UNIVERSITÀ DELLA CALABRIA

UNIVERSITA' DELLA CALABRIA

Dipartimento di Economia, Statistica e Finanza

Dottorato di Ricerca in

Scienze Economiche e Aziendali

CICLO

XXXII

TITOLO TESI

OPPORTUNISTIC BEHAVIORS IN FISCAL POLICY: NEW EVIDENCE FROM ITALIAN MUNICIPALITIES

Settore Scientifico Disciplinare SECS-P/01

Coordinatore: Ch.mo Prof. Franco Ernesto Rubino

Firma Firma oscurata in base alle linee guida del Garante della privacy

Supervisore: Ch.mo Prof. Giuseppe Rose

Firma Firma oscurata in base alle linee guida del Garante della privacy

Dottorando: Dott. Pasquale Giacobbe

Firma Firma oscurata in base alle linee guida del Garante della privacy

UNIVERSITÀ DELLA CALABRIA

Opportunistic Behaviors in Fiscal Policy: New Evidence from Italian Municipalities

Pasquale Giacobbe

A thesis submitted in total fulfillment of the degree of
Doctor of Philosophy in Economics and Managerial Decisions

in the

Department of Economics, Statistics and Finance "Giovanni Anania"
Department of Business Administration and Law

April 2020

"In finance, as much as in economic policy, problems that look technical are in fact political."

Warren Buffett

UNIVERSITÀ DELLA CALABRIA

Abstract

Department of Economics, Statistics and Finance "Giovanni Anania"
Department of Business Administration and Law

Doctor of Philosophy in Economics and Managerial Decisions

Opportunistic Behaviors in Fiscal Policy:
New Evidence from Italian Municipalities

by Pasquale Giacobbe

This doctoral dissertation aims at investigating how electoral outcomes and political constraints contribute at shaping objectives, conduction and results of fiscal policy. Nowadays it is widely recognized that the analysis of economic policy should further explore the incentives and the political and institutional constraints which influence the authorities' behavior.

This research targets Italian municipalities. Local political bodies are characterized by a non-negligible spending discretion which can transpose in an opportunistic and patronizing management of fiscal policy aiming at pursuing selfish interest, which can damage national financial equilibrium. Thus, the empirical analyses presented in this dissertation are delineated in a political economy view.

This doctoral thesis is composed by three chapters joining a common micro-econometric nature and each of them constitutes an independent research than others. All together they shed light on still inadequately answered questions in economic literature and depict a general perspective on the mechanisms through which fiscal policy is carried out and how this last interacts and gets influenced by legislative processes. The three chapters have the following titles:

1. **Political Budget Cycle in Italy: a Quasi-Experimental Analysis on Local Elections**
2. **Female Representation, Public Expenditure and the Political Budget Cycle: First Evidence from Italian Municipalities**
3. **Local Fiscal Multiplier: What Do We Know about Italy?**

First chapter investigates the presence of *Political Budget Cycle* (PBC) in local investment spending. The effects of the *Domestic Stability Pact* (DSP) are analyzed. Relying on the fact that this tax rule, since 2001, is not binding for municipalities under 5,000 inhabitants, we can analyze its effects in a quasi-experimental setting (diff-in-diff). The results show that investment spending increases by about 37 percent in the pre-election year. Targeted spending mechanism is confirmed: most visible components of public spending (i.e. roads; territory; sport and culture) are increased more than the other categories. Using disaggregated data on municipal revenues, we demonstrate that PBC is partly financed through new loans and disposals of public assets. Our estimates confirm that the introduction of the DSP halves the PBC, but does not eliminate it.

Second chapter analyzes the impact that gender composition of political institutions may have on the Political Budget Cycle. To adequately test this conjecture, we use an exogenous variation in female participation in politics (i.e. *gender quotas rule*) occurred in Italy with the law no. 81/1993 introduced in 1993 and repealed in 1995, which established gender quotas for some Italian municipalities. By using this natural experiment and by means of an instrumental variable approach, we highlight how the presence of women elected in municipal councils affects the PBC. The results show that: *i*) an increase in the number of elected women reduces public expenditure; *ii*) this reduction involves those fields typically affected by PBC (e.g. roads' maintenance); *iii*) an higher female share within municipal councils makes public investment in local police and sport rising; *iv*) larger presence of women does not affect the (electoral) fluctuations in local public spending so that the strategic raise of public expenditure nearby elections seems to be implemented independently of politicians' gender.

While first two chapters study the effects of tax rules and gender composition of political bodies on the electoral patterns of public spending, the third one tries to link local investment expenditure to citizens' income. Thus, third chapter investigates the main transmission mechanism of fiscal policy, namely the fiscal multiplier, which numerically summarizes its degree of effectiveness. Local fiscal multiplier measures the effect of public spending's variations on local income. Also in this case, we use the exogenous variation in local spending coming from the *Domestic Stability Pact* to analyze its impact on Declared Personal Income (our proxy for local GDP). Once again, given that, since 2001 this tax rule is not binding for municipalities under 5,000 inhabitants, we adopt a quasi-experimental setting. Our diff-in-diff estimates show that for municipalities subjected to DSP constraints, despite the reduction of their investment expenditures, the effect on local income is higher than for exempted municipalities. In addition to that, our results demonstrate that the Italian local fiscal multiplier, for several reasons (low investment expenditure; corruption; etc.) is extremely low. Finally, spatial econometrics methods confirm that the impact of municipal investment spending on declared income is very modest and is not affected by any spatial dispersion between adjacent geographical areas.

[**Italian**]

L'obiettivo di questa tesi di dottorato e' quello di investigare come gli outcome elettorali e i vincoli di natura politica influenzano gli obiettivi, la conduzione e i risultati della politica fiscale. E' infatti ormai generalmente riconosciuto come l'analisi della politica economica debba spingersi a studiare gli incentivi e i vincoli politici ed istituzionali che condizionano il comportamento delle autorita'.

Il target di ricerca di questo lavoro e' focalizzato sui comuni italiani. Gli apparati amministrativi locali dispongono infatti di una non trascurabile discrezionalita' di spesa che puo' tradursi in una gestione opportunistica e clientelare della politica fiscale da parte dei politici in carica al fine di perseguire obiettivi personalistici, con conseguenze molto negative sugli equilibri finanziari del Paese. Le analisi empiriche presentate in questo lavoro vengono cosi' declinate secondo una prospettiva di *political economy*.

Questa tesi e' articolata in tre studi di natura micro-econometrica, ognuno dei quali rappresenta una ricerca autonoma e indipendente dalle altre, che fanno chiarezza su importanti quesiti ai quali la letteratura economica, ad oggi, non ha ancora risposto in maniera soddisfacente ed esaustiva. Le diverse prospettive di analisi adottate permettono pero' di desumere una visione unitaria, inquadrando i meccanismi attraverso i quali la politica fiscale locale viene attuata e come questa interagisce e viene influenzata da cambiamenti legislativi. Gli studi presentati hanno i seguenti titoli:

1. **Political Budget Cycle in Italy: a Quasi-Experimental Analysis on Local Elections**
2. **Female Representation, Public Expenditure and the Political Budget Cycle: First Evidence from Italian Municipalities**
3. **Local Fiscal Multiplier: What Do We Know about Italy?**

Il primo capitolo verifica la presenza di un *Political Budget Cycle* (PBC) nella spesa per investimenti comunali. La strategia identificativa si basa sulla variazione esogena nella spesa in conto capitale proveniente dal *Patto di Stabilita' Interno*. Dato che dal 2001 i vincoli fiscali stabiliti da questo provvedimento legislativo non si applicano piu' ai comuni con meno di 5,000 abitanti, possiamo cosi' utilizzare tecniche di tipo quasi-sperimentale (*diff-in-diff*). I risultati dimostrano che la spesa per investimenti aumenta del 37 percento nell'anno precedente le elezioni comunali. Vengono evidenziati dei meccanismi di *targeted spending*, ovvero vengono incrementate maggiormente quelle categorie di spese piu' "visibili" dagli elettori quali strade, manutenzione del territorio, sport e cultura. Utilizzando i dati sulla composizione delle entrate pubbliche locali, si dimostra inoltre che il PBC e' parzialmente finanziato tramite gli strumenti sui quali gli amministratori in carica hanno piu' controllo, ovvero accensione di nuovi prestiti e la dismissione di beni strumentali di proprieta' del comune. Le nostre stime dimostrano che l'ntroduzione del Patto di Stabilita' Interno dimezza ma non elimina il fenomeno del PBC.

Nel secondo capitolo si analizza l'impatto sul PBC della composizione in termini di gender degli organi politici comunali. Questo studio utilizza la variazione esogena nella partecipazione femminile locale derivante dalla riforma sulle quote rosa, introdotta nel 1993 con la legge n.81/1993 ed abrogata nel 1995 per motivi di incostituzionalita'. Utilizzando questo esperimento naturale e metodi a variabili strumentali, documentiamo gli effetti della presenza femminile nei consigli comunali. I risultati ottenuti mostrano che *i*) un aumento del numero di donne elette, in generale, riduce il livello di spesa pubblica; *ii*) questa riduzione colpisce quei settori tipicamente caratterizzati da PBC quali, ad esempio, la spesa per la manutenzione delle strade; *iii*) un maggiore numero di donne elette all'interno dei consigli comunali porta ad un incremento della spesa per investimenti in polizia locale e sport; *iv*) una maggiore presenza femminile non incide sulla dinamica del PBC; vengono percio' evidenziate fluttuazione elettorali nella politica fiscale indipendentemente dal gender dei politici in carica.

Mentre i primi due capitoli investigano gli effetti delle regole fiscali e della composizione femminile sui pattern elettorali della spesa pubblica comunale, il terzo capitolo ha l'obiettivo di rispondere al quesito circa gli effetti sul reddito pro-capite della spesa per investimenti locale. Viene cosi' analizzato il principale meccanismo di trasmissione della politica fiscale: il moltiplicatore. Esso, in un certo senso, rappresenta una sintesi numerica del grado di efficacia della politica fiscale. Il moltiplicatore fiscale (locale) misura infatti l'effetto sul reddito (locale) di un aumento della spesa pubblica (locale). Anche in questo caso utilizziamo la variazione esogena nella spesa per investimenti comunale derivante dal *Patto di Stabilita' Interno*. I risultati stimati dimostrano che per i comuni soggetti al *Patto di Stabilita' Interno*, nonostante la riduzione nella loro spesa per investimenti, l'effetto della spesa in conto capitale sul reddito dichiarato e' maggiore rispetto ai comuni non vincolati. In aggiunta, le nostre stime dimostrano che in Italia il valore del moltiplicatore, per tutta una serie di ragioni (bassa spesa per infrastrutture; corruzione; etc.), e' estremamente basso. Infine, le analisi tramite metodi di econometria spaziale confermano che l'impatto della spesa per investimenti comunali sul reddito dichiarato e' molto modesto e non e' afflitto da dispersione spaziale tra le aree geografiche contigue.

Contents

List of Figures

List of Tables

To the memory of my beloved father, Mimmo Giacobbe.

Chapter 1

Political Budget Cycle in Italy: a Quasi-Experimental Analysis on Local Elections

In this paper, we investigate the presence of Political Budget Cycle (PBC) in local investment spending. Data based on balance sheets of the Italian municipalities are explored over 1999-2004. The effects of the Domestic Stability Pact (DSP) are analyzed. Relying on the fact that this tax rule, since 2001, is not binding for municipalities under 5,000 inhabitants, we can analyze its effects in a quasi-experimental setting. The results show that investment spending increases by about 37 percent in the pre-election year. Targeted spending mechanism is confirmed: most visible components of public spending (i.e. roads; territory; sport and culture) are increased more than the other categories. Using disaggregated data on municipal revenues, we demonstrate that PBC is partly financed through new loans and disposals of public assets. Our estimates confirm that the introduction of the DSP halves the PBC, but does not eliminate it.

Keywords: Political Budget Cycle, local government finance, Italian municipalities, tax rules.

JEL Codes: C23, E62, H72, P16

1.1 Introduction

The idea that there is some dependence between the business cycle and the political cycle is nowadays a consolidated fact in economic literature. It is generally recognized that the analysis of economic policy should further explore incentives and the political and institutional constraints which influence the authorities' behavior. Over the years, the attention of scholars has shifted gradually from the study of the *Political Business Cycle* (Kalecki [1943], Nordhaus [1975], Hibbs [1977]), i.e. the pre-electoral manipulations implemented through the use of monetary policy instruments, to a more particular situation known as *Political Budget Cycle* (PBC) (Rogoff [1990], Drazen and Eslava [2006], Shi and Svensson [2006]). The former definition indicates a periodic fluctuation in fiscal policy implemented by governments in proximity to election period. The PBC may look like an increase in public spending (total or just some of its components); an increase in the budget deficit or a reduction in tax revenue in the electoral year.

The presence of PBCs suggests the idea that politicians in office pursue goals that are different from the social welfare maximization. From a macroeconomic point of view, PBC can heavily impact on public debt and budget deficit. Financial unsustainability of public finances in many countries originates from sub-national imbalances. Instability in the expenditures and in the deficit level leads to inefficiency in the allocation of resources, which is harmful to the entire national economic system. From a social welfare point of view, the existence of pre-electoral manipulations in the public spending, implemented by the politicians in office in order to maximize their probability of re-election, is a symptom of an inefficient use of the fiscal instruments. Many countries have adopted fiscal rules in order to regulate the local administrations and to curb the incentives to accumulate debt. As defined in Kopits and Symansky [1998], fiscal rules consist in a permanent numerical constraint on fiscal policy defined in term of an indicator of overall fiscal performance such as the government deficit, debt or expenditures. Despite their widespread application over the world, there is no consensus on fiscal rules effects in increasing fiscal stability. Estimating the effect of fiscal rules is a complicated task. In particular, the leading threat to the internal validity of the analysis derives from endogeneity issue: the country that introduces a tax rule (or adopt more burdensome constraints), for example, may be the one with a greater preference for balanced public finances.

The Italian case represents an interesting testing ground because many fiscal rules have been implemented at sub-national level. The European Stability and Growth Pact, for example, has been introduced at local level through the so-called Domestic Stability Pact (DSP). Since 2001, municipalities with fewer than 5,000 inhabitants have been excluded from its fiscal constraints, mainly for scale-economies reasons. This last aspect allows exogenous grouping of Italian municipalities into two sub-classes, greatly reducing the fears of endogeneity.

This paper sheds further light on PBC phenomenon by providing new evidence of the presence of pre-election trends in public spending. The empirical evidence on Italian municipalities is limited to a few works: Bartolini and Santolini [2009]; Cioffi et al. [2012] and Repetto [2018]

regarding local spending; Alesina and Paradisi [2017] and Bordignon et al. [2017] on the revenue side. None of these studies, however, analyzes the connections between elections and DSP. As far as we are concerned, we are the first to address this issue.

Our estimates show that, *ceteris paribus*, in the year preceding the local elections there is a 37 percent increase in capital expenditure. Targeted spending mechanism is confirmed: most visible components of public spending (i.e. roads; territory; sport and culture) are increased more than the others categories. The introduction of the DSP halves the PBC, but does not eliminate it[1] . Results are robust to *i*) several panel data methodologies (Fixed Effects and GMM) and *ii*) on some sub-samples, used for taking account of some administrative and economic-demographic features of municipalities. Furthermore, PBC presence is controlled also on the revenues side. Italian mayors have limited taxing power, thus pre-electoral changes in these components of balance sheet are rather limited. Interestingly, those components most under mayors' control (i.e. disposals and loans) have significant pre-election fluctuations, with a magnitude similar to that recorded on the expenditure side. Even in this case, DSP halves pre-electoral manipulations on revenues.

The structure of the paper is as follows: section 1.2) reviews the literature on PBC; section 1.3) introduces administrative aspects of Italian sub-national governments; section 1.4) describes the sample and the variables involved in the analysis; section 1.5) clarifies the econometric strategy and the results achieved; sections 1.6) concludes.

1.2 Literature Review

Kalecki [1943] coined the term of *Political Business Cycle* to identify the variations in the trade-off between inflation and unemployment arising from the struggle between opposing social classes, with divergent economic preferences. The original definition did not have any direct connection between economic cycle and elections. Nordhaus [1975] was the first to elaborate a macroeconomic model whose variables are forced by political reasons. Exhaustive surveys on *Political Business/Budget Cycle* are proposed by Dubois [2016] and De Haan and Klomp [2013]. We can identify three main areas in which significant progress have been achieved in recent years. Firstly, new theoretical models where PBC emerges as a result of moral hazard problem between government and electorate have been proposed. Secondly, more sophisticated methods have been adopted in the cross-country analysis (mainly dynamic panel data and, lately, quasi experimental methods). Lastly, the attention has not been focused exclusively on developed countries, but also on developing ones. In addition to that, from the mere existence of the PBC, researchers turned towards its magnitude and its composition (tax revenues vs public spending).

[1]This result aligns with De Haan and Mink [2005] who show how the European Stability and Growth Pact, does not eliminate the phenomenon of PBC. After the aforementioned reform, PBC appears to split over the entire electoral cycle.

1.2.1 Theoretical Studies

There are two main approaches in the study of the *Political Business Cycle*. The first approach is called *opportunistic approach* and assumes a political class with an opportunistic nature. Opportunistic approach develops the idea that politicians have an objective function which differs from that of the voters. Governments are driven by private interest and they aim to be re-elected. In Nordhaus model, given the Phillips curve, politicians have direct control on inflation through the control of the money supply and, indirectly, on the employment rate. If elections are held at predetermined dates, on the basis of these simple (and unrealistic) hypotheses, in proximity to elections, politicians in office are induced to carry out expansionary policies by exploiting the short-run Phillips curve. Once the re-election is achieved, inflation must be curbed with recessionary measures.

The second approach is called *partisan approach*: in a democratic setting, politicians with different ideological orientations (*ideological politicians*) compete with each other. This political competition generates electoral cycles. According to Hibbs [1977], politicians have different ideals: high economic growth and low unemployment rates are priorities for left parties; on the other hand, right-wing parties are more oriented towards price stability, and low inflation.

Over the years both views have been criticized. First, theoretical predictions provided by these models did not find full confirmations. Secondarily, Political Business Cycle's evidence has been found in countries characterized by independent central banks, that manage the monetary policy independently by the governments. Finally, the crucial role played by the Phillips curve's trade-off in the functioning of the economic system is widely criticized in macroeconomic literature.

These implications shifted the research focus from monetary policy to fiscal policy. Fiscal tools are effectively controlled by political power and they can be used for generating electoral cycle in fiscal variables.

Rogoff [1990] builds a PBC model where public goods are divided in two categories: consumption goods and investment goods. Public spending composition is manipulated before elections: capital expenditures for investment goods fall while transfers and current expenditures for consumption goods are increased. The model incorporates also an incumbent's *ego-rent*, which represents the non-monetary benefit of being in office (e.g. merits attributed by citizens; political influence; etc.).

Shi and Svensson [2006] identify in the public debt rising, the instrument to carry out pre-electoral manipulations. In this model, voters are divided in two distinct groups. A fraction of the voters' audience, the *informed voters*, (ρ), knows exactly the levels of tax burden; public debt and public goods supply. The other fraction, namely the *non-informed voters*, (1 - ρ), has less information about these variables. The smaller the group of informed voters, the higher public debt will be[2].

[2]Public debt level depends also on the wideness of the benefits from being in charge.

Drazen and Eslava [2006] present a further category of PBC model based on the concept of asymmetric preferences of incumbents (*pork-barrel cycles*[3]). In this model, the structure of expenditures is analyzed. The authors argue that politicians in charge can address public spending towards specific groups of voters. The amounts of expenditures more functional to the re-election goal are increased without altering the total level of public spending (*targeted spending*). This aspect has crucial importance in the so-called *old democracy* (mature democracy), where the empirical research shows how voters are *fiscal conservative* and they punish incumbents who generate or aggravate budget. In Drazen and Eslava [2006] model, PBC derives by the incumbent's preference towards different voters' groups.

1.2.2 International Empirical Studies at Sub-National Level

The empirical advantage of PBC models is that they allow the analysis of political cycle both at national and local level. Akhmedov and Zhuravskaya [2004] elaborated a research based on monthly data from 80 Russian provinces in the period 1996-2003. The results are obtained by applying a fixed effects methodology. PBC is carried out by increasing the monetary transfers to the voters near the elections. This study fits with the idea that the presence of electoral cycles is greater in the so-called *immature democracies*, characterized by lesser government transparency; media freedom and voter awareness. According to this view, Akhmedov and Zhuravskaya [2004] show that the electoral cycles decrease as a result of economic development. The strength of national parties has the effect to improve the quality of decentralized government and the efficiency in the provision of public goods. An additional analysis, through the application of a method for binary dependent variables (Logit model), demonstrates that the pre-electoral manipulations increases the incumbent's chances for re-election.

The papers proposed by Veiga and Veiga [2007] and Drazen and Eslava [2010] represent the firsts empirical researches at municipal level. Veiga and Veiga [2007]) apply dynamic panel data estimators (GMM methods) on a sample of 218 Portuguese municipalities for the period 1979-2011. The municipal tax pressure decreases in the year before the elections; at the same time, there are increases in the level of total expenditure and a deterioration in the budget deficit. Politicians in charge manipulate not only the total spending, but they apply a strategic distortion also on its components: the investments expenditures (for example *streets* and *rural roads*) raise; less visible categories (the authors explicitly mention the expenditures for *transportation materials* and *machinery* and *equipment*) are reduced.

Drazen and Eslava [2010] investigate the presence of PBCs on the municipalities of Colombia for the period 1992-2000. The GMM estimates do not show increases in total expenditure during the election period; there are instead changes in the structure of total expenditure: current expenditures decrease while capital expenditures increase. Prior to elections, spending categories such as infrastructure expenditures (i.e. road and construction of power and water

[3]The term pork barrel indicates the use of government funds for projects designed to please voters or legislators and win votes.

plants), which represent the *targeted spending*, are significantly expanded by governments in charge, while the current expenditures (such as interest payments, transfers to retirees, and payments to temporary workers), which represent the *non-targeted spending*, show a reduction in the election years. Furthermore, using the share of votes obtained by election winners as dependent variable, the additional estimates suggest that: *i*) Colombian voters penalize incumbents who run high deficits; *ii*) an increase in the capital expenditures brings to a wider share of voters received by the incumbent party and, conversely, *iii*) the current expenditures (which represent the non-targeted spending) do not impact on the voters' share. These results are compatible with the assumption of rational voters that are positively sensitive to pre-electoral increments in those public spending categories more congenial to them, but who punish, at the same time, politicians for exacerbating public finance imbalances.

1.2.3 Empirical Studies on Italy

Contextualized on Italy, the analysis of the connections between elections and economic cycles is stimulating. Italy is traditionally labeled as the OECD country with the less efficient and more patronizing political class. Low standards of law enforcement and government effectiveness are usually detected, as well as persistently high level of corruption. Moreover, in recent years various tax rules have been applied, even on local administrations, in order to curb explosive dynamics in public finance. As regards the study of the PBC at the Italian municipal level, there is not a large number of researches. Bartolini and Santolini [2009]; Cioffi et al. [2012] and Repetto [2018] analyze the links between electoral cycles and local public spending. Alesina and Paradisi [2017] and Bordignon et al. [2017] study PBC on the revenue side.

Bartolini and Santolini [2009] analyze 246 Italian Municipalities over the period 1994-2003, finding a PBC in the current expenditure during the pre-electoral years. This paper represents the first research on local Italian case. The authors test the effects of fiscal discipline rules on the electoral cycles. The pre-electoral manipulation in current spending is concentrated in the pre-electoral years. In addition to that, the introduction of the *Domestic Stability and Growth Pact* (*DSP*) does not eliminate the PBC. Rules imposing fiscal constraints seem to bring the politicians in office to implement opportunistic behaviors that manifest their effects in the year before the elections, or to implement strategies aimed at imposing fiscal expansions that cover both the pre-electoral and the electoral years. Finally, spatial econometrics analysis demonstrates that the Municipalities subject to the DSP constraints are very sensitive to changes in the fiscal policies implemented by neighboring Municipalities. DSP reinforces the mimicking behavior of politicians, as it can represent an additional element of comparison between contiguous municipalities. Conversely, not complying with DSP constraints can be seen as a signal of bad performance for electorate if neighboring jurisdictions do.

The sample explored by Bartolini and Santolini [2009] is not representative because it contains data only on municipalities located in the Marche region. Cioffi et al. [2012] enlarge the analysis on all the Italian municipalities for the period 1998-2006. Cioffi et al. [2012], differing

from Bartolini and Santolini [2009], focus on capital (and total) expenditures and not on current ones. The econometric specifications adopted in the works mentioned above have some common aspects. In the empirical literature on cross-country electoral cycles, a dummy which is equal to 1 in the electoral year (or in the pre-electoral year) is usually used to detect the electoral effects on fiscal variables. Cioffi et al. [2012] used the number of days to the next municipal election as proxy of the electoral cycle. The election year could be a biased indicator: if the elections take place in the first months of the year it could capture the post-election effects. On the contrary, if the elections take place in the final months, yearly electoral indicator could detect the pre-electoral effects. In order to assess the robustness of the results and considering that the wide share of the local election, in the observed period, takes place during the first half of the year, a dummy variable that assume value of 1 in the pre-electoral year is also applied. Public spending is influenced by the socio-economic characteristics of the municipality, then, demographic variables such as total population, population density and the dependency ratio (the share of the population less than 10 and more than 65 years old) are included. A positive impact of the population and the density can suggest the presence of scale economy in the public good provision; a wide percentage of children and old people can mean that the rise in the public spending is driven by social programs. The economic characteristics are considered by adding per-capita income and per-capita transfer from the central government in the regression model. A positive sign of these variables can be interpreted as a prove of the *Wagner's Law*, according to which the public spending increases as a consequence of the economic development. Finally, some political features are explored: a dummy equal to 1 if the mayor is not eligible for re-election is added; another indicator takes value 1 if the majors belongs to a national party.

Focusing on the political aspect of the analysis, there is empirical evidence of PBC in the total and capital expenditure paths. In the year leading up the elections, both capital and total expenditures record a 40 percent rise. Those increments are carried out only by mayors not affiliated to a national political party. Reasonably, the entire increase in total expenditure is driven by the rise in capital spending. All mayors who are at the end of the second term, or that, for any other reason, can no longer be re-elected (*lame-duck mayors*), tend to spend more, on average, than re-eligible candidates, even in this case, provided that they are not affiliated to a national political party. These results are consistent with a whole series of consolidated explanations in the political science literature. According to Van Houten [2009], national parties aim more to be distincted as fiscally responsible, rather than winning the elections in a single municipality (or, more precisely, in medium-small size cities). Similarly, the Logit analysis shows that the pre-electoral manipulation on expenditures increases the incumbents' re-election probability only if they are not affiliated with a national political party. Finally, the effects of the DSP are assessed by restricting the analysis on the sub-sample of municipalities with more than 5,000 inhabitants[4]. The effect of the electoral cycle on municipal spending, induced by independent mayors, is still present but it appears halved with respect to the totality of the

[4]It is important to underline that 70 percent of Italian towns have a population of less than 5,000 and about 90 percent have a population of less than 15,000.

sample. On the basis of this result, the DSP seems to be a valid instrument to constrain the pre-electoral spending excesses[5].

Repetto [2018] studies the effects on PBC caused by a recent legislative reform. In October 2008, the *law 189/2008* obliged the Italian municipalities to approve and publish their budgets two months in advance, anticipating the deadline from June 30th to April 30th. This measure was part of a broader reform that made changes on provinces and regions. The mentioned reform was designed with the dual objective of containing the huge increase in regional health spending and with the central government's need to have more information on the financial conditions of the municipalities. The balance sheet is a wide source of information containing data such as the total amount and the distribution of capital and current expenditures, the local debt and the deficit level. This tool can be consulted by the voters in order to evaluate, from an economic and financial point of view, the work of the administration in office. For example, politicians in charge, exploiting situations of information asymmetry due to the fact that voters do not have access to the balance sheet before the election, could finance a greater supply of public goods, borrowing more and then providing a biased signal of their ability. From a theoretical point of view the argument of asymmetric information has been convincingly developed (Rogoff [1990], Shi and Svensson [2006]). From the empirical perspective there is not much evidence, mainly because of the difficulty in finding mechanisms that exogenously increase the information available to voters.Repetto [2018], using the law 189/2008 to identify the *quasi-experimental variation in the information* available to voters, analyzes the impact of local media on electoral cycles. As a direct measure of the information available, data on the local newspapers' sales at the provincial level are used. The dissemination of information by the media and the presence of political oppositions are important control instruments.

Through a *difference in differences setting*, the municipalities are divided in two separate groups (pre-reform and post-reform) and the reform's effects on public spending are analyzed. Municipalities belonging to the *Autonomous Regions* (Trentino-Alto Adige, Friuli-Venezia Giulia, Valle d'Aosta, Sicily and Sardinia) are excluded from the analyzed sample because they have electoral and budgetary rules different from the ordinary statute Regions. Focusing on municipalities in *Ordinary Regions*, the first documented result is a 28.5 percent increase in investment expenditure (mainly most visible components such as *roads* or *public housing*) in the pre-election year. In the years following the reform there is an average reduction of about one third in the PBC. This effect, however, is not homogeneous throughout Italy. The reduction in pre-electoral spending increases is almost twice in those provinces where local newspapers' sales are higher than the national median. The empirical analysis proposed by Repetto [2018], following the theory of Shi and Svensson [2006], confirms that Italian mayors react to the increase in the share of informed voters, by reducing pre-electoral spending manipulations. Finally, further results show that a doubling of investments in the pre-electoral year produces a 2 percent

[5]The DSP is a constantly debated topic in the Italian political agenda and various actors (especially the national populist parties, that wave the anti-austerity movements proliferation) impute having excessive paralyzed public investments to it.

increase in the re-election probability. However, the introduction of the reform reduces this effect by about one quarter.

Despite the tax autonomy of Italian mayors is rather limited, some legislative changes make it possible to implement electoral cycles also in municipal revenues. A recent literature branch starting with papers by Alesina and Paradisi [2017] and Bordignon et al. [2017] analyze this aspect. Their results show that the PBCs on revenue are much more modest than those on expenditures, but their effects are not negligible.

In 2011, a new property tax called *IMU* was introduced in Italy. This measure has been passed as a component of a fiscal package proposed with the aim to calm the international financial markets pressure on Italian sovereign debt. The introduction of this new real estate tax provides a natural experiment, used by Alesina and Paradisi [2017] for investigating the presence of PBC[6]. All 8,100 municipalities are analyzed over the period 2012-2014. About 50 percent of the IMU revenues is addressed to the central government, while the remainder represent the main municipalities' revenue (50 percent of the total). The previous real estate tax (namely *ICI*) was not applied on the main residence; on the contrary, the IMU hit all properties. The IMU tax rate is based on the nominal value of the property. A default rate for each category of houses (main residence; additional residence and rural property) is set by the national government. A 0.4 percent rate applies on the main residence, with a discretionary window for municipalities between 0.2 and 0.6 percent. For the rural building the tax rate is 0.2 percent and it can be reduced to zero. On the additional residence, a 0.76 percent default rate has been set and the discretional interval ranges between 0.46 and 1.06 percent. The municipalities chose the tax rate through a municipal council deliberation; in the absence of that, the default rate applies.

The results of the research show that the mayors in office reduce the rates before the elections in order to gain re-election. This effect is more evident in small towns and in Southern Italy. In small municipalities because there is a lesser complex political environment than in a large city, then it can be easier to implement an opportunistic strategy aimed to increase the re-election chances. Regarding Southern Italy, there is a cultural explanation: in the South there is less "civic conscience", less participation in public decisions and less control on administrators; the electorate is thus more easily manipulated by politicians (Nannicini et al. [2013]). Another interesting result is that left parties tend to impose higher rates than right parties: 35 percent of municipalities administered by left parties fix higher rates than the standard one, compared to 27.6 percent of right administered municipalities. 8.4 percent of right municipalities lowered the IMU rate on first house against 6.5 percent of the left ones. This result is coherent with the two different ideological approaches on wealth taxation. The countertendency data is instead represented by 3 percent of the center-left municipalities that have decided to lower the rate on the second house against the modest 0.2 percent of the center-right Municipalities.

[6]This is an important issue, since that 61.9 percent of Italian households own their main house and the real estate investments represent around half of the total Italian households' asset.

Bordignon et al. [2017] provide interesting additional results by studying a 1999 reform that transfers to the municipalities the management of the surcharge on residents' personal income tax (*PIT*). The sample analyzed is composed by 7,583 municipalities over the period 1995-2005. After reform, municipalities can partially replace a more accountable revenue, such as the property tax (ICI), with a less transparent one (the surcharge). The different level of transparency between these two financing instruments is based on the fact that, while decisions on the property tax can only be attributed to the municipalities, on the other hand, the central government maintains full control over the PIT (about the definition of tax rates, tax base and tax brackets). Municipalities can vary only a small surcharge on their PIT base, by 0.2 percent up to a maximum of 0.5 percent over three years. For citizens it may be difficult understanding how much of the PIT's amount is responsibility of local administration. Conversely, the property tax, being exclusive competence of the municipality, gives a clear vision of the tax behavior of the local administration. The overlapping between central and local governments concerning the income tax produces a loss of accountability. As a consequence, re-elegible mayors increase more the revenue arising from the less transparent instrument (surcharge) and reduce the rate of the most transparent instrument (property tax). Such a strategy is not implemented by non re-elegible mayors. According to Alesina and Paradisi [2017], these effects are greater for those municipalities characterized by lower levels of human capital. Drazen and Eslava [2006] elaborated the concept of targeted spending; the results of Bordignon et al. [2017] demonstrate the existence of *targeted revenue* mechanisms in Italy.

1.3 Administrative Aspects of Italian Municipalities

The Italian decentralization of government includes three levels: the Regions, the Provinces and the Municipalities. The Municipalities are grouped within 110 Provinces and 20 Regions. The Regions are mainly involved in the provision of health services. Provinces perform functions related to road maintenance and environmental protection, while Municipalities are responsible for services such as public lighting, urban road maintenance, local transport, waste disposal, social assistance and primary school. The decision-making bodies, at the municipal level, are: the mayor (*Sindaco*); the Executive committee (*Giunta comunale*) appointed and chaired by the Mayor, and the Municipal Council (*Consiglio comunale*), endowed with legislative power.

The Stability and Growth Pact, introduced in 1997 between EU member States, has been implemented in Italy also at sub-national level through the so-called *Domestic Stability Pact* (DSP) with the aim to make local governments more accountable[7]. Constrained and unconstrained municipalities can accumulate debt, but if they encounter fiscal distress they must go through a special procedure of budget consolidation (*Piano di Risanamento*). DSP's rules are revisited every year. Initially, the budget rules have been set in terms of budget deficit (*budget balance target*). The main variable under control was the *fiscal gap*, defined as municipal deficit

[7]Law No. 448/1998.

net of transfers and debt service. Since 2005, these rules have been expressed in terms of expenditures growth rate. The punishment for not complying with the DSP includes penalties such as: *i*) 5 percent cut in the annual transfer from central government; *ii*) ban on municipalities hires and *iii*) 30 percent cut on reimbursement and non-absenteeism bonuses for the municipal administration's employees. Cities complying with DSP, instead, benefit from a reduction on interest for loans from the central government[8]. Since 2001, municipalities with fewer than 5,000 inhabitants have been excluded from the rules of the DSP. Smaller municipalities, in fact, may be disadvantaged by economies of scale in managing the municipal government and fiscal constraints can be excessively burdensome for them.

1.3.1 Electoral Rules

The electoral system assumes different characteristics if the municipality has or not a population lesser than 15,000 inhabitants. Below this threshold a simple plurality system is applied and each candidate can be supported only by a single list. Over this threshold, candidates may be supported by more than one list, and, if none of the candidates reaches the absolute majority of the votes at the first round, a round-off takes place. Below the 15,000 inhabitants threshold, the list supporting the winning candidate receives two-thirds of the council seats, while above this threshold, the lists supporting the elected mayor get 60 percent of the seats. The size of municipal bodies also depends on the population level: the municipal council (*Consiglio comunale*) can range from 12 to 60 members, while the members' number of the Executive committee (*Giunta comunale*) ranges from 4 to 16. From 1993 onwards, the mayors cannot remain in office for more than two consecutive terms, unless (from April 1999) there is an early interruption of the mandate for reasons other than early resignations and, in any case, before half their term has expired. Recently, re-eligibility for a third consecutive term is only permitted in municipalities with a population of less than 3,000 inhabitants[9].

1.4 Data

The hypothesis of sub-national PBC is tested by using a dataset of 6,700 Italian municipalities (out of about 8,100). Municipalities belonging to special autonomy Regions (*Regioni a Statuto Speciale*) were excluded because they are allowed to set their own fiscal and electoral rules[10].

Different sources have been consulted for procuring the necessary information. Revenues and expenditures data have been extracted from (annual) municipalities balance sheets[11]. Final dataset contains information on local elections and mayors (turnout; vote share obtained by each candidate; gender; age; years of schooling.). Economic and electoral variables have been

[8]Municipalities' debt can be financed through: *i*) bonds' emission (*Buoni Obbligazionari Comunali*); *ii*) loans from *Cassa Depositi e Prestiti* (a central administrative agency) and from private banks.

[9]Law 56/2014.

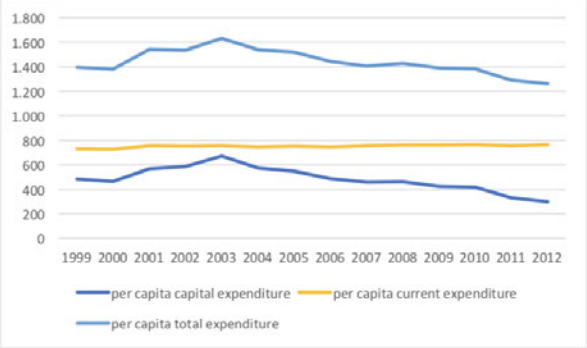
[10]Special autonomy Regions are: *Friuli-Venezia-Giulia; Sardinia; Sicily; Trentino-Alto-Adige* and *Valle d'Aosta*.

[11]These data are deflated to 2005 euros using data from FRED (St. Louis) GDP deflator.

provided by the Ministry of Internal Affairs. Data from National Statistical Office (*ISTAT*) are used to explore the demographic and geographic characteristics of municipalities.

As in Bartolini and Santolini [2009]; Cioffi et al. [2012] and Repetto [2018], the electoral cycle's analysis of this paper is explored on the expenditure side rather than revenue. The adequacy of this approach is supported by the fact that, in Italy, municipal administrations do not have a high degree of control over local revenues. The municipalities have a limited power of taxation and there are few tax rates that can be manipulated by majors (and with room for maneuver rather limited); moreover, transfers by the central government play a primary role on local economic-financial equilibriums. Following Cioffi et al. [2012] and Repetto [2018], the main dependent variable is capital expenditure instead of the current one (as in Bartolini and Santolini [2009]). Several considerations seem to give reason to this choice. The largest and most important part of capital expenditures is represented by investments and it is not subjected to the rules of the DSP in most of the years considered in the dataset. On the contrary, the higher amount of current expenditures consists of particularly rigid balance sheet items, such as compensation of employees. Furthermore, as stated by Drazen and Eslava [2010], capital expenditures are the most appropriate tool to implement *targeted spending strategies*, aimed at increasing the amounts of those categories of expenditure that can most affect the probability of re-election. Current expenditure has an average value of 752.41 euros per capita and it appears constant over time. Capital expenditure shows a slightly more fluctuating trend (decreasing after 2003) with an average value of 484.9 euros per capita.

FIGURE 1.1: Public Spending of Municipalities

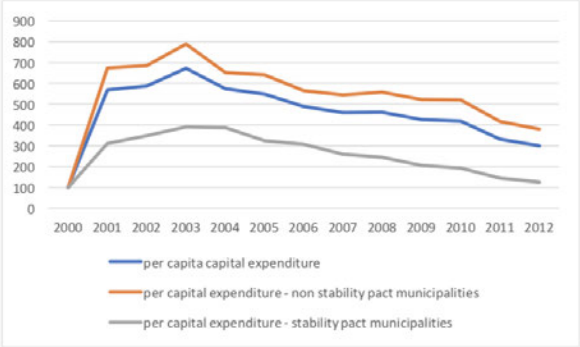


Notes: Data are expressed in 2005 euros, deflated through St. Louis FED GDP deflator. Municipalities from Italian special Regions are excluded from the sample.

From Fig. 1.1 it is clear that expenditures' data, deflated and expressed in per-capita terms, appear normalized and do not reveal the presence of trends. Thus, preliminary tests on unit-root, in order to characterize trends' nature, are not required. In order to elaborate a more detailed comparison and to take into account changes in economic variables potentially related to the institutional aspects of the DSP (Fig. 1.2), we divide our sample into three sub-categories

using 5,000 and 15,000 inhabitants thresholds.

FIGURE 1.2: Municipalities Subjected to DSP vs Municipalities Not Subjected to DSP



Notes: Data are expressed in 2005 euros, deflated through St. Louis FED GDP deflator. Municipalities from Italian special Regions are excluded from the sample. Domestic Stability Pact (DSP) exempts municipalities 5,000 inhabitants since 2001; values for 2000 are arbitrarily set equal to 100.

In Table 1.1, we can note the wide difference in the levels of capital expenditure between municipalities below 5,000 inhabitants, exempted from DSP rules, and those between 5,000 and 15,000 inhabitants, subjected to DSP (576.2 vs 274.4 per-capita euros). Interestingly, municipalities with more than 15,000 inhabitants show the same average capital expenditure as those between 5,000 and 15,000 inhabitants. The gap in the current expenditures is less pronounced and more balanced. Regarding the revenues side, we can note that the tax levy is pretty homogenous. As expected, small municipalities get more resources from central government through transfers and they resort more to borrowing and non-tax. A huge gap is registered in the use of disposals as revenue instrument: 426.4 euros for small municipalities and about 196 euros for the bigger ones. This kind of discrepancy is confirmed also in the per-capita levels of municipal deficit and debt.

The results in the descriptive statistics about revenues and spending, seem to confirm the local public finance theory's predictions, according to which, as the demographic dimension increases, in terms of population and density, efficiency gains should be achieved. Nevertheless, also an increasing complexity in the management is connected to the increase of the population. The data would seem to confirm that the most efficient municipalities are those between 5,000 and 15,000 inhabitants. From a geographical point of view, the average municipality has a surface of 33 km^2; a population of 7,395 people with a density of 313 inhabitants per km^2. The percentage of foreign residents is homogeneous throughout the sub-samples. Larger municipalities have 4.6 percent more people aged 30-34 with a college degree, reasonably for labor market dynamics.

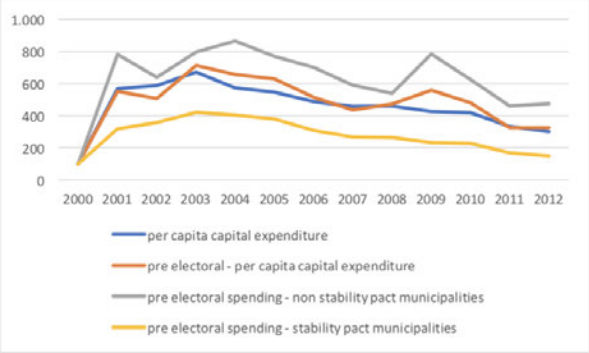
In the analyzed sample, on average, 0.22 elections per year were held (Table 1.2). To comment the electoral descriptive statistics, in line with what was explained in the paragraph on administrative-institutional aspects, we split our sample using the 15,000 inhabitants' threshold, so as to consider the change in the electoral rule. Electoral turnout does not record any

differences and the average value is around 78 percent. About 24 percent of the bigger municipalities' electoral mandates did not end regularly, against 7 percent among the smaller ones. Yearly, about 2 percent of smaller municipalities are administrated by commissioners. This last value is twice for municipalities with more than 15,000 inhabitants. Due to the difference in the underlying electoral system, municipalities below the just mentioned threshold show a small percentage of ballots (about 0.2 percent), while this value is 0.45 percent for municipalities above[12]. Electoral system influences also the winner's average share, which is higher for smaller municipalities and could make PBC's implementation easier.

90 percent of Italian majors are male. Majors' characteristics (i.e., age and education years) are pretty balanced throughout the two sub-samples. On average, smaller municipalities' majors tend to be more re-elected.

Making a comparison between the pre-election years and the average sample values, we can see how much pre-electoral capital expenditure is higher than the average sample value. The difference is even more marked if we compare the municipalities subject to the DSP compared to those exempted (Fig. 1.3).

FIGURE 1.3: Pre-electoral Capital Spending



Notes: Data are expressed in 2005 euros, deflated through St. Louis FED GDP deflator. Municipalities from Italian special Regions are excluded from the sample. Domestic Stability Pact (DSP) exempts municipalities $\leqslant$ 5,000 inhabitants since 2001; values for 2000 are arbitrarily set equal to 100.

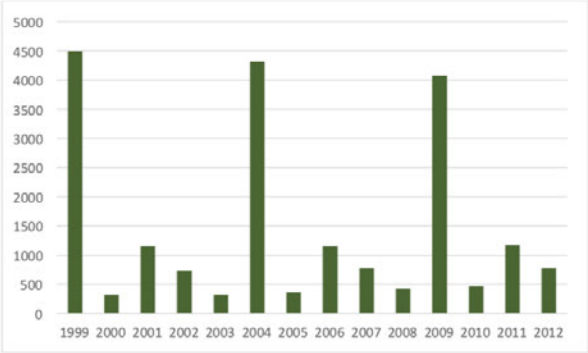
Table 1.3 reports the pre-electoral variations in economic and demographic variables, while Table 1.4 summarizes these variations in percentage terms. As Figure 1.1 suggested, current expenditures do not show pre-electoral increments, confirming the rigidity of this component of public spending. Obviously, the fluctuations in total spending are driven by capital expenditure's movements. Comparing the peaks in Fig. 1.3, it seems that they correspond to the years in which the largest number of municipal elections are held (Fig. 1.4).

[12]Since 1993, the mayors' election of municipalities with at least 15,000 inhabitants takes place through a run-off between the two most voted candidates in the first round, if none of the candidates has obtained an absolute majority of votes validly cast (without counting, therefore, the white ballots and null). The second round takes place fourteen days after the first.

For municipalities with less than 15,000 inhabitants, the mayor's election takes place by a relative majority of the votes validly expressed. However, it is possible to run the ballot in the case, rare but historically already verified, that the two candidates most voted in the first round have obtained the exact same electoral number.

Among the sources of revenues, the largest pre-electoral increases are highlighted in the loans

FIGURE 1.4: Local Elections' Frequency



Notes: Frequency of Italian municipal elections, 1999 2012.

and disposal of assets, which could be the source of finance most directly manipulated by the major in office. Debt parameter does not rise during pre-electoral years, even municipalities in second population band (5,000-15,000 inhabitants) register a debt reduction. On the contrary, deficit shows an extremely marked pre-electoral increase.

1.5 Econometric Strategy

In the preceding paragraph, we noted the presence of electoral fluctuations in some fiscal variables managed by the municipalities. Nonetheless, it is important to bear in mind that the explanatory capacity of descriptive statistics is rather limited and, to reach scientifically robust conclusions, resorting to regression models is needful.

Initially, in order to provide a first general idea of the problem addressed, we perform regressions on the full sample available (Table 1.5). In the subsequent analyzes (from Table 1.6 on) we restrict our observations to the period 1999-2004 aiming to get a more homogeneous sample and not to undermine the identification strategy. Indeed, in the years following the 2005 there have been several changes on fiscal rules and the binding population threshold has been shifted from 5,000 inhabitants to 3,000 and back. In addition to that, we restrict our sample to the municipalities with a population of less than 15,000 inhabitants in order to keep constant the electoral system.

1.5.1 PBC Analysis I – Capital Spending

For testing the presence and the potential impact of the PBC, we specify the following baseline regression equation:

$$y_{i,t} \quad \alpha + \beta' Ele + \gamma' \mathbf{X}_{i,t} + \mu_i + \lambda_r \times \delta_t + \epsilon_{i,t} \tag{1.1}$$

$y_{i,t}$ is the capital spending for municipality i in year t. Ele is a set of dummies built to capture the timing of the electoral cycle and it is defined as follows:

$$Ele \quad \left\{ \begin{array}{cc} Ele_{i,t}^{-3} & 1 \text{ three years before elections} \\ Ele_{i,t}^{-2} & 1 \text{ two years before elections} \\ Ele_{i,t}^{-1} & 1 \text{ one year before elections} \\ Ele_{i,t}^{+1} & 1 \text{ one year after elections} \end{array} \right\}$$

and zero otherwise. β' measures how capital spending behaves as election year approaches. The election year indicator represents the reference group and it is excluded from the econometric specification to avoid multicollinearity concerns[13]. Electoral dummies' set varies cross-sectionally because municipalities are in different points of the electoral cycle[14]. Following Repetto [2018], municipality, mayor-level and political controls are included in the vector $X_{i,t}$. The determinants of capital expenditure related to geographical dimension are controlled by adding a cubic polynomial in population; population density; altitude; surface in km^2 plus an indicator for province capital. Mayors' characteristics are controlled through several variables such as: age; gender and schooling years. Endogenous term's resignations are accounted by adding two further dummy variables which assume value 1, respectively, if a term ended early and if a commissioner is in office. Furthermore, a proper indicator captures if a mayor is subjected to term limited. Municipality fixed effect, μ_i, captures local level unobservable determinants of our outcome of interest. δ_t counts for the year effects. Potential geographic differentials in the various areas of the country are taken into account by means of a Region-year interaction, $\lambda_r \times \delta_t$. $\epsilon_{i,t}$ is the idiosyncratic error term which includes all unobserved factors. Finally, standard errors are clustered at municipality level. Economic variables such as total revenues; their disaggregation by categories; deficit and debt are not added in the regressions for avoiding endogeneity's concerns arising from reverse causality relation among mentioned variables which could threats the internal validity of the proposed analysis[15]. Table 1.5 shows the results for the baseline regression.

The empirical specification in column 1 includes temporal fixed effects (also the interaction between regional fixed effects and year effects). In column 2 municipal fixed effects are added. In order to evaluate the robustness of results, regression reported in column 3 counts for all fixed effects, while control variables are excluded. On the contrary, in column 4 controls are included while any type of fixed effect is ruled out. Municipal capital expenditure records large variations related to the electoral cycle. Considering the election year as a reference, the estimates in column 2 (where controls and fixed effects are included) show that three years before the election there is an increase in investments of about 71.8 euros per capita. Comparing this result with the sample average, the percentage increase is 14.7 percent. As elections approach, spending rises: two years before the election, the capital expenditures are 16.7 percent higher.

[13]The so-called "*dummy trap*", i.e. a multicollinearity problem that occurs due to the violation of the linear independence hypothesis between the columns of the regressors matrix.

[14]Local elections are staggered because several early terminations of term occurred, for example due to resignation of the mayor.

[15]Capital expenditures and total revenues exhibit a correlation of about 90 percent. Deficit and debt are strictly constrained by DSP.

This value increases up to 24.2 percent in the year before election. In the post-election year, when the new election cycle begins, the increase is much more moderate (9.4 percent). In column 4, the exclusion of time effects leads to wider electoral cycle coefficients records, as the estimates incorporates the national decreasing trend in local public spending (see Fig.1.1).

About other covariates: polynomial population coefficients confirm non-linear dynamics in this variable. Surface and density suggest the possibility to achieve scale economies as municipal dimension grows; while a higher altitude is connected to a higher level of capital expenditure (think for example at the greater investments for territory needed in a mountain municipality). We checked if the ineligibility of the mayor causes an increase in public spending. It is plausible to suppose that most politicians have candidates that are more congenial to them and more welcome as successors (so-called *dolphins*). It is therefore reasonable to conjecture that even a mayor who is no longer eligible has an interest in increasing public spending to boost the election's chance of his "favorite". In this case, we obtain positive coefficients in all the regressions. Older mayors spend less. Increasing education leads to a reduction in capital expenditure. This last effect can be interpreted as a sign of the correlation between education and competence[16]. Finally, mayor's gender is not statistically significant.

1.5.2 PBC Analysis II – Domestic Stability Pact Effects

In the previous section, the presence of a PBC in investment spending was confirmed. The purpose of this section is to evaluate the effects of the DSP on the electoral cycle just ascertained. In the literature, a univocal vision on DSP effects has not yet emerged. Grembi et al. [2016], analysing Italian municipalities over 1999-2004, conclude that DSP was effectively enforced; Chiades and Mengotto [2013]) argue that the drastic drop in municipal investments is attributable to this. To estimate the effect of the DSP on the political cycle, electoral dummies' set is interacted with an additional variable which equals 1 when a municipal is subjected to its constraints[17]. As argued in paragraphs 3 and 4, we restrict our sample to the period 1999-2004 where tax rules do not change in their constraints. Furthermore, we consider just the municipalities with a residential population lesser than 15,000 inhabitants[18]. This subdivision is carried out for two reasons: *i*) for excluding larger municipalities that may have different economic and financial dynamics due to significant socio-demographic differences; *ii*) to obtain a sample of municipalities subject to the same electoral system[19]. Several studies show that differences in electoral systems lead to important divergences in fiscal outcomes (Persson and Tabellini [2002], Milesi-Ferretti et al. [2002], Ferraresi et al. [2015]). Pooling municipalities with different electoral systems into a single sample can be a source of bias.

[16] According to Rogoff [1990], a more competent politician is able to provide a greater quantity of public services with a lower disbursement.

[17] The variable just mentioned is equal to zero for municipalities under 5,000 inhabitants from 2001 onwards.

[18] Italy is characterized by a large number of small size municipalities. It is worth mentioning that 70 percent of the municipalities have a population of less than 5,000 inhabitants, while 90 percent of the total has a population that does not exceed the threshold of 15,000 inhabitants.

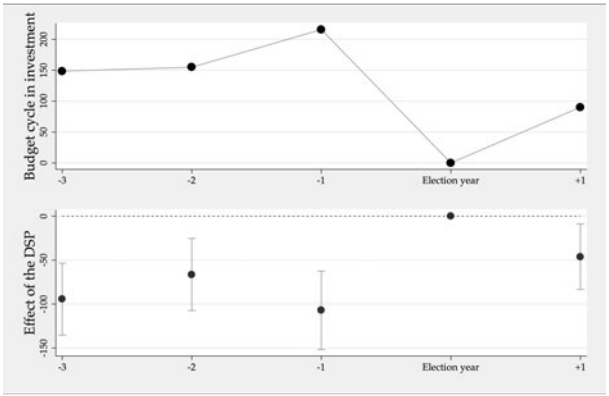
[19] A different electoral system is applied to municipalities with more than 15,000 inhabitants (see paragraph on administrative aspects).

The econometric specification is:

$$y_{i,t} \quad \alpha + \beta_1' Ele_{i,t} + \beta_2' Ele_{i,t} \times DSP + \gamma' \mathbf{X}_{i,t} + \mu_i + \lambda_r \times \delta_t + \epsilon_{i,t} \tag{1.2}$$

Estimation results are reported in Table 1.6. Using the regression that includes all fixed effects and control variables (as in column 2 Table 1.5) as a reference, we note that the electoral coefficients is now larger. In this case, 3 years before the elections there is an increase in capital expenditure of about 148.6 euros per capita, corresponding to 25.68 percent if compared with the sample average. Two years before the election, on average, investments are 26.75 percent higher. In the year before the elections the highest increase (about 37.30 percent) is recorded. The percentage change in capital expenditures, in the post-election year, stands at + 15.60 percent[20]. In general, in this empirical specification, the magnitude of the PBC cycle appears larger than previous estimations. For municipalities subject to the DSP, the fluctuations are significantly reduced. The indicators one year before and one year after (the first year of the new electoral cycle) are halved. Three years before election undergoes a reduction of about two thirds if compared to the municipalities not subject to the DSP, while the resizing of the indicator for two years before election stands at - 43%. Fig. 1.5 plots the results obtained by estimating the Eq. 1.2.

FIGURE 1.5: Effect of Domestic Stability Pact on Political Budget Cycle



Notes: Plot of coefficients estimated through Eq. 1.2

1.5.3 Robustness

Many studies analyze the pre-electoral effects of fiscal policies using dynamic fixed effects models (Schuknecht [2000], Shi et al. [2003], Brender and Drazen [2005], Katsimi and Sarantides [2012]). Dynamic fixed effects models allow for cross-country differences in the time-average of the

[20] *F-test* (on baseline regression) confirms that the variables "three years before the elections" and "two years before the elections" are not statistically distinguishable (p-value = 0.77 - Null not rejected: coefficients are not statistically distinguishable). On the contrary, "two years before the elections" and "one year before the elections" are statistically different (p-value = 0.008 - Null rejected: coefficients are statistically different). Also "one year after the elections" and "three years before elections" are different (p-value = 0.007 - Null rejected: coefficients come out statistically different).

dependent variable. Ordinary Least Square (OLS) estimator is biased if the unobserved country-specific effects vary across countries. The most used econometric structure for investigating the effects of elections on fiscal variables is as follows:

$$y_{i,t} \quad \alpha + \phi y_{i,t-1} + \beta_1' Ele_{i,t} + \beta_2' Ele_{i,t} \times DSP + \gamma' \mathbf{X}_{i,t} + \mu_i + \lambda_r \times \delta_t + \epsilon_{i,t} \tag{1.3}$$

The inclusion of the lagged dependent variable introduces a bias in the model that cannot be eliminated by fixed effects regressions. As explained by Nickell [1981], standard procedures (e.g. first differencing or within transformation) would lead to an estimation bias of order $1/T$, where T is the length of the panel[21]. Nickell's bias can be corrected by applying the GMM procedures for dynamic panel data developed by Arellano and Bond [1991]; Arellano and Bover [1995] and Blundell and Bond [1998]. These methods control for the unobserved country-specific effects and for the bias induced by the lagged dependent variables. The idea is to instrument the first differenced lag of the dependent variable with a set of internal instruments such as two or more lags of the dependent variable. In order to avoid the mentioned concerns, in the first regressions we did not add any lag of dependent variable. In this section, as robustness exercises, we run a fixed effects regression where the lagged dependent variable, as specified in Eq. 1.3, is added (column 2). In column 3 we use the Arellano and Bond [1991] estimator on the same equation, while in column 4 Arellano and Bond [1991] estimator is applied on the regression equation with two lags of the dependent variable. Results are reported in Table 1.7.

New regressions' results appear to be stable enough (percentage variations of coefficients are reported in Table 1.8) regarding the electoral cycles estimation. Even adding one lag of the dependent variable as additional regressors, useful for explaining phenomena persistent over time such as public spending, our fixed effects estimates do not seem to be bias. The dynamic of the electoral cycle in the local capital spending is confirmed but the effect of the DSP appears now stronger.

The Arellano and Bond [1991] estimator confirms capital spendings trend expressed by both fixed effects regressions. On the other hand, this estimator records a much stronger impact of DSP on PBC on the coefficients three years before election (- 84.97 percent) and one year after (- 69.22 percent). When we insert two lags of the dependent variable in the model[22], the widest discrepancies with respect to the baseline model are recorded on the coefficients one year before elections (28.82 percent vs 37.30 percent) and one years after election*DSP (- 84.15 percent vs - 51.02 percent). When we insert two lags of the dependent variable in the model, the electoral cycle appears more smoothed but still maintains a clear peak on the pre-electoral year.

From a theoretical point of view, econometricians usually consider Nickell [1981]'s bias as heavily invalidating. Likewise, GMM-type methods are extremely sensitive to the underlying

[21] In this case, fixed-effects estimator is consistent only if sample length goes to infinity.

[22] We run this specification because, under the assumption that the error term $\Delta\epsilon_i, t$ is not serially correlated, Arellano and Bond [1991] demonstrate that values of y lagged two or more periods can be used as valid instruments for $\Delta y_{i,t1}$.

specification and to the different options available for standard errors calculus[23]. Given that the results presented are not roughly different from each other, we keep the fixed effects specification without lags as our baseline regression.

1.5.4 Further Results

As further control, we run the baseline regression without imposing any restriction on the population dimension. The results of this estimation (Table 1.9, column 2) show that, even if the sample is narrowed, not too many observations are lost. The fitting of the model does not worsen and, above all, previous estimated coefficients are strongly confirmed also on the full-sample (percentage variations of coefficients are reported on Table 1.10). Moreover, to take into account that, due to their demographic size, municipalities can have different public spending's trends, we restrict the sample in the population band between 3,500 and 7,000 inhabitants[24]. Estimation results are reported in Table 1.9, column 3. The number of observations is reduced to almost one sixth of the original sample. The overall fitting of the model does not undergo variations (R^2 is 47 percent). Coefficient of PBC show some difference: the highest peak (+ 41.84 percent) is now recorded two years before the elections. On the contrary, in previous analysis, the biggest increase in capital expenditure occurs between the second and the first year before the elections. Collapse in public investments in the year following the elections, when a new electoral cycle begins, is confirmed. On the other hand, the DSP fully nullifies the investment rising in the post-elections year while we still witness the halving of pre-election variations.

1.5.5 PBC Analysis III – Disaggregated Expenditures and Revenues

To analyze the relationship between PBC and revenues, we performed the regression specified in Eq. 1.2 using as dependent variables, alternatively, the total revenues and their disaggregation by components. The results are shown in Table 1.11. On the revenue side, there does not appear to be a strong presence of PBC. This result is not surprising because, as already mentioned previously, Italian mayors have limited decision-making power with regard to municipal revenues. It is interesting, however, to note that in those components most under mayors' control (i.e. disposals and loans) there are significant pre-election fluctuations, with a magnitude similar to that recorded on the expenditure side.

3 years before the elections and two years before the elections the increase in disposals is about 25 percent. This value increases up to + 30.38 percent in the pre-election years and then

[23]The diagnostic on GMM estimates presents several problems. By adding regional fixed effects, Arellano-Bond procedure, due to collinearity issues, drops automatically some values. In this specific case, the Arellano-Bond test on second-order autocorrelation cannot be run. Furthermore, the distribution of the Sargan test of overidentifying restrictions is by construction only known when the errors are independently and identically distributed; this test statistic is then not available when robust standard errors are computed. Finally, also the two-step estimator is not applicable because its variance-covariance matrix has not full rank in the underlying data structure.

[24]We restrict the sample to the interval 3,500-7,000 to stay relatively far from the 3,000 threshold, where other policies change (i.e. wage of mayors and of the executive committees), and to balance the sample size on either side of the 5,000 threshold.

reduces to + 16.36 percent in the post-election years. Similar behavior is shown on loans: there is an increase of 23 percent two years before the elections and of 32 percent in the year before the elections. Even in this case, the DSP halves pre-electoral manipulations on total revenue. The effects are even greater as far as disposals are concerned. The municipalities subject to DSP, for example, record a reduction of over 93 percent in the coefficient "3 years before the elections". With regard to loans, the only contraction is recorded on the post-elections years and it stoods at - 29 percent, the other indicators do not seem to be affected by DSP.

Finally, using again the specification 1.2, we test the hypothesis of PBC on disaggregated components of investment expenditure. This operation is very interesting because it allows to highlight which categories of capital spending are more subjected to electoral fluctuations. The estimates are shown in Table 1.12. The targeted spending phenomenon (Drazen and Eslava [2010]) on the local Italian public spending is empirically confirmed. Not surprisingly, there are (statistically significant) PBC presences in most visible capital expenditure such as: roads; territory (which includes public housing and parks); sport; social and culture. Taking as example the category "roads", which is usually considered in literature as one of the main mechanisms of targeted spending: 3 years before the elections, spending increases by 9 percent; 2 years before the election the increase is about 25 percent. The electoral coefficient grows up to 43 percent in the year preceding elections, while it gets reduced to + 7.8 percent in the post-election year Also in this case, the DSP leads to wide reductions in electoral manipulations on local public spending.

1.6 Conclusions

In this paper we investigated the conjecture of electoral cycles in the investment expenditure of Italian municipalities. The PBC phenomenon has been extensively studied in last decade; despite that, evidence on Italy is very small. With this aim, our analysis has shed more light on the interactions between electoral cycles and economic cycles at sub-national level. The econometric results confirm the presupposed hypothesis: Italian mayors behave strategically and increase progressively the level of capital expenditure as the elections approach. The level of investments reaches its maximum point in the year before the elections; while the lower peak occurs in the post-electoral year when the new electoral cycle begins. In addition to that we evaluated the effects of the DSP on the electoral cycles. The DSP is a tax rule implemented by the Italian government for monitoring local finances. Since 2001, municipalities with fewer than 5,000 inhabitants have been excluded from its rules. This aspect can be thought as a quasi (or natural) experiment that randomly splits the Italian municipalities into two groups (treated and control groups). By doing so, fears of endogeneity related to the study of the effects of tax rules are avoided. The current evidence on Italy does not answer satisfactory to the questions of effectiveness of fiscal rules in weakening the electoral cycle. For what we know, our work is the first to analyze this perspective.

Using disaggregated data by components for both expenditure and revenue, we find evidence of very sophisticated strategies of moral hazard implemented by incumbents. On the expenditure side, according to Drazen and Eslava [2010], our estimates prove the existence of targeted spending mechanism: the most visible components of public spending are increased more than the others. PBC is stronger in investment expenditures such as roads; territory; sport and culture. Despite their reduced power on local revenues, Italian mayors adopt what we call targeted revenues strategy. Complementary to Bordignon et al. [2017], who show how Italian municipalities partially replace a more accountable revenue (the property tax - namely, ICI) with a less transparent one (the surcharge on income tax), we further demonstrate that mayors in office increase the amounts of the revenues on which they have more control (i.e. loans and disposals) to finance part of the PBC. The DSP halves the magnitude of electoral cycles in all estimations. In such a perspective, a tax rules that widely reduces the pre-electoral fluctuations in fiscal variables can be characterized as welfare improving.

Finally, we conclude indicating potential future research directions. The study of PBC, especially from an empirical point of view, still represents a branch of research relatively young. Many promising features can be explored. For instance, greater attention could be given to *i*) vertical relationship between parties (reasonably, local PBC can be larger if the municipal administration has the same political orientation as the national and regional governments) and to analyze *ii*) if PBCs are larger in the case of simultaneous elections.

TABLE 1.1: Descriptive Statistics of Municipalities.

	All sample	Pop.⩽5,000	5,000 <Pop.⩽15,000	Pop.>15,000
Expenditures				
Capital expenditures	484.9	576.2	274.4	274.6
	(713.0)	(813.9)	(292.6)	(317.4)
Current expenditures	752.4	795.6	621.7	716.7
	(458.9)	(520.6)	(224.4)	(225.4)
Total expenditures	1440.3	1587.3	1057.9	1188.9
	(1078.7)	(1217.4)	(482.6)	(532.4)
Revenues				
Tax revenues	364.7	362.1	357.0	403.9
	(192.7)	(208.1)	(148.6)	(148.1)
Transfers revenues	245.7	280.4	153.9	186.7
	(188.5)	(203.1)	(110.5)	(112.3)
Loans revenues	120.2	128.4	93.6	119.2
	(217.7)	(234.6)	(161.5)	(190.4)
Non-tax revenues	180.9	191.2	152.7	166.2
	(166.0)	(179.6)	(127.6)	(118.9)
Disposal of assets	356.4	426.4	195.9	198.8
	(599.2)	(685.9)	(249.1)	(287.5)
Services revenues	109.7	116.9	88.8	102.6
	(98.8)	(106.6)	(73.0)	(78.2)
Total revenues	1428.3	1573.7	1048.8	1181.5
	(1089.7)	(1232.0)	(480.4)	(532.1)
Budget parameters				
Deficit	15.5	18.3	9.2	7.3
	(176.3)	(207.5)	(52.3)	(49.7)
Debt	776.0	805.5	703.2	717.4
	(3474.1)	(1819.7)	(6795.2)	(654.8)
Geographic characteristics				
Population	7394.8	1822.3	8467.8	49166.7
	(42703.2)	(1288.1)	(2690.2)	(136285.4)
Pop. density (inh./km^2)	313.6	146.2	507.2	1189.3
	(669.3)	(248.8)	(594.2)	(1631.4)
Other characteristics				
perc. of foreign residents	2.44	2.37	2.68	2.49
	(2.55)	(2.57)	(2.53)	(2.44)
perc. of young (30-34y) with college degree	10.42	9.77	10.96	14.37
	(6.68)	(6.77)	(5.56)	(6.87)
non-profit association	0.00	0.01	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Local newspapers sales	3.65	3.70	3.72	3.12
	(2.33)	(2.30)	(2.45)	(2.25)
Observations	93,807	66,002	19,491	8,314

Notes: Data refer to the period 1999-2012. Averages taken over the groups specified in the column headings (standard deviations are in parentheses). Balance sheet quantities are expressed in per-capita terms and in 2005 euros deflated through St. Louis FED GDP deflator.

TABLE 1.2: Descriptive Statistics for Local Elections.

	Pop.⩽15,000	Pop.>15,000
Elections' characteristics		
Elections	0.2	0.2
	(0.4)	(0.4)
Turnout	0.8	0.8
	(0.1)	(0.1)
1st candidate share	0.6	0.5
	(0.2)	(0.1)
2nd candidate share	0.4	0.3
	(0.1)	(0.1)
Ballot	0.0	0.4
	(0.0)	(0.5)
Re-elected mayor	0.3	0.3
	(0.5)	(0.4)
Term limited	0.4	0.3
	(0.5)	(0.5)
Term not ended regularly	0.1	0.2
	(0.3)	(0.4)
Commissioner in office	0.0	0.0
	(0.1)	(0.2)
Majors' characteristics		
Age	50.52	51.06
	(9.88)	(8.88)
Male	0.90	0.92
	(0.30)	(0.27)
Years of schooling	14.27	15.96
	(3.55)	(2.91)
Observations	83,974	7,857

Notes: Data refer to the period 1999-2012. 15,000 inhabitants threshold is applied to account for the change in the electoral system.

TABLE 1.3: Descriptive Statistics for Pre-electoral Years.

	All sample	Pop.⩽5,000	5,000 <Pop.⩽15,000	Pop.>15,000
Expenditures				
Capital expenditures	555.5	675.0	309.3	297.9
	(775.7)	(892.8)	(309.4)	(335.5)
Current expenditures	756.5	806.2	619.7	714.8
	(479.4)	(551.7)	(223.0)	(228.7)
Total expenditures	1524.8	1709.8	1094.5	1213.6
	(1162.8)	(1325.5)	(485.8)	(566.6)
Revenues				
Tax revenues	354.5	349.1	351.6	397.7
	(185.3)	(198.3)	(152.8)	(149.6)
Transfers revenues	255.9	296.2	159.7	191.5
	(184.5)	(198.2)	(107.1)	(110.9)
Loans revenues	137.9	149.2	107.5	129.1
	(233.2)	(252.4)	(174.3)	(204.1)
Non-tax revenues	181.3	194.0	150.1	162.9
	(163.0)	(178.4)	(120.7)	(117.2)
Disposal of assets	401.0	491.3	214.6	212.6
	(641.3)	(739.6)	(268.7)	(304.5)
Services revenues	111.9	120.0	90.8	103.8
	(97.5)	(106.1)	(69.3)	(81.7)
Total revenues	1504.5	1686.0	1080.9	1202.4
	(1164.9)	(1329.9)	(482.9)	(567.4)
Budget parameters				
Deficit	22.4	26.9	13.6	11.5
	(145.4)	(172.5)	(51.3)	(46.5)
Debt	762.9	804.2	644.4	717.2
	(1717.0)	(2025.0)	(476.6)	(531.0)
Geographic characteristics				
Population	8082.08	1836.83	8508.28	50022.56
	(46750.45)	(1290.96)	(2716.38)	(141099.22)
Pop. density (inh./km^2)	330.89	144.75	509.59	1219.01
	(717.52)	(241.31)	(602.15)	(1698.78)
Observations	16,141	11,031	3,503	1,607

Notes: Data refer to the period 1999-2012. Averages taken over the groups specified in the column headings (standard deviations are in parentheses) referring only to electoral years. Balance sheet quantities are expressed in per-capita terms and in 2005 euros deflated through St. Louis FED GDP deflator.

TABLE 1.4: Pre-electoral Average Values vs Sample Averages.

	All sample	Pop.⩽5,000	5,000 <Pop.⩽15,000	Pop.>15,000
Expenditures				
Capital expenditures	+ 14.56 %	+ 17.14 %	+ 12.71 %	+ 8.48 %
Current expenditures	+ 0.54 %	+ 1.33 %	- 0.32 %	- 0.26 %
Total expenditures	+ 5.86 %	+ 7.72 %	+ 3.45 %	+ 2.1 %
Revenues				
Tax revenues	- 2.80 %	- 3.58 %	- 1.51 %	- 1.53 %
Transfers revenues	+ 4.17 %	+ 5.62 %	+ 3.76 %	+ 2.57 %
Loans revenues	+ 14.77 %	+ 16.22 %	+ 14.85 %	+ 8.30 %
Non-tax revenues	+ 0.20 %	+ 1.45 %	- 1.70 %	- 1.98 %
Disposal of assets	+ 12.5 %	+ 15.21 %	+ 9.54 %	+ 6.94 %
Services revenues	+ 2.04 %	+ 2.63 %	+ 2.25 %	+ 1.17 %
Total revenues	+ 5.34 %	+ 7.13 %	+ 3.06 %	+ 1.77 %
Budget parameters				
Deficit	+ 45.21 %	+ 46.49 %	+ 47.82 %	+ 57.53 %
Debt	- 1.69 %	- 0.16 %	- 8.36 %	- 0.03 %
Geographic characteristics				
Population	+ 9.29 %	+ 0.80 %	+ 0.48 %	+ 1.74 %
Pop. density (inh./km^2)	+ 5.51 %	- 0.99 %	+ 0.47 %	+ 2.50 %

Notes: Data refer to the period 1999-2012. Average pre-electoral variations with respect to sample averages (percentage values).

TABLE 1.5: Baseline Results for Capital Expenditures.

	Baseline specification		W/o controls	W/o year effects
	(1)	(2)	(3)	(4)
	Invest. exp.	Invest. exp.	Invest. exp.	Invest. exp.
3 years before election	73.2***	71.8***	70.0***	45.4***
	(7.25)	(7.61)	(7.34)	(5.89)
2 years before election	81.7***	81.5***	79.1***	43.9***
	(6.85)	(7.09)	(6.93)	(5.79)
1 year before election	119.3***	118.1***	104.8***	126.3***
	(8.62)	(8.88)	(7.96)	(6.72)
1 year after election	46.5***	46.0***	44.1***	17.9***
	(7.17)	(7.52)	(7.17)	(5.49)
Mayor is a male	-5.62	2.45		24.3*
	(12.09)	(11.24)		(12.65)
Age of mayor	-0.77**	-0.49		-1.63***
	(0.39)	(0.38)		(0.40)
Years of schooling of mayor	-5.25***	0.76		-2.55**
	(1.18)	(1.12)		(1.21)
Population	-0.0024***	-0.0028		-0.0027***
	(0.00)	(0.00)		(0.00)
Population squared	5.8e-09***	-4.7e-09		6.1e-09***
	(0.00)	(0.00)		(0.00)
Population cube	-1.8e-15***	1.3e-15		-1.9e-15***
	(0.00)	(0.00)		(0.00)
Surface (km^2)	-0.63***			-0.37***
	(0.15)			(0.14)
Pop. density (inh./km^2)	-0.082***	-0.047		-0.055***
	(0.01)	(0.05)		(0.01)
Altitude (mt.)	0.75***			0.74***
	(0.03)			(0.03)
Province capital	257.4***			225.8***
	(47.27)			(45.61)
Term not ended regularly	-23.0**	-10.6		11.1
	(11.03)	(10.50)		(11.39)
Term limited mayor	10.1*	8.64		21.3***
	(5.65)	(5.41)		(5.64)
Mean of dep. var.	488.05	488.05	485.02	488.05
Controls	Y	Y	N	Y
Year Effects	Y	Y	Y	N
Year-Region Effects	Y	Y	Y	N
Municipality Effects	N	Y	Y	N
R^2	0.16	0.41	0.40	0.10
Obs.	86,157	86,157	90,279	86,157

Notes: Data refer to the period 1999-2012. Dependent variable is per-capita capital expenditure expressed in 2005 euros. Standard errors are robust to heteroscedasticity and clustered at municipality level.

* p <0.1; ** p<0.05; *** p<0.001.

TABLE 1.6: Effects of Domestic Stability Pact.

	Baseline specification		W/o controls	W/o year effects
	(1)	(2)	(3)	(4)
	Invest. exp.	Invest. exp.	Invest. exp.	Invest. exp.
3 years before election	135.7***	148.6***	139.6***	145.1***
	(17.38)	(19.26)	(19.07)	(13.81)
2 years before election	142.8***	154.8***	146.7***	136.8***
	(16.51)	(18.31)	(18.17)	(13.09)
1 year before election	203.9***	215.8***	191.5***	222.9***
	(19.31)	(21.66)	(20.18)	(14.13)
1 year after election	78.7***	90.2***	86.0***	3.61
	(17.10)	(18.90)	(18.75)	(11.68)
3 years before elect*DSP	-65.7***	-94.3***	-92.7***	-72.1***
	(18.86)	(20.86)	(20.56)	(18.19)
2 years before elect*DSP	-50.8***	-66.4***	-61.3***	-54.2***
	(18.64)	(20.93)	(20.70)	(17.58)
1 year before elect*DSP	-80.5***	-107.1***	-97.6***	-97.9***
	(20.66)	(22.78)	(22.14)	(21.08)
1 year after elect*DSP	-26.5	-46.0**	-43.9**	18.5
	(16.81)	(18.99)	(19.12)	(15.37)
Mayor is a male	-20.6	-12.4		0.11
	(20.96)	(26.08)		(22.23)
Age of mayor	0.15	-1.28		0.24
	(0.61)	(0.90)		(0.63)
Years of schooling of mayor	0.92	0.40		6.36***
	(1.72)	(2.36)		(1.72)
Population	-0.29***	-0.50**		-0.27***
	(0.01)	(0.25)		(0.01)
Population squared	0.000042***	0.000064**		0.000038***
	(0.00)	(0.00)		(0.00)
Population cube	-1.7e-09***	-2.4e-09***		-1.6e-09***
	(0.00)	(0.00)		(0.00)
Surface (km2)	1.22***			1.57***
	(0.28)			(0.25)
Pop. density (inh./km2)	-0.050***	-0.33		-0.0079
	(0.01)	(0.45)		(0.01)
Altitude (mt.)	0.52***			0.51***
	(0.04)			(0.04)
Province capital	0			0
	(.)			(.)
Term not ended regularly	-23.9	-10.7		11.2
	(18.25)	(24.72)		(19.83)
Term limited mayor	-5.34	5.45		-21.7**
	(9.88)	(10.95)		(9.96)
Mean of dep. var.	578.55	578.55	578.00	578.55
Controls	Y	Y	N	Y
Year Effects	Y	Y	Y	N
Year-Region Effects	Y	Y	Y	N
Municipality Effects	N	Y	Y	N
R^2	0.18	0.48	0.48	0.12
Obs.	34,367	34,367	35,316	34,367

Notes: Data refer to the period 1999-2004. Dependent variable is per-capita capital expenditure expressed in 2005 euros. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Standard errors are robust to heteroscedasticity and clustered at municipality level. * p <0.1; ** p<0.05; *** p<0.001.

TABLE 1.7: Robustness Controls I.

	Fixed Effects		GMM	
	Baseline regression (1)	1 - Lag (2)	1 - Lag (3)	2 - Lags (4)
	Invest. exp.	Invest. exp.	Invest. exp.	Invest. exp.
L1*Invest. exp.		0.18***	0.02	0.08
		(0.01)	(0.02)	(0.05)
L2*Invest. exp.				0.04***
				(0.03)
3 years before election	148.6***	122.2***	149.6***	127.9***
	(19.3)	(21.6)	(21.4)	(25.6)
2 years before election	154.8***	140.9***	164.2***	154.8***
	(18.3)	(21.0)	(21.5)	(25.4)
1 year before election	215.8***	202.6***	201.7***	179.1***
	(21.7)	(21.7)	(21.2)	(24.9)
1 year after election	90.2***	56.6***	105.7***	123.1***
	(18.9)	(21.5)	(23.7)	(29.9)
3 years before elect*DSP	-94.3***	-95.0***	-125.8***	-90.8***
	(20.9)	(23.2)	(23.8)	(26.4)
2 years before elect*DSP	-66.4***	-67.2***	-83.0***	-64.5**
	(20.9)	(23.0)	(22.5)	(25.6)
1 year before elect*DSP	-107.1***	-123.5***	-130.9***	-109.9***
	(22.8)	(20.6)	(20.3)	(22.7)
1 year after elect*DSP	-46.0**	-26.1	-73.1***	-103.6***
	(19.0)	(21.6)	(25.6)	(32.3)
Mayor is a male	-12.4	-0.036	-1.68	6.40
	(26.1)	(30.8)	(36.6)	(37.1)
Age of mayor	-1.28	-1.72*	0.32	0.84
	(0.90)	(1.03)	(1.27)	(1.48)
Years of schooling of mayor	0.40	0.95	1.21	0.93
	(2.36)	(2.64)	(3.13)	(3.47)
Population	-0.50**	-0.63*	-0.88**	-0.39
	(0.25)	(0.33)	(0.41)	(0.48)
Population squared	0.000064**	0.000070**	0.000095**	0.000051
	(0.000026)	(0.000034)	(0.000043)	(0.000050)
Population cube	-2.4e-09***	-2.6e-09**	-3.4e-09**	-2.0e-09
	(8.9e-10)	(1.2e-09)	(1.5e-09)	(1.7e-09)
Pop. density (inh./km2)	-0.33	-0.58	0.76	0.96
	(0.45)	(0.60)	(0.74)	(0.90)
Term not ended regularly	-10.7	-17.0	-12.4	-26.6
	(24.7)	(29.3)	(38.0)	(47.5)
Term limited mayor	5.45	11.3	12.6	6.86
	(10.9)	(12.4)	(14.3)	(16.9)
Mean of dep. var.	578.55	593.16	593.16	621.62
Controls	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y
R^2	0.48	0.53	//	//
Obs.	34,367	28,320	22,106	16,429

Notes: Data refer to the period 1999-2004. Dependent variable is per-capita capital expenditure expressed in 2005 euros. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. L1 is the one period lag of dependent variable. L2 is the two periods lags of dependent variable. Standard errors are robust to heteroscedasticity and clustered at municipality level. GMM estimations do not report R^2. The concept of R^2 is valid for OLS since it minimizes the residual sum of squares. * p <0.1; ** p<0.05; *** p<0.001.

TABLE 1.8: Robustness Controls II.

	Fixed Effects		GMM	
	Baseline regression (1)	1 - Lag (2)	1 - Lag (3)	2 - Lags (4)
	Invest. exp.	Invest. exp.	Invest. exp.	Invest. exp.
3 years before election	+ 25.68 %	+ 20.60 %	+ 25.22 %	+ 20.58 %
2 years before election	+ 26.75 %	+ 23.75 %	+ 27.68 %	+ 24.90 %
1 year before election	+ 37.30 %	+ 34.16 %	+ 34.00 %	+ 28.82 %
1 year after election	+ 15.60 %	+ 9.54 %	+ 17.81 %	+ 19.80 %
3 years before election*DSP	- 63.51 %	- 77.75 %	- 84.07 %	- 71.00 %
2 years before election*DSP	- 42.87 %	- 47.66 %	- 50.54 %	- 41.67 %
1 year before election*DSP	- 49.63 %	- 60.95 %	- 64.90 %	- 61.37 %
1 year after election*DSP	- 51.02 %	- 46.12 %	- 69.22 %	- 84.15 %
Mean of dep. var.	578.55	593.16	593.16	621.62

Notes: The percentage variations for the estimated coefficients without interaction term is respect to their sample averages. The percentage variation for the estimated coefficients interacted with the DSP dummy is respect to the estimated coefficients without interaction term.

TABLE 1.9: Robustness Controls III.

	Baseline specification		
	Pop.⩽15,000 (1)	No Restrictions on Pop. (2)	3,500⩽Pop.⩽7,000 (3)
	Invest. exp.	Invest. exp.	Invest. exp.
3 years before election	148.6***	151.2***	107.3***
	(19.26)	(18.49)	(31.59)
2 years before election	154.8***	155.0***	166.8***
	(18.31)	(17.66)	(33.23)
1 year before election	215.8***	214.9***	107.5***
	(21.66)	(20.47)	(30.54)
1 year after election	90.2***	84.1***	75.9***
	(18.90)	(17.86)	(27.31)
3 years before elect*DSP	-94.3***	-96.6***	-59.7*
	(20.86)	(19.47)	(33.35)
2 years before elect*DSP	-66.4***	-71.5***	-98.9***
	(20.93)	(19.55)	(37.44)
1 year before elect*DSP	-107.1***	-120.3***	-39.5
	(22.78)	(21.03)	(30.46)
1 year after elect*DSP	-46.0**	-46.0**	-76.3***
	(18.99)	(17.94)	(26.19)
Mayor is a male	-12.4	-12.6	14.9
	(26.08)	(24.35)	(38.94)
Age of mayor	-1.28	-1.20	-0.33
	(0.90)	(0.83)	(1.27)
Years of schooling of mayor	0.40	0.57	-0.89
	(2.36)	(2.21)	(2.95)
Population	-0.50**	-0.0023	2.54
	(0.25)	(0.01)	(2.07)
Population squared	0.000064**	-0.000000014	-0.00044
	(0.00)	(0.00)	(0.00)
Population cube	-2.4e-09***	3.6e-15	0.000000026
	(0.00)	(0.00)	(0.00)
Pop. density (inh./km2)	-0.33	-0.30	-0.54
	(0.45)	(0.18)	(0.91)
Term not ended regularly	-10.7	-4.22	-35.7
	(24.72)	(20.44)	(49.25)
Term limited mayor	5.45	5.91	-23.8*
	(10.95)	(10.04)	(13.23)
Mean of dep. var.	578.55	560.11	398.70
Controls	Y	Y	Y
Year Effects	Y	Y	Y
Year-Region Effects	Y	Y	Y
Municipality Effects	Y	Y	Y
R^2	0.48	0.49	0.47
Obs.	34,367	37,477	6,775

Notes: Data refer to the period 1999-2004. Dependent variable is per-capita capital expenditure expressed in 2005 euros. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Fixed effects regression in all columns. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 1.10: Robustness Controls IV.

	Baseline specification		
	Pop.⩽15,000 (1)	No Restrictions on Pop. (2)	3,500⩽Pop.⩽7,000 (3)
	Invest. exp.	Invest. exp.	Invest. exp.
3 years before election	+ 25.68 %	+ 26.99 %	+ 26.91 %
2 years before election	+ 26.75 %	+ 27.67 %	+ 41.84 %
1 year before election	+ 37.30 %	+ 38.38 %	+ 26.96 %
1 year after election	+ 15.60 %	+ 15.02 %	+ 19.03 %
3 years before elect*DSP	- 63.51 %	- 63,90 %	- 55.63 %
2 years before elect*DSP	- 42.87 %	- 46.16 %	- 59.30 %
1 year before elect*DSP	- 49.63 %	- 55.96 %	- 36.75 %
1 year after elect*DSP	- 51.02 %	- 54.70 %	- 100.49 %
Mean of dep. var.	578.55	560.11	398.70

Notes: The percentage variations for the estimated coefficients without interaction term is respect to their sample averages. The percentage variation for the estimated coefficients interacted with the DSP dummy is respect to the estimated coefficients without interaction term.

TABLE 1.11: Baseline Results for Disaggregated Revenues.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Disposals	Borrowing	Non-tax	Services	Tax	Transf.	Revenues
3 years before election	99.8***	22.2***	1.31	2.19	7.04***	0.027	132.6***
	(16.42)	(5.63)	(1.99)	(2.50)	(1.34)	(1.55)	(18.12)
2 years before election	101.0***	29.9***	3.74*	-0.096	1.77	4.57***	140.9***
	(15.10)	(5.61)	(1.91)	(2.44)	(1.28)	(1.77)	(16.96)
1 year before election	119.1***	42.5***	4.49**	0.71	2.76**	3.46**	173.1***
	(16.99)	(6.13)	(1.79)	(2.39)	(1.28)	(1.45)	(18.95)
1 year after election	64.1***	20.1***	0.20	0.79	2.62**	2.02	89.8***
	(15.82)	(5.95)	(1.66)	(2.43)	(1.30)	(1.60)	(18.06)
3 years before elect*DSP	-92.8***	14.7**	-1.97	-2.58	-2.46	1.01	-84.2***
	(17.57)	(7.37)	(3.07)	(3.00)	(1.85)	(2.33)	(20.24)
2 years before elect*DSP	-59.5***	6.71	-3.73	-0.17	8.12***	-11.1***	-59.7***
	(17.58)	(7.08)	(2.50)	(2.70)	(1.78)	(2.18)	(19.88)
1 year before elect*DSP	-72.2***	-0.31	-5.54**	2.11	5.77***	-9.46***	-79.7***
	(17.95)	(7.22)	(2.29)	(2.64)	(1.59)	(1.74)	(20.05)
1 year after elect*DSP	-32.6**	-5.83	3.77	0.94	1.67	-2.57	-34.6*
	(15.92)	(6.49)	(2.33)	(2.62)	(1.73)	(1.97)	(18.39)
Mean of dep. var.	391.9	132.8	169.6	108.9	323.5	271.0	1397.7
Controls	Y	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y	Y	Y
R^2	0.47	0.40	0.84	0.51	0.94	0.91	0.63
Obs.	33,064	33,064	33,064	33,064	33,064	33,064	33,064

Notes: Data refer to the period 1999-2004. In each column, the dependent variable is a different category of per-capita revenue expressed in 2005 euros. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Fixed effects regression in all columns. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 1.12: Baseline Results for Disaggregated Capital Expenditures.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Educ.	Police	Admin.	Roads	Devel.	Tourism	Social	Sport	Services	Culture	Justice	Territory
3 years before election	9.73***	-0.025	17.9**	13.5	1.75	7.76	9.44***	7.13	5.62	8.19**	0.19	35.1
	(2.30)	(0.11)	(7.36)	(12.01)	(4.53)	(8.59)	(2.83)	(6.20)	(4.79)	(3.43)	(0.35)	(22.27)
2 years before election	9.90***	-0.085	20.2***	36.7***	1.72	-0.032	15.5***	10.9	4.53	11.1*	0.062	45.1**
	(2.34)	(0.15)	(5.91)	(9.68)	(4.56)	(6.28)	(3.20)	(9.53)	(3.86)	(6.62)	(0.23)	(18.85)
1 year before election	6.63**	-0.10	17.2**	64.8***	12.0*	-5.33	15.3***	11.6	6.58	7.17*	0.35	75.7***
	(2.68)	(0.11)	(7.01)	(15.19)	(6.46)	(8.55)	(3.69)	(9.32)	(4.71)	(3.70)	(0.55)	(20.49)
1 year after election	8.18***	-0.016	8.19	11.6	6.34	-2.60	7.48***	0.33	3.27	6.79*	0.15	39.1*
	(2.26)	(0.14)	(6.01)	(9.73)	(5.44)	(7.08)	(2.79)	(7.01)	(5.33)	(3.48)	(0.51)	(22.09)
3 years before elect*DSP	-5.34*	0.046	-5.06	-10.2	-1.72	1.37	-7.85**	-1.34	-2.52	-1.26	0.17	-1.78
	(2.87)	(0.17)	(10.25)	(11.37)	(4.82)	(8.55)	(3.16)	(5.19)	(4.43)	(3.66)	(0.77)	(34.30)
2 years before elect*DSP	-1.58	0.10	1.42	-2.43	1.26	25.0	-14.1***	-5.28	-4.68	-0.11	-0.17	3.58
	(3.02)	(0.19)	(9.06)	(14.62)	(5.18)	(25.53)	(3.51)	(7.87)	(4.05)	(6.52)	(0.46)	(20.28)
1 year before elect*DSP	-0.45	0.25	-3.08	-41.5***	-10.7*	10.8	-12.0***	-5.75	-2.74	-1.21	-0.53	-15.8
	(3.13)	(0.18)	(7.55)	(14.21)	(5.97)	(12.69)	(3.69)	(7.54)	(4.57)	(3.30)	(0.74)	(23.31)
1 year after elect*DSP	-7.03***	0.070	-0.18	5.47	-3.99	10.9	-7.25**	0.74	-3.07	-1.79	-0.41	9.01
	(2.69)	(0.15)	(7.96)	(10.17)	(5.25)	(9.80)	(2.83)	(5.14)	(4.69)	(3.21)	(0.64)	(30.62)
Mean of dep. var.	34.6	0.71	91.1	149.2	22.4	21.4	34.6	33.2	15.6	19.2	0.48	262.9
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R^2	0.25	0.28	0.55	0.37	0.25	0.26	0.23	0.28	0.27	0.32	0.19	0.47
Obs.	35,203	35,203	35,203	35,203	35,203	35,203	35,203	35,203	35,203	35,203	35,203	35,203

Notes: Data refer to the period 1999-2004. In each column, the dependent variable is a different category of per-capita expenditure expressed in 2005 euros. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Fixed effects regression in all columns. Standard errors are robust to heteroscedasticity and clustered at municipality level.

* p <0.1; ** p<0.05; *** p<0.001.

Chapter 2

Female Representation, Public Expenditure and the Political Budget Cycle: First Evidence from Italian Municipalities

This study analyzes the impact that gender composition of political institutions may have on the Political Budget Cycle (PBC). To adequately test this conjecture, we make use of an exogenous variation in female participation in politics occurred in Italy in 1993 which established gender quotas for Italian municipalities. An instrumental variable (IV) approach is implemented to evaluate how the presence of women elected in municipal councils affects public expenditure and the PBC. The results show that: *i*) an increase in the number of elected women reduces public expenditure; *ii*) this reduction involves those fields typically affected by PBC (e.g. roads' maintenance); *iii*) an higher female share within municipal councils makes public investment in local police and sport rising; *iv*) larger presence of women does not affect the (electoral) fluctuations in local public spending so that the strategic raise of public expenditure nearby elections seems to be implemented independently of politicians' gender.

Keywords: Political Budget Cycle, Gender Quotas, Instrumental Variables.

JEL Codes: H72, D72.

2.1 Introduction

This study investigates the economic consequences of reducing gender imbalances in political bodies. The focus is posed on the effect of larger female representation within local municipal councils on public expenditure and, more in particular, on the so called Political Budget Cycle (PBC).[1]

The evaluation of the existence of a causal relation between female representation and the opportunistic use of fiscal policy is important in order to be properly informed about the consequences of setting norms targeted to balance gender participation in electoral competitions. Indeed, there is evidence that a greater involvement of women in politics could create a positive model and push more of them to participate actively in it (Gilardi [2015]). Furthermore, it has been argued that female participation in politics may contribute to reduce other types of social imbalances (Sen [1999]). Another relevant issue is to investigate if women act in a systematically different way with respect to men and are less likely to sacrifice the collective welfare to satisfy selfish interests. This aspect has not been sufficiently considered in the existing literature.

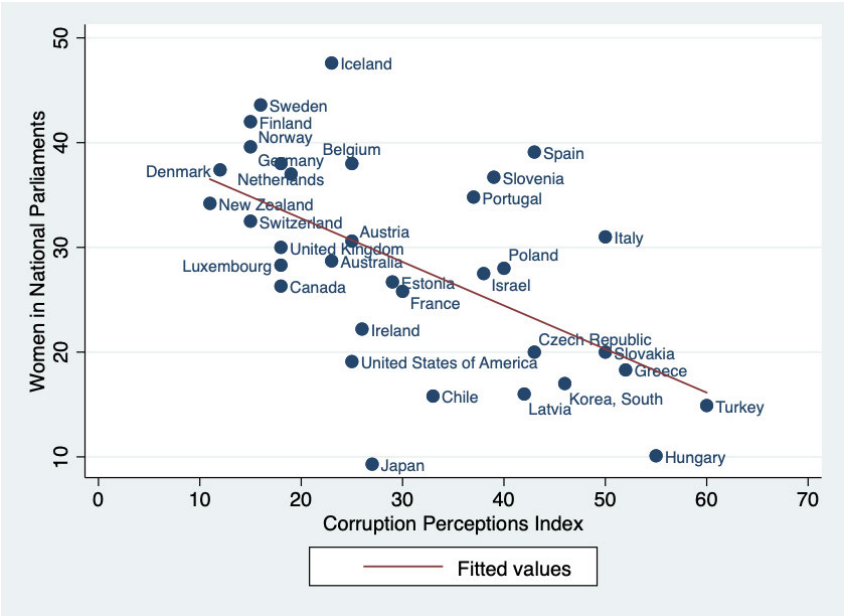
There exists empirical evidence highlighting how gender composition of political institutions impacts on the legislative process and thus on the allocation of resources across different categories of public goods (among others see Chattopadhyay and Duflo [2004]). However, there is almost no experimental evidence on whether female legislators devote particular attention to distinctive issues and priorities. While there is some evidence about a positive correlation between the share of women in political bodies and some desirable economic outcome (Dollar et al. [2001]), it is not clear cut whether this means that women have pursued such goals or, instead, they are simply more likely to be voted and supported wherein these outcome variables are already particularly high. In Figure 2.1, for instance, we report the existing correlation between the *corruption perception index* (CPI) and the *share of women in national parliament* derived using data from Transparency International and World Bank respectively. Clearly, the highlighted correlation is strong but it must be reckoned that this does not mean that women are less prone to corruption, since it is still possible women are more likely to participate to electoral competition in countries where corruption is low. Therefore, understanding if a greater share of women in political bodies may help to shape virtuous and more effective institutions and to discourage opportunistic behavior is an issue that deserves attention.

The target of this paper is to shade some light on the effect of having larger female representation in local municipalities on the use of public expenditure. Our focus is posed on the use that incumbent politicians make of public investments to opportunistically rise their probability of re-election, i.e., the so called PBC.

PBC is one of the most studied phenomena in the political economy field (among others see Rogoff [1990]; Drazen and Eslava [2006] and Shi and Svensson [2006]). It indicates a periodic fluctuation in fiscal policy implemented by governments nearby the election period. The PBC

[1]We define PBC as the rise of investment expenditure observed nearby the election date, which typically is implemented in order to rise the probability of re-election of local incumbent politicians (Rogoff [1990]; Shi and Svensson [2006]).

FIGURE 2.1: Female Representation and Corruption Perceptions.



Notes: Correlation between share of women elected in the National Parliaments and Corruption Perceptions Index. OECD Countries (2018).

may look like an increase in public spending (total or just some of its components); an increase in the budget deficit or a reduction in tax revenue in the pre-electoral year with the aim of boosting the re-election chance of the politicians in office.

The presence of PBC suggests the idea that politicians pursue goals that are different from the social welfare maximization. From a macroeconomic point of view, the PBC can heavily impact on public debt and budget deficit. In many countries, unsustainability of public finances originates from sub-national imbalances. Instability in the expenditures and in the deficit level leads to inefficiency in the allocation of resources, which is harmful to the entire national economic system. From a social welfare point of view, the existence of pre-electoral manipulations in public spending is clearly a symptom of an inefficient use of fiscal instruments.

To evaluate if female politicians behave differently from males in terms of PBC we make use of Italian data on 6,200 municipalities observed for the period 1986-2009. Considering that the share of female politicians may be correlated with several factors which may depend on the quality of the institutional environment, from a strictly econometric point of view, there may be endogeneity concerns that would threaten the internal and external validity of a linear regression analysis. In order to adequately test our conjecture we exploit an exogenous variation in female participation in politics occurred in Italy through the law no. 81/1993, introduced in 1993 and repealed in 1995, which established gender quotas for Italian municipalities. This legislative set up provides an exogenous variation in the number of women elected. De Paola et al. [2010] show that female political representation has increased in those municipalities that voted under gender quotas. In addition, even after gender quotas were abolished, municipalities continued to express a significantly higher female political representation. Such a shock led then to an

exogenous rise of female representation in local councils that represents an excellent instrument for answering our research question by means of Instrumental Variables (IV) technique.

This is the first study assessing the impact that gender composition may have on the PBC. Results can be summarized as follows. First-stage regressions show that *i*) the chosen instrument is very powerful (the F-statistics assume satisfactory values) and it simultaneously respects the conditions of relevance and exogeneity. First-stage estimates confirm that *ii*) the elections held under the gender quotas regime produced a substantial increase in female participation in Italian municipalities in subsequent elections. The instrumented share of women elected is used in second-stage regressions to assess its impact on capital expenditure and PBC. Our findings show that *iii*) an increase in the number of elected women significantly reduces the overall capital expenditure, but it does not impact the (electoral) fluctuations in local public spending. This is particularly true if we look at investments in roads' construction/maintenance and rubbish collection, while those devoted to local police and sport rise.

The interpretation of these results deserves particular attention. Firstly, although women seem to reduce the overall capital expenditure we cannot untangle whether this reduction is really the result of efficiency gains. However, since the reduction in public expenditure mainly affects some sectors typically used by politicians to gain electoral consensus (roads, territory and administration), we could argue that female representation, for some categories of public investments, may at least limit the amount of resources used opportunistically. Secondly, the fact that PBC is not influenced by gender composition of politicians may reflect either a similar opportunistic behavior or a lack of actual political power and impact of women actions. To shade some light on this issue, we consider PBC in municipalities whose share of women in the council is larger than 50%. The empirical exercise is carried out on a sub-sample that includes only those municipalities with at least 35% of women elected. In this case, IV estimates confirm that public expenditure is not reduced in those municipalities where females are the majority in the council. No differences in PBC are detected between those municipalities with the relative majority of female politicians and the others. All in all, the reported evidence supports the idea that women do implement some opportunistic behavior to be re-elected, in a similar way to that done by male colleagues. However, the amount of resources they opportunistically allocate is significantly smaller than that used by men.

The structure of the paper is as follows: Section 2.2 reviews literature; Section 2.3 introduces administrative aspects of Italian sub-national government; Section 2.4 describes the sample and the variables involved in the analysis; Section 2.5 sets the econometric strategy; Section 2.6 comments the results. Concluding remarks are highlighted in Section 2.7.

2.2 Literature Review

The phenomenon of low representation of women in politics is an issue that affects both developed and developing countries. Gender inequality is a multidimensional problem and many factors can underlie it. Related literature has provided several explanations that can partly

explain gender imbalances in politics. Schlozman et al. [1994] show that women are not willing to join the political arena due to time constraints imposed by taking care of the children. Fox and Lawless [2004] argue that female participation may be discouraged by lack of self-esteem and external encouragement. Indeed, women may be discouraged in pursuing a political career due to cultural barriers that attribute a predominant role to men. For instance, voters may not like the presence of female candidates in legislative bodies due to their biased beliefs in thinking female politicians as less competent. If women are considered as less able to attract votes, then political parties could have a more male-dominated composition in their organization charts and electoral lists. Aforementioned stereotypes may further discourage women' willingness to actively participate in politics. De Paola et al. [2010] show that in Italy female political representation has increased in those municipalities that voted after the introduction of gender quotas, even after these were abolished. Hence, according to these authors normative constraints may actually be a powerful tool to breakdown gender stereotypes.

Notwithstanding, the issue of whether women are more respectful of ethical principles and legislate with social issues in mind is not clear cut. Brollo and Troiano [2016] - using data on Brazilian municipalities - show that female mayors are less likely to engage in strategic behaviors, even at the cost of damaging their electoral performance. More virtuous behavior negatively affects their chances of re-election. Brazilian female mayors have lower re-election probability, mainly due to the fact that they hire fewer temporary public employees during the electoral year and tend to receive less campaign contributions than male. Chattopadhyay and Duflo [2004] find that in India women policy makers invest more resources in public goods closer to women' needs, such as investment in fresh water. Afridi et al. [2017]; Alatas et al. [2009] and Frank et al. [2011] present studies supporting evidence of at least equal corruption and opportunism under women decision makers. However, whether women leaders are more opportunistic due to systematic gender differences in preferences or because of the social environment in which these leaders operate is unclear. To isolate the causal effects of the social environment on opportunism by women leaders, Gangadharan et al. [2019] conduct an experiment in India, showing that social environment has causal implications on leaders' behavior.

Empirical evidence for developed countries is rather poor. Ferreira and Gyourko [2014] find that the election of a female mayor in the US has no influence on variables such as the composition of local public spending, the size of municipal government or employment and crime rates. As regards Italy, Baltrunaite et al. [2017] show how the law no. 215/2012 introducing double preference has increased the percentage of women elected by 19 percent. Once elected, women address public spending differently than men, allocating more resources to public goods such as education and environment's protection.

As regards the study of the PBC at the Italian municipal level, there is not a large number of researches. Bartolini and Santolini [2009] analyze 246 Italian municipalities located in the Marche region over the period 1994-2003 finding that the pre-electoral manipulation in current spending is concentrated in the pre-electoral years. Cioffi et al. [2012] enlarge the analysis on all

the Italian municipalities for the period 1998-2006 and focus on capital (and total) expenditures. Results show that in the year leading up the elections, both capital and total expenditures record a 40 percent rise. Those increments are carried out only by mayors not affiliated to a national party. Repetto [2018] studies the effects on PBC caused by law no. 189/2008, which obliged the Italian municipalities to approve and publish their budgets two months in advance, anticipating the deadline from June 30th to April 30th. The first documented result is a 28.5 percent increase in investment expenditure (mainly most visible component such as *roads* or *public housing*) in the pre-election years. In the years following the reform there is an average reduction of about one third in PBC. This effect, however, is not homogenous throughout Italy. The reduction in pre-electoral spending is almost twice in those provinces where local newspapers' sales are higher than the national median.

2.3 Administrative Aspects of Italian Municipalities

The Italian decentralization of government includes three levels: the Regions, the Provinces and the Municipalities. The Municipalities are grouped within 110 Provinces and 20 Regions. The Regions are mainly involved in the provision of health services. Provinces perform functions related to road maintenance and environmental protection, while Municipalities are responsible for services such as public lighting, urban road maintenance, local transport, waste disposal, social assistance and primary school. The decision-making bodies, at the municipal level, are: the mayor (*Sindaco*); the Executive committee (*Giunta comunale*) appointed and chaired by the Mayor, and the Municipal Council (*Consiglio comunale*), endowed with legislative power. Some constraint on the public finances is imposed by the Stability and Growth Pact which forces the EMU countries to control their budget balances and the stock of debt with respect to general government, i.e., the consolidated accounts of central government, local government and social security institutions. The Stability and Growth Pact, introduced in 1997 between EU member States, has been implemented in Italy also at sub-national level through the so-called *Domestic Stability Pact* (DSP) with the aim to make local governments more accountable (Law no. 448/1998). DSP's rules are revisited every year. Initially, the budget rules have been set in terms of budget deficit (*budget balance target*). The main variable under control was the *fiscal gap*, defined as municipal deficit net of transfers and debt service. Since 2005, these rules have been expressed in terms of expenditures growth rate. The punishment for not complying with the DSP includes penalties such as: *i*) 5 percent cut in the annual transfer from central government; *ii*) ban on municipalities hires and *iii*) 30 percent cut on reimbursement and non-absenteeism bonuses for the municipal employees. Cities complying with DSP, instead, benefit from a reduction on interest for loans from the central government. Municipalities' debt can be financed through: *i*) bonds' emission (*Buoni Obbligazionari Comunali*); *ii*) loans from *Cassa Depositi e Prestiti* (a central administrative agency) and from private banks.

2.3.1 The Reform of Electoral Rules and the Introduction of Gender Quotas

Law no. 81/1993, introduced the direct election of the mayor and other severe changes in the Italian electoral system, with some differences on the basis of the size of the city. Importantly, it imposed that neither gender can represent more than two thirds of each list of candidates for municipal elections (*gender quota reform*)[2]. However, in municipalities up to 15,000 inhabitants, this limit is slightly lower and set at three quarters. It is important to remark that the law does not impose that a given percentage of them should be elected. On September 12, 1995, the constitutional court declared this law as unconstitutional, stating that the fundamental right of equal access to elective offices cannot be subject to special treatment on the basis of sex, as established by Art. 3 and Art. 51 of the Italian Constitution. As a result of this provision, only the elections held between April 1993 and September 1995 were influenced by the reform of the gender quota. However the vast majority of municipalities (7,716) voted when the law was still in force while few of them (389) never voted under gender quota reform.

2.4 Data

The effects of the presence of female politicians on sub-national PBC are tested by using a data set of 6,200 Italian municipalities (out of about 8,100). Municipalities belonging to special autonomy Regions (*Regioni a Statuto Speciale*) were excluded because they are allowed to set their own fiscal and electoral rules.[3] The data set contains several (crucial) information at the municipality level. In particular, for the period 1986-2009 they provide information about the share of women elected in each municipal council, while balance sheets are available for the period 1999-2009.

Different sources have been consulted in order to obtain necessary information. Revenues and expenditures data have been extracted from (annual) municipalities' balance sheets.[4] Information on balance sheets as well as those on local elections (percentage of elected women; gender, age and years of schooling of the mayors) have been provided by the Ministry of Internal Affairs. These data have been merged with information provided by National Statistical Office (ISTAT) about the demographic and geographic characteristics of each municipality.

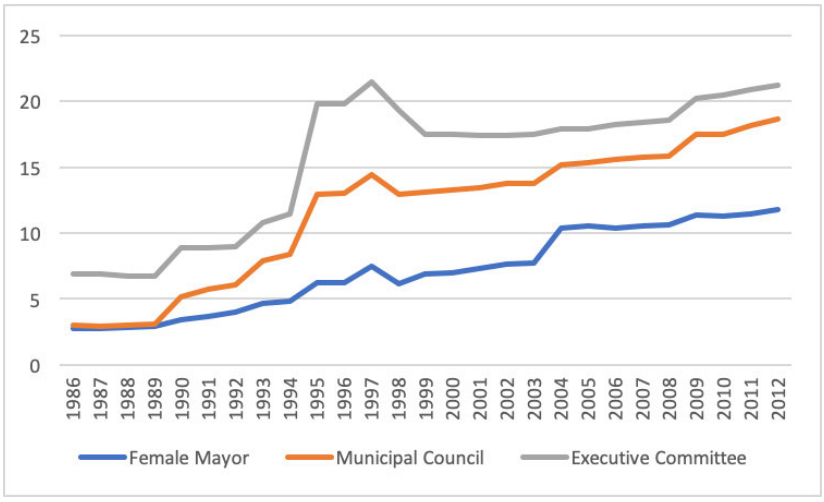
Figure 2.2 summarizes the most relevant descriptive statistics about female representation in the Italian municipalities. Before 1993 reform, female members were on average just about 8 percent. Regarding Executive Committees and mayors, male dominance was even higher. Two important facts steam out from this figure. Firstly, in the considered time period there has been an increasing trend of women representation in Italian municipalities. Secondly, and most importantly, after the 1993 reform there has been a fairly evident jump in the share of elected women in municipal councils and in the share of those who joined the Executive Committees.

[2]This type of constraint has also been applied to the Provincial Councils and the Chamber of Deputies. Since February 1995 (Law No. 43), the same procedures applied to Regional Councils.

[3]Special autonomy Regions are: *Friuli-Venezia-Giulia*; *Sardinia*; *Sicily*; *Trentino-Alto-Adige* and *Valle D'Aosta*.

[4]These data are deflated to 2005 euros using FRED (St. Louis) GDP deflator.

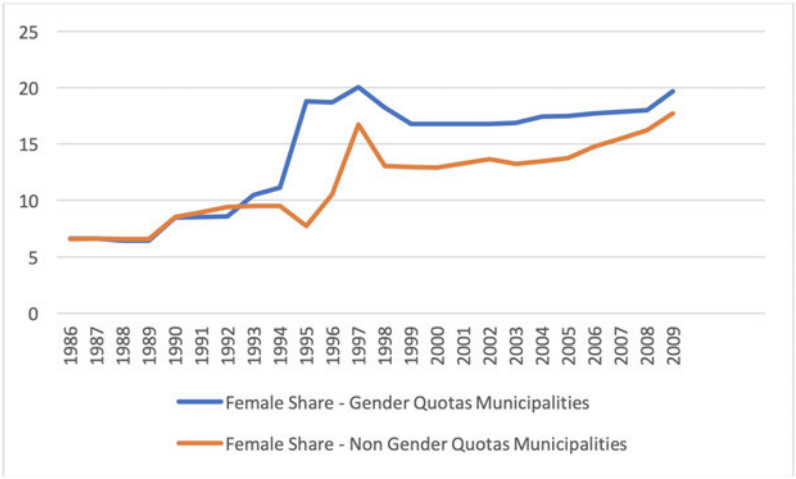
FIGURE 2.2: Female Representation in Italian municipalities.



Notes: Share of women elected in the various municipal bodies (1986-2009).

The jump is not detected when looking at the share of female mayors and this is not surprising given that although the reform imposed a lower bound for gender representativeness in each list of candidates as members of the municipal council, no gender quotas has been imposed on candidates to the mayor position.

FIGURE 2.3: Gender Quotas Municipalities vs Non Gender Quotas Municipalities.



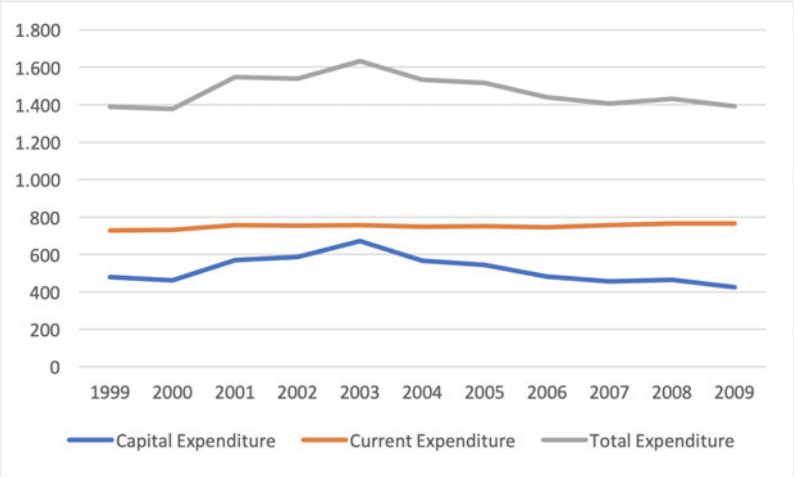
Notes: Difference in the share of elected women between gender quotas and non-gender quotas municipalities.

Interestingly, in Figure 2.3 we also report the share of elected women over time in the municipalities that voted under the gender quotas versus the others. The former had a much higher number of women elected than the municipalities not subject to this legislative provision, but over the years this difference has gradually diminished.

Table 2.1 contains some descriptive statistics about balance sheets which, as already mentioned, are available from 1999 onwards. Capital expenditure has an average value of 518.7

euros per capita. No-gender quotas municipalities present a slightly higher level of capital expenditures, while current expenditures are on the contrary lower if compared with municipalities which voted under gender quotas.

FIGURE 2.4: Local Expenditures.



Notes: Data are expressed in 2005 euros, deflated through St. Louis FED GDP deflator. Municipalities from Italian special Regions are excluded from the sample.

2.5 Econometric Strategy

The first issue to be posed is the definition of the variable of interest which represents our index of PBC. As in Bartolini and Santolini [2009]; Cioffi et al. [2012] and Repetto [2018], the electoral cycle's analysis of this paper is based on the expenditure rather than on revenue side. This approach is supported by the fact that, in Italy, municipal administrations do not have a high degree of control over local revenues. The municipalities have a limited power of taxation and there are few tax rates that can be manipulated by mayors (in a very limited way). Indeed, transfers by the central government play a primary role on local economic-financial equilibria.

Our main dependent variable is then capital expenditure and this measure has been preferred to the current expenditure. Several arguments support this choice. First of all, investment represents the largest and most important part of capital expenditures and it is not subjected to the rules of the *Domestic Stability Pact* (DSP) in most of the year considered in the data set. Furthermore, as stated by Drazen and Eslava [2010], capital expenditures are the most appropriate tool to implement *targeted spending strategies*, aimed at increasing the amounts of those categories of expenditure that can mostly affect the probability of re-election.

Severe empirical difficulties are faced when trying to assess the impact of female participation in local politics on PBC. Indeed, some omitted variables may affect both the share of female within Municipal Councils and the level of capital expenditures. This implies that when evaluating the impact of female representation on PBC in a linear regression model, estimated parameters are likely to be biased.

To tackle this issue, in this paper we propose an identification strategy based on the exogenous variation of the share of female politicians obtained from the legislative reform that in 1993 imposed gender quotas and using an IV estimation procedure. Thus, the very big advantage of the approach applied here is that the instrument comes from a policy reform and, consequently, is exogenous. The variable used for instrumenting the share of female in charge in the municipalities is the female share resulting from elections that took place during the period from March 25, 1993 to September 12, 1995. This means that we use only those municipalities that voted when the gender-quotas rule was in force, and we consider as instrument the share of elected women that has been enforced by the law which is likely to be orthogonal to the capital expenditure of municipalities in the period 1999-2009.

Formally, the applied econometric strategy works as follows. Consider only those municipalities that have voted under the gender quotas law and consider the time period 1999-2009. Using this sample we can estimate the following model:

$$\begin{aligned} y_{i,t} \quad & \alpha_1 + \beta_1 Ele_{i,t} + \beta_2 (Female_{i,t})^{IV} + \beta_3 (Ele_{i,t} \times Female_{i,t})^{IV} \\ & + \gamma_1 \mathbf{X}_{i,t} + \mu_i + \rho_i \times \tau_t + \varepsilon_1 i, t \end{aligned} \tag{2.1}$$

In an IV setup, equation (2.1) refers to second-stage regression. In this equation, $y_{i,t}$ is the capital spending for municipality i in year t, α is a constant while $X_{i,t}$ indicates a set of control variables, μ_i indicates municipal fixed effects, τ_t indicates time fixed effects, ρ_i captures regional fixed effects while ε are the residuals.[5] $Ele_{i,t}$ is a set of dummies built to capture the timing of the electoral cycle and it is defined as follows:

$$Ele_{i,t} \quad \begin{cases} Ele_{i,t}^{-3} & 1 \text{ if for municipal } i \text{ year } t \text{ is three years before elections} \\ Ele_{i,t}^{-2} & 1 \text{ if for municipal } i \text{ year } t \text{ is two years before elections} \\ Ele_{i,t}^{-1} & 1 \text{ if for municipal } i \text{ year } t \text{ is one year before elections} \\ Ele_{i,t}^{+1} & 1 \text{ if for municipal } i \text{ year } t \text{ is one year after elections} \end{cases} . \tag{2.2}$$

β_1 is a parameters' vector measuring how capital spending behaves as election year approaches; one year after the election targets when the new electoral cycle begins. The election year indicator represents the reference group. Electoral dummies' set varies cross-sectionally

[5] It must be stressed that, differently from Cioffi et al. [2012] we have decided not to estimate a dynamic model, i.e. we do not include the first lag of the depended variable among covariates. The reason is that, since we are implementing an IV estimation, having a dynamic model in the second stage would be problematic. However, it must be recognized that, in principle, it is questionable if capital expenditure is persistent or, instead, volatile during time. Indeed, Cioffi et al. [2012] in most of their specification do not find a significant coefficient of the lagged variable and, in some cases, they actually detect a very low degree of persistence. For this reason we proceed by using a non-dynamic panel data model with the inclusion of municipal fixed effects and time dummy variables.

because municipalities are in different points of the electoral cycle.[6] Variable $Female_{i,t}$ measures the share of females in each municipal council in year t. Notice that, since elections take place every five years, the share of women in each council normally does not change within this time frame, unless the occurrence of some peculiar event (e.g. resignation, etc.). In order to estimate the effect of the female share on the PBC, $Ele_{i,t}$ is interacted with the share of elected females ($Female_{i,t}$). This effect is captured by the parameters' vector β_3.

Since variable $Female_{i,t}$ is likely to be endogenous, in order to estimate an unbiased value of its coefficient β_2, it needs to be instrumented. Furthermore, since $Ele_{i,t} \times Female_{i,t}$ represent interactions among an endogenous variable and (four) dummy variables, unbiased estimates of β_3 may be obtained by using appropriate instruments for these interactions too.

We can now turn our attention to the first-stage equations. Firstly, $Female_{i,t}$ is instrumented according to the following first-stage regression:

$$\begin{aligned} Female_{i,t} \quad & \alpha_2 + \nu_1 Female_{i,GQ} + \nu_2 Ele_{i,t} + \nu_3 (Ele_{i,t} \times Female_{i,GQ}) \\ & + \gamma_2 \mathbf{X}_{i,t} + \mu_i + \rho_i \times \tau_t + \varepsilon_2 i,t \end{aligned} \tag{2.3}$$

Equation 2.3 regresses the female share in municipality i at time t on our instrumental variable $Female_{i,GQ}$ which gives the female share of municipality i resulting from the elections that took place between 1993 and 1995, i.e., those that have been affected by law no. 81/1993. ν_1 gives us the impact that the exogenous shock had on the gender composition of municipality i during the subsequent elections that we record in our data.

To clarify this point, consider a municipality that had elections in 1993. In this case, the dataset provides information about the results (in terms of the share of elected females) of elections that took place in 1993 under the gender quotas, and in those held in 1998, 2003 and 2008, i.e. after the cancellation of gender quotas. Hence we can evaluate how the exogenous female share determined in 1993 explains future female shares. The same is true for those municipalities that voted in 1994 and in 1995 for which we record the share of elected women in 1999, 2004 and 2009 and in 2000 and 2005 respectively. The idea is that of using the part of the female share at time t explained by the past level of female share induced by the gender quotas reform to set the impact that women have on the level of capital expenditure and on the PBC. Since $Female_{i,GB}$ is not correlated with future capital expenditure and future PBC, it represents an ideal instrument to predict the female share in each municipality and to evaluate the effect it has on local expenditure.

Now, we can turn our attention to interactions between the endogenous variable $Female_{i,t}$ and the four variables included in the vector $Ele_{i,t}$ which need to be instrumented as well. According to the literature (among others see Wooldridge [2002]) the interactions among instrument $Female_{i,GQ}$ with exogenous variables represents a good instrument for the $Female_{i,t} \times$

[6] Local elections are staggered because of early terminations of term occurred in the past due, for example, to resignation of the mayor.

$Ele_{i,t}$ variables. In practice, we need to add four first-stage equations before estimating eq. (2.1). Taking as an example the case of $Female_{i,t} \times Ele_t^{-3}$ (whose parameter in eq. (2.1) should tell us if the share of females affects the behavior of capital expenditure three year before the election) we have the following first-stage equation[7]:

$$Ele_t^{-3} \times Female_{i,t} \quad \alpha_3 + \phi_1(Ele_t^{-3} \times Female_{i,GQ}) + \gamma_3 \mathbf{X}_{i,t} + \mu_i + \rho_i \times \tau_t + \varepsilon_3 i,t \quad (2.4)$$

Since we have just an instrument for each endogenous variable, our model is perfectly identified. The other first-stage equations are:

$$Ele_t^{-2} \times Female_{i,t} \quad \alpha_4 + \chi_1(Ele_t^{-2} \times Female_{i,GQ}) + \gamma_4 \mathbf{X}_{i,t} + \mu_i + \rho_i \times \tau_t + \varepsilon_4 i,t \quad (2.5)$$

$$Ele_t^{-1} \times Female_{i,t} \quad \alpha_5 + \psi_1(Ele_t^{-1} \times Female_{i,GQ}) + \gamma_5 \mathbf{X}_{i,t} + \mu_i + \rho_i \times \tau_t + \varepsilon_5 i,t \quad (2.6)$$

$$Ele_t^{+1} \times Female_{i,t} \quad \alpha_6 + \omega_1(Ele_t^{+1} \times Female_{i,GQ}) + \gamma_6 \mathbf{X}_{i,t} + \mu_i + \rho_i \times \tau_t + \varepsilon_6 i,t \quad (2.7)$$

In practice, the main idea is to use the exogenous rise in female share induced by the 1993-1995 reform to predict the share of women in the municipal councils in years 1999-2009. This allows us to estimate the rise in female politicians induced by the reform and to evaluate how this has affected the municipal PBC. The chosen instrument is excellent because it respects simultaneously both validity conditions: *i*) *Relevance*: municipal elections under gender quotas reform impact on elected female politicians, but not on investment expenditures; and *ii*) *Exogeneity*: the instrument is not correlated with the error term, being the result of a legislative provision.

Finally, several control variables are included in the vector $X_{i,t}$. The determinants of capital expenditure related to geographical dimension are controlled by adding a quadratic polynomial in population and population density. Mayors' characteristics are controlled through age, gender and education. Two further dummy variables have been included to control if a term ended early and if a commissioner is in office. Furthermore, a dummy variable takes value one if a mayor

[7] Eq. (2.4) is written in "compact form": it explicitly reports its main instrument, while others instrumental variables and electoral cycle dummies enter in the vector of control variable $\mathbf{X}_{i,t}$.
If we had to write eq. (2.4) in extended form, we would write it as:

$$\begin{aligned} Ele_t^{-3} \times Female_{i,t} = {} & \alpha_3 + \phi_1(Ele_t^{-3} \times Female_{i,GQ}) + \phi_2(Ele_t^{-2} \times Female_{i,GQ}) + \phi_3(Ele_t^{-1} \times Female_{i,GQ}) \\ & + \phi_4(Ele_t^{+1} \times Female_{i,GQ}) + \phi_5 Female_{i,GQ} + \phi_6(Ele_t^{-3}) + \phi_7(Ele_t^{-2}) + \phi_8(Ele_t^{-1}) \\ & + \phi_9(Ele_t^{+1}) + \gamma_3 \mathbf{X}_{i,t} + \mu_i + \rho_i \times \tau_t + \varepsilon_3 i,t \end{aligned} \quad (2.4.1)$$

is subjected to term limited. Municipality fixed effect, μ_i, captures local level unobservable determinants of our outcome of interest. τ_t counts for the year effects. Potential geographic differentials in the various areas of the country are taken into account by means of a Region-year interaction, $\rho_i \times \tau_t$. Economic variables such as total revenues; their disaggregation by categories; deficit and debt are not added in the regressions to avoid endogeneity's concerns arising from reverse causality which could threats the internal validity of the proposed analysis.[8] Finally, for all equations (first-stages and second stage as well), standard errors are robust to heteroscedasticity and are clustered at municipal level.

2.6 Results

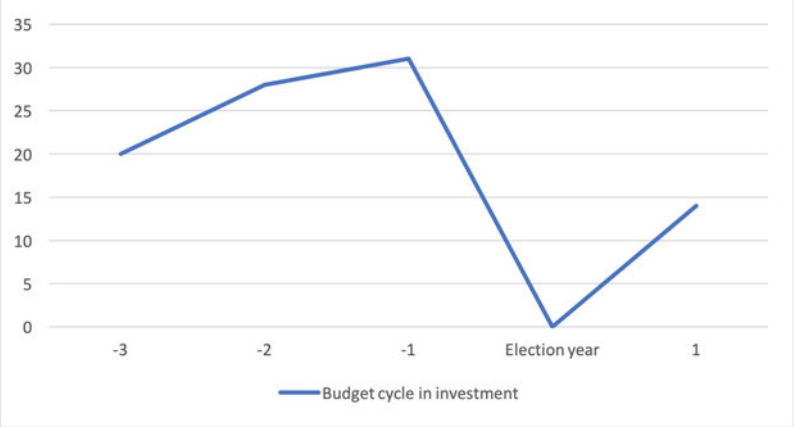
In Table 2.2 we start by presenting estimates of eq. (2.1) using a simple OLS model where the dependent variable is municipal capital expenditure. In this preliminary investigation, among regressors we use the actual female share ($\texttt{Female}_{i,t}$) in the municipal council. In this case we also include the dummy variables $\texttt{Ele}_{i,t}$ to check for the presence of electoral cycle and we do not include the interaction between these variables and the female share. Hence, the aim of this specification is *i*) to detect evidence of PBC and *ii*) to set the presence of any correlation between female share and capital expenditure.

The model presented in column (I) accounts for fixed effects at the municipal level, as well as regional fixed effects interacted with time dummies to control for the impact that central and regional governments policies may have on capital expenditure. The main result we gather from this specification is that actually there is evidence of PBC and this result is consistent with previous findings highlighted among others by Cioffi et al. [2012] and Repetto [2018]. Indeed, before the election year we detect a rise in capital expenditure whose maximum level is achieved exactly one year before the election (coefficient stands at +29%, significant at 1%). This parameter is statistically different from all other coefficients associated to two and three years before the election (+25% and +21% respectively) and it clearly points for the presence of PBC. Further, one year after the election, when the new electoral cycle begins, we record a significant rise in capital expenditure but the associated coefficient is much smaller (+14%). In Figure 2.5 we highlight the estimated parameters and the presence of PBC at municipal level appears as fairly evident. Turning attention to possible correlation between capital expenditure and the municipal council's total female share, we do not find evidence of it, being the coefficient associated to female share not significant and very close to zero.

In column (II) of Table 2.2 we report estimates of the same specification presented in column (I) but we have added interaction between the female share (not instrumented) with the set of dummy variables $\texttt{Ele}_{i,t}$. In this case we want to evaluate what happens to the PBC when the share of women in the Municipal Council rises. Results again show clear-cut evidence of PBC. Furthermore, it appears that women reduce a little the presence of PBC. Starting from two years before the election, one point more in the share of women implies a reduction of about

[8] Capital expenditures and total revenues exhibit a correlation of about 90 percent.

FIGURE 2.5: Estimated Political Budget Cycle in Italian Municipalities.



Notes: Plot of coefficients estimated in Table 2.2 (column 2).

0.18% in capital expenditure. One year before the election an additional reduction of 0.19% is detected, and these parameters are significant at 10% level.

As discussed previously, the effect of female share on PBC estimated in a simple linear regression model is likely to be biased because of endogeneity issues, hence it is not informative about gender differences in the use of capital expenditure nearby the election.

To move a step toward the identification of the causal effect, we now turn our attention on the IV procedure.

In Table 2.3 we summarize the result of our (five) first-stage equations. In column 1 we regress the female share of municipality i at time t ($Female_{i,t}$) on $Female_{i,GQ}$ which represents the female share that municipality i had after the election that took place under the gender quota law. In the second column we estimate the same model but using only data for municipality i if t is "three years before the election[9]". In the third, we use data only if t is "two years before the election" and so on till the fifth column where we consider only observations if t is the year after the election. In all equations our time span is 1999-2009.

For all first-stage regressions the effect of the instrument on female share in charge is positive, meaning that gender quotas law effectively increased the percentage of female elected in municipal bodies even after it has been repealed. All parameters are significant at 1 percent. It is worth mentioning that the instrument is not "weak" since all the F-statistics are considerably larger than the rule of thumb value of 10 (Staiger and Stock [1997]). Moreover, the fitting expressed by the R^2, ranging from 16 to 65 percent, is reasonably satisfactory.

Table 2.4 reports results for the second-stage regressions. The main empirical specification in column (I) includes temporal fixed effects (also the interaction between regional fixed effects and the time dummies) and municipal fixed effects as well. Municipal capital expenditure records large variations related to the electoral cycle. In this case, however, the detected parameters are slightly smaller in absolute value than those detected in the previous specification.

[9]The main instrument for each first-stage regression is bold written.

Notwithstanding, the presence of PBC is again clearly detected. Considering the election year as a reference, the baseline estimates in column (I) - where controls and fixed effects are included - show that three years before the election there is an increase in investment of about 9%. As elections approach, spending rises: two years before the election, capital expenditure is 19% higher. This value increases up to 21% percent in the year before election. In the post-election year, when the new election cycle begins, the increase is much more moderate (9%).

We now turn our attention on the effect that the female share has on capital expenditure. In this case, we do find a significant impact of the female share on total capital expenditure. One point rise in female percentage within the Municipal Council reduces capital expenditure of about 1% (-0.7). It is important to remark that, although women seem to reduce the overall capital expenditure, we cannot untangle whether this reduction is really the result of efficiency gains. However, in paragraph 2.6.2 we push further our investigation by separating capital expenditure in several components, in order to investigate if this reduction in public expenditure mainly affects those sectors typically used by politicians to gain electoral consent. In this case, we could argue that female representation may at least limit the amount of resources used opportunistically.

We now focus on the impact that the female share has on the use of public expenditures as elections approach. Estimates in column (I) of Table 2.4 show that a rise in female share has a negligible impact on PBC's dynamics (the coefficients for"three years before the election" and "one year before the election" are significant but their magnitude is around half a percentage point).

In order to evaluate the robustness of results, findings reported in column (II) counts for all fixed effects, while control variables are excluded: the interactions between electoral cycle dummies and elected female share do not drastically change, even though some accuracy in estimates is lost as the R^2 suggests. On the contrary, in column (III) municipal fixed effects are ruled out and the controls added: the exclusion of time effects leads to smaller electoral coefficients as the estimates incorporate the nation decreasing trend in local public spending (Figure 2.4). The interpretation of this result deserves particular attention. Indeed, albeit on the one side it may seem that females behave exactly as males in raising public expenditure when the election approaches, on the other side it is also possible that women are not able to impact on decisions about the time-schedule of expenditure. Put differently, if males have the majority in the council, even in the presence of larger female share they can still control some decisions such as that of rising investments in the pre-electoral years. In the next paragraph, we investigate this issue.

2.6.1 Enhancing Interpretation: Evidence from a Restricted Sample

In order to further investigate if female politicians give rise to a PBC exactly as males do or, instead, they are simple not able to contrast decisions about the amount of expenditure, we run an IV strategy similar to that implemented before, but we limit our study to those municipalities

that in year t have at least a 35% of women in their council. Using this restricted sample, we are interested in evaluating if those municipalities whose council contains a majority of women ($Female_{i,t} \geqslant 50\%$) present different PBC patterns. The idea of limiting our sample derives from the fact that we want to compare municipalities that in all cases present large female shares. If PBC is unaffected by the presence of women since they are not able to influence decisions, we should detect no evidence of PBC where councils have women' majority.

Econometrically, we basically re-estimate equations (2.1)-(2.7) but in this case the variable $Female_{i,t}$ is replaced by latent variable ($Majority_{i,t}$) which takes value 1 only if municipality i has the female share greater or equal to 50%, and zero otherwise. The decision about fixing the threshold of the used sample at 35% is the result of a trade-off between the use of a larger bandwidth and the rise in the variance using a triangular Kernel.[10] Results of the first-stage equations are reported in Table 2.5 while Table 2.6 contains the second-stage results. In Table 2.6, the main finding is that the presence of a PCB with a peak on the pre-electoral year coefficient is confirmed, even though the whole electoral cycle is much more smoothed than in the previous cases. This means that even for those councils whose composition embodies a large presence of women we detect the presence of PBC. Furthermore, the PBC is not attenuated even in those municipality whose majority is made by women. This evidence supports the idea that female politicians do not behave differently from males in timing strategically public expenditure.

2.6.2 Disaggregating Capital Expenditure

In Table 2.7 we present some results derived by replicating our main IV strategy and by changing the dependent variable in eq. (2.1).[11] In particular, instead of using the overall amount of capital expenditure we can divide it in eleven different classes: roads and territory, education, police, administration, development, tourism, social, sport, services, culture, justice. Hence, we can estimate eleven second-stage IV models to evaluate some additional aspects. The first one is that, by separating expenditure in specific investments, we can understand if our previous estimated models actually captures a PBC. Indeed, a proper PBC should imply that only immediately visible investments increase when election approaches while other type of investments, and in particular those which do not produce their effects in the very short run, should not be characterized by PBC (Repetto [2018]). In addition, we can evaluate the type of investments that are actually reduced when the female share raises and this gives us a clearer picture of what are the consequences of reducing gender imbalances in politics.

Second-stage estimates in Table 2.7 confirm our expectations, i.e., the presence of PBC is detected only for capital expenditure in roads (new roads and maintenance) and territory (public lighting and rubbish collection); social services (childcare; services for the elderly and

[10] We remark that by using threshold of 30 and 40 percent, results remain almost identical to those presented here.

[11] Table 2.7 reports second-stage estimates. First-stage estimates are reported in Tables A1-A11 in the Appendix A.

social assistance) and sport (swimming pools; stadium; recreational and sport events). Other types of investments do not give raise to PBC and their expenditure varies with no specific path. Also in this case, the female share does not affect the PBC but, crucially, it must be remarked that the total expenditure in roads and territory and administration (spending in administrative bodies; personnel; registry office; statistical and electoral services) decreases substantially when the presence of women in the municipality increases; while, on the contrary, the investments in police and sport raise. These results are consistent with the idea that women use opportunistically public expenditure giving rise to PBC as men politicians do. The general conclusion is that the amount of public resources they use opportunistically appears to be much smaller, since the reduction in public expenditure recorded when the female share increases hits almost entirely those investments typically characterized by PBC (roads and territory). At the same time, female politicians seem to have a preference for higher investment among certain categories of expenditures such us police and sport, highlighting how women may have a distinctive attention toward particular public goods.

2.7 Conclusions

Generally female participation in politics is considered to be quite low and it grows very slowly. In recent years, many countries have changed their electoral rules by introducing gender quotas laws. The intention is to erode some of the barriers that prevent fair participation of women in politics.

While there is unanimous agreement on the positive effects of gender quotas on female participation in politics, very little is known about the repercussions they produce in terms of economic outcomes, especially with regard to developed countries. Furthermore, it is very important to analyze if more balanced political bodies, in terms of gender, can lead to a better use of economic policy instruments characterized by some discretionary power such as fiscal policy. In order to fill this gap in the literature, in this chapter we investigate the relationships between female participation in political bodies, the patterns of municipal capital spending and the opportunistic use of public finance by the politicians in office.

In this respect, we refer to the Political Budget Cycle (PBC) phenomenon, namely the use of public expenditure in an electoral perspective. Such an occurrence can create financial imbalances that bring to disproportionate and unsustainable increases in debt levels and/or budget deficits, with a subsequent reduction in the expected value of future income flow due to the increased probability of higher tax levy in the foreseeable future and growing likelihood of default of the institution.

The proposed empirical analysis exploits the temporary introduction of gender quotas (Law no. 81/1993) in Italy where the number of women actively involved in politics, both nationally and locally, is still far from the levels recorded in many other European countries. With a view to investigate the effect of that exogenous variation in female participation on the pattern

of municipal investment expenditures, a two-stage IV procedure has been applied: the first-stage equations regress female share elected between 1999-2009 against the female share elected between 1993 and 1995 (the instrument), i.e., when the law on gender quotas was in force. The instrumented value of female participation obtained is used in the second-stage regression to investigate its effect on the dynamics of local capital spending in the period 1999-2009. 2SLS estimates show that an increase in the number of women in municipal bodies generally reduces the total amount of public expenditure in the sectors most subject to PBC such as roads, territory and administration, while, on the contrary, they rise investments in sport and police. However, even if female politicians invest less resources in these sectors, they do behave as males in generating electoral fluctuations in local public spending. To the best of our knowledge, this article is the first to study the effects of female participation on PBC, documenting that no gender differences characterize the opportunistic use of capital expenditure, despite the total amount of resources used for strategic electoral purposes vary between categories when the female share in the council rises.

TABLE 2.1: Descriptive Statistics of Municipalities.

	All sample	Gender Quota municip.	Non-Gender Quota municip.
Expenditures			
Capital expenditures	520.8	518.7	562.4
	(731.8)	(726.2)	(832.9)
Current expenditures	749.6	750.9	722.8
	(437.1)	(443.6)	(282.3)
Total expenditures	1,474.6	1,472.8	1,509.6
	(1,089.6)	(1,087.5)	(1,130.34)
Revenues			
Tax revenues	340.2	341.6	313.2
	(177.6)	(176.4)	(199.1)
Transfers revenues	267.7	266.5	291.7
	(185.4)	(185.2)	(188.0)
Loans revenues	127.0	126.2	143.4
	(220.5)	(219.3)	(243.2)
Non-tax revenues	180.3	181.2	162.3
	(162.3)	(163.0)	(146.6)
Disposal of assets	380.2	378.8	407.3
	(617.8)	(612.9)	(705.8)
Services revenues	113.4	113.4	113.2
	(102.5)	(102.7)	(98.0)
Total revenues	1,460.4	1,458.6	1,496.4
	(1,096.0)	(1,094.0)	(1,132.2)
Budget parameters			
Deficit	17.4	17.6	12.8
	(181.8)	(185.6)	(77.1)
Debt	747.5	742.9	832.1
	(4,102.5)	(4,077.7)	(4,535.0)
Geographic characteristics			
Population	7,344.8	7,335.9	7,514.4
	(42,562.8)	(43,511.4)	(15,882.89)
Pop. density (inh./km^2)	310.3	305.7	397.3
	(668.0)	(666.0)	(699.2)
Observations	70,821	67,366	3,455

Notes: Data refer to the period 1999-2009. Averages taken over the groups specified in the column headings (standard deviations are in parentheses). Balance sheet quantities are expressed in per-capita terms and in 2005 euros deflated through St. Louis FED GDP deflator.

TABLE 2.2: Testing for Electoral Cycle.

	Electoral Cycle	Electoral Cycle × Female Share
	(1)	(2)
	Invest. exp.	Invest. exp.
3 years before election	0.21***	0.20***
	(0.01)	(0.02)
2 years before election	0.25***	0.28***
	(0.01)	(0.02)
1 year before election	0.29***	0.31***
	(0.01)	(0.02)
1 year after election	0.14***	0.14***
	(0.01)	(0.02)
3 years before elec.*Females share (%)		0.00082
		(0.00)
2 years before elec.*Females share (%)		-0.0018*
		(0.00)
1 year before elec.*Females share (%)		-0.0017*
		(0.00)
1 year after elec.*Females share (%)		-0.00011
		(0.00)
Females share (%)	0.000064	0.00054
	(0.00)	(0.00)
Stability pact municipalities	-0.065***	-0.066***
	(0.02)	(0.02)
Mayor is a male	-0.0024	-0.0023
	(0.02)	(0.02)
Age of mayor	-0.00041	-0.00041
	(0.00)	(0.00)
Years of schooling of mayor	0.00081	0.00079
	(0.00)	(0.00)
Population	-0.000021***	-0.000021***
	(0.00)	(0.00)
Population squared	4.5e-12***	4.5e-12***
	(0.00)	(0.00)
Pop. density (inh./km2)	-0.00061***	-0.00061***
	(0.00)	(0.00)
Term not ended regularly	-0.053***	-0.053***
	(0.02)	(0.02)
Term limited mayor	0.0097	0.0097
	(0.01)	(0.01)
Mean of dep. var.	5.75	5.75
Controls	Y	Y
Year Effects	Y	Y
Year-Region Effects	Y	Y
Municipality Effects	Y	Y
R^2	0.45	0.45
Obs.	64,924	64,924

Notes: Data refer to the period 1999-2009. Dependent variable is the natural log of per-capita capital expenditure expressed in 2005 euros. Female share is the percentage of women in the municipal government. The sample expands over the period 1999-2009. Standard errors are robust to heteroscedasticity and clustered at municipality level.

* p <0.1; ** p<0.05; *** p<0.001.

TABLE 2.3: Female Share and Municipal Spending: Two-Stage Least Squares Estimates I.

	Panel A: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.347*** **	-0.0155***	-0.0147***	-0.00302***	-0.0171***
	(0.00864)	(0.00102)	(0.00129)	(0.000527)	(0.00111)
3 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0102	**0.410*** **	0.000166	-0.00920***	0.00486***
	(0.00694)	(0.00970)	(0.00144)	(0.00116)	(0.00122)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0107	0.00725***	**0.414*** **	-0.00526***	0.000580
	(0.00729)	(0.000957)	(0.00945)	(0.000988)	(0.00157)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.371***	0.000879	0.00515***	**0.790*** **	-0.00801***
	(0.00913)	(0.00148)	(0.00125)	(0.00751)	(0.00158)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0232***	0.00295*	-0.00761***	0.000508	**0.394*** **
	(0.00586)	(0.00129)	(0.00160)	(0.00116)	(0.00912)
F-statistics (Excluded Instruments)	1557.35	433.91	482.66	3021.10	482.19
Mean of dep. var.	17.66	3.03	3.35	3.14	3.46
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.20	0.16	0.16	0.65	0.15
Observations	56,029	62,652	62,652	62,652	62,652

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. The main instrument for each first-stage regression is bold written. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 2.4: Female Share and Municipal Spending: Two-Stage Least Squares Estimates II.

Panel B: Second Stages			
	Preferred specification	No Controls	No Fixed Effects
	(1)	(2)	(3)
	Invest. exp.	Invest. exp.	Invest. exp.
3 years before election	0.091**	0.070*	0.069*
	(0.04)	(0.04)	(0.04)
2 years before election	0.19***	0.18***	0.18***
	(0.04)	(0.04)	(0.04)
1 year before election	0.21***	0.29***	0.22***
	(0.03)	(0.03)	(0.03)
1 year after election	0.095**	0.051	0.14***
	(0.04)	(0.04)	(0.04)
3 years before elec.*Females share^{IV}(%)	0.0061**	0.0075***	0.0040*
	(0.00)	(0.00)	(0.00)
2 years before elec.*Females share^{IV}(%)	0.0029	0.0044**	0.0014
	(0.00)	(0.00)	(0.00)
1 year before elec.*Females share^{IV}(%)	0.0037*	-0.00018	0.0021
	(0.00)	(0.00)	(0.00)
1 year after elec.*Females share^{IV}(%)	0.0016	0.0047**	-0.0039*
	(0.00)	(0.00)	(0.00)
Females share (%)	-0.0072***	0.0012	-0.0073***
	(0.00)	(0.00)	(0.00)
Stability pact municipalities	-0.38***		-0.32***
	(0.02)		(0.02)
Mayor is a male	-0.0076		0.017
	(0.02)		(0.02)
Age of mayor	-0.0016**		-0.0027***
	(0.00)		(0.00)
Years of schooling of mayor	-0.0076***		-0.0071***
	(0.00)		(0.00)
Population	0.0000033***		0.0000028***
	(0.00)		(0.00)
Population squared	-1.1e-12***		-8.5e-13***
	(0.00)		(0.00)
Pop. density (inh./km2)	-0.00020***		-0.00019***
	(0.00)		(0.00)
Term not ended regularly	-0.097***		-0.086***
	(0.02)		(0.02)
Term limited mayor	0.024***		0.064***
	(0.01)		(0.01)
Mean of dep. var.	5.75	5.75	5.75
Controls	Y	N	Y
Year Effects	Y	Y	N
Year-Region Effects	Y	Y	N
Municipality Effects	Y	Y	N
R^2 (Centered)	0.14	0.09	0.06
R^2 (Uncentered)	0.98	0.97	0.97
Obs.	62,652	64,074	62,652

Notes: Data refer to the period 1999-2009. Dependent variable is the natural log of per-capita capital expenditure expressed in 2005 euros. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. Standard errors are robust to heteroscedasticity and clustered at municipality level.

* p <0.1; ** p<0.05; *** p<0.001.

TABLE 2.5: Female Majority and Municipal Spending: Two-Stage Least Squares Estimates I.

	Panel A: First Stages				
	Majority	3 Yrs Bef. Elec.*Majority	2 Yrs Bef. Elec.*Majority	1 Yr Bef. Elec.*Majority	1 Yr Aft. Elec.*Majority
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.000756**	-0.0000149	0.0000489	0.00000227	-0.0000316
	(0.000465)	(0.0000996)	(0.000101)	(0.0000611)	(0.000106)
3 Yrs. Before Elec.*GQ Fem. Share (%)	0.0270***	**0.0275*** **	-0.0000635	0.000145	-0.0000210
	(0.00245)	(0.00253)	(0.0000665)	(0.0000998)	(0.0000524)
2 Yrs. Before Elec.*GQ Fem. Share (%)	0.0277***	0.0000364	**0.0281*** **	-0.0000314	-0.0000829
	(0.00247)	(0.0000574)	(0.00254)	(0.0000468)	(0.0000902)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.0279***	-0.000116	-0.0000285	**0.0287*** **	0.000143
	(0.00246)	(0.000120)	(0.0000971)	(0.00253)	(0.000154)
1 Yr. After Elec.*GQ Fem. Share (%)	0.0256***	0.0000241	0.000173	0.0000380	**0.0258*** **
	(0.00261)	(0.0000643)	(0.000106)	(0.000124)	(0.00265)
F-statistics (Excluded Instruments)	27.48	23.88	24.57	26.14	19.37
Mean of dep. var.	0.05	0.008	0.009	0.009	0.008
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.29	0.45	0.45	0.47	0.40
Observations	4,288	4,288	4,288	4,288	4,288

Notes: Data refer to the period 1999-2009. Majority is a dummy variable equal to 1 if the municipality i has a female share greater or equal to 50%, and zero otherwise. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, Majority is interacted with the electoral cycle's dummies. The main instrument for each first-stage regression is bold written. Standard errors are robust to heteroscedasticity and clustered at municipality level.

* p <0.1; ** p<0.05; *** p<0.001.

TABLE 2.6: Female Majority and Municipal Spending: Two-Stage Least Squares Estimates II.

Panel B: Second Stage	
	(1) Invest. exp.
3 years before election	0.19
	(0.12)
2 years before election	0.23**
	(0.11)
1 year before election	0.27**
	(0.12)
1 year after election	0.20*
	(0.11)
3 years before elec.*Female Majority^{IV}	-0.48
	(2.25)
2 years before elec.*Female Majority^{IV}	-0.82
	(2.30)
1 year before elec.*Female Majority^{IV}	-0.44
	(2.26)
1 year after elec.*Female Majority^{IV}	-0.70
	(2.27)
Majority^{IV}	0.35
	(2.26)
Stability pact municipalities	0.0021
	(0.10)
Mayor is a male	0.019
	(0.05)
Age of mayor	-0.0018
	(0.00)
Years of schooling of mayor	-0.0011
	(0.01)
Population	-0.000026**
	(0.00)
Population squared	2.6e-10**
	(0.00)
Pop. density (inh./km2)	-0.00047***
	(0.00)
Term not ended regularly	-0.10
	(0.07)
Term limited mayor	0.065*
	(0.04)
Mean of dep. var.	5.72
Controls	Y
Year Effects	Y
Year-Region Effects	Y
Municipality Effects	Y
R^2 (Centered)	0.18
R^2 (Uncentered)	0.98
Obs.	4,288

Notes: Data refer to the period 1999-2009. Dependent variable is the natural log of per-capita capital expenditure expressed in 2005 euros. Majority is a dummy variable equal to 1 if the municipality i has a female share greater or equal to 50%, and zero otherwise. The sample expands over the period 1999-2009. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 2.7: Female Share and Disaggregated Expenditures: Two-Stage Least Squares Estimates I.

	Panel A: Second Stages										
	Roads and Territory	Educ	Police	Admin.	Devel.	Tourism	Social	Sport	Services	Culture	Justice
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
3 years before election	0.13**	0.11	0.022	0.076	-0.22	-0.31	0.082	0.38***	0.069	0.029	-0.36
	(0.06)	(0.09)	(0.14)	(0.07)	(0.21)	(0.28)	(0.10)	(0.11)	(0.31)	(0.15)	(0.58)
2 years before election	0.23***	0.27***	0.046	0.18***	-0.14	0.41	0.23**	0.39***	-0.089	0.12	0.41
	(0.05)	(0.09)	(0.13)	(0.06)	(0.19)	(0.28)	(0.09)	(0.11)	(0.27)	(0.14)	(0.53)
1 year before election	0.29***	0.19***	0.22**	0.064	0.039	0.21	0.26***	0.43***	-0.14	0.20	-0.30
	(0.05)	(0.07)	(0.11)	(0.05)	(0.16)	(0.22)	(0.08)	(0.09)	(0.24)	(0.12)	(0.43)
1 year after election	0.17***	-0.014	0.12	0.071	-0.22	-0.049	0.11	0.23**	0.31	-0.100	-0.71
	(0.05)	(0.09)	(0.13)	(0.06)	(0.19)	(0.26)	(0.09)	(0.11)	(0.30)	(0.14)	(0.45)
3 years before elec.*Females share^{IV}(%)	0.0033	0.0061	0.0030	0.0045	0.012	0.018	0.0083	-0.012*	-0.0058	0.0060	0.0085
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.04)
2 years before elec.*Females share^{IV}(%)	0.0013	-0.0018	-0.0011	0.00046	0.011	-0.011	-0.0011	-0.0082	0.0045	0.00048	-0.039
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.04)
1 year before elec.*Females share^{IV}(%)	0.0031	-0.00098	-0.011*	0.0057*	0.0028	-0.0062	-0.0016	-0.015***	0.0057	-0.0022	-0.0052
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.03)
1 year after elec.*Females share^{IV}(%)	-0.0022	0.011**	-0.0026	0.0020	0.011	0.00056	0.0015	-0.0092	-0.030	0.0061	0.026
	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.03)
Females share^{IV}(%)	-0.0098***	-0.00069	0.020***	-0.0062*	0.0019	0.0073	0.0065	0.018***	0.013	0.0054	-0.044
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)	(0.01)	(0.03)
Mean of dep. var.	4.99	2.91	0.64	3.43	2.25	2.63	2.49	2.62	2.20	1.91	0.80
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R^2 (Centered)	0.13	0.04	0.12	0.05	0.18	0.25	0.06	0.12	0.20	0.14	0.23
R^2 (Uncentered)	0.94	0.78	0.28	0.85	0.59	0.67	0.70	0.74	0.57	0.55	0.33
Obs.	63,259	42,598	13,048	58,268	12,515	8046	45,602	32,785	7,215	22,870	1,603

Notes: Data refer to the period 1999-2009. In each column, the dependent variable is a different category of per-capita expenditure expressed in 2005 euros. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

Chapter 3

Local Fiscal Multiplier: What Do We Know about Italy?

Local fiscal multiplier measures the effect on income of an increase in public spending. By using the exogenous variation in local spending coming from the Domestic Stability Pact we analyze its impact on declared personal income. Given that, since 2001 this tax rule is not binding for municipalities under 5,000 inhabitants, we adopt a quasi-experimental setting. Our diff-in-diff estimates show that for municipalities subjected to DSP constraints, despite the reduction of their investment expenditures, the effect on local income is higher than for exempted municipalities (even though the point estimate is far away from 1). Spatial econometrics methods confirm that the impact of municipal investment spending on declared income is very modest and is not affected by any spatial dispersion between adjacent geographical areas.

Keywords: fiscal rules, government expenditure, local government, personal income, spatial econometrics.

JEL Codes: D72, E62, H71

3.1 Introduction

With many economies near or already at the Zero Lower Bound and then with their central banks unable to adopt conventional monetary policies, the study of the effects of fiscal policy is at the center of the debate among economists. The main transmission mechanism of fiscal policy, which numerically summarizes its degree of effectiveness, is represented by the fiscal multiplier. Thus, the value assumed by this indicator is of crucial importance for the definition of the national economic policy.

If the initial contributions studied the macroeconomic effects of the multiplier by using national aggregates, most recent literature focuses on local effects. Acconcia et al. [2014] motivate this choice thanks to the considerable advantages obtained in terms of identification strategy, achieved by exploiting the institutional architecture of a given country. Indeed, subnational bodies such as provinces and municipalities are subjected to fiscal and monetary policies which, being implemented at national level, are largely unresponsive to their idiosyncratic conditions.

Even more debate has taken place in Italy. Last Italian national elections (2018) saw the main populist parties, namely Five Stars Movement and Northern League, in the top two positions. This wave of populism, with regard to economic policy, seems to be bounded together by a single goal: generating growth through massive injections of public spending. The rationale behind both political programs relies on the existence of fiscal multipliers greater than 1, which imply that an increase in public spending has an expansive effect on income that is more than proportional. At the same time, Italy is characterized by very high levels of public debt, which makes problematic carrying out expansive fiscal policies without violating European treaties and triggering dangerous tensions on spreads.

The figure just pointed out makes the study on the effects of local fiscal multiplier stimulating. In addition to that, very few studies have investigated this topic referring to Italy, then more research is needed. To date, only two papers have studied the Italian case: *i*) Acconcia et al. [2014], by using data on Italian provinces for the period 1990-1999, instrument the capital expenditures growth rate with the dismissal of city councils due to Mafia infiltration. Those exogenous spending contractions lead to an estimated multiplier of 1.5. *ii*) Trezzi and Porcelli [2016] investigate on all 305 municipalities located in the Abruzzo region over the period 2002-2011. They exploit as a source of exogenous variation in public spending the reconstruction grants following the 2009 L'Aquila earthquake. Their 2SLS estimates show that the local fiscal multiplier stands at 0.71.

This paper aims at studying the dynamic effects of local public spending on local economic activity, proxied by declared personal income. Our analysis on local fiscal multiplier uses the exogenous variation in local investment expenditures coming from the Domestic Stability Pact (*Patto di Stabilita' dei comuni* or *Patto di Stabilita' Interno*). Given that, since 2001 municipalities with fewer than 5,000 inhabitants have been excluded from its fiscal constraints (mainly for scale-economies reason), we set a quasi-experimental framework by splitting Italian municipalities in two groups on the base of this population threshold.

Our results show that, *ceteris paribus*, for non-constrained municipalities, the estimated fiscal multiplier is very small scaled. Its impact on declared personal income stands at less than 1 cent (about 0.006). For municipalities subjected to DSP, despite the reduction of their investment expenditures, the effect on local income is much higher (even though, still, the point estimate is far away from 1): the estimated multiplier is 3 cents higher. If we include both dynamic effects of past investment expenditures and income, the difference in the estimated declared personal income growth rate is 6 cents higher for DSP municipalities. Robustness checks confirm that our estimates are not conflated neither by the effects of subprime mortgage crisis and the European debt crisis nor by any spatial dispersion. As a matter of fact, by running spatial fixed-effects regressions and by aggregating at provincial level the municipal variables, we find that the (potential) spatial dispersion in the impact of investment expenditures on income is totally negligible.
Our results align to Cohen et al. [2011]; Clemens and Miran [2012] and Trezzi and Porcelli [2016] which document limited stimulating capabilities of local government spending.

The structure of the paper is as follow: section 3.2) reviews the literature on local fiscal multiplier; section 3.3) introduces administrative aspects of Italian local governments; section 3.4) describes the data used in the empirical analysis; section 3.5) clarifies the econometric strategy and the results achieved; section 3.6) reports the robustness checks and the spatial analysis; section 3.7) concludes.

3.2 Literature Review

The literature on the transmission mechanisms of fiscal policy through the local multiplier establishes a newborn and rapidly expanding field. Many recent studies have devoted their attention to the study of local fiscal multiplier by using sub-national level data. Chodorow-Reich [2019] provides an exhaustive review of both theoretical facts and empirics of local fiscal multiplier. The core of this literature is mainly grounded on US empirical evidence (see Auerbach et al. [2019] for a summary). A first line of studies uses historical variations in public spending occurred during 1930s to isolate multiplier effect of fiscal policies. Hausman [2016] investigates the effect of Veterans bonus payment in 1936 by using the spatial distribution of World War I veterans. The primary evidence comes from household consumption survey which allows to measure veterans' marginal propensity to consume. Hausman [2016] finds that veterans' spending was concentrated on durable goods such as automobiles purchases and new buildings. The increase in spending on cars and new buildings is higher in those cities (and states) where a higher percentage of veterans is settled.
Fishback and Kachanovskaya [2015] instrument the government grants allocated during the New Deal by exploiting a swing voting measure across US federal states for the period 1930-1940. Their estimates highlight a multiplier for public work grants of close to but below one (between 40 and 96 cents).

A bunch of papers (Chodorow-Reich et al. [2012]; Conley and Dupor [2013]; Dupor and Mehkari [2016]; Wilson [2012]) use as exogenous variations of fiscal policy the public spending related to the *Medicaid* program or the *American Recovery and Reinvestment Act* (*ARRA*) funds[1].

Other studies attempt to provide supporting empirical evidence by means of brilliant identification strategies. Adelino et al. [2017] base their identification strategy on the variation in the borrowing cost resulting from the upward recalibration of Moody's rating on municipal bonds. Their sample consists of 1,768 counties (which correspond to about 60 percent of total US counties) for the period 2007-2013. When the rating upgrades, the debt capacity of local governments raises bringing to an expansion of local expenditures. The estimated local multiplier records a point estimate of 1.9. However, this result appears questionable as the reduction in interest rates after the revision of the rating seems too small to justify such a high effect on income and employment.

Suárez Serrato and Wingender [2016] use as identification strategy the reallocation of funds across US counties following revisions in the estimates of local population. Several federal transfers to local government depend on local population, but the census of population is done every ten years. In the meanwhile, the Census Bureau provides an estimate of the local population by using data on births, deaths and migration flows. When the Census occurs, as a matter of fact, there is an increment in federal payments due to measurement errors which bring to a revision in the estimates of local population. The reallocation of funds following those revisions provides an exogenous variation in fiscal policy which brings to an estimated income multiplier ranging from 1.7 to 2.

Nakamura and Steinsson [2014] gather information on state and regional output and spending for the period 1966-2006. Nakamura and Steinsson [2014], by using bi-annual data and looking at state-level relative to national-level military spending in the US, find a fiscal multiplier which swings from 1.4 to 1.9.

On the other hand, some papers document a limited stimulating capabilities of local government spending. Cohen et al. [2011] use changes in congressional committee chairmanships as a source of exogenous variation: when a member of the states Congressional delegation becomes the chair of an important committee there is an increase in state-level federal expenditures. By using a sample of 16,734 US firms over the years 1967-2008, the estimated effect of those spending shocks appears to significantly dampen investments in new capital and R&D, employment and sales of the firms. In addition to that, when there is a reversion of the spending shocks, for instance due to a relinquishing of a chairmanship, most all of the documented effects are reversed. Clemens and Miran [2012], by using a lightening of state balanced budget requirements among US states as identification mechanism, estimate a spending multiplier standing close to zero (the point estimate is 0.29 while the upper bound reaches the value of 0.8).

[1]Since those articles investigates the effects on the employment of fiscal measures just mentioned and, given that the goal of our paper is to target the effect of public spending on income, we do not explore them in details.

The empirical evidence outside the US is rather meager. Brückner and Tuladhar [2014] use a timing assumption in the spirit of Blanchard and Perotti [2002] and apply dynamic panel data estimator (system GMM) to investigate the effect of yearly variation in the public spending of 47 Japanese prefectures during the period 1990-2000. Their results indicate a multiplier lower than 1. Noteworthy, the value of the multiplier is higher for locally-financed public investment than centrally-financed ones.

As regards the Italian context, only two studies have been carried out. Acconcia et al. [2014] use data on Italian provinces for the period 1990-1999. Those authors instrument the capital expenditures growth rate with the dismissal of city councils due to Mafia infiltration. Upon evidence of Mafia infiltration, Law 164/1991 contemplates the dismissal of all elected local officials who are replaced by three external commissioners delegated by the central governments. The commissioners, as soon as they are appointed, usually cut all public investment projects. This translates into a quasi-experimental variation in fiscal policy which, being temporary and unanticipated, makes it possible to avoid endogeneity concerns. Those exogenous spending contractions lead to an estimated multiplier of 1.5 (1.9 if its dynamic effects are considered). Trezzi and Porcelli [2016] investigate all the 305 municipalities located in the Abruzzo region over the period 2002-2011. They exploit as a source of exogenous variation in public spending the reconstruction grants following the 2009 L'Aquila earthquake (in Italy). 2SLS estimates show that the local fiscal multiplier stands at 0.71.

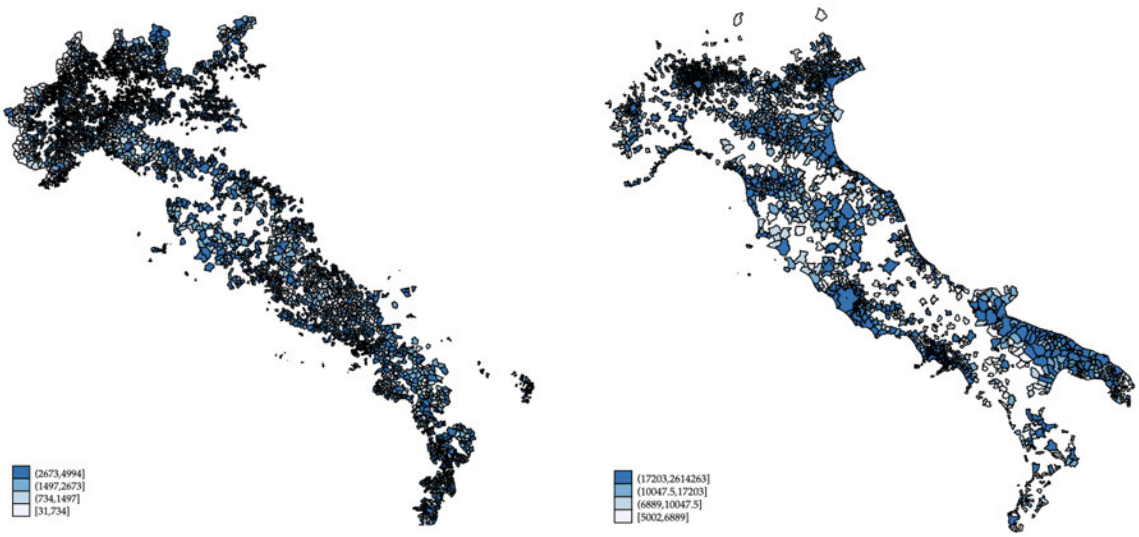
3.3 Administrative Aspects of Italian Municipalities

The Italian decentralization of government includes three levels: the Regions, the Provinces and the Municipalities. The Municipalities are grouped within 110 Provinces and 20 Regions. The Regions are mainly involved in the provision of health services. Provinces perform functions related to road maintenance and environmental protection, while Municipalities are responsible for services such as public lighting, urban road maintenance, local transport, waste disposal, social assistance and primary school. The decision-making bodies, at the municipal level, are: the mayor (*Sindaco*); the Executive committee (*Giunta comunale*) appointed and chaired by the Mayor, and the Municipal Council (*Consiglio comunale*), endowed with legislative power.

The Stability and Growth Pact, introduced in 1997 between EU member States, has been implemented in Italy also at sub-national level through the so-called *Domestic Stability Pact* (DSP) with the aim to make local governments more accountable [2]. Constrained and unconstrained municipalities can accumulate debt, but if they encounter fiscal distress they must go through a special procedure of budget consolidation (*Piano di Risanamento*). DSP's rules are revisited every year. Initially, the budget rules have been set in terms of budget deficit (*budget balance target*). The main variable under control was the *fiscal gap*, defined as municipal deficit net of transfers and debt service. Since 2005, these rules have been expressed in terms of expenditures growth rate. The punishment for not complying with the DSP includes penalties such

[2] Law No. 448/1998.

FIGURE 3.1: Population Size of Italian Municipalities



(A) Municipalities with less than 5,000 inh.

(B) Municipalities with more than 5,000 inh.

Notes: Panel a reports municipalities with a resident population lesser than 5,000 inh. and then exempted from DSP rules. Panel b plots constrained municipalities. Data refer to the year 2012.

as: *i*) 5 percent cut in the annual transfer from central government; *ii*) ban on municipalities hires and *iii*) 30 percent cut on reimbursement and non-absenteeism bonuses for the municipal administration's employees. Cities complying with DSP, instead, benefit from a reduction on interest for loans from the central government[3].

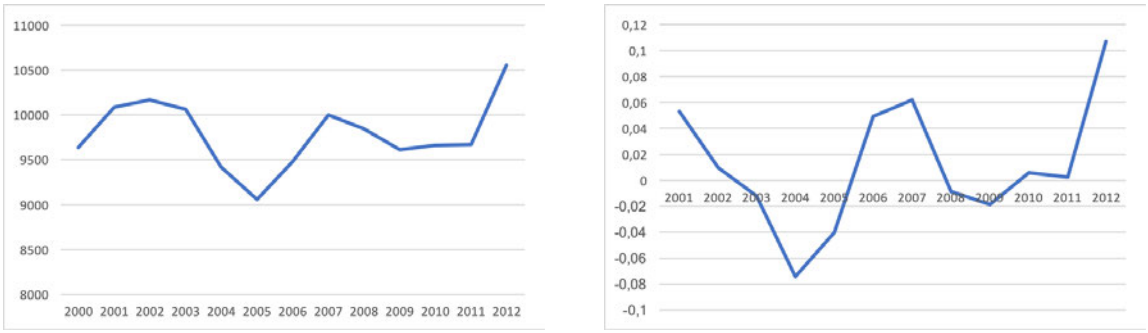
Since 2001, municipalities with fewer than 5,000 inhabitants have been excluded from the rules of the DSP. Smaller municipalities, in fact, may be disadvantaged by economies of scale in managing the municipal government and fiscal constraints can be excessively burdensome for them. Fig. 3.1 reports municipalities subject (panel 3.1a) and not subject (panel 3.1b) to the DSP rules, respectively.

3.3.1 Electoral Rules

The electoral system assumes different characteristics if the municipality has or not a population lesser than 15,000 inhabitants. Below this threshold a simple plurality system is applied and each candidate can be supported only by a single list. Over this threshold, candidates may be supported by more than one list, and, if none of the candidates reaches the absolute majority of the votes at the first round, a round-off takes place. Below the 15,000 inhabitants threshold, the list supporting the winning candidate receives two-thirds of the council seats, while above this threshold, the lists supporting the elected mayor get 60 percent of the seats. The size of municipal bodies also depends on the population level: the municipal council (*Consiglio comunale*) can range from 12 to 60 members, while the members' number of the Executive committee (*Giunta comunale*) ranges from 4 to 16. From 1993 onwards, the mayors cannot

[3]Municipalities' debt can be financed through: *i*) bonds' emission (*Buoni Obbligazionari Comunali*); *ii*) loans from *Cassa Depositi e Prestiti* (a central administrative agency) and from private banks.

FIGURE 3.2: Local Income



(A) Declared Personal Income (B) Declared Personal Income - Growth Rate

Notes: Declared personal income is expressed in 2005 euros, deflated through St. Louis FED GDP deflator. Growth rate of per capita declared personal income is calculated as year on year change divided by previous year's per capita declared personal income. Municipalities from Italian special Regions are excluded from the sample.

remain in office for more than two consecutive terms, unless (from April 1999) there is an early interruption of the mandate for reasons other than early resignations and, in any case, before half their term has expired. Recently, re-eligibility for a third consecutive term is only permitted in municipalities with a population of less than 3,000 inhabitants[4].

3.4 Data

The effects of investment expenditure on declared personal income are tested by using a dataset of 6,700 Italian municipalities (out of about 8,100). Municipalities belonging to special autonomy Regions (*Regioni a Statuto Speciale*) were excluded because they are allowed to set their own fiscal and electoral rules[5]. Different sources have been consulted for procuring the necessary information. Declared personal income comes from Italian revenue agency (*Agenzia delle Entrate*). Revenues and expenditures data have been extracted from (annual) municipalities' balance sheets[6].

Final dataset contains information on local elections and mayors (gender; age; years of schooling). Balance sheets and electoral variable have been provided by the Ministry of Internal Affairs. Data from National Statistical Office (*ISTAT*) are used to explore the demographic and geographic characteristics of municipalities.

Table 3.1 reports descriptive statistics of our variables. From a geographical point of view, the average municipality has a surface of 34km^2; a population of 7,398 inhabitants with a density of 311 inhabitants per km^2.

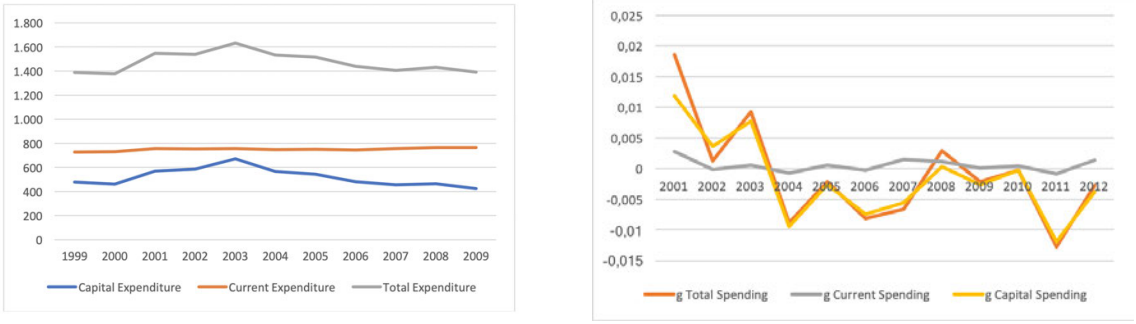
Declared personal income (Fig. 3.2a) has an average level of 9,787 euros and it shows some fluctuations in its path, even though it appears stationary on average. From Fig. 3.3a,

[4]Law 56/2014.

[5]Special autonomy Regions are: *Friuli-Venezia-Giulia*; *Sardinia*; *Sicily*; *Trentino-Alto-Adige* and *Valle d'Aosta*.

[6]These data are deflated to 2005 euros using FRED (St. Louis) GDP deflator.

FIGURE 3.3: Local Expenditures

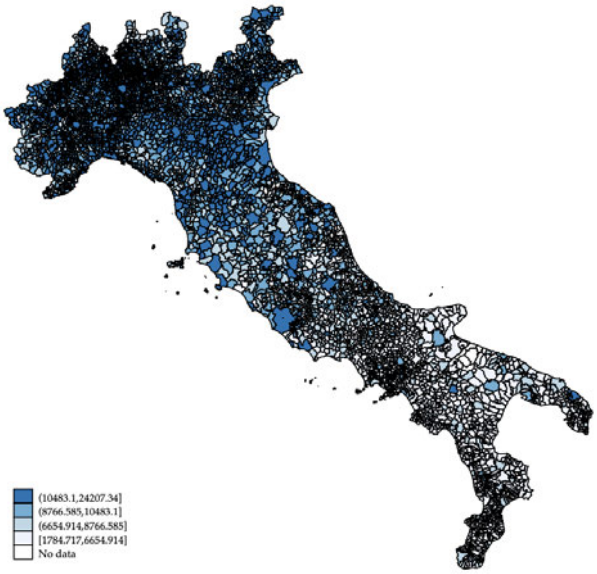


(A) Municipal Spending (B) Municipal Spending - Growth Rates

Notes: Expenditures are expressed in 2005 euros, deflated through St. Louis FED GDP deflator. Growth rates of expenditures are calculated as year on year changes divided by previous year's per capita declared personal income. Municipalities from Italian special Regions are excluded from the sample.

current expenditure appears constant over time with an average value of 754.6 euros per capita. Capital expenditure shows a slightly more fluctuating trend (decreasing after 2003) with an average value of 486.6 euros per capita. Total expenditures appear aligned to the total revenues and this brings to a relatively low level of per capita deficit (14.8 euros), while the average value of local debt is very high and stands at 777.6 euros per capita.

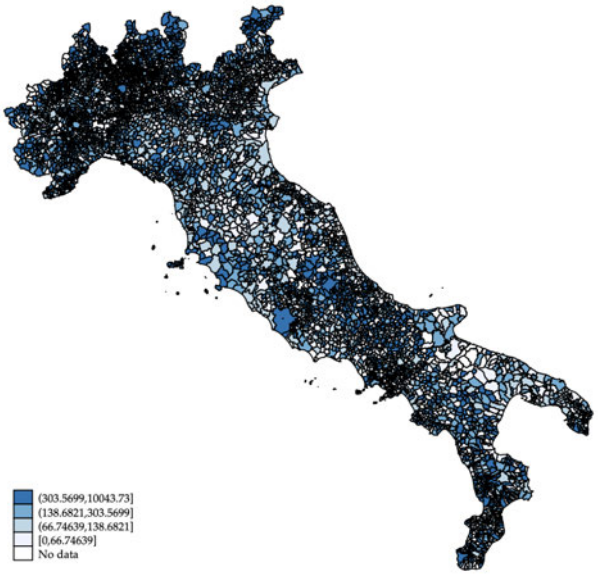
FIGURE 3.4: Map of Declared Personal Income



Notes: Growth rate of per capita declared personal income calculated as year on year change divided by previous year's per capita declared personal income. Municipalities from Italian special Regions are excluded from the sample.

Both declared personal income (Fig. 3.2b) and capital expenditure (Fig. 3.3b) growth rates record very small variations (in absolute values) even though some dynamic is detected in their paths. As expected, the growth rate of current expenditure appears constant over time confirming the rigidity of this variable. Fig. 3.3 and Fig. 3.4 map the geographical distribution of the declared personal income and the capital expenditure, respectively: while

FIGURE 3.5: Map of Capital Expenditure



Notes: Growth rates of capital expenditures calculated as year on year changes divided by previous year's per capita declared personal income. Municipalities from Italian special Regions are excluded from the sample.

capital expenditure seems to be distributed fairly evenly, income assumes higher values in the central-northern regions[7].

In order to elaborate a more detailed comparison and to take into account changes in economic variables potentially related to the demographic size of Italian municipalities, we report descriptive statistics by splitting our sample in three sub-categories by means of 5,000 and 15,000 inhabitants thresholds. Bigger municipalities show a higher per capita declared personal income. On the contrary, smaller municipalities detect a slightly larger per capita declared personal income growth rate. In principle, we can see a wide difference in the level of capital expenditure between municipalities below 5,000 inhabitants, exempted from DSP rules, and those between 5,000 and 15,000 inhabitants, subjected to the DSP rules (579.5 vs 272.8 per capita euros). Interestingly, municipalities with more than 15,000 inhabitants show the same average capital expenditures as those between 5,000 and 15,000 inhabitants. On the contrary, the gap in the current expenditure is less pronounced and more balanced. Expenditures growth rates do not show differences with respect to population thresholds.

The results in the descriptive statistics about income and spending, seem to confirm the local public finance theory's predictions, according to which, as the demographic dimension increases, in terms of population and density, efficiency gains should be achieved. Nevertheless, also an increasing complexity in the management is connected to the increase of the population. On the contrary, a higher per capita income is expected on bigger municipalities, because those are supposed to hold a higher concentration of economic activities and business units.

[7]Both the correlations between income and capital expenditure and their growth rates are remarkably low as these stand at less than 1 percent.

3.5 Econometric Strategy

Following Acconcia et al. [2014], the multiplicative effect of public spending on income is analyzed by isolating its capital expenditure component. The largest part of capital expenditure consists of investments and, for municipalities below the 5,000 inhabitant thresholds, it is excluded from the constraints imposed by DSP in most of the years within our dataset. Moreover, the literature in this field suggests that capital spending has a greater potential expansive effect than current spending, given that the higher amount of current expenditure consists of very rigid items, such as compensation of employees and interests on debt.

According to Barro and Redlick [2011], the multiplier of public expenditure is estimated by relating the annual variation in local investment spending to the growth of declared personal income at the municipal level. For each municipality, $y_{i,t}$ is the real per capita declared personal income and $Y_{i,t}$ represents its growth rate; likewise, $g_{i,t}$ denotes local real per capita investment expenditures and $G_{i,t}$ expresses year on year change as a ratio of lagged declared personal income. More in details, $Y_{i,t}$ and $G_{i,t}$ are defined as:

$$Y_{i,t} \quad \frac{(y_{i,t} - y_{i,t-1})}{y_{i,t-1}} \qquad G_{i,t} \quad \frac{(g_{i,t} - g_{i,t-1})}{y_{i,t-1}} \tag{3.1}$$

The short-run multiplicative effects of capital spending on declared personal income is estimated by means of the following regression:

$$Y_{i,t} \quad \alpha + \beta' G_{i,t} + \gamma' \mathbf{X}_{i,t} + \mu_i + \lambda_r \times \delta_t + \epsilon_{i,t} \tag{3.2}$$

$Y_{i,t}$ is the rate of growth of per-capita declared personal income for municipality i in year t. β' measures the effect of local capital spending multiplier. $\mathbf{X}_{i,t}$ is the vector of control variables. Municipality fixed effect, μ_i, captures local level unobservable determinants of our outcome of interest. Using disaggregated data at municipal level, endogeneity issues may arise from the fact that the criteria relating to the allocation of resources may depend on specific characteristics of the municipalities. For example, municipalities characterized by low per capita income levels could be recipients of greater resources in order to trigger some growth. These circumstances are captured by introducing municipal fixed effects into the model. δ_t counts for the year effects. Year fixed effects capture the effects of the fiscal and monetary policies implemented at national level. Not checking those aspects would lead the local fiscal multiplier estimate to muddle the fiscal shock effects with those of budgetary and monetary policy. Potential geographic differentials in the various areas of the country are taken into account by means of a Region-year interaction, $\lambda_r \times \delta_t$. $\epsilon_{i,t}$ is the idiosyncratic error term which includes all unobserved factors. Standard errors are clustered at municipality level.

In order to check for local cyclical aspects, the model needs some dynamic characteristics, thus we add $t-2$ lags of the growth rates of declared personal income and local investment

spending. In fact, as pointed out by Blanchard and Perotti [2002], the key identifying assumption in SVAR models consists of the fact that the lags of $G_{i,t}$ are predetermined with respect to $Y_{i,t}$. Then, the lags of $G_{i,t}$ allows to estimate the dynamic multiplier.

In addition to that, when working with panel data some problems may derive due to situations of serial correlation and spatial correlation between the observed statistical units. Adding two lags of the dependent variable allows us to properly deal with serial correlation problems. Regarding the spatial correlation, Guiso et al. [2004] argue that the provinces (and the municipalities) within the same region are correlated to each other due to an unobservable cluster effect arising from common regional rules and policies. To take this into account, we include regional fixed effects in our model in addition to municipal fixed effects.

3.6 Results

We start the empirical analysis by running a standard (dynamic) OLS regression (Table 3.2). The empirical specification in column 1 includes temporal fixed effects (also the interaction between regional fixed effects and year effects). In column 2 municipal fixed effects are added. In order to evaluate the robustness of results, regression reported in column 3 counts for all fixed effects, while control variables are excluded. On the contrary, in column 4 controls are included while any type of fixed effect is ruled out.

We consider just the municipalities with a residential population lesser than 15,000 inhabitants[8]. This subdivision is carried out for two reasons: *i*) for excluding larger municipalities that may have different economic and financial dynamics due to significative socio-demographic differences; *ii*) to obtain a small sample of municipalities subject to the same electoral system[9]. Indeed, several studies show that differences in electoral system lead to important divergences in fiscal outcomes (Persson and Tabellini [2002]; Milesi-Ferretti et al. [2002]; Ferraresi et al. [2015]). Thus, pooling municipalities with different electoral systems into a single sample can be a source of bias.

Considering fixed effects model in column 2 as baseline regression, the estimated fiscal multiplier and its $t-1$ coefficient are both statistically significant, but their impact is very small in size. Namely, an additional euro of local capital expenditures makes personal income increasing for less than 1 cent (0.007). Given that the first lag of the income growth rate is significantly different than zero, the point estimate of the dynamic multiplier accounting for lagged income effect is even lesser and it stands to 0.006. This value comes from taking the ratio between the estimate of β and one minus y_{t-1}[10]. Said differently, a variation in local capital

[8] Italy is characterized by a large number of small size municipalities. It is worth mentioning that 70 percent of the municipalities have a population of less than 5,000 inhabitants, while 90 percent of the total has a population that does not exceed the threshold of 15,000 inhabitants.

[9] A different electoral system is applied to municipalities with more than 15,000 inhabitants (see paragraph on administrative aspects).

[10]
$$\frac{G_{i,t}}{1-Y_{i,t-1}} = \frac{0.0075}{1+0.28} = 0.00586 \simeq 0.006$$

expenditures by 1 percent of local declared personal income yields to a cumulative expansion of declared personal income of 0,006 cents.

Under the assumption that lagged spending is exogenous to current income level, it is possible to further analyze the dynamic effects of fiscal multiplier. This is done by adding up the one-year lagged value of spending growth to its contemporaneous value (statistically different than zero). The point estimate of the dynamic local multiplier, after correcting for the impact of the first lag of the dependent variable, stands to 0,012[11]. As a matter of fact, OLS regression (column 1) is in line with the fixed effects regression (column 2). Colum 3 reports our main regression without controls; in this case the coefficient of interest gets down-biased, meaning that chosen regression contribute to explain the investigated phenomenon. In column 4, the exclusion of time effects leads to smaller multiplier coefficients record, as the estimates incorporates the national decreasing trend in local public spending (see Fig. 3.3).

About other covariates: polynomial population coefficients suggest their non-linear effect on local income. In general, all the additional control variables, independently than their sign, have such a small magnitude that their importance ends up being negligible. It seems that local income is slightly responsive to variables related to the institutional environment such the age (positive sign) or the gender of the mayor (negative sign for male mayors). Mayor's educational level comes as not statistical significant. Finally, we checked if the ineligibility of the mayor or an early decommissioning of the municipal bodies may have any effect on income: in both case the estimated coefficients are not significant.

3.6.1 Domestic Stability Pact Effects

In the previous section, we provide some results on the effect of growth rate of capital expenditures on local income's growth rate. As pointed out in macro-literature, we added both lagged dependent variable and lagged main regressor ($G_{i,t}$) in our baseline model in order to get a more solid internal validity. Despite this, some endogeneity concerns still persist. In particular, it is well known that income and public expenditures, for several reasons, move together. *Wagner's law*, for instance, states that public spending increases as a consequence of the economic development[12].

In order to carry out a clearer and stronger identification strategy, rather than (only) using internal instrument we need an exogenous variation in public spending. Such a variation is detected by means of the fiscal constraints posed by DSP. Grembi et al. [2016] show that relaxing DSP's rules for municipalities with less than 5,000 inhabitants increases deficits and

[11] $$\frac{G_{i,t} + G_{i,t-1}}{1 - Y_{i,t-1}} = \frac{0.0075 + 0.0082}{1 + 0.28} = 0.01226 \simeq 0.012$$

[12] Evidence from UK for the period (1891-1955) shows that the increase in revenue to the government due to the economic development ended up for boosting public expenditure. In addition to that, governments cannot ignore voters' demand for public goods and services, especially when there is an increase in revenue collection.

lowers taxes. The effect is larger if the mayor can be reelected, the number of parties is higher, and voters are older. Chiades and Mengotto [2013] argue that the drastic drop in municipal investments is attributable to the DSP.

To estimate the effect of the DSP on the local fiscal multiplier we interact the capital expenditure growth rate with a dummy variable equals to 1 when a municipality is subjected to DSP's contraints[13]. The econometric specification becomes:

$$Y_{i,t} \quad \alpha + \beta_1' G_{i,t} + \beta_2' G_{i,t} \times DSP + \gamma' \mathbf{X}_{i,t} + \mu_i + \lambda_r \times \delta_t + \epsilon_{i,t} \tag{3.3}$$

Estimation results are reported on Table 3.3. The effect of DSP on declared personal income (the variable *Stability pact municipalities*), even if pretty small (1 cent higher), is positive and statistically significant at 1 percent for constrained municipalities. Estimated fiscal multiplier for municipalities not subjected to DSP's constraints stands at less than 1 euro-cents (0.007). Interacting the capital expenditure growth rate with the dummy variable for municipalities subjected to DSP brings to a higher point estimate of 3 cents. Stated differently, for constrained municipalities a one more euro of declared personal income invested in capital expenditures (i.e. public investment) leads to a 3 cents higher fiscal multiplier than for municipalities not subjected to DSP rules. In general, lagged values of declared personal income's growth rate do not record statistical differences between two groups of municipalities. On the contrary, the lags of the capital expenditures growth rate are higher for municipalities subjected to the DSP with a 1 percent statistical significance. A reasonable explanation could be that constrained municipalities, being subjected to fiscal constraints, end up adopting more virtuous and sustainable spending policies which trigger a higher local fiscal multiplier than for non-constrained municipalities, which run more discretionary fiscal policies.

This proposition is confirmed also if we calculate the dynamic effect of local fiscal multiplier. In fact, discriminating between control and treatment groups, the dynamic multiplier has a point estimate standing at

$$\frac{G_{i,t}}{1 - Y_{i,t-1}} \quad \frac{0.0066}{1 + 0.28} \quad 0.00516 \simeq 0.005$$

for municipalities not subjected to DSP, while for constrained cities it records a positive difference of

$$\frac{G_{i,t_{DSP}}}{1 - Y_{i,t-1}} \quad \frac{0.030}{1 + 0.28} \quad 0.02344 \simeq 0.02^{14}$$

As a further result, given that lagged spending is by construction exogenous to current income level, a different version of the dynamic multiplier accounting for the (1 percent statistically significant) effect of lagged income stands at

[13] This variable is equal to zero for municipalities under 5,000 inhabitants from 2001 onwards.

[14] The denominator contains the same number for both dynamic multiplier calculations because the regression does not show any significant difference on the $t-1$ lag of declared personal income between constrained and non-constrained municipalities.

$$\frac{G_{i,t} + G_{i,t-1}}{1 - Y_{i,t-1}} \quad \frac{0.0066 + 0.0071}{1 + 0.28} \quad 0.01070 \simeq 0.01$$

for municipalities without fiscal constraints and at

$$\frac{G_{i,t_{DSP}} + G_{i,t-1_{DSP}}}{1 - Y_{i,t-1}} \quad \frac{0.030 + 0.040}{1 + 0.28} \quad 0.05469 \simeq 0.06$$

for DSP municipalities.

As for the other covariates, their estimated magnitude as well as their signs remain stable with respect to the previous regression, the only discrepancy is recorded on the coefficient related to the density which now becomes not significant.

3.6.2 Robustness Checks and Spillover Analysis

In this section we run several robustness check in other to test the stability of our results among different model specifications. First of all, we restrict our sample to the period 2000-2007 in order to exclude the possible effect of financial crisis on our estimates (Table 3.4, column 2). Regression's results show that magnitudes, signs and statistical significance of coefficients are very stable even if we reduce the time dimension of the sample. The estimated fiscal multiplier for municipalities subjected to DSP rules does not change among the two regressions. On the contrary, using the 2000-2007 sample, fixed effects regression suggests that the fiscal multiplier for municipalities exempted from fiscal constraints is not significant.

As further control, to take into account that, due to their demographic size, municipalities can have different trends of public spending and local income, we restrict the sample in the population band between 3,500 and 7,000 inhabitants[15] (Table 3.4, column 3). Once again, we get the same results as in the previous robustness check, namely: fiscal multiplier for non-DSP municipalities is not significant, while the estimations for DSP municipalities are in line with the ones from main regression.

Finally, some doubts may arise from the consideration that spending variations in one city may influence economic processes in neighboring municipalities. Those spillovers can spread up through different channels. From the one hand, the demand's contraction affecting one municipality may reverse into nearby areas, concurrently pushing down economic activity within and outside the city where the spending is cut. Demand spillovers may generate a positive correlation as in response of added value in contiguous cities. On the other hand, productions factors can spatially relocate as a consequence of their departure from the cities hit by fiscal consolidation. The fall in the economic activity in the cities subjected to DSP's constraints may translate in a raising economic activity in neighboring municipalities due to production factors relocation. This induces a negative correlation in the response of local income across borders.

[15] We restrict the sample to the interval 3,500-7,000 inhabitants to stay relatively far from the 3,000 threshold, where other policies change (i.e. wage of mayors and of the executive committees, which can motivate more competent politicians to join the political arena, triggering better economic outcomes), and to balance the sample size on either side of the 5,000 threshold.

If those spillovers were statistically significant, our previous estimate may fail to count a non-negligible portion of the output effects of investment expenditure by conflating both demand leakages and relocation effects.

In order to investigate the cross-border effects of local investment spending on declared personal income, we proceed in two different ways: we rely first on *i*) spatial econometrics techniques in order to calculate potential spillovers and, secondly, *ii*) for each variable involved in the analysis, we calculate an aggregate value by taking its mean by province.

As far as it concerns the point *i*), we adopt the following *spatial diff-in-diff*:

$$\begin{aligned} Y_{i,t} \quad & \alpha + \beta_1' G_{i,t} + \beta_2' G_{i,t} \times DSP + \beta_3' \mathbf{W} G_{i,t} + \beta_4' \mathbf{W} G_{i,t} \times DSP \\ & + \gamma' \mathbf{X}_{i,t} + \lambda' \mathbf{W} \mathbf{X}_{i,t} + \mu_i + \delta_t + (\mathbf{I} - \rho \mathbf{W})^{-1} \epsilon_{i,t} \end{aligned} \tag{3.4}$$

$Y_{i,t}$ is the rate of growth of per-capita declared personal income for municipality i in year t. $\mathbf{W}$ is the contiguity matrix (or spatial weighting matrix) which characterizes the spatial relationships between areas. Since it is reasonable to believe that there are spillover effects from adjacent areas and even from areas adjacent to adjacent areas, the contiguity matrix has been created as a *first-second order matrix*, i.e. not only the neighbors which share a vertex with the municipality i are supposed to impact on the latter, but also the "neighbors of the neighbors". DSP is a dummy equals to zero for municipalities under 5,000 inhabitants from 2001 onwards. β_2' measures the difference in the magnitude of local capital spending multiplier with respect to β_1'. β_4' and β_3', respectively, are their "spatial" counterparts which allow to decompose the total impact of investment expenditure on income between direct and indirect effect of neighboring municipalities[16]. $\mathbf{X}_{i,t}$ is the vector of control variables (e.g. population and density[17]). λ' measures the adjacent areas' effects of control variables on income's growth rate. Municipality fixed effect, μ_i, captures local level unobservable determinants of our outcome of interest. δ_t counts for the year effects which capture the effects of the fiscal and monetary policies implemented at national level. $(\mathbf{I}-\rho\mathbf{W})^{-1}\epsilon_{i,t}$ is the idiosyncratic spatial autoregressive error term which allows nearby errors to affect outcomes and it includes all unobserved factors.

Spatial autoregressive (SAR) models require very restrictive conditions on the data in order to be exploitable. In particular, *i*) data structure must be strongly balanced and *ii*) missing values have to be dealt with. To that end, we balanced the panel structure of our dataset and each missing value has been replaced with its respective mean by group (municipality). In addition to that, SAR models have very high computation costs, especially when the sample dimension tend to be large as in our case. In this regard, we allowed the main explanatory variables, all other controls and the idiosyncratic errors to count for spillover effect, while we

[16] Said in the spatial jargon, these are the spatial lags of covariates.

[17] For parsimony reason, differently than the previous econometric specifications, we did not add any political control because we believe that variable such as gender or age of the mayor have a negligible spatial "meaning".

did not add the spatial autoregressive terms of the dependent variable and, differently than previous regressions, we also ruled out the regional fixed-effect.[18].

Our fixed-effects model is estimated by means of the quasi-maximum likelihood (QML) estimator developed by Lee and Yu [2010]. Results (Table 3.5) show that there is no indirect effect by any control variables on the growth rate of the declared personal income. Focusing on direct effects, it seems that, for non constrained municipalities, public investments do not have any significant effect on personal income, while for municipalities subjected to the DSP a negative effects is recorded (-0.06)[19]. The estimation results and their conclusions do not change also if we compute the spatial weighting matrix as inverse distance matrix by imposing 100 km as maximum distance between units[20]. Finally, in order to avoid any potential bias, we specify a further (static) spatial regression without any lagged variable; the results (Table 3.6), still, are robust and no discrepancy is recorded with respect to the dynamic spatial model.

Regarding point *ii*), by taking the provincial means of our variables, the econometric specification becomes:

$$Y_{i,t} \quad \alpha + \beta' G_{j,t} + \gamma' \mathbf{X}_{i,t} + \mu_i + \lambda_r \times \delta_t + \epsilon_{i,t} \qquad i \;/\; j \;\; \forall \;\; t \tag{3.5}$$

$y_{i,t}$ is the within province mean of real per-capita declared personal income at municipal level and $Y_{i,t}$ represents its growth rate. $g_{j,t}$ denotes the provincial mean of local real per-capita investment expenditures and $G_{j,t}$ expresses year on year change as a ratio of lagged declared personal income. As in the previous regressions, δ_t is the year effects. λ_r counts for regional fixed-effects and enters in the regression model as an interaction with year effects, $\lambda_r \times \delta_t$. $\epsilon_{i,t}$ is the idiosyncratic error term. Standard errors are clustered at provincial level.

$i \;/\; j \quad \forall \quad t$ means that we regress the provincial average of the growth rates of income of municipalities within the province i on the provincial averages of the growth rates of the municipal investment expenditure of the j provinces. More precisely, i targets all the provinces with the most important city of the region (*Capoluogo di Regione*), while j represents all other provinces. By doing so, we try to estimate the effect of neighboring investment expenditures on local income. Results reported in Table 3.7 shows that the growth rate of municipal investment expenditures in the j provinces produces an estimated effect of 9 cents on growth rate of local income in the i provinces.

In principle, we can reasonably state that spatial econometric techniques ward off any indirect spillover of public spending on income; by taking aggregate provincial values we can further argue that these spillovers are rather weak and negligible.

[18]We tried to calculate the spillover effect of the income's growth rate of adjacent areas, but we had to abort the procedure because after several days the computation was still running. Same happened when including regional fixed effect.

[19]Moran's test for spatial correlation among residuals confirms that the growth rate of declared personal income does not have spatial correlation; on the contrary, the residuals of the growth rate of capital expenditure seem to be spatially correlated.

[20]This estimation output is available upon request.

3.7 Conclusions

The analysis presented in this paper contributes to the growing literature on local fiscal multiplier. Unlike almost all of the studies in this field, we document that the short-run output effect of local public spending is remarkably small. Our results tag along with Cohen et al. [2011]; Clemens and Miran [2012] and Trezzi and Porcelli [2016] in documenting limited stimulating capabilities of local government spending. We dealt with endogeneity concerns by isolating the exogenous contraction in investment expenditures of Italian municipalities due to constraints imposed by a tax rule called Domestic Stability Pact (DSP). Since 2001 municipalities with fewer than 5,000 inhabitants are exempted from that rule, thus we design a quasi-experiment by splitting Italian municipalities in two groups on the base of the 5,000 inhabitant threshold. Municipalities below this cut-off represent the control group, while municipalities with a residential population of more than 5,000 inhabitants constitute the treatment group (given that for them DSP's requirements still hold). Dynamic features of our empirical model, jointly with the inclusion of several fixed effects, assure that estimated results do not mirror budgetary and monetary policy interactions.

For non-constrained municipalities, our estimated fiscal multiplier has an impact on declared personal income of less than 1 cent (about 0,006). If we include both dynamic effects of past investment expenditures and income, this coefficient reaches the value of 1 cent. On the contrary, for municipalities subjected to DSP, despite the reduction of their investment expenditures, the effect on local income is much higher (even though, still, the point estimate is far away from 1): the estimated multiplier is 3 cents higher, while, if we consider its dynamic version, the difference in the estimated declared personal income growth rate stands at 6 cents.

Robustness checks confirm that our estimates are not conflated by the effects of subprime mortgages crisis and the European debt crisis. The Italian municipalities we focus on in our study depict very small and very open economies. By running spatial fixed-effects regressions and by aggregating at provincial level the municipal variables, we find that the (potential) spatial dispersion in the impact of investment expenditures on income is totally negligible.

In some ways, these results are not surprising. From the one hand, the average local investment spending is much smaller than the average declared personal income (486.64 vs. 9,786.65 per-capita euros). On the other hand, for having a high multiplier, one of the theoretical assumptions underlying Keynesian models is that there must be sufficient potential productive capacity. Trezzi and Porcelli [2016], by using the funds for reconstruction after the earthquake in L'Aquila (Italy), therefore when the local productive capacity has been heavily reduced and thus the theoretical multiplier should be very high, also find a spending multiplier less than 1 (0.71).

We can draw very important lessons for policy-makers from our study. The most important fact is that the impact of municipal investment spending on local income is quite modest. This means that, although trying to stimulate the growth of local investments is very important, in spite of that, public investments themselves must not be motivated on the basis of a hypothetical

more than proportional return on income. It should not be forgotten that, while fundamental in smoothing out the business cycle, the former function of public spending is to supply public goods and services, i.e. those goods and services that the market "fails" to supply in optimal quantities and to price correctly. From a theoretical point of view, neoclassical models developed in last decades argue opposite effects of public spending on income compared with respect to Keynesian frameworks. Empirically, some "expansive austerity" effect have been observed, namely increases in GDP and in private consumption following major cuts in public spending. In addition to that, one of the main stricture against Keynesian models refers to the fact that they assume rather than documenting expansive effects of public spending on output.

The second takeaway is that being constrained by fiscal rules that reduce local administrators' spending discretion and set limits to debt growth may have a positive impact on citizens' income. This is especially true in those countries such as Italy characterized by high levels of corruption, patronizing political class and untidy public finances. Finally, the last point is that harmonious and organized investment plans between several municipalities, by generating scale economies phenomena, may have greater expansionary effects on income than single municipality's investment programs.

TABLE 3.1: Descriptive Statistics of Municipalities.

	All sample	Pop.⩽5,000	5,000 <Pop.⩽15,000	Pop.>15,000
Income				
Declared Personal Income	9,786.653	9,487.928	10,364.57	10,807.73
	(2,904.105)	(2,757.469)	(3,002.937)	(3,338.519)
Declared Personal Income Growth Rate	0.011	0.0121979	0.008573	0.0074364
	(0.068)	(0.0729118)	(0.0559436)	(0.0526716)
Expenditures				
Capital Expenditures	486.6361	579.4835	272.8321	272.4454
	(715.1556)	(817.5988)	(281.9192)	(308.2537)
Current Expenditures	754.5648	799.9828	618.8578	713.252
	(467.6529)	(531.3205)	(224.1147)	(219.1548)
Total Expenditures	1,434.723	1,583.801	1,046.654	1,179.655
	(1,096.503)	(1,240.533)	(472.1555)	(524.0939)
Capital Expenditures Growth Rate	-0.0016673	-0.00167	-0.0016537	-0.0016781
	(0.1087702)	(0.1278566)	(0.0421034)	(0.0264386)
Current Expenditures Growth Rate	.0005395	0.0009756	-0.0004969	-0.0004782
	(0.0239677)	(0.028056)	(0.0084694)	(0.0081507)
Total Expenditures Growth Rate	-0.0009483	-0.00167	-0.001983	-0.001934
	(-0.0009483)	(0.1278566)	(0.0470788)	(0.0342258)
Revenues				
Total Revenues	1,434.723	1,583.801	1,046.654	1,179.655
	(1096.503)	(1,240.533)	(472.1555)	(524.0939)
Total Revenues Growth Rate	-0.0007584	-0.0003449	-0.0017777	-0.0015913
	(0.1323725)	(0.1556643)	(0.0467621)	(0.0340879)
Budget parameters				
Deficit	14.78016	17.6502	8.7149	6.229028
	(143.9557)	(168.24)	(52.69804)	(49.67275)
Deficit Growth rate	-0.0001817	-0.0001551	-0.0002075	-0.0003331
	(.0232139)	(0.0272202)	(0.0081997)	(0.0068796)
Debt	777.6285	806.0775	706.1166	722.6905
	(3,495.607)	(1,828.508)	(6,840.91)	(659.9193)
Debt Growth rate	0.0019413	0.0041353	-0.0044606	-0.0001413
	(0.3937635)	(0.2789849)	(0.6856898)	(0.1280973)
Geographic characteristics				
Population	7,397.84	1,820,526	8,467.837	49,445.25
	(42,934.33)	(1,287.316)	(2,688.881)	(137,432.6)
Pop. density (inh./km^2)	310.6497	145.4888	501.5543	1,179.311
	(665.5834)	(248.1529)	(585.8193)	(1,633.508)
Surface (km^2)	33.95	25.55	40.21	86.26
	(47.64)	(26.77)	(42.86)	(110.88)
Observations	86,164	60,638	17,939	8,314

Notes: Data refer to the period 2000-2012. Averages taken over the groups specified in the column headings (standard deviations are in parentheses). Declared Personal Income and balance sheet quantities are expressed in per-capita terms and in 2005 euros deflated through St. Louis FED GDP deflator.

TABLE 3.2: Baseline Results.

	Baseline specification		W/o controls	W/o fixed effects
	(1)	(2)	(3)	(4)
	G Decl. Income	G Decl. Income	G Decl. Income	G Decl. Income
G Declared Pers. Inc. (t − 1)	-0.19***	-0.28***	-0.24***	0.13***
	(0.01)	(0.01)	(0.01)	(0.01)
G Declared Pers. Inc. (t − 2)	-0.094***	-0.17***	-0.14***	-0.28***
	(0.01)	(0.01)	(0.01)	(0.01)
G Investment Exp.	0.0074**	0.0075**	0.0059**	-0.015***
	(0.00)	(0.00)	(0.00)	(0.00)
G Investment Exp. (t − 1)	0.0073**	0.0083**	0.0074**	-0.039***
	(0.00)	(0.00)	(0.00)	(0.01)
G Investment Exp. (t − 2)	0.0024	0.0037	0.0035	-0.028***
	(0.00)	(0.00)	(0.00)	(0.00)
Stability pact municipalities	0.0025***	0.012***		0.0048***
	(0.00)	(0.00)		(0.00)
Mayor is a male	-0.00060	-0.0038***		-0.00027
	(0.00)	(0.00)		(0.00)
Age of mayor	0.000024	0.00012***		0.00037***
	(0.00)	(0.00)		(0.00)
Years of schooling of mayor	-0.000046	-0.000012		0.00056***
	(0.00)	(0.00)		(0.00)
Population	-0.0000020***	-0.00025***		-0.0000022***
	(0.00)	(0.00)		(0.00)
Population squared	8.6e-11***	0.000000022***		1.0e-10***
	(0.00)	(0.00)		(0.00)
Surface (km2)	0.000027***			0.000039***
	(0.00)			(0.00)
Pop. density (inh./km2)	-0.00000018	0.000030		-0.00000050
	(0.00)	(0.00)		(0.00)
Altitude (mt.)	0.0000034***			0.0000052***
	(0.00)			(0.00)
Province capital	0			0
	(.)			(.)
Term not ended regularly	0.0011	0.00045		-0.0059***
	(0.00)	(0.00)		(0.00)
Term limited mayor	-0.00011	-0.00029		0.0016***
	(0.00)	(0.00)		(0.00)
Mean of dep. var.	0.006	0.006	0.007	0.006
Controls	Y	Y	N	Y
Year Effects	Y	Y	Y	N
Year-Region Effects	Y	Y	Y	N
Municipality Effects	N	Y	Y	N
R^2	0.63	0.67	0.66	0.077
Obs.	54,124	54,124	56,983	54,124

Notes: Data are annual from 2000 to 2012 at municipal level. Dependent variable is the growth rate of per-capita declared personal income expressed in 2005 euros and as year on year change divided by previous year's per capita declared personal income. Standards errors are robust to heteroscedasticity and clustered at municipal level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 3.3: Effects of Domestic Stability Pact.

	Baseline specification		W/o controls	W/o fixed effects
	(1)	(2)	(3)	(4)
	G Decl. Income	G Decl. Income	G Decl. Income	G Decl. Income
G Declared Pers. Inc. $(t-1)$	-0.19***	-0.28***	-0.24***	0.11***
	(0.01)	(0.01)	(0.01)	(0.01)
G Declared Pers. Inc. $(t-2)$	-0.094***	-0.17***	-0.14***	-0.26***
	(0.01)	(0.01)	(0.01)	(0.01)
G Declared Pers. Inc. - DSP $(t-1)$	0.0088	0.00020	-0.00052	0.15***
	(0.01)	(0.01)	(0.01)	(0.02)
G Declared Pers. Inc. - DSP $(t-2)$	0.0068	-0.0069	0.0028	-0.18***
	(0.01)	(0.01)	(0.01)	(0.01)
G Investment Exp.	0.0064**	0.0066**	0.0047	-0.015***
	(0.00)	(0.00)	(0.00)	(0.00)
G Investment Exp. $(t-1)$	0.0060*	0.0071**	0.0058*	-0.037***
	(0.00)	(0.00)	(0.00)	(0.01)
G Investment Exp. $(t-2)$	0.0016	0.0029	0.0023	-0.026***
	(0.00)	(0.00)	(0.00)	(0.00)
G Investment Exp. - DSP	0.032***	0.030***	0.039***	-0.015
	(0.01)	(0.01)	(0.01)	(0.02)
G Investment Exp. - DSP $(t-1)$	0.043***	0.040***	0.053***	-0.066***
	(0.01)	(0.01)	(0.01)	(0.02)
G Investment Exp. - DSP $(t-2)$	0.029***	0.027***	0.035***	-0.058***
	(0.01)	(0.01)	(0.01)	(0.02)
Stability pact municipalities	0.0014**	0.012***		0.0052***
	(0.00)	(0.00)		(0.00)
Mayor is a male	-0.00046	-0.0038***		0.00014
	(0.00)	(0.00)		(0.00)
Age of mayor	0.000026	0.00012***		0.00037***
	(0.00)	(0.00)		(0.00)
Years of schooling of mayor	-0.000039	-0.000012		0.00059***
	(0.00)	(0.00)		(0.00)
Population	-0.0000029***	-0.00025***		-0.0000024***
	(0.00)	(0.00)		(0.00)
Population squared	3.0e-10***	0.000000022***		1.4e-10
	(0.00)	(0.00)		(0.00)
Population cube	-1.1e-14***	-6.8e-13***		-1.4e-15
	(0.00)	(0.00)		(0.00)
Pop. density (inh./km2)	-0.0000012**	0.000031		-0.0000025***
	(0.00)	(0.00)		(0.00)
Term not ended regularly	0.0012	0.00050		-0.0058***
	(0.00)	(0.00)		(0.00)
Term limited mayor	-0.00018	-0.00027		0.0015***
	(0.00)	(0.00)		(0.00)
Mean of dep. var.	0.006	0.006	0.007	0.006
Controls	Y	Y	N	Y
Year Effects	Y	Y	Y	N
Year-Region Effects	Y	Y	Y	N
Municipality Effects	N	Y	Y	N
R^2	0.63	0.67	0.66	0.081
Obs.	54,124	54,124	56,983	54,124

Notes: Data are annual from 2000 to 2012 at municipal level. Dependent variable is the growth rate of per-capita declared personal income expressed in 2005 euros and as year on year change divided by previous year's per capita declared personal income. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Standards errors are robust to heteroscedasticity and clustered at municipal level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 3.4: Robustness Checks.

	Pop⩽15,000		3,500⩽Pop⩽7,000
	(2000-2012)	(2000-2007)	(2000-2012)
	(1) G Decl. Income	(2) G Decl. Income	(3) G Decl. Income
G Declared Pers. Inc. (t − 1)	-0.28***	-0.40***	-0.25***
	(0.01)	(0.01)	(0.04)
G Declared Pers. Inc. (t − 2)	-0.17***	-0.25***	-0.20***
	(0.01)	(0.02)	(0.02)
G Declared Pers. Income - DSP (t − 1)	0.00020	0.0069	-0.022
	(0.01)	(0.01)	(0.02)
G Declared Pers. Income - DSP (t − 2)	-0.0069	0.029**	0.0079
	(0.01)	(0.01)	(0.01)
G Investment Exp.	0.0066**	0.0027	-0.0020
	(0.00)	(0.00)	(0.01)
G Investment Exp. (t − 1)	0.0071**	0.0041	0.0023
	(0.00)	(0.00)	(0.01)
G Investment Exp. (t − 2)	0.0029	0.0038	0.0085
	(0.00)	(0.00)	(0.01)
G Investment Exp. - DSP	0.030***	0.030**	0.029*
	(0.01)	(0.01)	(0.02)
G Investment Exp. - DSP (t − 1)	0.040***	0.044**	0.036**
	(0.01)	(0.02)	(0.02)
G Investment Exp. - DSP (t − 2)	0.027***	0.027*	0.0095
	(0.01)	(0.01)	(0.02)
Stability pact municipalities	0.012***	0.0065	0.0047**
	(0.00)	(0.01)	(0.00)
Mayor is a male	-0.0038***	-0.0045**	-0.0032**
	(0.00)	(0.00)	(0.00)
Age of mayor	0.00012***	0.00016**	0.000042
	(0.00)	(0.00)	(0.00)
Years of schooling of mayor	-0.000012	0.00010	0.000080
	(0.00)	(0.00)	(0.00)
Population	-0.00025***	-0.00031***	-0.00020**
	(0.00)	(0.00)	(0.00)
Population squared	0.000000022***	0.000000027***	0.000000023
	(0.00)	(0.00)	(0.00)
Population cube	-6.8e-13***	-8.4e-13***	-1.2e-12
	(0.00)	(0.00)	(0.00)
Pop. density (inh./km2)	0.000031	-0.000053	-0.000017
	(0.00)	(0.00)	(0.00)
Term not ended regularly	0.00050	0.0018	-0.00035
	(0.00)	(0.00)	(0.00)
Term limited mayor	-0.00027	-0.00047	-0.00039
	(0.00)	(0.00)	(0.00)
Mean of dep. var.	0.006	-0.003	0.005
Controls	Y	Y	Y
Year Effects	Y	Y	Y
Year-Region Effects	Y	Y	Y
Municipality Effects	Y	Y	Y
R^2	0.67	0.73	0.80
Obs.	54,124	27,582	10,785

Notes: Annual municipal level data, time span is indicated in the column headline. Dependent variable is the growth rate of per-capita declared personal income expressed in 2005 euros and as year on year change divided by previous year's per capita declared personal income. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Standards errors are robust to heteroscedasticity and clustered at municipal level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 3.5: Spillover Analysis I: Spatial Fixed-Effect Regression I.

	Direct effect	Indirect effect	Total effect
	(1)	(2)	(3)
	G Decl. Income	G Decl. Income	G Decl. Income
G Declared Pers. Inc. $(t-1)$	-0.64***	//	0.64***
	(0.004)		(0.004)
G Declared Pers. Inc. $(t-2)$	-0.31***	//	-0.31***
	(0.004)		(0.004)
G Declared Pers. Income - DSP $(t-1)$	-0.01	//	-0.01
	(0.008)		(0.008)
G Declared Pers. Income - DSP $(t-2)$	-0.01	//	-0.01
	(0.008)		(0.008)
G Investment Exp.	0.002	-0.003	-0.001
	(0.006)	(0.024)	(0.024)
G Investment Exp. $(t-1)$	0.002	0.016	0.018
	(0.008)	(0.027)	(0.27)
G Investment Exp. $(t-2)$	3.77e-0.5	0.004	0.004
	(0.007)	(0.026)	(0.26)
G Investment Exp. - DSP	-0.06*	0.02	-0.03
	(0.033)	(0.136)	(0.139)
G Investment Exp. - DSP $(t-1)$	-0.05	-0.01	-0.06
	(0.038)	(0.157)	(0.160)
G Investment Exp. - DSP $(t-2)$	-0.03	0.09	0.06
	(0.035)	(0.146)	(0.149)
Stability pact municipalities	-0.008	-0.016	-0.02
	(0.007)	(0.03)	(0.03)
Population	-1.57e-06	7.57e-07	-8.10e-07
	(1.13e-06)	(2.68e-06)	(2.62e-06)
Population squared	3.35e-13	-2.27e-13	1.08e-13
	(2.38e-13)	(6.74e-13)	(6.88e-13)
Pop. density (inh./km2)	-8.39e-05***	9.87e-05*	1.47e-05
	(2.52e-05)	(5.53e-05)	(5.19e-05)
Mean of dep. var.			-0.006
Controls			Y
Year Effects			Y
Year-Region Effects			N
Municipality Effects			Y
R^2 (Pseudo)			0.19
Obs.			86,879

Notes: Data are annual from 2000 to 2012 at municipal level. Dependent variable is the growth rate of per-capita declared personal income expressed in 2005 euros and as year on year change divided by previous year's per capita declared personal income. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Spatial weighting matrix is a first-second order matrix. Regional fixed effects have been dropped to ease the computation. Standards errors are robust to heteroscedasticity and clustered at municipal level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 3.6: Spillover Analysis II: Spatial Fixed-Effect Regression II.

	Direct effect	Indirect effect	Total effect
	(1)	(2)	(3)
	G Decl. Income	G Decl. Income	G Decl. Income
G Investment Exp.	-0.004	-0.009	-0.013
	(0.006)	(0.025)	(0.025)
G Investment Exp. - DSP	-0.065*	0.10	0.035
	(0.034)	(0.14)	(0.14)
Stability pact municipalities	-0.005	0.014	0.009
	(0.008)	(0.035)	(0.036)
Population	-3.95e-07	4.65e-07	6.98e-08
	(1.34e-06)	(3.16e-06)	(3.10e-06)
Population squared	5.78e-14	-2.07e-13	1.49e-13
	(2.82e-13)	(7.97e-13)	(8.13e-13)
Pop. density (inh./km2)	-.4.9e-05*	4.2e-05	-6.96e-06
	(2.99e-05)	(6.56e-05)	(6.17e-05)
Mean of dep. var.			-0.006
Controls			Y
Year Effects			Y
Year-Region Effects			N
Municipality Effects			Y
R^2 (Pseudo)			0.0008
Obs.			86,879

Notes: Data are annual from 2000 to 2012 at municipal level. Dependent variable is the growth rate of per-capita declared personal income expressed in 2005 euros and as year on year change divided by previous year's per capita declared personal income. DSP is a dummy indicator for municipalities subjected to Domestic Stability Pact constraints from 2001 onwards. Spatial weighting matrix is a first-second order matrix. Regional fixed effects have been dropped to ease the computation. Standards errors are robust to heteroscedasticity and clustered at municipal level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE 3.7: Spillovers Analysis III: Provincial Means.

	Provincial Means
	(1)
	G Decl. Income
G Declared Pers. Inc. $(t-1)$	0.49***
	(0.07)
G Declared Pers. Inc. $(t-2)$	-0.56***
	(0.05)
G Investment Exp.	0.092**
	(0.04)
G Investment Exp. $(t-1)$	0.24***
	(0.07)
G Investment Exp. $(t-2)$	0.13**
	(0.05)
Stability pact municipalities	-0.058
	(0.12)
Mayor is a male	0.043
	(0.04)
Age of mayor	-0.0014
	(0.00)
Years of schooling of mayor	-0.0021
	(0.00)
Population	0.0000049
	(0.00)
Pop. density (inh./km2)	-0.00014
	(0.00)
Term not ended regularly	-0.0048
	(0.02)
Term limited mayor	-0.0041
	(0.01)
Mean of dep. var.	0.007
Controls	Y
Year Effects	Y
Year-Region Effects	Y
Province Effects	Y
R^2	0.52
Obs.	830

Notes: Data are annual provincial means of municipal level variables for the period 2000-2012. Dependent variable is the provincial mean of the growth rate of per-capita declared personal income divided by previous year's per capita declared personal income. Standards errors are robust to heteroscedasticity and clustered at provincial level.
* p <0.1; ** p<0.05; *** p<0.001.

Appendix A

First-Stage Regressions for Disaggregated Expenditures

TABLE A.1: Female Share and Municipal Spending: Two-Stage Least Squares Estimates II.

	Panel B - Roads and Territory: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.348*** **	-0.0154***	-0.0147***	-0.00280***	-0.0170***
	(0.00869)	(0.00101)	(0.00128)	(0.000530)	(0.00110)
3 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0109	**0.410*** **	0.000169	-0.00928***	0.00461***
	(0.00707)	(0.00970)	(0.00143)	(0.00115)	(0.00122)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0131	0.00710***	**0.413*** **	-0.00525***	0.0000337
	(0.00736)	(0.000949)	(0.00953)	(0.000971)	(0.00157)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.372***	0.000849	0.00539***	**0.792*** **	-0.00773***
	(0.00925)	(0.00147)	(0.00124)	(0.00747)	(0.00156)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0242***	0.00298*	-0.00759***	0.000342	**0.394*** **
	(0.00600)	(0.00128)	(0.00159)	(0.00116)	(0.00913)
F-statistics (Excluded Instruments)	1,591.37	436.38	478.61	3,072.34	478.74
Mean of dep. var.	17.68	3.03	3.36	3.15	3.47
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.20	0.16	0.16	0.65	0.15
Observations	63,259	63,259	63,259	63,259	63,259

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.2: Female Share and Municipal Spending: Two-Stage Least Squares Estimates III.

	Panel C - Education: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.331*** **	-0.0182***	-0.0159***	-0.00402***	-0.0203***
	(0.0104)	(0.00136)	(0.00162)	(0.000721)	(0.00143)
3 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0141	**0.400*** **	-0.000267	-0.0112***	0.00636***
	(0.00988)	(0.0112)	(0.00190)	(0.00156)	(0.00165)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.00310	0.00906***	**0.414*** **	-0.00671***	0.00264
	(0.0105)	(0.00129)	(0.0110)	(0.00138)	(0.00203)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.356***	0.000531	0.00410*	**0.773*** **	-0.00904***
	(0.0119)	(0.00201)	(0.00167)	(0.00935)	(0.00215)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0216*	0.00341	-0.00967***	0.000765	**0.390*** **
	(0.00921)	(0.00177)	(0.00223)	(0.00153)	(0.0108)
F-statistics (Excluded Instruments)	918.23	322.82	361.60	1,905.79	347.40
Mean of dep. var.	17.52	3.05	3.35	3.14	3.48
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.19	0.16	0.16	0.62	0.14
Observations	42,598	42,598	42,598	42,598	42,598

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.3: Female Share and Municipal Spending: Two-Stage Least Squares Estimates IV.

	Panel D - Police: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.339*** **	-0.0222***	-0.0207***	-0.00664***	-0.0265***
	(0.0196)	(0.00320)	(0.00349)	(0.00141)	(0.00306)
3 Yrs. Before Elec.*GQ Fem. Share (%)	0.00126	**0.436*** **	-0.00490	-0.0134***	0.0104**
	(0.0222)	(0.0220)	(0.00444)	(0.00305)	(0.00342)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0409	0.0109***	**0.398*** **	-0.00487*	0.00683
	(0.0233)	(0.00303)	(0.0216)	(0.00240)	(0.00391)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.290***	0.00544	0.00670	**0.719*** **	-0.00441
	(0.0214)	(0.00468)	(0.00377)	(0.0159)	(0.00460)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0217	0.00246	-0.00919	0.00341	**0.414*** **
	(0.0202)	(0.00429)	(0.00514)	(0.00324)	(0.0196)
F-statistics (Excluded Instruments)	266.78	96.00	87.71	483.54	104.82
Mean of dep. var.	17.00	3.00	3.38	3.14	3.37
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.18	0.18	0.15	0.58	0.16
Observations	13,048	13,048	13,048	13,048	13,048

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.4: Female Share and Municipal Spending: Two-Stage Least Squares Estimates V.

	Panel E - Administration: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.347*** **	-0.0160***	-0.0148***	-0.00296***	-0.0178***
	(0.00898)	(0.00106)	(0.00131)	(0.000568)	(0.00116)
3 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0148	**0.405*** **	0.000675	-0.00939***	0.00534***
	(0.00766)	(0.0101)	(0.00148)	(0.00122)	(0.00127)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0145	0.00722***	**0.412*** **	-0.00532***	0.000502
	(0.00807)	(0.00100)	(0.00987)	(0.00104)	(0.00160)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.372***	0.000990	0.00554***	**0.793*** **	-0.00753***
	(0.00975)	(0.00154)	(0.00129)	(0.00779)	(0.00163)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0250***	0.00303*	-0.00794***	0.000418	**0.394*** **
	(0.00655)	(0.00134)	(0.00166)	(0.00120)	(0.00952)
F-statistics (Excluded Instruments)	1,452.60	395.56	439.80	2,834.75	447.85
Mean of dep. var.	17.83	3.007	3.38	3.17	3.51
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.20	0.16	0.16	0.65	0.15
Observations	58,268	58,268	58,268	58,268	58,268

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.5: Female Share and Municipal Spending: Two-Stage Least Squares Estimates VI.

	Panel F - Development: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.348*** **	-0.0214***	-0.0137***	-0.00685***	-0.0220***
	(0.0199)	(0.00348)	(0.00319)	(0.00169)	(0.00259)
3 Yrs. Before Elec.*GQ Fem. Share (%)	0.00241	**0.435*** **	-0.00124	-0.0152***	0.00770*
	(0.0233)	(0.0225)	(0.00349)	(0.00338)	(0.00329)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0199	0.0109**	**0.411*** **	-0.00236	0.00987*
	(0.0244)	(0.00336)	(0.0200)	(0.00242)	(0.00433)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.312***	0.00368	0.00221	**0.748*** **	-0.00944*
	(0.0261)	(0.00465)	(0.00331)	(0.0174)	(0.00412)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0232	0.00728	-0.0192***	0.00383	**0.413*** **
	(0.0218)	(0.00407)	(0.00482)	(0.00360)	(0.0202)
F-statistics (Excluded Instruments)	296.94	87.93	107.02	453.18	95.35
Mean of dep. var.	16.33	2.75	3.19	3.00	3.39
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.19	0.18	0.17	0.59	0.15
Observations	12,515	12,515	12,515	12,515	12,515

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.6: Female Share and Municipal Spending: Two-Stage Least Squares Estimates VII.

	Panel G - Tourism: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.336*** **	-0.0134***	-0.0102**	-0.00333	-0.0164***
	(0.0265)	(0.00268)	(0.00392)	(0.00204)	(0.00324)
3 Yrs. Before Elec.*GQ Fem. Share (%)	0.00828	**0.415*** **	-0.00431	-0.00727*	0.00444
	(0.0329)	(0.0290)	(0.00427)	(0.00352)	(0.00373)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0553	0.00640*	**0.350*** **	-0.00413	0.000642
	(0.0308)	(0.00322)	(0.0274)	(0.00311)	(0.00480)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.360***	-0.00140	0.000935	**0.761*** **	-0.00749
	(0.0348)	(0.00412)	(0.00414)	(0.0238)	(0.00412)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0260	0.00142	-0.0107*	0.000745	**0.375*** **
	(0.0305)	(0.00332)	(0.00512)	(0.00347)	(0.0266)
F-statistics (Excluded Instruments)	183.86	52.15	43.93	243.45	50.97
Mean of dep. var.	17.26	2.98	3.53	3.22	3.44
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.18	0.16	0.11	0.62	0.13
Observations	8,046	8,046	8,046	8,046	8,046

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.7: Female Share and Municipal Spending: Two-Stage Least Squares Estimates VIII.

	Panel H - Social: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.350*** **	-0.0158***	-0.0143***	-0.00300***	-0.0176***
	(0.0103)	(0.00125)	(0.00153)	(0.000671)	(0.00131)
3 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0144	**0.407*** **	0.000262	-0.0101***	0.00528***
	(0.00970)	(0.0114)	(0.00171)	(0.00140)	(0.00148)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0147	0.00773***	**0.412*** **	-0.00631***	0.00153
	(0.0101)	(0.00115)	(0.0111)	(0.00126)	(0.00183)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.357***	0.00119	0.00488**	**0.779*** **	-0.00779***
	(0.0115)	(0.00175)	(0.00153)	(0.00874)	(0.00193)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0308***	0.00354*	-0.00980***	0.00126	**0.390*** **
	(0.00879)	(0.00157)	(0.00204)	(0.00137)	(0.0104)
F-statistics (Excluded Instruments)	1,117.28	314.41	353.94	2,153.96	361.43
Mean of dep. var.	17.68	3.06	3.43	3.19	3.48
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.20	0.16	0.16	0.63	0.15
Observations	45,602	45,602	45,602	45,602	45,602

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.8: Female Share and Municipal Spending: Two-Stage Least Squares Estimates IX.

	Panel I - Sport: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.334*** **	-0.0176***	-0.0139***	-0.00338***	-0.0175***
	(0.0121)	(0.00161)	(0.00186)	(0.000846)	(0.00159)
3 Yrs. Before Elec.*GQ Fem. Share (%)	0.0129	**0.420*** **	-0.00100	-0.0104***	0.00566**
	(0.0125)	(0.0131)	(0.00209)	(0.00162)	(0.00181)
2 Yrs. Before Elec.*GQ Fem. Share (%)	0.00283	0.00836***	**0.413*** **	-0.00565***	0.00255
	(0.0132)	(0.00153)	(0.0130)	(0.00143)	(0.00227)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.365***	0.00190	0.00441*	**0.772*** **	-0.00853***
	(0.0138)	(0.00229)	(0.00185)	(0.0102)	(0.00239)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0198	0.00427*	-0.00975***	0.000578	**0.386*** **
	(0.0116)	(0.00203)	(0.00247)	(0.00170)	(0.0121)
F-statistics (Excluded Instruments)	831.56	248.75	252.75	1,491.41	256.10
Mean of dep. var.	17.64	3.08	3.41	3.30	3.48
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.20	0.17	0.17	0.63	0.15
Observations	32,785	32,785	32,785	32,785	32,785

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.9: Female Share and Municipal Spending: Two-Stage Least Squares Estimates X.

	Panel L - Services: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.345*** **	-0.0168***	-0.0113*	-0.00456*	-0.0161***
	(0.0246)	(0.00331)	(0.00451)	(0.00213)	(0.00306)
3 Yrs. Before Elec.*GQ Fem. Share (%)	-0.00776	**0.403*** **	-0.00260	-0.0131***	0.00390
	(0.0295)	(0.0277)	(0.00465)	(0.00385)	(0.00347)
2 Yrs. Before Elec.*GQ Fem. Share (%)	0.0137	0.0124***	**0.422*** **	-0.00414	0.00733
	(0.0293)	(0.00361)	(0.0265)	(0.00332)	(0.00525)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.358***	0.00581	0.00226	**0.767*** **	-0.00644
	(0.0282)	(0.00502)	(0.00472)	(0.0195)	(0.00480)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0333	0.00601	-0.0128*	0.0100*	**0.368*** **
	(0.0272)	(0.00458)	(0.00654)	(0.00472)	(0.0254)
F-statistics (Excluded Instruments)	209.45	50.80	66.03	391.58	54.17
Mean of dep. var.	16.09	2.69	3.31	2.91	3.18
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.20	0.16	0.17	0.62	0.14
Observations	7,215	7,215	7,215	7,215	7,215

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.10: Female Share and Municipal Spending: Two-Stage Least Squares Estimates XI.

	Panel M - Culture: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.340*** **	-0.0159***	-0.0115***	-0.00364***	-0.0180***
	(0.0145)	(0.00189)	(0.00231)	(0.00101)	(0.00182)
3 Yrs. Before Elec.*GQ Fem. Share (%)	-0.00945	**0.408*** **	-0.00623*	-0.0108***	0.00383
	(0.0161)	(0.0157)	(0.00282)	(0.00226)	(0.00208)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0212	0.00730***	**0.390*** **	-0.00690***	0.00524*
	(0.0164)	(0.00182)	(0.0162)	(0.00182)	(0.00265)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.356***	0.00287	0.00177	**0.767*** **	-0.00587*
	(0.0168)	(0.00264)	(0.00232)	(0.0119)	(0.00250)
1 Yr. After Elec.*GQ Fem. Share (%)	-0.0181	0.00314	-0.0132***	0.00188	**0.394*** **
	(0.0136)	(0.00232)	(0.00305)	(0.00231)	(0.0149)
F-statistics (Excluded Instruments)	608.84	153.84	165.05	1,002.79	181.09
Mean of dep. var.	17.83	3.15	3.46	3.37	3.47
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.20	0.17	0.16	0.62	0.15
Observations	22,870	22,870	22,870	22,870	22,870

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

TABLE A.11: Female Share and Municipal Spending: Two-Stage Least Squares Estimates XII.

	Panel N - Justice: First Stages				
	Fem. Share	3 Yrs Bef. Elec.*Female	2 Yrs Bef. Elec.*Female	1 Yr Bef. Elec.*Female	1 Yr Aft. Elec.*Female
	(1)	(2)	(3)	(4)	(5)
GQ Female Share (%)	**0.304*** **	-0.0232**	-0.0132	-0.00820	-0.0341**
	(0.0599)	(0.00851)	(0.0109)	(0.00702)	(0.0105)
3 Yrs. Before Elec.*GQ Fem. Share (%)	0.0476	**0.474*** **	-0.00879	-0.0308*	0.0154
	(0.0776)	(0.0621)	(0.0191)	(0.0136)	(0.0168)
2 Yrs. Before Elec.*GQ Fem. Share (%)	-0.0370	0.0227	**0.376*** **	-0.0240*	0.00496
	(0.0739)	(0.0120)	(0.0504)	(0.0122)	(0.0148)
1 Yr. Before Elec.*GQ Fem. Share (%)	0.228**	0.0154	0.0242	**0.610*** **	-0.00281
	(0.0704)	(0.0139)	(0.0156)	(0.0417)	(0.0148)
1 Yr. After Elec.*GQ Fem. Share (%)	0.0930	-0.00278	-0.0221	0.0000303	**0.528*** **
	(0.0572)	(0.0125)	(0.0148)	(0.0116)	(0.0630)
F-statistics (Excluded Instruments)	31.98	12.12	14.03	50.92	16.11
Mean of dep. var.	13.84	2.24	2.76	2.42	3.03
Controls	Y	Y	Y	Y	Y
Year Effects	Y	Y	Y	Y	Y
Year-Region Effects	Y	Y	Y	Y	Y
Municipality Effects	Y	Y	Y	Y	Y
(Partial) R^2	0.18	0.19	0.15	0.47	0.26
Observations	1,603	1,603	1,603	1,603	1,603

Notes: Data refer to the period 1999-2009. Female share is the percentage of women in the municipal government. The instrumental variable is the female share upward forced by gender quotas law during the years 1993-1995. In columns 2-5, female share is interacted with the electoral cycle's dummies. Standard errors are robust to heteroscedasticity and clustered at municipality level.
* p <0.1; ** p<0.05; *** p<0.001.

Bibliography

A. Acconcia, G. Corsetti, and S. Simonelli. Mafia and public spending: Evidence on the fiscal multiplier from a quasi-experiment. *American Economic Review*, 104(7):2185–2209, July 2014.

M. Adelino, I. Cunha, and M. A. Ferreira. The economic effects of public financing: Evidence from municipal bond ratings recalibration. *The Review of Financial Studies*, 30(9):3223–3268

F. Afridi, V. Iversen, and M. Sharan. Women political leaders, corruption, and learning: Evidence from a large public program in india. *Economic Development and Cultural Change*, 66 (1):1–30

A. Akhmedov and E. Zhuravskaya. Opportunistic political cycles: test in a young democracy setting. *The Quarterly Journal of Economics*, 119(4):1301–1338, 2004.

V. Alatas, L. Cameron, A. Chaudhuri, N. Erkal, and L. Gangadharan. Gender, culture, and corruption: Insights from an experimental analysis. *Southern Economic Journal*, 75:663–680, 01 2009.

A. Alesina and M. Paradisi. Political budget cycles: Evidence from italian cities. *Economics & Politics*, 29(2):157–177, 2017.

M. Arellano and S. Bond. Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. *The review of economic studies*, 58(2):277–297, 1991.

M. Arellano and O. Bover. Another look at the instrumental variable estimation of error-components models. *Journal of econometrics*, 68(1):29–51, 1995.

A. J. Auerbach, Y. Gorodnichenko, and D. Murphy. Local fiscal multipliers and fiscal spillovers in the united states. Technical report, NBER Working Paper No. 25457, 2019.

A. Baltrunaite, A. Casarico, P. Profeta, and G. Savio. Let the voters choose women. 2017.

R. J. Barro and C. J. Redlick. Macroeconomic effects from government purchases and taxes. *The Quarterly Journal of Economics*, 126(1):51–102

D. Bartolini and R. Santolini. Fiscal rules and the opportunistic behaviour of the incumbent politician: evidence from italian municipalities. *CESifo Working Paper*, (2605), 2009.

O. Blanchard and R. Perotti. An empirical characterization of the dynamic effects of changes in government spending and taxes on output. *The Quarterly Journal of economics*, 117(4): 1329–1368

R. Blundell and S. Bond. Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, 87(1):115–143, 1998.

M. Bordignon, V. Grembi, and S. Piazza. Who do you blame in local finance? an analysis of municipal financing in italy. *European Journal of Political Economy*, 49:146–163, 2017.

A. Brender and A. Drazen. Political budget cycles in new versus established democracies. *Journal of monetary Economics*, 52(7):1271–1295, 2005.

F. Brollo and U. Troiano. What happens when a woman wins an election? evidence from close races in brazil. *Journal of Development Economics*, 122:28–45 0304–3878, 2016.

M. Brückner and A. Tuladhar. Local government spending multipliers and financial distress: Evidence from japanese prefectures. *The Economic Journal*, 581(124):1279–1316

R. Chattopadhyay and E. Duflo. Women as policy makers: Evidence from a randomized policy experiment in india. *Econometrica*, 72(5):1409–1443 0012–9682, 2004.

P. Chiades and V. Mengotto. Il calo degli investimenti nei comuni tra patto di stabilità interno e carenza di risorse (the decline in municipal investments between domestic stability pact and lack of financial resources). *Bank of Italy Occasional Paper*, 2013.

G. Chodorow-Reich. Geographic cross-sectional fiscal spending multipliers: What have we learned? *American Economic Journal: Economic Policy*, 11(2):1–34

G. Chodorow-Reich, L. Feiveson, Z. Liscow, and W. G. Woolston. Does state fiscal relief during recessions increase employment? evidence from the american recovery and reinvestment act. *American Economic Journal: Economic Policy*, 4(3):118–45

M. Cioffi, G. Messina, and P. Tommasino. Parties, institutions and political budget cycles at the municipal level. *Bank of Italy Working Paper*, 2012.

J. Clemens and S. Miran. Fiscal policy multipliers on subnational government spending. *American Economic Journal: Economic Policy*, 4(2):46–68

L. Cohen, J. Coval, and C. Malloy. Do powerful politicians cause corporate downsizing? *Journal of Political Economy*, 119(6):1015–1060

T. G. Conley and B. Dupor. The american recovery and reinvestment act: Solely a government jobs program? *Journal of monetary Economics*, 60(5):535–549

J. De Haan and J. Klomp. Conditional political budget cycles: a review of recent evidence. *Public Choice*, 157(3-4):387–410, 2013.

J. De Haan and M. Mink. Has the stability and growth pact impeded political budget cycles in the european union? *CESifo Working Paper*, (1535), 2005.

M. De Paola, V. Scoppa, and R. Lombardo. Can gender quotas break down negative stereotypes? evidence from changes in electoral rules. *Journal of Public Economics*, 94(5-6):344–353

D. Dollar, R. Fisman, and R. Gatti. Are women really the "fairer" sex? corruption and women in government. *Journal of Economic Behavior & Organization*, 46(4):423–429, 2001.

A. Drazen and M. Eslava. Pork barrel cycles. *National Bureau of Economic Research*, 2006.

A. Drazen and M. Eslava. Electoral manipulation via voter-friendly spending: Theory and evidence. *Journal of development economics*, 92(1):39–52, 2010.

E. Dubois. Political business cycles 40 years after nordhaus. *Public Choice*, 166(1-2):235–259, 2016.

B. Dupor and M. S. Mehkari. The 2009 recovery act: Stimulus at the extensive and intensive labor margins. *European Economic Review*, 85:208–228 2016.

M. Ferraresi, L. Rizzo, and A. Zanardi. Policy outcomes of single and double-ballot elections. *International Tax and Public Finance*, 22(6):977–998, 2015.

F. Ferreira and J. Gyourko. Does gender matter for political leadership? the case of us mayors. *Journal of Public Economics*, 112:24–39 0047–2727, 2014.

P. Fishback and V. Kachanovskaya. The multiplier for federal spending in the states during the great depression. *The Journal of Economic History*, 75(1):125–162

R. L. Fox and J. L. Lawless. Entering the arena? gender and the decision to run for office. *American Journal of Political Science*, 48(2):264–280

B. Frank, J. G. Lambsdorff, and F. Boehm. Gender and corruption: Lessons from laboratory corruption experiments. *The European Journal of Development Research*, 23(1):59–71

L. Gangadharan, T. Jain, P. Maitra, and J. Vecci. Female leaders and their response to the social environment. *Journal of Economic Behavior & Organization*, 164:256–272

F. Gilardi. The temporary importance of role models for women's political representation. *American Journal of Political Science*, 59(4):957–970

V. Grembi, T. Nannicini, and U. Troiano. Do fiscal rules matter? *American Economic Journal: Applied Economics*, 8(3):1–30, 2016.

L. Guiso, P. Sapienza, and L. Zingales. Does local financial development matter? *The Quarterly Journal of Economics*, 119(3):929–969

J. K. Hausman. Fiscal policy and economic recovery: The case of the 1936 veterans' bonus. *American Economic Review*, 106(4):1100–1143

D. A. Hibbs. Political parties and macroeconomic policy. *American political science review*, 71 (4):1467–1487, 1977.

M. Kalecki. Political aspects of full employment 1. *The Political Quarterly*, 14(4):322–330, 1943.

M. Katsimi and V. Sarantides. Do elections affect the composition of fiscal policy in developed, established democracies? *Public Choice*, 151(1-2):325–362, 2012.

G. Kopits and S. Symansky. Fiscal policy rules, imf occasional paper, 162, washington. *International Monetary Fund*, 1998.

L. F. Lee and J. Yu. Estimation of spatial autoregressive panel data models with fixed effects. *Journal of Econometrics*, 154(2):165–185

G. M. Milesi-Ferretti, R. Perotti, and M. Rostagno. Electoral systems and public spending. *The Quarterly Journal of Economics*, 117(2):609–657, 2002.

E. Nakamura and J. Steinsson. Fiscal stimulus in a monetary union: Evidence from us regions. *American Economic Review*, 104(3):753–92

T. Nannicini, A. Stella, G. Tabellini, and U. Troiano. Social capital and political accountability. *American Economic Journal: Economic Policy*, 5(2):222–50, 2013.

S. Nickell. Biases in dynamic models with fixed effects. *Econometrica: Journal of the Econometric Society*, pages 1417–1426, 1981.

W. D. Nordhaus. The political business cycle. *The review of economic studies*, 42(2):169–190, 1975.

T. Persson and G. E. Tabellini. *Political economics: explaining economic policy*. MIT press, 2002.

L. Repetto. Political budget cycles with informed voters: evidence from italy. *The Economic Journal*, 128(616):3320–3353

K. Rogoff. Equilibrium political budget cycles. *The American Economic Review*, pages 21–36, 1990.

K. L. Schlozman, N. Burns, and S. Verba. Gender and the pathways to participation: The role of resources. *the Journal of Politics*, 56(4):963–990 0022–3816, 1994.

L. Schuknecht. Fiscal policy cycles and public expenditure in developing countries. *Public Choice*, 102(1-2):113–128, 2000.

A. Sen. *Development as freedom (1999)*. Random House, 1999.

M. Shi and J. Svensson. Political budget cycles: Do they differ across countries and why? *Journal of public economics*, 90(8-9):1367–1389, 2006.

M. Shi, J. Svensson, et al. Political budget cycles: a review of recent developments. *Nordic Journal of Political Economy*, 29(1):67–76, 2003.

D. Staiger and J. H. Stock. Instrumental variables regression with weak instruments. *Econometrica*, 65(3):557–586, 1997.

J. C. Suárez Serrato and P. Wingender. Estimating local fiscal multipliers. Technical report, NBER Working Paper No. 22425, 2016.

R. Trezzi and F. Porcelli. Reconstruction multipliers. Technical report, Cambridge Working Papers in Economics No. 1649, 2016.

P. Van Houten. Multi-level relations in political parties: a delegation approach. *Party Politics*, 15(2):137–156, 2009.

L. G. Veiga and F. J. Veiga. Political business cycles at the municipal level. *Public choice*, 131 (1-2):45–64, 2007.

D. J. Wilson. Fiscal spending jobs multipliers: Evidence from the 2009 american recovery and reinvestment act. *American Economic Journal: Economic Policy*, 4(3):251–82

J. M. Wooldridge. Econometric analysis of cross section and panel data mit press. *Cambridge, MA*, 108, 2002.