 and 3). The inclusion of additional covariates (column 2 and 4), while confirming the baseline results, reduces the magnitude of the estimated effects. Furthermore, to include in the analysis municipalities which are similar in every respect except for the treatment, we run linear regressions (with year and municipality fixed effects) around the 5000 threshold using observations within a set of symmetric bandwidths. Estimated coefficients, reported in Table A.9, are in line with those obtained using polynomial regressions, showing that the DSP significantly reduces pre-electoral capital spending.<sup>15</sup>

<sup>14</sup> For other works using municipality fixed effects in regression discontinuity analysis, see for example Petterson-Lidbom (2008) and Ferraresi et al. (2015).

<sup>15</sup> As a further robustness check, we also run a local linear regression, with optimal symmetric bandwidth around the DSP threshold, using the algorithm by Calonico et al. (2014). The outcome variable is the difference between average real per-capita capital spending (in logs) in pre-electoral and post-electoral years computed for each municipality. The estimated effect of the DSP on capital spending ( $-0.190$ , significant at 10 percent level) is consistent with the results of the baseline polynomial regressions, which are our preferred choice as they allow for the inclusion of time fixed effects.

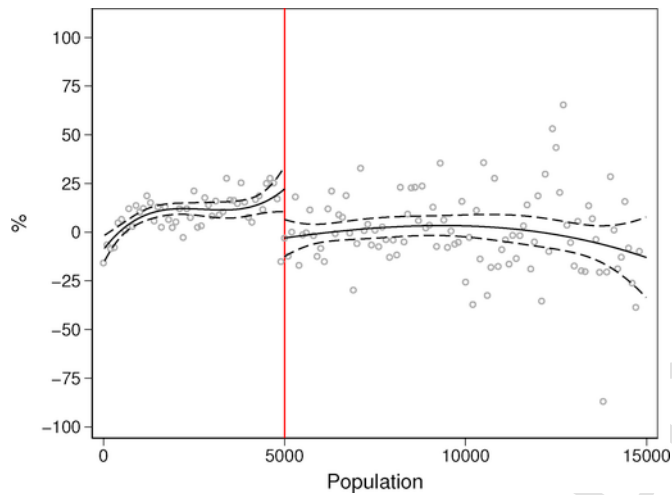


Fig. 8. Difference in pre- vs. post-electoral log-capital spending per-capita.

Table 6

Effect of the fiscal rule on the political budget cycle in log-capital spending of municipalities at the DSP threshold. RD-FE estimates (2005–2012).

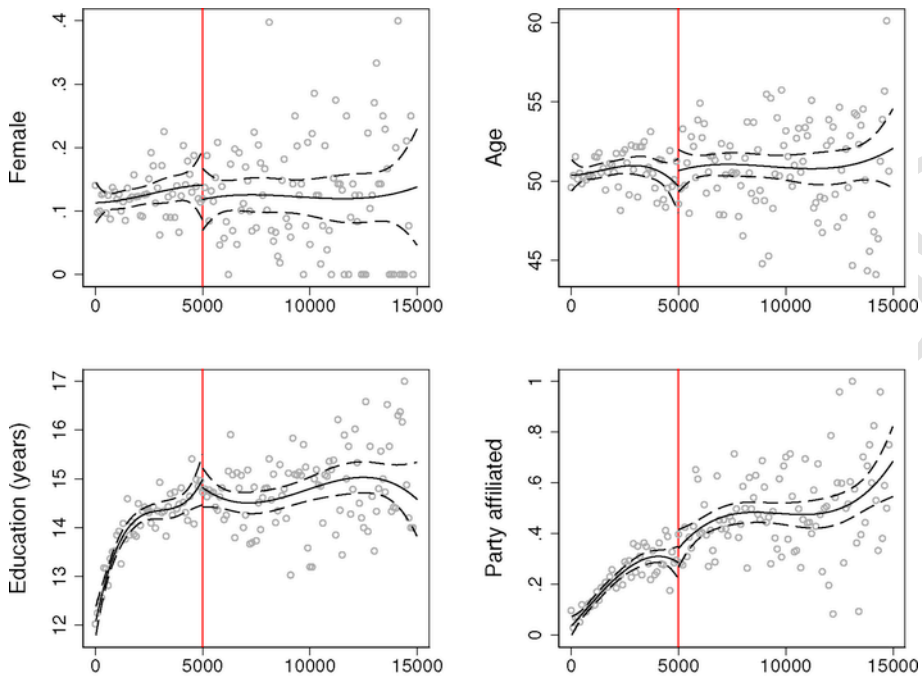
	< 15,000		All	
	(1)	(2)	(3)	(4)
> 5000	-0.180** (0.084)	-0.248*** (0.079)	-0.270*** (0.071)	-0.290*** (0.069)
Pre-election years	0.242*** (0.047)	0.184*** (0.045)	0.231*** (0.022)	0.201*** (0.021)
Pre-election years × > 5000	-0.186*** (0.063)	-0.138** (0.060)	-0.189*** (0.025)	-0.178*** (0.024)
Other covariates	No	Yes	No	Yes
R-squared	0.064	0.188	0.067	0.191
Municipalities	5396	5295	5796	5685
Obs.	28,664	27,374	30,873	29,493

Notes: Variables in real per-capita terms (2010 euro). All specifications include a third-degree population polynomial, its interactions with the electoral and DSP dummies, year and municipality fixed effects. Other covariates include mayor's characteristics (gender, age, education, party affiliation, political orientation) and municipality level variables (total transfers per-capita received). Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

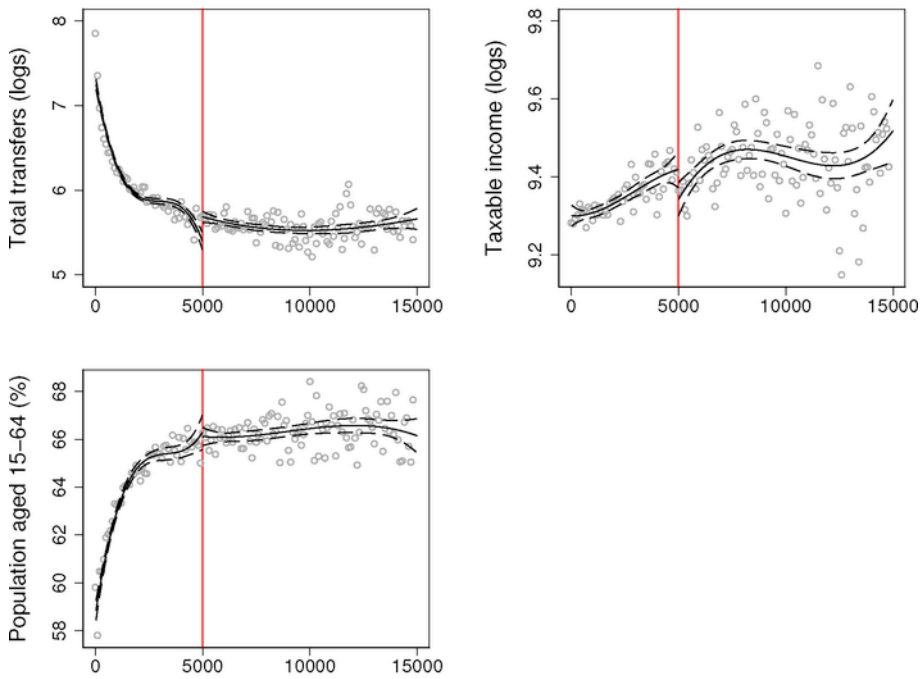
We then turn to check whether pre-determined characteristics of mayors and of municipalities are balanced on either side of the DSP threshold. Fig. 9 shows scatter plots of mayors' characteristics (gender, age, years of education and party affiliation) and municipalities' characteristics (per-capita total transfers, per-capita taxable income and the proportion of population aged 15–64), with observations averaged over intervals of 100 inhabitants. No large and significant discontinuities at the threshold can be detected by looking at the (third-order) fitted polynomials, except for per-capita taxable income and total transfers, which display small jumps at the threshold.

To further test for the continuity of covariates, we run third-order polynomial regressions around the DSP threshold, with year and municipality fixed effects. Results reported in Table 7 do not show evidence of significant discontinuities at the cut-off, except for mayor's gender.

Finally, we address the issue of the increase of the mayor's wage at 5000. We follow two approaches. In the first one we use data from 1999 to 2004. During those years, the DSP rule was in place but did not include capital spending. Therefore, there was no difference between municipalities below and above the 5000-threshold regarding the treatment of capital spending. Still, the wage of the mayor would increase at the threshold. Table 8 runs the same regression as in Table 6 but on the years 1999–2004. It shows that there is no evidence of a more muted political budget cycle above the 5000 threshold, supporting the view that the increase in the mayor's wage does not explain the attenuation of the political budget cycle. In the second approach, we run the same regression as in Table 6 - over the period 2005–2012 - but using as population thresholds those where the mayor's wage increases but at 5,000, namely 1,000, 3000 and 10,000 inhabitants. The results, reported in Table 9, do not support the hypothesis that increases in the mayor's wage have an effect on the political budget cycle, as we find no significant effects. We do not find it especially at the 3000 threshold, which entails a 50 percent wage increase. Overall therefore, the reported evidence supports the view that the increase in the wage of the mayor is not a relevant element in explaining the reduction in the political budget cycle.



(a) Mayors' characteristics



(b) Municipalities' characteristics

Fig. 9. Checking continuity of covariates around the 5000 inhabitants threshold.

**Table 7**

Checking continuity of covariates around the 5000 threshold (population below 15,000). RD-FE estimates.

	Female	Age	Education	Party affiliated	Total transfers	Population 15–64 (%)	Taxable income
> 5000	−0.083** (0.038)	−0.664 (0.958)	0.140 (0.251)	−0.047 (0.048)	0.063 (0.045)	−0.003 (0.107)	−0.004 (0.004)
R-squared	0.002	0.033	0.013	0.016	0.489	0.087	0.289
Municipalities	5397	5397	5297	5396	5396	5397	5397
Observations	28,601	28,596	27,529	28,514	28,666	28,729	28,713

Notes: Monetary variables in real per-capita terms (2010 euro). Controls include a third-degree population polynomial, its interactions with the DSP indicator, year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

**Table 8**

Checking for differences in PBC between small and large municipalities before the introduction of the DSP rule on capital spending. RD-FE estimates (1999–2004).

	< 15,000		All	
	(1)	(2)	(3)	(4)
> 5000	−0.170* (0.099)	−0.184** (0.090)	−0.207*** (0.071)	−0.193*** (0.064)
Pre-election years	0.140* (0.080)	0.132* (0.075)	0.103*** (0.035)	0.108*** (0.033)
Pre-election years × > 5000	−0.031 (0.103)	−0.014 (0.097)	0.035 (0.040)	0.027 (0.037)
Other covariates	No	Yes	No	Yes
R-squared	0.114	0.248	0.114	0.246
Municipalities	4039	4003	4329	4292
Observations	13,900	13,623	14,889	14,604

Notes: Variables in real per-capita terms (2010 euro). All specifications include a third-degree population polynomial, its interactions with the electoral and DSP dummies, year and municipality fixed effects. Other covariates include mayor's characteristics (gender, age, education, party affiliation, political orientation) and municipality level variables (total transfers per-capita received). Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

**Table 9**

Effect of the fiscal rule on electoral log-capital capital spending at population thresholds relevant for mayor's wage. RD-FE estimates.

	1000		3000		10,000	
	(1)	(2)	(3)	(4)	(5)	(6)
> threshold	0.057 (0.091)	−0.001 (0.079)	0.055 (0.085)	0.037 (0.082)	0.090 (0.104)	0.062 (0.092)
Pre-election years	0.126* (0.068)	0.057 (0.057)	0.189*** (0.047)	0.152*** (0.046)	0.151* (0.081)	0.229*** (0.080)
Pre-election years × > threshold	0.039 (0.075)	0.110* (0.065)	−0.095 (0.078)	−0.060 (0.077)	−0.181 (0.119)	−0.121 (0.108)
Other covariates	No	Yes	No	Yes	No	Yes
R-squared	0.031	0.159	0.031	0.159	0.250	0.358
Municipalities	4239	4150	4239	4150	1224	1211
Observations	22,469	21,379	22,469	21,379	6194	5994

Notes: Variables in real per-capita terms (2010 euro). Sample restricted to municipalities with population below 5000 inhabitants in columns (1)–(4), between 5000 and 15,000 in columns (5)–(6). All specifications include a third-degree population polynomial, its interactions with the electoral and DSP dummies, year and municipality fixed effects. Other covariates include mayor's characteristics (gender, age, education, party affiliation, political orientation) and municipality level variables (total transfers per-capita received, proportion of population aged 15–64, taxable income per-capita). Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

## 7. Conclusions

This paper has used data on Italian municipalities to present evidence suggesting that fiscal rules can moderate the political budget cycle. We have used the discontinuity in the application of the Domestic Stability Pact (DSP) at 5000 inhabitants to identify the effect of the rule on the political budget cycle. We find that the political budget cycle increases real capital spending by about 11 percent on average in the years prior to municipal elections and that the sub-national fiscal rule largely offsets this effect. A regression discontinuity analysis around the 5000 threshold reinforces these results, as the increase of capital spending in pre-electoral years for municipalities subject to the DSP is about 25 percent of that of municipalities not subject to the rule. We have also provided evidence that the fiscal rule has been enforced by the central government, at least over the period 2004–2006 for which we have data on the municipalities that have breached the DSP.

Indeed, our analysis stresses the importance of the enforcement mechanisms of the fiscal rule. In the case of Italian municipalities not complying with the fiscal rule, the “punishment” has worked through limits on hiring, spending and borrowing. Of course, the central government has leverage (from using national laws, to using administrative powers) to enforce these limits. Too often fiscal rules are not effective as the enforcement mechanism is weak. For example, the debate on the limited effectiveness of the Stability and Growth Pact (SGP) for European countries partly revolves around the fact that imposing a fine to non-complying countries is neither credible nor efficient. It might be more effective to include in the SGP provisions to limit the management of fiscal policy on the part of deviating countries, as for example setting limits in terms of spending growth. The European Union should use all the leverage that it has to enforce these constraints, for example by resorting to cuts in European funds.

As far as we know, this is the first paper that provides evidence that fiscal rules can limit the political budget cycle. To this extent, it adds to the small and growing literature trying to establish the impact of fiscal rules on budget outcomes. Differently from the papers showing that fiscal rules can have an effect on budget deficits, however, our results have more direct welfare implications. Results showing that fiscal rules can help contain the budget deficit suggest that those rules are enforced, but it does not imply that they are welfare improving. On the contrary, the political budget cycle is inherently inefficient as it distorts spending and revenues for electoral and political purposes. In this regard, our results point to a possible partial welfare-improving role of fiscal rules. In practice, it remains difficult to assess the welfare implications of fiscal rules. In the specific Italian case analyzed in this paper, it is generally accepted that the DSP has contributed to reduce local authorities deficits but at the same time that this has been achieved mainly compressing capital spending. An assessment of the overall welfare effects of the rule, therefore, would have to include the benefits from reductions in deficits and in the political budget cycle, but also the costs of the fall in capital spending.

## A. Appendix

**Table A.1**  
Dataset description

Variable	Description	Data source
Capital spending in real per-capita terms (cash definition)	It is the sum of all cash capital expenditures by municipalities, the largest outlays referring to the construction of buildings, roads, public transports, purchase of furnitures and other equipments. Nominal values are deflated by using the national Consumption Price Index (all items, base 2010).	Certificati di Conto Consuntivo - Ministero dell'Interno ( <a href="http://finanzalocale.interno.it">http://finanzalocale.interno.it</a> )
Current spending in real per-capita terms (cash definition)	It is the sum of all cash current expenditures by municipalities, the largest outlays referring to personnel and purchases of goods and services. Nominal values are deflated by using the national Consumption Price Index (all items, base 2010).	Certificati di Conto Consuntivo - Ministero dell'Interno ( <a href="http://finanzalocale.interno.it">http://finanzalocale.interno.it</a> )
Total spending in real per-capita terms (cash definition)	It is the sum of all cash current and capital expenditures by municipalities, as defined above. Nominal values are deflated by using the national Consumption Price Index (all items, base 2010).	Certificati di Conto Consuntivo - Ministero dell'Interno ( <a href="http://finanzalocale.interno.it">http://finanzalocale.interno.it</a> )
Long-term borrowing in real per-capita terms (accrual definition)	It is the sum of revenues from loans and bonds issued to fund investment projects. Nominal values are deflated by using the national Consumption Price Index (all items, base 2010).	Certificati di Conto Consuntivo - Ministero dell'Interno ( <a href="http://finanzalocale.interno.it">http://finanzalocale.interno.it</a> )
Pre-election years	Dummy equal to one in the three years prior to municipal elections, including the electoral year.	Archivio storico delle elezioni - Ministero dell'Interno ( <a href="http://elezionistorico.interno.it">http://elezionistorico.interno.it</a> )
Taxable income in real per-capita terms	It is the sum at municipality level of total incomes as available from the personal income tax returns (IRPEF).	Open Data Dichiarazioni Fiscali - Ministero dell'Economia e delle Finanze ( <a href="http://www1.finanze.gov.it">http://www1.finanze.gov.it</a> )
Share of population aged 15-64	It is computed as the ratio of population aged 15–64 over total population.	Demo -Istituto Nazionale di Statistica ( <a href="http://demo.istat.it">http://demo.istat.it</a> )
Age of mayor	The age dummy is equal to one if the mayor has an age above the median.	Anagrafe degli Amministratori Locali e Regionali - Ministero dell'Interno ( <a href="http://amministratori.interno.it">http://amministratori.interno.it</a> )



Education of mayor	Education is measured in years of schooling by converting ISCED levels.	Anagrafe degli Amministratori Locali e Regionali - Ministero dell'Interno ( <a href="http://amministratori.interno.it">http://amministratori.interno.it</a> )
Party affiliation of mayor	Dummy equal to one if the list or coalition supporting the winning candidate mayor at municipal elections is not a <i>Lista civica</i> , that is a list not affiliated to a national or regional party.	Anagrafe degli Amministratori Locali e Regionali - Ministero dell'Interno ( <a href="http://amministratori.interno.it">http://amministratori.interno.it</a> )
Hired personnel	It is the sum of personnel hired over the year under permanent contracts (measured in number of units at 31/12), plus the positive annual change of personnel hired with fixed term and other temporary or flexible contracts. Temporary personnel is in annual units, obtained by summing up the number of months worked per year by each category of temporary workers and dividing by 12.	Conto annuale della PA - Ministero dell'Economia e delle Finanze ( <a href="http://www.contoannuale.tesoro.it">http://www.contoannuale.tesoro.it</a> )

**Table A.2**

Summary statistics by population size (2005–2012).

	≤ 5000		5000–15000		≥ 15,000	
	Mean	S. D.	Mean	S. D.	Mean	S. D.
Capital spending	572.7	888.5	228.8	236.8	246.4	279.0
Current spending	833.7	465.5	624.5	228.4	740.5	210.0
Total spending	1406.5	1207.4	853.3	376.7	986.8	403.8
Total transfers	701.6	895.8	310.3	247.9	347.9	202.6
Total revenues	1642.9	1411.8	1026.9	454.7	1206.4	511.9
Long-term borrowing	97.8	223.4	55.5	99.1	74.3	134.5
Total outstanding debt	1539.0	2881.8	1073.5	6753.4	1223.2	715.8
Taxable income	11,661.3	2841.2	12,950.2	3061.3	13,874.2	3141.5
Hiring (per 1000-capita)	0.5	2.0	0.3	0.5	0.3	0.3
Population (units)	1825.2	1307.2	8565.1	2699.7	54,385.5	162,654.0
Population aged 15–64 (%)	63.6	4.4	66.2	2.4	65.7	2.3
Pre-election years (%)	54.3	49.8	56.9	49.5	59.0	49.2
Female (%)	11.0	31.3	11.6	32.0	9.3	29.1
Age (years)	51.6	10.2	52.0	9.1	52.6	8.9
Education (years)	13.7	3.1	14.7	2.7	15.4	2.4
Party affiliated (%)	18.2	38.6	45.5	49.8	90.1	29.8
First mandate (%)	67.8	46.7	66.7	47.1	67.3	46.9

Notes: Variables in real per-capita terms (2010 euro).

**Table A.3**

Political budget cycle in log-capital per-capita spending of municipalities by population size (specification with electoral dummies for each year of the term).

	≤ 5000		5000–15000	
	(1)	(2)	(3)	(4)
Pre-election year (t-3)	0.022 (0.014)	0.009 (0.013)	0.047*** (0.018)	0.039** (0.018)
Pre-election year (t-2)	0.091*** (0.015)	0.071*** (0.014)	0.054*** (0.018)	0.028 (0.017)
Pre-election year (t-1)	0.101*** (0.016)	0.078*** (0.014)	0.089*** (0.020)	0.075*** (0.019)
Pre-election year (t)	0.112*** (0.017)	0.105*** (0.015)	0.147*** (0.022)	0.136*** (0.021)
Female	0.020 (0.032)	0.011 (0.027)	-0.012 (0.053)	-0.049 (0.054)
Age	-0.002* (0.001)	-0.002** (0.001)	-0.004*** (0.002)	-0.003** (0.001)
Education (years)	0.002 (0.004)	0.001 (0.003)	-0.004 (0.006)	-0.005 (0.006)
Party affiliated	0.069** (0.034)	0.057* (0.029)	-0.093** (0.040)	-0.091** (0.040)
Right wing	-0.022 (0.049)	-0.010 (0.043)	-0.023 (0.050)	-0.003 (0.045)
Taxable income (logs)	0.142 (0.130)	-0.001 (0.125)	0.949*** (0.361)	0.780** (0.359)
Population aged 15–64 (%)	-0.010** (0.005)	-0.007 (0.005)	0.055*** (0.015)	0.028** (0.014)
Total transfers (logs)	0.555***		0.566***	

	(0.015)		(0.027)	
Total revenues (logs)		1.362***		1.392***
		(0.030)		(0.059)
R-squared	0.156	0.267	0.356	0.419
Municipalities	4150	4150	1211	1211
Observations	21,379	21,379	5995	5995

Notes: Variables in real per-capita terms (2010 euro). Total transfers (current and capital) include municipalities' share of the personal income tax. All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

Table A.4

Effect of the fiscal rule on political budget cycle in log-capital per-capita spending of municipalities by population windows around the 5000 inhabitants threshold.

	1000–15000		3000–7000		4000–6000	
	(1)	(2)	(3)	(4)	(5)	(6)
> 5000	-0.278***	-0.193***	-0.291***	-0.195***	-0.291***	-0.184***
	(0.067)	(0.062)	(0.067)	(0.063)	(0.069)	(0.066)
Pre-election years	0.142***	0.120***	0.159***	0.147***	0.137***	0.138***
	(0.012)	(0.011)	(0.019)	(0.018)	(0.030)	(0.027)
> 5000 × Pre-election years	-0.133***	-0.108***	-0.130***	-0.116***	-0.110***	-0.112***
	(0.016)	(0.014)	(0.026)	(0.025)	(0.038)	(0.036)
Female	0.019	0.005	-0.001	0.005	0.014	0.017
	(0.032)	(0.028)	(0.050)	(0.042)	(0.076)	(0.064)
Age	-0.001	-0.001*	-0.003**	-0.002*	-0.004	-0.002
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Education (years)	-0.002	-0.002	-0.001	-0.003	0.001	-0.002
	(0.004)	(0.004)	(0.006)	(0.005)	(0.010)	(0.009)
Party affiliated	0.048	0.034	-0.015	-0.010	0.045	0.049
	(0.030)	(0.026)	(0.044)	(0.037)	(0.066)	(0.054)
Right wing	-0.116***	-0.083**	0.003	0.029	-0.027	-0.001
	(0.039)	(0.034)	(0.057)	(0.048)	(0.088)	(0.072)
Taxable income (logs)	0.462***	0.237	0.276	0.064	0.229	0.124
	(0.169)	(0.160)	(0.307)	(0.279)	(0.489)	(0.447)
Population aged 15–64 (%)	0.008	-0.001	-0.023*	-0.035***	-0.018	-0.027
	(0.007)	(0.007)	(0.014)	(0.013)	(0.019)	(0.018)
Total transfers (logs)	0.519***		0.465***		0.479***	
	(0.016)		(0.027)		(0.036)	
Total revenues (logs)		1.410***		1.425***		1.409***
		(0.032)		(0.057)		(0.092)
R-squared	0.182	0.298	0.196	0.323	0.208	0.329
Municipalities	3904	3904	1348	1348	667	667
Observations	19,928	19,928	6528	6528	3069	3069

Notes: Variables in real per-capita terms (2010 euro). Total transfers (current and capital) include municipalities' share of the personal income tax. All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

Table A.5

Effect of mayor's education on electoral log-capital per-capita spending of municipalities by population size.

	< 15,000		All	
	(1)	(2)	(3)	(4)
Education > median	0.009	0.002	0.001	-0.006
	(0.035)	(0.032)	(0.033)	(0.031)
Pre-election years	0.074***	0.061***	0.071***	0.057***
	(0.011)	(0.010)	(0.011)	(0.010)
Education > median × Pre-election years	0.021	0.023*	0.029**	0.031**
	(0.014)	(0.013)	(0.014)	(0.012)
Female	0.023	0.008	0.030	0.012
	(0.028)	(0.025)	(0.027)	(0.023)
Age	-0.002*	-0.002**	-0.001	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Education (years)	-0.001	-0.001	0.000	0.000
	(0.006)	(0.005)	(0.006)	(0.005)
Party affiliated	0.047*	0.035	0.054**	0.041*
	(0.027)	(0.024)	(0.025)	(0.022)
Right wing	-0.112***	-0.084**	-0.120***	-0.089***
	(0.038)	(0.033)	(0.029)	(0.026)
Taxable income (logs)	0.309**	0.122	0.375***	0.156
	(0.124)	(0.118)	(0.123)	(0.117)

Population aged 15–64 (%)	0.002 (0.005)	0.001 (0.004)	0.006 (0.005)	0.004 (0.004)
Total transfers (logs)	0.558*** (0.014)		0.553*** (0.013)	
Total revenues (logs)		1.381*** (0.028)		1.368*** (0.027)
R-squared	0.176	0.284	0.183	0.289
Municipalities	5295	5295	5685	5685
Observations	27,374	27,374	29,493	29,493

Notes: Variables in real per-capita terms (2010 euro). Total transfers (current and capital) include municipalities' share of the personal income tax. All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

**Table A.6**

Effect of mayor's age on electoral log-capital per-capita spending of municipalities by population size.

	< 15,000		All	
	(1)	(2)	(3)	(4)
Age > median	-0.017 (0.020)	-0.022 (0.019)	-0.018 (0.019)	-0.022 (0.018)
Pre-election years	0.076*** (0.011)	0.061*** (0.010)	0.077*** (0.011)	0.062*** (0.010)
Age > median × Pre-election years	0.016 (0.015)	0.021 (0.013)	0.014 (0.014)	0.019 (0.013)
Female	0.023 (0.028)	0.008 (0.025)	0.031 (0.027)	0.012 (0.023)
Age	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Education (years)	0.001 (0.003)	0.001 (0.003)	0.002 (0.003)	0.002 (0.003)
Party affiliated	0.049* (0.027)	0.036 (0.024)	0.055** (0.025)	0.043* (0.022)
Right wing	-0.113*** (0.038)	-0.085*** (0.033)	-0.121*** (0.029)	-0.091*** (0.026)
Taxable income (logs)	0.309** (0.124)	0.122 (0.119)	0.375*** (0.123)	0.157 (0.117)
Population aged 15–64 (%)	0.002 (0.005)	0.002 (0.004)	0.006 (0.005)	0.004 (0.004)
Total transfers (logs)	0.558*** (0.014)		0.553*** (0.013)	
Total revenues (logs)		1.382*** (0.028)		1.368*** (0.027)
R-squared	0.176	0.284	0.183	0.289
Municipalities	5295	5295	5685	5685
Observations	27,374	27,374	29,493	29,493

Notes: Variables in real per-capita terms (2010 euro). Total transfers (current and capital) include municipality share of the personal income tax. All specifications include year and municipalities' fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

**Table A.7**

Effect of mayor's affiliation to a national political party on electoral log-capital per-capita spending of municipalities by population size.

	< 15,000		All	
	(1)	(2)	(3)	(4)
Party affiliated	0.054* (0.029)	0.043* (0.026)	0.065** (0.026)	0.053** (0.023)
Pre-election years	0.085*** (0.010)	0.074*** (0.009)	0.088*** (0.010)	0.076*** (0.009)
Party affiliated × Pre-election years	-0.008 (0.016)	-0.011 (0.015)	-0.017 (0.014)	-0.017 (0.013)
Female	0.023 (0.028)	0.008 (0.025)	0.031 (0.027)	0.013 (0.023)
Age	-0.002* (0.001)	-0.002* (0.001)	-0.001 (0.001)	-0.001* (0.001)
Education (years)	0.001 (0.003)	0.000 (0.003)	0.002 (0.003)	0.002 (0.003)
Right wing	-0.113*** (0.038)	-0.086*** (0.033)	-0.123*** (0.029)	-0.093*** (0.026)
Taxable income (logs)	0.309** (0.124)	0.122 (0.119)	0.375*** (0.123)	0.157 (0.117)

Population aged 15–64 (%)	0.002 (0.005)	0.001 (0.004)	0.006 (0.005)	0.004 (0.004)
Total transfers (logs)	0.559*** (0.014)		0.553*** (0.013)	
Total revenues (logs)		1.382*** (0.028)		1.369*** (0.027)
R-squared	0.176	0.284	0.183	0.289
Municipalities	5295	5295	5685	5685
Observations	27,374	27,374	29,493	29,493

Notes: Variables in real per-capita terms (2010 euro). Total transfers (current and capital) include municipalities' share of the personal income tax. All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

**Table A.8**

Effect of the fiscal rule on electoral log-capital spending at population thresholds relevant for mayor's wage.

	1000		3000		10,000	
	(1)	(2)	(3)	(4)	(5)	(6)
> threshold	0.025 (0.068)	0.028 (0.059)	-0.001 (0.062)	0.027 (0.053)	-0.044 (0.062)	0.034 (0.074)
Pre-election years	0.017 (0.017)	0.007 (0.015)	0.076*** (0.012)	0.063*** (0.011)	0.079*** (0.016)	0.062*** (0.015)
> threshold × Pre-election years	0.112*** (0.018)	0.107*** (0.017)	0.068*** (0.019)	0.072*** (0.018)	-0.050* (0.027)	-0.042* (0.024)
Female	0.022 (0.032)	0.013 (0.027)	0.020 (0.032)	0.011 (0.027)	-0.008 (0.053)	-0.044 (0.055)
Age	-0.002* (0.001)	-0.002** (0.001)	-0.002 (0.001)	-0.002** (0.001)	-0.003** (0.002)	-0.002 (0.001)
Education (years)	0.002 (0.004)	0.001 (0.003)	0.002 (0.004)	0.001 (0.003)	-0.004 (0.006)	-0.005 (0.006)
Party affiliated	0.067** (0.034)	0.055* (0.029)	0.069** (0.034)	0.057** (0.029)	-0.081** (0.039)	-0.076* (0.040)
Right wing	-0.018 (0.049)	-0.006 (0.043)	-0.020 (0.049)	-0.008 (0.043)	-0.038 (0.049)	-0.020 (0.045)
Taxable income (logs)	0.138 (0.130)	-0.011 (0.124)	0.143 (0.130)	-0.005 (0.125)	0.851** (0.356)	0.697** (0.353)
Population aged 15–64 (%)	-0.009* (0.005)	-0.006 (0.005)	-0.010* (0.005)	-0.006 (0.005)	0.054*** (0.015)	0.027** (0.014)
Total transfers (logs)	0.555*** (0.015)		0.555*** (0.015)		0.567*** (0.027)	
Total revenues (logs)		1.361*** (0.030)		1.362*** (0.030)		1.389*** (0.059)
R-squared	0.158	0.269	0.156	0.267	0.354	0.415
Municipalities	4150	4150	4150	4150	1211	1211
Observations	21,379	21,379	21,379	21,379	5995	5995

Notes: Variables in real per-capita terms (2010 euro). Sample restricted to municipalities with population below 5000 inhabitants in columns (1)–(4), between 5000 and 15,000 in columns (5)–(6). Total transfers (current and capital) include municipalities' share of the personal income tax. All specifications include year and municipality fixed effects. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

**Table A.9**

Political budget cycle in log-capital spending of municipalities at the DSP threshold. RD-FE estimates, linear regression (2005–2012).

	(1)	(2)	(3)	(4)
> 5000	-0.221*** (0.082)	-0.280*** (0.076)	-0.277*** (0.092)	-0.279*** (0.084)
Pre-election years	0.166*** (0.038)	0.131*** (0.037)	0.223*** (0.056)	0.204*** (0.054)
Pre-election years × > 5000	-0.126** (0.058)	-0.090* (0.055)	-0.143* (0.086)	-0.159** (0.080)
Other covariates	No	Yes	No	Yes
Bandwidth	2000	2000	1000	1000
R-squared	0.121	0.206	0.127	0.213
Municipalities	1383	1350	684	668
Observations	6867	6531	3193	3071

Notes: Variables in real per-capita terms (2010 euro). All specifications include a first-degree population polynomial, its interactions with the electoral and DSP dummies, year and municipality fixed effects. Other covariates include mayor's characteristics (gender, age, education, party affiliation, political orientation) and municipality level variables (total transfers per-capita received). The symmetric optimal bandwidth computed following Calonico et al. (2014) is 1048. Clustered standard errors at municipality level in parenthesis. Significance: \*\*\* = 1%; \*\* = 5%; \* = 10%.

## References

- Aconcia, A., Corsetti, G., Simonelli, S., 2014. Mafia and public spending: evidence on the fiscal multiplier from a quasi-experiment. *Am. Econ. Rev.* 104 (7), 2185–2209.
- Alesina, A., 1987. Macroeconomic policy in a two party system as a repeated game. *Q. J. Econ.* 102 (3), 651–678.
- Alesina, A., 1988. Credibility and policy convergence in a two-party system with rational voters. *Am. Econ. Rev.* 78 (4), 796–805.
- Alesina, A., Paradisi, M., 2017. Political budget cycles: evidence from Italian cities. *Écon. Polit.* 29, 157–177.
- Alesina, A., Cohen, G.D., Roubini, N., 1997. *Political Cycles and the Macroeconomy*. The MIT Press, Cambridge (MA, United States) and London (UK).
- Alesina, A., Troiano, U., Cassidy, T., 2018. Old and Young Politicians. *Economica*.
- Beetsma, R.M.W.J., Debrun, X., 2004. Reconciling Stability and Growth: Smart Pacts and Structural Reforms, IMF Staff Papers 51/3. International Monetary Fund.
- Beetsma, R.M.W.J., Debrun, X., 2007. The new stability and growth pact: a first assessment. *Eur. Econ. Rev.* 51 (2), 453–477.
- Brender, A., Drazen, A., 2005. Political budget cycles in new versus established democracies. *J. Monet. Econ.* 52 (7), 1271–1295.
- Brender, A., Drazen, A., 2008. How do budget deficits and economic growth affect reelection prospects? Evidence from a large panel of countries. *Am. Econ. Rev.* 98 (5), 2203–2220.
- Brollo, F., Nannicini, T., 2012. Tying your enemy's hands in close races: the politics of federal transfers in Brazil. *Am. Pol. Sci. Rev.* 106 (4), 742–761.
- Burret, H., Feld, L., 2014. A Note on Budget Rules and Fiscal Federalism, CESifo DICE Report 1/2014, (March).
- Calonico, S., Cattaneo, M.D., Titiunik, R., 2014. Robust data-driven inference in regression-discontinuity design. *STATA J.* 14 (4), 909–946.
- Chiades, P., Mengotto, V., 2013. Il calo degli investimenti nei Comuni tra Patto di stabilità interno e carenza di risorse. *Bank of Italy Occasional papers*, vol. 121.
- Cioffi, M., Messina, G., Tommasino, P., 2012. Parties, Institutions and Political Budget Cycles at the Municipal Level. *Temî di discussione (Economic working papers)*, vol. 885, Bank of Italy.
- Coelho, C., Veiga, F.J., Veiga, L.G., 2006. Political business cycles in local employment: evidence from Portugal. *Econ. Lett.* 93, 82–87.
- Debrun, X., Moulin, L., Turrini, A., Ayuso-i-Casals, J., Kumar, M.S., 2008. Tied to the mast? National fiscal rules in the European Union. *Econ. Policy* 23, 297–362.
- Drazen, A., Eslava, M., 2010. Electoral manipulation via voter friendly spending: theory and evidence. *J. Dev. Econ.* 92 (1), 39–52.
- Ferraresi, M., Rizzo, L., Zanardi, A., 2015. Policy outcomes of single and double-ballot elections. *Int. Tax Publ. Financ.* 22 (6), 977–998.
- Foremny, D., Riedel, N., 2014. Business taxes and the electoral cycle. *J. Public Econ.* 115, 48–61.
- Gagliarducci, S., Nannicini, T., 2013. Do better paid politicians perform better? Disentangling incentives from selection. *J. Eur. Econ. Assoc.* 11 (2), 369–398.
- Grembi, V., Nannicini, T., Troiano, U., 2016. Do fiscal rules matter?. *Am. Econ. J. Appl. Econ.* 8 (3), 1–30.
- Gupta, S., Mulas-Granados, C., Liu, E., 2015. Now or later? The political economy of public investment in democracies, IMF Working paper 155.
- Lee, D., Lemieux, T., 2010. Regression discontinuity designs in economics. *J. Econ. Lit.* 48, 281–355.
- Lindbeck, A., 1976. Stabilization policies in open economies with endogenous politicians. *American Economic Review Papers and Proceedings* 1–19.
- McCrary, J., 2008. Manipulation of the running variable in the regression discontinuity design: a density test. *J. Econom.* 142 (2), 698–714.
- Milesi-Ferretti, G.M., Perotti, R., Rostagno, M., 2002. Electoral systems and public spending. *Q. J. Econ.* 117 (2), 609–657.
- Nordhaus, W., 1975. The political business cycle. *Rev. Econ. Stud.* 42, 169–190.
- Persson, T., Tabellini, G., 2000. *Political Economics: Explaining Economic Policy*. MIT Press, Cambridge and London.
- Pettersson-Lidbom, P., 2008. Do parties matter for economic outcomes? A regression-discontinuity approach. *J. Eur. Econ. Assoc.* 6 (5), 1037–1056.
- Rogoff, K., 1990. Equilibrium political budget cycles. *Am. Econ. Rev.* 80 (1), 21–36.
- Rogoff, K., Sibert, A., 1988. Elections and macroeconomic policy cycles. *Rev. Econ. Stud.* 55.
- Shi, M., Svensson, J., 2006. Political budget cycles: do they differ across countries and why?. *J. Public Econ.* 90 (8–9), 1367–1389.
- Veiga, L., Veiga, F., 2007. Political business cycles at the municipal level. *Publ. Choice* 131 (1), 45–64.