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## **Essays on Political Economy and Local Fiscal Policy**

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# Essays on Political Economy and Local Fiscal Policy

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### Abstract

This PhD thesis investigates the role of the reduction of fiscal autonomy and uncertainty in the allocation of resources in driving the behaviour of Italian municipalities in non-autonomous regions and of the central government. Focusing on the uncertainty of grants to compensate the abolition of the property tax on main dwellings, we construct a regression discontinuity (RD) and regression kink (RK) design to test how the behaviour of municipalities changes depending on whether they are in a “bad” state (when they manage fewer resources after property tax reform) or in a “good” state (when they manage more resources after property tax reform), and also in light of the “partisan effect” (the mechanism that allows central governments to allocate more resources to the lower layer of government politically aligned with it). An empirical analysis of Italian municipalities suggests that:

1. Municipalities acted differently in terms of waste tax implementation. Their behaviour depended on the benefits or costs they assumed after the abolition of the property tax on main dwellings: in particular municipalities that suffered a loss of resources increased the waste tax more;
2. Property tax reform led to an imperfect substitution between the property tax on the main dwelling and the waste tax, with a consequent loss in equality;
3. Despite the weakness of the ex-post control and the absence of punishment for lying municipalities concerning the definition of a compensatory grant may allow the presence of a weak “partisan effect”, the reform of the main dwelling property tax was transparent in resources allocation.

Hence, the thesis is structured as follows: first, we focus on the rules and economic literature concerning local public finance; then, we analyse the behaviour of Italian municipalities as a response to the abolition of the property tax on the main dwelling; finally, we test the presence of the “partisan effect”.





# Chapter 1

## Local fiscal policy: the institutional framework

### 1.1 Introduction

During the 2008 national election, the political debate was monopolised by discussion about the abolition of the property tax (“imposta comunale sugli immobili, I.C.I.”) on the main dwelling. The centre-right premier candidate used his announcement on I.C.I. abolition as an electoral tool, which helped him to win the election. Journalists and political researchers agree that thanks to this announcement the centre-right won the votes of the middle class. Indeed, as the median voter theorem states, the median voter in Italy is a homeowner and could thus be influenced by the abolition of a tax on property. The choice of eliminating this tax was strategic because of its unpopularity. In 2008 the Italian government promulgated the abolition<sup>1</sup> of the property tax on the main dwelling. This measure had important consequences for Italian municipalities. First, municipalities lost a significant fiscal tool and second, the substitution of a local tax generated a debate on how it should be refunded. In particular:

1. The abolition increased uncertainty concerning the municipal budget.
2. The abolition reduced municipal fiscal autonomy.

Italian municipalities can finance themselves through taxation and transfers from the government, region and province. In the 1990's, governments began promulgating reforms to guarantee greater autonomy to regions, provinces

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<sup>1</sup>Law decree 93/2008.

and local entities<sup>2</sup>. In general, many of these reforms<sup>3</sup> involved local finances, particularly during the early 2000's. These rule changes were made for reasons of political and fiscal sustainability. In particular, the debate concerned two main issues: greater fiscal autonomy for local entities (that is, fiscal federalism) and the reduction of public debt at the national and sub-national level. To guarantee greater fiscal autonomy, the amount of grants decreased dramatically during this time, while the number and amount of local taxes increased. Rules were introduced to guarantee the reduction of public debt at both the national and sub-national level; one was the Domestic Stability Pact (the national version of the Stability and Growth Pact).

In this Phd thesis, we analyse the behaviour of municipalities as a reaction to the abolition of the property tax on the main dwelling, studying the behaviour of municipalities in terms of manipulating revenues and expenses. For this reason, we consider the waste tax, the current expenditure and the concession of building permits. The last of these represents a growing source of revenues for municipalities. Indeed, recent literature on this subject (see for example Ermini, Fiorillo and Santolini, 2013) underlines its use as substitute for taxation in order to fulfill budget targets. In addition, since 2004 the revenues related to building permits, for a percentage of 75% of them, could finance the current expenditure<sup>4</sup>. This law incentivised municipalities to increase land consumption in order to maintain stable taxation and increase services.

However, uncertainty may have led the municipalities towards two states of nature: the "good" state occurs when a municipality manages more resources after property tax reform, and the "bad" state occurs when a municipality manages fewer resources after property tax reform. When a municipality is in the "good" state we consider it the "winner" while when it is in the "bad" state we define it as the "loser". This differentiation allows investigation of the fiscal behaviour of both types of municipalities as a response to the reduction in fiscal autonomy and uncertainty in the allocation mechanism of resources.

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<sup>2</sup>Law n.142/1990 was the first to draw the principles of the legal system for local autonomies, substituting the law 383/1934. The Bassanini reform (law 59/1997 and 127/1997) continued the aim of a wider autonomy. It established an important decentralisation process in giving more power to regions and local entities. Finally, the reform of the Title V of the Italian constitution improved the autonomy of local entities, especially for regions.

<sup>3</sup>The decree n. 504/1992 ruled on local taxation. The decree n. 244/1997 defined equilibrium and equality fiscal rules. It allowed to allocate resources according to public good provisions. Subsequently, laws on fiscal federalism introduced other criteria that regulated the grants, giving the government the role to rule the allocation mechanism.

<sup>4</sup>Law 311/2004.

Even in the scenario of a slow decrease in grants over time, governments may allocate a higher amount of grants to those municipalities that are politically linked to them. Indeed, Italy represents an illustrative laboratory to test the political use of grants because of the presence of discretionary power in their allocation<sup>5</sup>. Thus, this strategy may allow politicians of the majority party to maintain and even increase votes. Indeed, it may test loyalty of the mayor who is incentivised to show his loyalty for receiving higher transfers that, in turn, could raise the probability of re-election. According to the literature (for example Nannicini and Brollo, 2012) an increase in transfers<sup>6</sup> may make a re-election more likely and may discourage new entrants in elections. In this way, governments may assure a favourable position in the elections within their mandate and reinforce their authority in the next governmental election. However, it could also generate a vicious cycle, wherein a bad politician gains support because of his connection to the government. In sum, we want to test if governments used the possibility of ruling on the distribution of resources to allocate more resources to mayors belonging to their coalition. Our approach assumes the existence of “backward-looking” politicians who reward their “core”<sup>7</sup> voters<sup>8</sup>. Indeed, we want to test if the maximisation of votes could be considered a further driver in grant allocation beyond the efficiency and equity principles. It is important to keep in mind that, even if the maximisation of votes is not a motive in the distribution of transfers, this does not necessarily mean that the allocation is based solely on efficiency and equity. In some cases, governments may transfer resources to municipalities that are richer in swing votes. Accordingly, as tested in the literature (Johansson, 2003), the partisan effect is substituted by the swing vote effect: politicians may use their roles to gain swing votes.

A shortcoming of this analysis is whether the government can influence discretionary the amount of transfers to local administrations. It also may not be clear whether there is space for the government to operate, or whether it is large enough.

The law regulates the quantity of transfers, which may exclude the possibil-

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<sup>5</sup>Bracco, Lockwood, Porcelli and Redoano (2015) used in their analysis a dataset of more than 500 municipalities, between 1998 and 2010, who depend on discretionary grants from the Central Government to fund approximately the 30% of their expenditure.

<sup>6</sup>Nannicini, Brollo (2012) consider transfers for investments.

<sup>7</sup>The term “core” means both voters that can be targeted most effectively by parties and voters ideologically committed with the party ideal point.

<sup>8</sup>“Opportunistic politicians will direct transfer toward their “core” supporters if they believe that this is the cheapest way to buy votes. Such behaviour would represent the “machine” politics that once characterized many large cities in the United States, such as Boston, Chicago, of New York.” Allan Drazen in *Political Economy in Macroeconomics*, Princeton University Press, 2000.

ity that the government can affect local grants. However, the government can make rules to manipulate this allocation: for example, it may decide to transfer more resources to a specific geographic area, because of the presence of a local party in its coalition. Thus, in this case, it can affect the law in order to transfer more resource to the north, the centre or the south. Italian data are valuable for this kind of analysis because grants from the government are characterised by significant discretionary elements among OECD countries (Bracco, Lockwood, Porcelli, Redoano, 2015). However, our study does not analyse the political alignment effect using the standard grants that governments allocate to municipalities. We use the grants that the 2008 government allocated to the municipalities following the main dwelling property tax (“I.C.I.”) abolition.

The aim of this paper is to investigate whether the abolition of this tax had a hidden goal. Indeed, the abolition of the property tax on the main dwelling led to both an increase in the amount of grants from the centre to the municipalities and a decrease in fiscal autonomy: in short, then, municipalities, became more dependent on the government.

On the other hand, the decrease in fiscal autonomy and the uncertainty of the allocation of the no-longer-collected resources may have affected local fiscal policy, particularly since municipalities must fulfil the fiscal targets established by new rules. As stated above, municipalities faced a shortage of resources, and the reform of 2008 made local finances more dependent on the central state. For both reasons, the municipal government may react to the reforms by manipulating local public finance. Municipal politicians faced a trade-off: on one hand, a politician wanted to guarantee a fiscal discipline that would allow him to be considered a “good politician”, on the other hand he wanted to guarantee as many services as possible for citizens.

In this preliminary chapter, we present an overview of the legislation concerning transfers from Italian governments to municipalities. In particular, we focus on the legislation subsequent to Silvio Berlusconi’s announcement to eliminate the property tax (I.C.I.) on the main dwelling. We consider laws and deliberations of the main institutions involved to try to find shortcomings, able to justify the presence of the cited effects. Furthermore, we provide a description of particular municipal taxation and revenue sources. Our goal is to provide an overview of the context of our analysis.

## 1.2 Literature on the argument

This PhD thesis focuses on two main arguments of economic literature: the role of fiscal decentralization/centralization and partisan alignment effect on

economy.

First, the abolition of the main dwelling property tax led to a fall in municipal fiscal autonomy after years of a decentralization process. The circumstances that municipalities are not anymore responsible for the establishment of the main dwelling property tax may have driven them towards different fiscal behaviour. Hence, we analyze municipalities reaction to a positive or negative shock on budgets caused by the more fiscal centralization. Literature on this subject is very developed, especially for the Italian case of study.

In general, literature on fiscal decentralization/centralization and soft budget constraints involves both the relationship between central state and local governments and between national countries and supranational government. In particular, Bordignon (2000) highlighted that the bailout problem and the connected problem of a perceived “soft budget” constraint at the local level have been significant in Italian local finance for the last fifty years. These years were characterized by a high degree of fiscal centralization. This has caused huge efficiency losses in the provision of local public good and services, induced a lack of responsiveness and accountability of local politicians to local preferences, undermined political participation at both local and central levels, and generated huge problems for the equilibrium of central government finances (Bordignon, 2000).

Bordignon, Turati and Gramalerio (2013) argued that autonomy in fiscal policies, especially in collecting revenues, is more efficient than the use of fiscal transfer from the central Government. Voters, indeed, may better recognize the good politician if he sets the tax rate. High tax rates are often due to bad administration, so if the voter knows it, he can either punish or reward politicians, efficiently. In addition, authors argued that fiscal decentralization may produce effects in municipalities, which are characterized by different degrees of vertical fiscal imbalances (VFI). In rich municipalities it may increase welfare by inducing better-educated politicians to enter into the election. Instead, the reverse may happen in the poorer municipalities. Boetti, Piacenza and Turati (2009) reinforced the theory also testing empirically that more fiscal autonomous municipalities exhibits less inefficient spending behaviour.

Stein (1999), analysing empirically Latin America countries, found that decentralization tends to produce larger governments, but this effect is particularly important in the cases where vertical imbalance is high, transfers are not formula-based and the degree of borrowing autonomy of subnational governments is large (Stein, 1999).

Eichengreen and von Hagen (1996), instead, analysed theoretically the Excessive Deficit Procedures (EDP) in Maastricht Treaty on European union. They argued that where subcentral governments do not own their own tax

base, the only options available to them in the event of financial difficulties are to default or obtain a bailout (Eichengreen and von Hagen, 1996). Thus, Eichengreen and von Hagen (1996), theoretically, and Stein (1999), empirically, suggested that a coherent assignment of resources of local governments is fundamental to avoid soft-budget constraint problems.

Quian and Roland (1998), instead, individuated two effects of fiscal decentralization between national states and supranational government: first fiscal competition between local governments under factor mobility increases the opportunity cost of bailout and thus serves as commitment device; second, monetary centralization, together with fiscal decentralization, induces a conflict of interest and may harden budget constraint and reduce inflation (Quian and Roland, 1998).

Furthermore, an academic and political debate on fiscal federalism took place in Italy since the mid-1990s, especially at a regional level. Most of the proposals focused on the way to eliminate huge soft budget constraint because of their central role in the political and economic scenario.

For example, according to Giarda (1995) Northern and Southern regions must be treated differently according to their different economic endowments of resources. Northern regions should become entirely independent from the central government while Southern regions should at least partially be financed by vertical grants (Giarda, 1995).

Bosi and Tabellini (1996) advocated a more radical version of the Giarda's idea. All regions would be made completely independent from the central government and vertical grants should be abolished and replaced by formula-based horizontal grants.

Looking in detail local revenues, we also analyze the behaviour of municipalities in issuing building permits. Italian municipalities experienced a shortage of resources during years. In addition, new rules (for example, the Domestic Stability Pact) committed them to a higher fiscal rigidity. For these reasons municipalities may need new fiscal tools to increase their revenues. Indeed, literature on the issues of building permits is very developed, especially in the last few years, that is when municipalities started to use these concessions as an active fiscal instrument. Ermini, Fiorillo and Santolini (2013) examined land use policies of Italian municipalities. They found, using Italian data, that politicians governing municipalities are more concerned about increasing revenues than preserving environment. Indeed, they found that taxes are used to commit the budget targets.

Ermini and Santolini (2017), instead, analysed the patter of the density growth using Italian data on 72 urban areas. They found that an increase in the city's core property tax rate lead to a decrease in the density on the urban area, due to dwelling effect. By contrast, an increase in tax rate in

the suburban area causes an increase in the density on the urban area, due to the so called “improvement effect”<sup>9</sup>.

Also Solé-Ollé and Viladecans-Marsal (2012) analysed, using Spanish data, whether the political competition may influence the land consumption. They found that stiffer political competition reduces the amount of land consumption. In addition, they found that this effect is stronger in suburbs, in town with a high percentage of commuters and homeowners, and in municipalities governed by left parties.

As said before, our analysis deals with the study of local politicians behaviour. Indeed, politicians can behave differently according to the fact that they could be in the good or in the bad state, as defined in the previous lines. For this reason, our case of study can have analogies with empirical literature which tested the loss aversion (Kaheman and Tversky, 1979).

Let’s suppose that two identical municipalities A and B had the same amount of main dwelling property tax in 2007, for example 100. After the abolition, A received 99 and B received 101, i.e. A had a loss and B had a gain. The two municipalities may decide to behave differently: A can rise taxes and B can reduce them. In addition, the tax increase occurred for A could be greater than the amount of reduction occurred for B. Hence, local politicians may perceive outcomes as gains and losses compared to some reference point and consider losses more salient than gains.

In this sense, Kaheman and Tversky (1979) elaborated what they defined as prospect theory. This implies that the utility function is kinked at the reference point.

Several empirical experiment have followed the paper written by Kahneman and Tversky (1979).

Genesove and Mayer (2001) showed that loss aversion affects seller behaviour in the residential real estate market, where sellers seem to assume the purchase price as the relevant reference point.

Pope and Sxhweitzer (2011) tested for the presence of loss aversion in highly experienced profession golfers. They analysed detailed data from the PGA Tour professional golfers’ performance and they demonstrated that professional golfers are more careful and accurate when they approach par putts. On the other side, they hit less accurately birdie putts (Pope and Sxhweitzer, 2011). So, they found loss aversion behaviour for profession golfers.

Engstrom, Nordblom, Ohlsson and Persson (2014) studied the behaviour of taxpayers when filing returns. They found that taxpayers that exhibit a

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<sup>9</sup>The dwelling size effect defines how people react to an increase in taxation. A higher cost of a housing floor space, obviously, can be associated to a reduction in the dwelling size (Ermini and Santolini, 2016).

deficit are loss adverse, that is people with a preliminary deficit are more likely than people that exhibit a refund to claim a deduction. Obviously, this finding is not consistent with neoclassical theory. They test it through a Regression Kink Design (Engstrom, Nordblom, Ohlsson and Persson, 2014). The second goal of this PhD thesis is to test whether or not governmental transfers go to core supporters. Indeed, the substitute grant may cause opportunistic behavior by central government, i.e. it may allocate more grant to municipalities politically aligned to it.

Literature on the argument is rich in both empirical and theoretical models. These papers investigate the maximization vote problem by politicians.

Lindbeck and Weibull (1987), for example, pointed out that politicians direct their actions to voters that are not so ideologically committed (“swing” voters), taking supporters votes for granted.

Dixit and Londregan (1996), instead, presented a model that encompasses both “core” and “swing” voters approach. They exhibit a model in which two parties, L (the left-wing party) and R (the right-wing party), compete in the vector of grants they give to groups of voters. The group can be identified by location, age, gender, etc. and each one within the group receives the same amount of transfers. This model is interesting because it highlights a variety of results.

Politicians have the ability to transfer:

1. If parties have the same abilities to tax and subsidize different groups, then “swing” voters are likely to be targeted;
2. If parties have different ability in tax and subsidize different groups, “core” voters are likely to be targeted (targeting becomes most effectively).

Another interesting result of Dixit and Londregan model is that core supporters may be tagged by negative transfers. A group of strong partisan voters, who care more on ideologically issues than pecuniary benefits may be hit by tax and still remain loyal (Dixit and Londregan, 1996).

Buchanan and Tullock (1962), instead, analysed the pork-barrel<sup>10</sup> issue, theoretically. In particular, they studied the “logrolling” (or vote trading) in majority system. Their idea was that politicians make actions taking in consideration reciprocity. Each legislator represents a single district and wants to maximize the utility of that district, for example, by implementing a public work financed by national taxation. The slogan is “You support my project

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<sup>10</sup>A “pork-barrel” program refers to collectively financed program that increase the utility of a small group and which have social cost that overcomes social benefit. These programs take place in order to increase the votes of the politician in his area.



and I'll support yours" (Buchanan and Tullock, 1962).

Johansson (2003) tested if a tactical effect of Government in distributing grants to municipalities exists. She empirically studied the preferences in distributing resources of the government using Swedish data. Her main answer to the question "Are inter-governmental grants tactical or not?" was yes or it depends (Johansson, 2003). She found, indeed, that transfers are expected to be larger for the presence of swing vote and low income. This finding enforces the argument that inter-governmental grants could be used as pork-barrel from the Government politics.

Solé-Ollé and Sorribas-Navarro (2008) tested the hypothesis, using Spanish data, that aligned municipalities receive more grants from the upper-tier governments than unaligned ones. They used the difference-in-difference strategy in order to test the alignment effect on allocation of grants from different sources. They exploited the latter fact using a triple-differences estimator. It consists in the estimation of the effects of changing the alignment status on the change in the grants from the aligned grantor compared to the change in grants from unaligned grantor (Solé-Ollé and Sorribas-Navarro, 2008). They found that the alignment effect matter in the allocation of grants.

Nannicini and Brollo (2012) documented the existence of tactical behaviour for the Government in order to punish not aligned politicians using Brazilian data. Their empirical model estimates that mayors who are politically aligned with the Brazilian President receive larger federal transfers. Tactical transfers may influence also future election thus making the incumbent stronger and building an entry barrier for new participants (even if this result is not so robust). Federal transfers are allocated more for political reasons than for efficiency and equity (Nannicini and Brollo, 2012).

Bracco, Lockwood, Porcelli and Redoano (2015) provided a political agency model to test the alignment effect in the allocation of grants. They pointed on the following features: rational voter interpret public good provision as a signal of incumbent competence; grants are unobservable to voters (Bracco, Lockwood, Porcelli, Redoano, 2015). They used a regression discontinuity design on Italian municipalities data. They found that the alignment effect exists, so the national government will use the grant as a tool to benefit the aligned local incumbent and challengers (Bracco, Lockwood, Porcelli, Redoano, 2015). Furthermore, they also test the flypaper effect for Italian municipalities.

Carozzi and Repetto (2016) tested the existence of pork-barrel politics. They used the data on Italian municipalities transfers to study if the birth town of members of Italian Parliament affects the allocation of resources. Specifically, they divided politicians in internal (who have their birthplace within the district of election) and external (who have not the birthplace within the

district of election). The authors found that municipalities who are connected to the Parliament by an external politician receive annually approximately 2 percent larger per-capita transfers. So, this effect is driven by politicians with an electoral district different from the place where they were born. But, rather than re-election motives<sup>11</sup> Carozzi and Repetto observed that legislators may be pursuing other motives. Moreover, they found that birth town bias tends to disappear when elections are near (Carozzi and Repetto, 2016).

## 1.3 Italy: layers of government and fiscal rules

Italy is a fiscally decentralised country with four layers of government: municipality, province or metropolitan area (upper-local), region and central state. These institutions are autonomous from each other, with their statute (“statuto”), powers and functions defined by the Constitution. There are 20 regional governments (five of which are recognised as autonomous regions, subject to particular rules) that have important spending responsibilities, for example, in health care.

Title V of the Italian Constitution regulates the relations between the central state, region, province, metropolitan area and municipality<sup>12</sup>.

### 1.3.1 Municipality

The Italian Constitution<sup>13</sup> recognises the municipality as an autonomous entity with its own statutes, powers and functions. In particular, legislative Decree 267/2000 defines a municipality as a local entity that *represents the community, ensures its interests and encourages its development*.

Italy has more than 8,000 municipalities, although most of them are quite small. Municipalities are multi-purpose government, with legislative power and their functions are regulated by *testo unico degli enti locali* (T.U.E.L.). In general, they must provide services for the community, and guarantee adequate social standards and economic growth. Major expenditure categories include the classic responsibilities assigned to the local public sector such

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<sup>11</sup>Pork-barrel literature focuses on re-election motives.

<sup>12</sup>Title V of the Italian Constitution rules local autonomies. It was involved by a series of reforms since Seventeen in the line of more “fiscal federalism”. In particular, the 2001’s reform guaranteed to the regions autonomy both in the expenditures and in the organization of their institutions. Hence, Title V ruled role and competencies of central state, giving the regions the power to rule on issues that are not competencies of the central government.

<sup>13</sup>See from article 114 of the Italian constitution.

as environmental services, urban planning, public transport, welfare and a part of educational expenses (for example the care of school buildings). Expenditures are financed by own revenues and by grants, both conditional and unconditional. Regulation concerning grants should minimise the use of pork-barrel politics. The grants come from the previously mentioned upper layers of government: central, regional and upper-local.

Many grants are conditioned by information and projects that municipalities send to the central government or to the other upper layers of government. These documents are evaluated according to criteria previously established by the law, but they can also be affected by the interpretation of the grantor. Therefore, such grants can be politically discretionary.

Italian municipalities have the following governing bodies<sup>14</sup>:

- city council (“consiglio comunale”), which has the aim of control and guidance;
- executive committee (“giunta comunale”), which has “residual jurisdiction” and manages functions that are not managed by other bodies;
- the mayor, who is the executive and representative authority.

The size of the city government and the city council depends on the population. The executive committee provides fiscal policies and it is appointed by the mayor, who must formulate an annual budget voted on by the council. Furthermore, local governments are characterised by high political stability, thanks to the reform of the local electoral system in 1993. The last electoral reform (law 81/1993) allowed the mayor and the legislative body to be elected directly by the citizens and it contains rules that guarantee a majority in council and thus political stability. The council can discharge the mayor, in which case a new election takes place.

The laws differentiate between municipalities with fewer than 15,000 inhabitants and those with more than 15,000. In the first case the mayor is elected through a single round-race, and the candidate with more votes wins (i.e. a plurality voting system); in the second, the mayor is elected by a two-round system. In the first stage the voters cast two preferences: the mayor and the party list. The mayor is elected if he receives at least 50 % of voters plus one. If no one achieves this threshold, the second stage takes place: the vote is only for the mayor and the two candidates with the most votes run against each other (Bordignon, Turati, 2014).

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<sup>14</sup>Decree 267/2000.

**Municipal Budget** <sup>15</sup> The already cited T.U.E.L. is the document in which all rules regarding local entities are gathered. The second part of this document (article 149-269) contains the budget rules.

Municipalities annually define the expected budget on the basis of accrual criteria (“criterio di competenza”) and the Economic and Finance Document (“Documento di Economia e Finanza”). The expected budget cannot be in deficit and the annual budget lasts from the first of January to the 31st of December<sup>16</sup>.

The Executive Committee must define the expected budget, in which the municipalities forecast their revenues and expenses for the year. The budget must be presented to the City Council with the relative documents and approved by the same body no later than the last day<sup>17</sup> of the year before the estimated year. The final budget (“bilancio consuntivo or rendiconto della gestione”), instead, certifies the revenues and expenses actually incurred. The City Council must approve this document before the 30th of April of the year following the relevant year.

These two documents are crucial for municipalities’ economies.

### 1.3.2 Domestic Stability Pact

In 1990, fiscal rules were adopted both at the supra-national and sub-national levels in order to reduce fiscal imbalances<sup>18</sup>. After the introduction of the

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<sup>15</sup>The municipal budget regulates economic activity in the municipality. It contains the revenues and the expenses in the year. For the Italian legislation, the municipal budget is formed by two documents: “bilancio previsionale” and “bilancio consuntivo”. The former is an ex-ante document with the aim of political programming and planning. It has an authoritative function and it contains the expenses expected and the relative revenues that will fund them.

The “bilancio consuntivo” is the document redacted at the end of the period that allows the municipality to certificate the revenues effectively collected and expenses effectively implemented. It has a particular structure. In the “gestione di competenza”, there are revenues “accertate” and expenses “impegnate”, that are revenues and expenses juridical chargeable to the financial year but not yet collected or implemented. In the “gestione di cassa”, there are revenues collected and expenses implemented. The third column represents the “gestione residui” which, de facto, calculates the difference between the two voices above.

<sup>16</sup>The articles from 149 to 269 of T.U.E.L. re-organized the rules contained in Decree 77/1995.

<sup>17</sup>The deadline of 31st December is mandatory but it may be changed in particular cases. The change of deadline must be ruled by Interior Minister.

<sup>18</sup>Balassone, Franco and Zotteri (2004) describe the evolution of sub-national fiscal rules in Europe and their relation with Maastricht Treaty. This relation provides the necessity of coordination and interaction between and within European countries and the necessity

Stability and Growth Pact in 1997, several European countries adopted the so-called “Internal Stability Pact” in order to coordinate the central budget with decentralised ones. In 1999, the Domestic Stability Pact (DSP) was introduced in Italy. Its regulation is always defined in the yearly budget law (“legge finanziaria”). The aim of this pact is to introduce a ceiling in the increase of the sub-national government’s deficit<sup>19</sup> and to coordinate public finances between the central government and local entities.

Municipal governments committed to keeping their fiscal gaps under control and those that did not comply the pact were subject to the following punishment<sup>20</sup>: 1) a cut of 5 % in grants from the central government, 2) the prohibition of municipal recruitment, and 3) a cut of 30 % in the resources designed to fund reimbursement and non-absenteeism bonuses of municipal employees. Instead, municipalities that followed the pact were eligible for a reduction in expenses for interests on loans funded by the central government (Marino, 2013).

In 2001, municipalities with a population less than or equal to 5,000 inhabitants were excluded from the commitment of the DSP. From 2002 to 2005, the Domestic Stability Pact established fiscal targets and constrained current expenditure.

In 2005, the review of that Pact also involved the constraint on capital expenditure<sup>21</sup>. In 2006, current and capital expenditures were differentiated, increasing the latter and thus the investment in the municipality. This rule was established to improve the efficiency of the local government’s spending. However, in 2009 this differentiation vanished when the principle of “mixed competence” (which states that the municipal government can decide which type of expenditure to cut in order to fulfil the target) was introduced (Marino, 2013).

In 2013, the DSP was extended to municipalities with a population between 1,000 and 5,000 inhabitants. In 2013 approximately 77 % of Italian municipalities were subject to the DSP while until 2012 only 30% of municipalities had been (Marino, 2013).

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of defining a central authority for fiscal policies.

<sup>19</sup>The definition of deficit in the Domestic Stability Pact did not involve health, capital and interest spending.

<sup>20</sup>In 2007, there wasn’t the publication of the list of not complying municipalities and thus the punishment did not occur. This fact generated a contradiction because complying municipalities were subject to a huge fiscal rigidity while not complying municipalities had not a punishment. Starting from 2009, punishment and control became more severe.

<sup>21</sup>The target changed from one year to another even if the structural change had occurred in 2005 when it passed from a fiscal gap to a financial gap, thus binding the expenses growth (Marino, 2013).

## 1.4 Local public finance: taxes and grants

In order to analyse local public finances we present the mechanisms for municipal revenue. In particular, municipalities can finance their revenues through taxation (“finanza propria”) and grants (“finanza derivata”). Article 149 of the T.U.E.L.<sup>22</sup> regulates the local economy and it establishes criteria<sup>23</sup> that must guarantee municipalities’ budget efficiency.

### 1.4.1 Grants from upper layers of government to municipalities

Municipalities receive grants from the central government, the region, the province and other entities<sup>24</sup>.

Government grants (“trasferimenti erariali o statali”) are important for the municipalities’ budgets as they represent one of the main components of municipal revenues.

These funds are included into the section of the municipal budget concerning the second title of revenues.

The amount of resources to transfer as grants is calculated according to criteria established by laws, and thus they are subject to significant change according to the government in charge. In particular, the budget law (“legge di stabilità”) determines the amount of resources to transfer to the municipalities.

In general, governments finance municipalities primarily using grants to fund

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<sup>22</sup>T.U.E.L. argues that municipalities can finance their expenses through:

- Local taxes;
- Surtax and revenues sharing from state and regional taxes;
- Taxes for public services;
- Governmental transfers;
- Regional transfers;
- Other municipal revenues and revenues from capital goods;
- Transfers for investment;
- Other revenues.

<sup>23</sup>It states that local taxation and grants must be founded on the criterion of the certainty of resources.

<sup>24</sup>For example municipalities can receive grants from Union of Cities or other inter-municipal institutions.

both local current expenditures and capital expenditures<sup>25</sup>. Grants are allocated according to population (the number of inhabitants of a municipality is a primary indicator of the resources needed), geography, socio-economic conditions, fiscal inequality or conditioned to information and projects.

However, Bracco, Lockwood, Porcelli and Redoano (2015) note that Italian grants are not purely formula-based. Indeed, the political debate of the last decade has highlighted the need for radical reforms on this point, in order to move toward formula-based grants.

Local fiscal policy was the subject of many reforms (to improve fiscal autonomy) beginning in the early 1990's. These reforms had the goal of increasing municipal taxation and thus reducing the dependency of municipalities on the central State. Increasing the local autonomy for fiscal policy may mean increasing the accountability of local politicians in setting such policy (Bordignon, Turati, Gramalerio, 2013) and it increases efficiency in spending behaviours (Boetti, Piacenza, Turati, 2009). However, this autonomy clearly penalises poorer municipalities, that lack the resources to guarantee the services provisions.

The share of grants over total revenues decreased drastically<sup>26</sup> because of

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<sup>25</sup>The grants were classified as:

Current transfer:

- ordinary grant ("contributo ordinario");
- consolidated grant ("contributo consolidato");
- grant for fiscal inequality ("contributo perequativo degli squilibri della fiscalità locale").

Capital transfer:

- Grant for investments ("contributo per lo sviluppo degli investimenti");
- ordinary grant for investments ("contributo nazionale ordinario per gli investimenti");
- grant for special investments ("contributo del fondo speciale per gli investimenti").

The ordinary grant represents the transfer to fund current expenditure. It's is mainly calculated using historical data on current expenditure ("criterio della spesa storica").

The consolidated grant is allocated for particular reasons, expected by Interior Minister. The amount of this grant may be considered more or less constant over time.

The grant for fiscal inequality represents the transfer with the aim to eliminate inequalities in collected revenues for Italian municipalities. It considers municipality's fiscal capacity. Hence, it allocates resources to municipalities with a weak fiscal capacity, thus those municipalities that are not able to fund the expenditure by their own tax revenues.

<sup>26</sup>The Italian mechanism of grants was highly centralized. Municipalities had a low fiscal autonomy and funded their expenditures mainly through government grants. Indeed, over the eighteen the share of grant over total municipalities revenue was around 80%.

reforms in 1992 and 1997. This significant decrease showed the rise in municipalities' fiscal autonomy during the 90s and the 2000s. In this context, in 1999 the Italian Parliament approved the DSP which consisted of a link between the internal process of fiscal consolidation and the European one. The DSP, indeed, represents a tool to coordinate public finance between the government and local entities.

However, the Figure 1.1 shows how the amount of grants rose in 2008 despite a drop of municipal taxation. This change of direction was due to the abolition of the main dwelling property tax.

Besides the central state, other layers of government can transfer resources to municipalities to fund municipal expenditures.

As stated above, the regional and upper-local grants are also included in the second title of the revenues side of the municipal budget.

Regional parliaments also regulate the discipline related to the distribution of grants. Regional grants can finance both current expenditures and capital expenditures. The resources that regions transfer to municipalities are added to the local budget on the revenues side as "grant from region" (which finances current expenditures) and "capital transfer from region" (which primarily finances investments). In particular, regions fund local capital expenditures through grants conditioned to projects.

The same occurs with the transfers from provinces or other public administrations.

### 1.4.2 Municipal taxation

Over time municipalities gained significant fiscal autonomy. Many reforms involved the possibility of creating new taxes with the aim of guaranteeing budget sustainability in terms of local revenues. For this reason during the 2000s local taxes assumed a crucial role in municipal budgets<sup>27</sup>.

In the following section, we limit ourselves describing only local taxes related to our analysis.

**Property tax ("Imposta Comunale sugli Immobili, I.C.I.")** In 1992, Amato's government introduced a property tax on dwelling called the I.C.I. ("Imposta Comunale sugli Immobili")<sup>28</sup>. This tax was applied on all buildings (residential or not residential) and lands. For the first time, Italian municipalities had a strong fiscal instrument that guaranteed greater auton-

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<sup>27</sup>They are enrolled at I Title of the revenues side in the final budget.

<sup>28</sup>Law 504/1992.



Figure 1.1: Per-capita total grant vs per-capita municipal taxes.

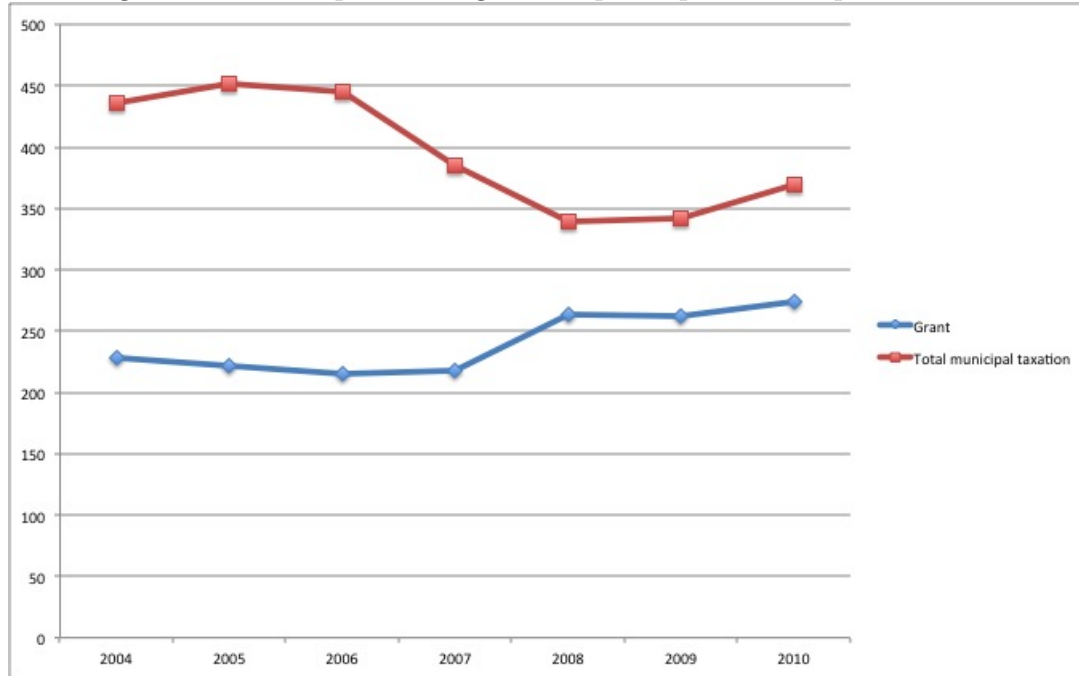


Figure 1.1 shows the evolution of per capita total grant and per capita established municipal taxes from 2004 to 2010. It describes a fall in revenues from total municipal taxation starting from 2008. Source: Interior Minister (Finanza Locale).

omy into raising revenues. The tax base was the same for all municipalities and ruled by Italian national Cadastre. However, municipalities set the tax rate and discount. The tax rate had ranged between 0.4 and 0.7 % and according to residential or commercial buildings. In addition, municipalities could adopt discounts for residential buildings. Obviously, in 2008 with the abolition of this tax, revenues were significantly reduced. Correspondingly, the grants from the government to local administrations increased in such a way that municipalities could manage the same amount of resources (that is the amount no longer collected on the main dwelling) after the property tax reform.

At that time, indeed, the property tax on the main dwelling was the most cited tax in political debates<sup>29</sup>. In 2007 the centre-left government applied a reduction to the main dwelling, subsequently, the centre-right government in 2008 abolished the property tax on the main dwelling, as promised in the electoral campaign.

The property tax (I.C.I.) on the main dwelling represented one of the main

<sup>29</sup>The political debate on this tax was intense: who pointed on tax free status of the main dwelling and who pointed on the importance of this tax for local revenues.

sources of local finance and its importance is highlighted by the fact that it also represented around 50% of municipal taxation (Nannicini, Grembi, Troiano, 2016). In addition, mayors may rule on it according to their political sensibility.

Of consequence, after 2008 the share of this tax declined despite an increase in governmental grants.

In addition, the abolition of the property tax (I.C.I.) on the main dwelling led to the question of how much the refund should have been. However, the amount of resources funded by the central government was less than the property tax on the main dwelling collected in 2007. Thus, in the allocation of grants some municipalities may have gained an “extra-resource” while others may have lost revenues.

**Tax on waste (“Tassa per lo smaltimento dei rifiuti solidi urbani, T.A.R.S.U.”)** Municipalities also have environmental responsibility<sup>30</sup> and must adopt rules to preserve it according to the principles of transparency, efficiency and effectiveness.

The tax on waste (T.A.R.S.U.)<sup>31</sup> was a municipal tax that must fund the cost of waste disposal. Not all types of waste, however, were the object of this tax. Private producers specifically must fund the disposal of highly polluting waste. At that time, the taxation was related to the occupation of space in the municipality in which the service is provided. This tax, except in municipalities with a population of fewer than 35,000 inhabitants, was proportional not to the quantity of waste produced but to the size of the occupied space. This characteristic made this de facto a tax on capital instead of a tax on a service. Furthermore, the law stated that municipalities must organise the tax through a dedicated regulation.

In order to create a tax on waste closely related to the service provided, in 1997 the centre-left government introduced a new tax the “tariffa per l’igiene ambientale” with the aim to substitute the T.A.R.S.U. However both taxes remained in the municipal fiscal scenario. Each municipality could choose which to apply but the majority of Italian municipalities preferred the T.A.R.S.U..

The dimension of the dwelling represented the base of this tax and it is considered linked to the waste yield<sup>32</sup>. Where highly applied, this tax repre-

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<sup>30</sup>Waste services are ruled by the Environment Code (“Codice dell’ambiente”), legislative decree 152/2006.

<sup>31</sup>Legislative decree n. 507/1993.

<sup>32</sup>Several Italian municipalities have not a correct methodology to calculate as well the waste yield.

sented approximately 20% of the municipal taxation. After the property tax and the IRPEF surcharge, it may be considered one of the most important source of municipal taxation.

In 2008, following the law abolishing the property tax (I.C.I.) on the main dwelling, Berlusconi's government ruled also on local fiscal policy. In particular, local fiscal policy was regulated by article 77-bis legislative decree n. 122, 2008. This article states that "it is established for 2009-2011 the prohibition for the local autonomies of increasing the local taxation with the exception of the tax on waste"<sup>33</sup>.

In sum, the T.A.R.S.U. was the only tax that could easily be increased in cases of fiscal necessity.

**Building permits ("permessi a costruzione")** The municipality regulates construction activity and in order to fulfill this task, it must adopt building rules ("regolamento edilizio") which includes issuing building permits.

The building permit<sup>34</sup> is an official document issued by the municipality in order to authorise building activity in accordance with the related regulation. In general, this authorisation involves both new building and restructuring activities.

First the building permit must be requested towards the payment of a certain amount of money ("oneri concessori") and the production of specific documents. The legislative side is ruled by a specific regulation ("testo unico dell'edilizia") and by regional laws.

Before 2004, the so-called "Bucalossi"<sup>35</sup> law ruled building permits. This law required that the revenues from building permits would have been used to finance infrastructures in the municipality. In 2004, the obligation to use these revenues to fund capital expenditure was relaxed and they could instead be used to finance part of the current expenditures at a maximum of 75%<sup>36</sup>(Ermini, Fiorillo and Santolini, 2013).

The effect of this law was notable. As consequence, 2004 saw an increase in the share of the revenues from building permits over total revenues<sup>37</sup>. How-

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<sup>33</sup>This prohibition was lowered by the Court of Auditors. Indeed, the Court stated that the prohibition to increase local taxation must not involve those municipalities that included this increase in their expected budget. This is the reason why some local taxes increased during 2009-2011.

<sup>34</sup>Building permits are mainly regulated by the Presidential Decree no. 380/2001. Decree unified and organized laws and rules regarding the building activity from 1942 to 2001.

<sup>35</sup>Law 10/1977.

<sup>36</sup>Law 311/2004.

<sup>37</sup>The data are not representative of all Italian municipalities. Some municipalities do not send their budget to the Interior Minister for the publication or simply put 0 at the

ever, the law of 2004 and subsequent ones<sup>38</sup> incentivised land consumption in order to increase revenues and thus the local expenditure.

## 1.5 Property tax reform: the abolition of main dwelling property tax (I.C.I.)

### 1.5.1 Political environment

The abolition of the property tax on the main dwelling was introduced in the political debate during the electoral race in 2006; it was proposed by Silvio Berlusconi, the leader of the centre-right coalition House of Freedom (“Casa delle libertà”). The centre-left coalition the Union (“L’Unione”), led by Romano Prodi, won the election with a restricted majority. In 2007 Prodi’s government reformed the property tax. In particular, it regulated a reduction in the property tax on the main dwelling. In 2008, after the crisis of the Prodi government, a new election was held. The centre-right coalition was formed by two parties, “Popolo della Libertà” and “Lega Nord” while the centre-left coalition was formed by “Partito Democratico” and “Italia dei valori”. The electoral race involved these two coalitions as well as a third formed by a centre party, “Unione di Centro”. The centre-right coalition won the election with a strong majority and one of the first acts of Berlusconi’s government was the abolition of the property tax (I.C.I.) on the main dwelling.

In general, the political environment in Italy is characterised by the presence of a large number of parties. In 2008, at the sub-national level the coalitions were wider than at the national level. In particular, they were composed of political parties and civic parties<sup>39</sup> and their composition did not necessarily reflect the coalitions at the national level.

In addition, Italy has different electoral rules for different layers of government. The electoral rules at the city, provincial and regional levels guarantee higher stability than the national level and governments at sub-national levels have higher probability to be in charge longer than the central government.

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voice in the local budget concerning building permits.

<sup>38</sup>Law 244/2007 and 2016 Budget Law.

<sup>39</sup>Civic parties are difficult to be identified along the ideological line.

## **1.5.2 The abolition of main dwelling property tax**

The debate about the abolition of the property tax on the main dwelling began in earnest during the electoral campaign in 2006. Next, Prodi's government decreased this tax, increasing deductions for the main dwelling<sup>40</sup> and financing transfers to municipalities for 904 millions of euros. Subsequently, Berlusconi's government issued the abolition of the property tax on the main dwelling<sup>41</sup>. Transfers for 1,700 millions of euros substituted the amount of the uncollected tax which was added to 904 millions of euros funded by Prodi's government. However, transfers increased during the year of the property tax reform (Table 1.1).

In addition, the law stated that the state-municipalities and local entities conference ("Conferenza Stato-città and enti locali") needed to decide the criteria and methods to regulate the amount of the transfers allocated to municipalities. In order to avoid problems with municipalities' accountability, the decree of June 2008 provided the transfer to the municipalities of 50% of the property tax collected for the main dwelling in 2007.

For 2008, the Interior Minister planned the amount to be transferred as follows:

- July 7, 2008, 50% of the tax revenues, certified, on the main dwelling for 2007;
- December 12, 2008, approximately 36% of the tax revenues, certified, on the main dwelling for 2007;
- December 13, 2008, the difference up to 94,75% of the tax revenues that was certified on the main dwelling for 2007<sup>42</sup>.

In order to define the amount to transfer to each municipality, the law regulated the duty of certifying the revenues of the property tax on the main dwelling no longer collected in 2008.

The Minister of the Interior and the Minister of Economy and Finance collected data on 2007, using also information from the Italian Post Office (Poste Italiane s.p.a.).

Institutions with control goal<sup>43</sup> was the Court of Auditors ("Corte dei Conti"). The fundamental issue of refunding the municipalities for the revenues no longer collected returned in 2009<sup>44</sup>.

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<sup>40</sup>Law n. 244 of 2006 Budget Law.

<sup>41</sup>Law n. 126/2008.

<sup>42</sup>Data are collected by Interior Minister.

<sup>43</sup>Decree n.154/2008, subparagraph 6 and 7, and it subsequently converted into law n. 189/2008.

<sup>44</sup>For 2009, Interior Minister planned the amount to be transferred as follows:

Table 1.1: Total amount of certificated main dwelling property tax and the following grant allocated by government, in million of euros.

	2008	2009	2010
Fund Allocated	2,864	2,604	2,604
Fund Increase	156	760	760
Total Fund Allocated	3,020	3,364	3,364
I.C.I. Certificated at 2008	3,364.6	3,364.6	3,364.6
Percent coverage	0.898	0.998	0.998

Note: Table shows data on amount (in million of euros), certificated by the Interior Minister, of the main dwelling property tax and total amount of compensatory grant allocated by central government. Source: Interior Minister.

### 1.5.3 The control system: the role of the Court of Auditors (“Corte dei Conti”)

The Minister of the Interior entrusted the Court of Auditors (“Corte dei Conti”) with control of the truthfulness of the data transmitted. To provide this aim, the Court of Auditors could be assisted by another institution, the Territorial Agency.

However, the Court of Auditors<sup>45</sup> encountered difficulties in testing the truthfulness of the data transmitted by the municipalities to the Minister of Interior. For this reason, the institution tasked with control preferred to substitute the term “truthfulness” with the term “reliability”. In particular, the regional sections of the Court of Auditors were responsible for defining criteria and methodology to verify “reliability”. Indeed, this control was implemented according to these parameters. However if data were considered unreliable, there was no punishment for the municipality; in this case, the municipality had only the duty of recalculating the amount of the property tax on the main dwelling no longer collected.

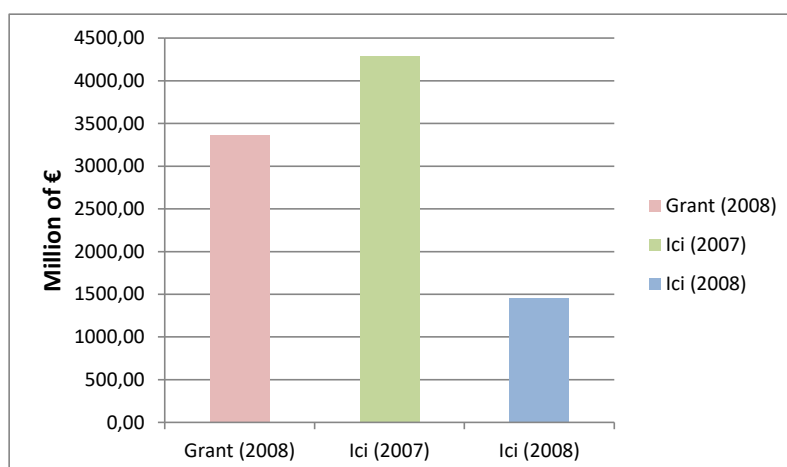
As stated above, the content of the approval showed the difficulty of control and thus, in the definition of the truthfulness of the data. These difficulties may make the issue of defining the amount of transfers to each municipality complex to be implemented. In addition uncertainty in controlling the data and the absence of a punishment may increase the moral hazard for municipi-

- 15 June 2009, 50% of the revenues from main dwelling property tax (I.C.I.) that were certificated in 2007;
- 27 November 2009, transfers based on 2008 data;
- 7 December 2009, transfers based on 2008 data.

<sup>45</sup>Deliberation n. 8/2009 by Court of Auditors.

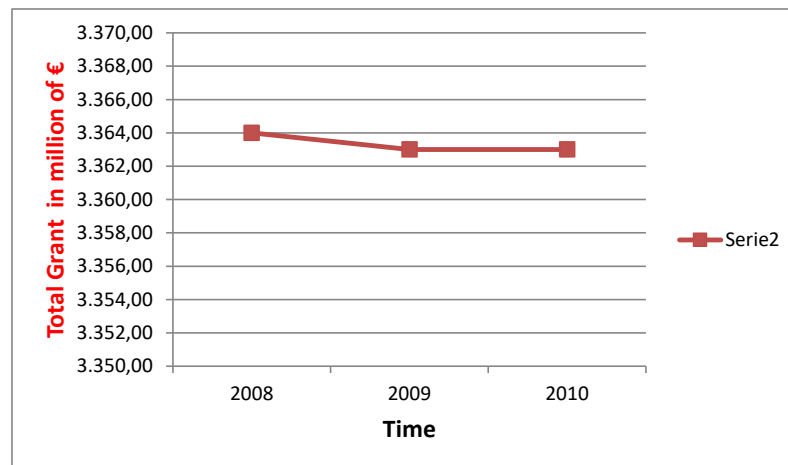
### 1.5 Property tax reform: the abolition of main dwelling property tax (I.C.I.)

Figure 1.2: Total amount of compensative grant and revenues from property tax collected in 2007 and in 2008.



The graph compares the total amount of compensatory grant in 2008 with the total amount of revenues from the main dwelling property tax collected in 2007 and 2008. The grant was allocated according to the revenues of the main dwelling property tax collected in 2007.

Figure 1.3: Total amount of compensative grant, 2008-2010.



The figure shows the evolution of the total amount of compensatory grant (in million of euros) from 2008 to 2010.

palities.



In this scenario, institutions asked with control and monitoring could have discretionary power in deciding which municipality tells the truth and which does not. However, it is not possible to suppose that the Court of Auditors could use its power for political aims. First, the Court of Auditors is a “super-partes” institution.

Second, the law establishing its role as first-step controller for the reliability of the data does not leave room for discretionary power: the Court of Auditors decides the criteria and parameters to test the data of all municipalities. However, the complexity in controlling the reliability of the data remains as it is possible that untrue data could be considered reliable. In order to minimise errors in this evaluation, the Minister of the Interior developed several indicators in order to implement a second-step control. As consequence, data that violated those indicators could be subject to a check.

#### **1.5.4 Mechanism of grant allocation: the role of State-municipalities, the local entities Conference (“Conferenza Stato-città ed autonomie locali”) and the Interior Minister**

The Interior Minister and the state-municipalities and local entities conference<sup>46</sup> were two important actors in the debate concerning the abolition of the property tax on the main dwelling. After providing the abolition of the main dwelling property tax in early 2008, the government met political representatives of municipalities to discuss the criteria to adopt for the reallocation of resources no longer collected.

The conference, which took place in June 2008, stated that the grants must be calculated on the amount certified by the Interior Minister (according to DM February 15th, 2008) and collected (“riscosso”) of the property tax on the main dwelling in 2007.

In addition, it became necessary to establish criteria for an efficient allocation of resources.

These criteria were established in the conference that took place on August 5th 2008. One of the parameters the conference chose and that was adopted by the government concerned efficiency in the property tax collection. It was defined as the ratio between the amounts collected in both “conto compe-

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<sup>46</sup>The State-municipalities and local entities Conference is an institution with the aim of coordination, research, gathering information and debate about policies that may affect Italian municipalities. It can debate about issues related to the local budget and thus it represented a good laboratory in which to discuss problems related to the abolition of the main dwelling property tax.

tenza” and “conto residui” (the amount effectively collected) for the period 2004-2006 and the “accertamenti” (the amount expected and so established) of the same tax for the same period. Data used to build this parameter included those sent from municipalities to the Interior Minister.

The same conference also defined other parameters such as the respect of the DSP and the characteristics of the municipality proxies by population size. For the definition of the last parameter, the municipalities under consideration were those with a population less than or equal to 5,000 inhabitants. Compliance with the parameters discussed above led to a score for each municipality:

- municipalities with a parameter of efficiency in the property tax collection greater than 4% of the national average level scores 1; between 4% and -4% scores zero; less than -4% scores -1.
- Municipalities that comply the DSP gain one point; municipalities that do not comply the Domestic Stability Pact gain zero points;
- Municipalities with fewer than 5,000 inhabitants gain one point; municipalities with more than 5,000 inhabitants gain zero points.

In the end, the Minister can assign to the municipalities a score that ranges between -2 and 2<sup>47</sup>. These percentages are applied to the amount of taxes not collected and certified by the municipalities. The non-allocated amount caused by a negative score resulted in the creation of a special fund designed for municipalities with a population less than 5,000 inhabitants.

The criteria for 2009<sup>48</sup> remained, approximately, the same as those ruled by the decree of the Interior Minister on August 2008<sup>49</sup>.

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<sup>47</sup>The decree of Interior Minister n. 216/2008 regulated, at article 2, the percentage of the reduction in grants according to the following criteria:

- 4% less for municipalities with a score of -2;
- 2,5% less for municipalities with a score of -1;
- 1% less for municipalities with a score of 0.

<sup>48</sup>The Conference was held in September 2009.

<sup>49</sup>It established, among other things, the percentage of reduction in grants according to the following criteria:

- 1,8% less for municipalities with a score of -2;
- 1,1% less for municipalities with a score of -1;
- 0,4% less for municipalities with a score of 0.

## 1.6 Conclusion

This chapter provides an overview of local public finance and the rules regulating the abolition of the property tax on main dwelling. In particular, we are interested in the weakness of the law on the property tax abolition that, in this case, may be the cause of discretionary policies by the government in the allocation of transfers. The previous sections show the complexity of collecting data, choosing the criteria for allocation and in control. Indeed, laws and regulations faced the constraint of regulating an alternative source of funding as soon as possible. In this scenario, the allocation of resources no longer collected may decline in efficiency and the municipality's moral hazard about data communication may arise. The assignment of data control to the Court of Auditors overcharged this institution's role, while the second-step control of the Interior Minister may be politically biased.

We have also described some aspects of municipal revenues and laws established by the central government that can affect local fiscal policy. The abolition of the property tax on the main dwelling increased uncertainty in local public finance. Thus the uncertainty on data and on the amount of resources calculated for the compensation of the tax abolition caused uncertainty in local budgets: municipalities could expect a loss in revenues, if the amount of resources transferred was lower than the amount of property tax no longer collected, or a gain if the amount of resources transferred was greater than the amount of property tax no longer collected. Local governments could set their fiscal policy according to what they expected to be the grant: politicians could increase, reduce or let the revenues and/or the expenses remain constant.

The property tax reform represents an experiment to investigate the behaviour of Italian municipalities as a response, although low in degree, to fiscal centralization. In particular, Italian municipalities follow tight fiscal rules (i.e. the DSP) promoted to efficiently manage resources and to reduce the debt of public administrations. Deviation from the target causes penalties in terms of grants transferred from the government to the municipalities (or fines) and may paint a politician in a negative light reducing his chances of being re-elected. This fear of a loss may influence the municipal politician to increase revenues more than necessary or cut expenses more than necessary to avoid fiscal imbalances.

On the other hand, the abolition of the property tax (I.C.I.) on the main dwelling represented a useful political instrument to win elections. Indeed, the median voter in Italy is a homeowner and is thus influenced by this policy. In addition, the abolition led to an increase in the amount of grants from the centre to the municipalities, as well as a decrease in fiscal auton-

omy. In this sense, Italian municipalities became more dependent on central grants and the government had more leeway for pork-barrel policies. In brief, the negative side of the legislation may allow for partisan alignment effects: politicians in the government may pursue the strategy of allocating more resources to the mayors politically linked to them. Thus, this strategy may provide the possibility that politicians of the majority maintain and even increase their votes.

In conclusion, our goal may be summarised as follows:

1. *Analysing the behaviour of fiscal policy for the municipalities as a reaction to the uncertainty caused by the property tax reform;*
2. *Testing whether the government adopted a pork-barrel strategy for the distribution of grants following the abolition of the property tax on the main dwelling.*

The PhD thesis is organised as follows: in chapter 2 we analyse the behaviour of Italian municipalities as a response to the abolition of the main dwelling property tax; in chapter 3 we test the presence of the “partisan effect”.

## Chapter 2

# An Empirical Analysis on the Fiscal Behaviour of Italian Municipalities

### 2.1 Introduction

The 2008 fiscal reform ruled the abolition of the main dwelling property tax. This tax represents one of the most important source of revenues for Italian municipalities and its partial abolition decreased the room for local fiscal policy. Municipalities lost this fiscal instrument that was substituted by governmental grants. This fiscal phenomenon moved the Italian system towards a centralization, after years of a fiscal decentralization (“federalismo fiscale”) process.

The abolition of the main dwelling property tax led two effects to the local political economy. On one hand, the substitution of a local tax by a governmental transfer decreased the political cost, in terms of votes, of the increase in local taxes, because local politicians were no longer politically responsible of the property tax on the main dwelling. Indeed, with the reduction of fiscal autonomy the cost of raising is largely borne by non-resident, and so local politicians have a clear tendency to free-ride against each other (Bordignon, 2000)<sup>1</sup>. Hence, local governments may be encouraged in increasing local taxation to obtain political rents.

On the other hand, local politicians could decide to increase local taxes to

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<sup>1</sup>The Italian case also suggest that the removal of vertical fiscal imbalance alone is not enough to eliminate the incentives to overspend at local level. Larger autonomy at the regional level in the health sector and a law that explicitly prohibiting the central government from eventually sustaining local bills were not enough to enforce a hard budget at regional level (Bordignon, 2000).

face budget imbalances. Indeed, the loss of revenues due to the abolition of main dwelling property tax was not always totally compensated by governmental grants. These two effects, political rents and fiscal balances motives, may rise local taxation.

For the reasons stated above, the Italian government prohibited by law the opportunity to increase municipal taxation from 2008 to 2011. However, this fiscal measure was “relaxed”, when the central government allowed, with another law<sup>2</sup>, the variation of the waste tax (“T.A.R.S.U.”). As a consequence, in 2009 the “accertata” waste tax in per-capita terms was in mean 93.5 euros while it was 88.4 euros in 2008.

In this chapter we want to test whether or not the behaviour of municipalities in terms of revenues may change according to the grant received to compensate the abolition of the tax on the main dwelling (Imposta Comunale sugli Immobili, I.C.I.). On the other hand, we also want to test whether the municipalities fix or not the local expenditure according to the grant received to compensate the abolition of the main dwelling property tax.

Furthermore, we also investigate whether or not the fiscal centralization process induce local politicians to behave differently according to the received grant. Indeed, the uncertainty on the data on the main dwelling property tax in 2007 may affect the amount of compensation in 2008. As a matter of fact, in 2008 some municipalities may receive more than the amount collected for the main dwelling in 2007 and some municipalities may receive less.

As stated before, the fiscal uncertainty generated by the reform may affect fiscal behaviour of local governments. Indeed, uncertainty may lead municipalities towards two states of nature:

1. the “good” state occurred when the municipality manages more resources after the property tax reform;
2. the “bad” state occurred when the municipality manages less resources after the property tax reform.

The position on the “bad” state may generate problems in terms of budget balance<sup>3</sup>: receiving less money than collected in 2007 decreased the revenues and it may lead to low budget unbalance. Therefore, the reform generated

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<sup>2</sup>The article 77-bis legislative decree n. 133/2008. The comma was eliminated by law n. 44/2012.

<sup>3</sup>The amount of resources subject to our analysis may generate weak budget difficulties. However, the reduction of resources following the reform and the constant decrease of grants from the central government to the municipalities may exacerbate these fiscal difficulties.

worse off municipalities. Obviously, local governments may intervene increasing local taxation, in particular the waste tax<sup>4</sup>, to compensate the loss<sup>5</sup>.

On the contrary, the position on the “good” state may generate extra-resources that can fund reduction in tax or increase in spending. Therefore, the reform generated better off municipalities.

In 2009 Salerno, for example, raised the “accertata” per-capita waste tax of more than 14 euros compared to 2008 against a net loss from the property tax abolition of less than 8 euros per-capita. On other hand and for the same reasons, municipalities that expected a gain in terms of revenues after the property tax abolition (better off municipalities) may have decided to decrease the rate of the waste tax or increase it for funding a further increase in the expenses. In 2009 Pavia, for example, decreased the “accertata” per-capita waste tax of more than 3 euros compared to 2008 against a net gain from the property tax abolition of more than 15 euros per-capita<sup>6</sup>. In the same year, Bologna raised the per-capita waste tax of approximately 7 euros compared to 2008 against a net gain of more than 15 euros per-capita.

Italian cities cited in the examples show a likely different behaviour of local politicians according to be in the “good” or “bad” scenario. Politicians that experienced a gain in revenues (Pavia or Bologna’s cases) may have decided to reduce as well as increase the waste tax less than the degree of a certain gain. On the contrary, politicians that experienced a loss in revenues (Salerno’s case) may have decided to increase the waste tax more than the municipalities in the gain side.

Thus, we may expect two different behaviours between local politicians in better off and worse off municipalities. Politicians in “bad” scenario increased the taxes while politicians in the “good” one did not set taxes according to the gain. In particular, politicians in “good” state could have used the extra-resources to reduce local taxes. They could have also increased the waste tax and used the extra-resources from the grant and the additional revenues from the waste tax to gain political rents. Hence, the substitution between municipal tax and governmental grant may rise the opportunistic behaviour for local politicians in line with soft budget literature (Bordignon, Turati and

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<sup>4</sup>Note that the waste tax revenues cannot overcome the total cost of waste disposal service. However, Italian waste service cannot establish the certain amount of the cost for that service.

<sup>5</sup>This fiscal tool is particularly expensive for local politicians. The increase in taxation, indeed, may be seen by citizens as a bad policy and this will be translated in a punishment in terms of votes in the electoral race. Hence, the 2008 fiscal reform reduced this political cost.

<sup>6</sup>These mean values are calculated on data of around 6,700 Italian municipalities in ordinary regions.

Gramalerio, 2013).

However not all politicians may be moved by opportunistic motives and thus have the same fiscal behaviour. Indeed, the worse off local governments increase more the waste tax than the better off government maybe because they fear a loss in revenues. Indeed, the waste tax increase for worse off municipalities was in line with the degree of loss.

The waste tax increase is not the only fiscal tool in the municipal economic policy. One of the voices that had an increasing attention in the municipal budget is the revenues from the building permits. In times of huge grants cut and greater autonomy of local fiscal policy, municipalities looked for other instruments in order to increase the revenues side. Indeed, literature on the argument highlights how, in the scenario of a shortage of resources and the increasing demand for local services, Italian municipalities rose the number of building permits for rising the revenues related to them. In addition, laws relaxing the spending use of the revenues from the building permits<sup>7</sup> led them to be considered close substitutes of local taxes (Ermini, Fiorillo and Santolini, 2013). It occurred, mostly, after that the Italian law allowed the revenues from the building permits to fund also the current expenditure, even if only for a given percentage.

Hence, looking to the recent literature on local fiscal policy, we include in our analysis also revenues from issuing the building permits. As stated before, these revenues may be considered substitute of local taxes and their use, especially in budget stress periods, could be fundamental. In our framework, municipal governments may use revenues from building permits to compensate the loss of revenues and to increase the number of dwellings (in particular the second dwellings) that will be taxed in the future. The dark side of this fiscal tool is represented by the high environment cost related to land consumption. Thus, the short-run benefit in terms of more resources must face the long-run environmental costs.

We extend our analysis also to the current expenditure. Indeed, the reduction of resources in revenues may be compensated by a reduction in the expenditure side. But reducing the expenses may have high social costs, especially because municipalities must guarantee essential services. However, it remains not inconceivable to assume that a fear of a loss of money due to the property tax reform, may lead to a cut in the current expenditure, while an expected extra-revenue could lead to an increase in the current expenditure.

This chapter attempts to investigate the following issues:

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<sup>7</sup>See national law: 311/2004 (art. 1, comma 43), 296/2006 (art. 1, comma 713), 244/2007 (art. 2, comma 8) and recently 10/2011 (art. 2, comma 41).



1. whether or not municipalities increased revenues subsequent to a loss following the property tax (I.C.I.) on the main dwelling abolition,
2. whether or not municipalities decreased the current expenditure subsequent to a loss following the property tax (I.C.I.) on the main dwelling abolition,
3. whether or not “losers” municipalities behaved differently from “winners” municipalities in terms of revenues and/or expenditure change.

The chapter is organized as follows: in section 2.2 we discuss about the institutional framework and the data of our analysis; in section 2.3 we discuss about the theory behind the empirical model used for our analysis; in section 2.4 we discuss the empirical model; in 2.5 we show the estimation results; in section 2.6 we operate the robustness check analysis and the conclusion.

## 2.2 Institutional Framework and Data

In the following paragraphs we briefly describe the institutional framework of our analysis<sup>8</sup>. We describe in more details the data that we use in our empirical model.

### 2.2.1 The Institutional Framework

Municipalities are the layer of government our analysis considers. There are two main sources of fund collection for municipalities:

- Municipal taxation mainly used to fund services that municipalities implement for citizens.
- In general, grants from governments, regions and provinces.

We now turn to the revenues side. The property tax (I.C.I.) has always been an important source of revenues for municipalities. It was reformed in 2008 and this reform led to the abolition of the tax. Other sources of interest are the waste tax and revenues from building permits. Indeed, our analysis involves not only the tax on the main dwelling, but also the waste tax and the building permits. In particular:

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<sup>8</sup>For a more detailed description see 1st Chapter.

- the waste tax (“Tassa per lo Smaltimento dei Rifiuti Solidi Urbani, T.A.R.S.U.”)<sup>9</sup> is applied by the municipalities and formally represents a tax related to the waste services. It must satisfy some parameters such as the cost of waste disposal, the size of the dwelling and the economic activity implemented in the dwelling subject to this tax;
- the property tax (“Imposta Comunale sugli Immobili, I.C.I.”)<sup>10</sup> is one of the main sources of funding in a municipality and is applied to its dwellings, buildings and lands. After its abolition, the I.C.I. was substituted by the IMU (“Imposta Municipale propria”)<sup>11</sup>, ruled in 2012 by Monti’s government;
- the building permit is an official document issued by the municipality in order to authorise building activity in accordance with the related regulation. In general, this authorisation involves both the new building and restructuring activities. The revenues from issuing building permits can be used to fund both current and capital expenditures.

In 2008 Berlusconi’s government decided to abolish the property tax (I.C.I.) on the main dwelling. The abolition did not concern all dwellings; for example it excluded luxury houses<sup>12</sup>. Furthermore, the government prohibited regions, provinces and municipalities from increasing taxation between 2009 and 2011<sup>13</sup>. The local governments thus were highly limited in their fiscal policy.

All of these measures could have negatively affected the municipal budget, especially for those municipalities that experienced a progressive reduction of their resources during time.

Furthermore, 2008 was known as the year in which the “Great Recession” began. Berlusconi’s government had serious problems facing the crisis, which is why the Italian President Giorgio Napolitano assigned Professor Mario Monti the burden of forming a new government that could lead Italy out of the crisis. This new government, in power from 2011 to 2013, implemented significant austerity measures that involved all layers of government. These measures had the aim of reducing the central budget deficit. In particular, at that time municipalities suffered further cut in grants.

The additional commitment to fiscal rules, the need to guarantee the maintenance of services at a minimum standard level during the crisis and the

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<sup>9</sup>Legislative decree n. 507/1993.

<sup>10</sup>Legislative decree n. 504/1992.

<sup>11</sup>Legislative decree n. 23/2011.

<sup>12</sup>The categories are ruled by Italian Cadastre.

<sup>13</sup>The law n. 133/2008.

progressive cuts to local entities exacerbated stress on the municipal budgets.

### 2.2.2 The Data

Italian data are available on different platforms. For our analysis, we have combined data from many sources. The data source for the amount of revenues from the property tax (“I.C.I.”), waste tax (“T.A.R.S.U.”), revenues from building permits (“permessi a costruire”) and current expenditures is the “Certificati Consuntivi di Bilancio”. The Italian Interior Ministry provides this data-set online. All others variables or statistics were obtained from the Italian National Institute of Statistics (ISTAT).

We do not analyse the totality of the Italian municipalities, but only those belonging to Italian regions that do not have the autonomous status. We have excluded these municipalities because of their fiscal advantages. Our analysis is thus restricted to municipalities in 15 Italian ordinary statute regions (“regioni a Statuto Ordinario”): Piemonte, Lombardia, Veneto, Liguria, Emilia-Romagna, Toscana, Umbria, Marche, Abruzzo, Lazio, Molise, Campania, Puglia, Basilicata and Calabria.

As stated above, the data on the municipal budgets<sup>14</sup> were collected from the Interior Minister web-site, from the section dedicated to the municipal finance (“Finanza Locale”).

We used data on waste taxation, building permits, property tax (I.C.I.) on the main dwelling and current expenditures. Municipalities’ balance sheets, on the revenues side, consist of three columns: “Accertamenti”, “Riscossioni in conto Competenza” and “Riscossioni in conto Residui”. Then, we use data from each column.

The data on compensatory grants for the abolition of the property tax on the main dwelling (“Trasferimenti compensativi minori introiti I.C.I. abitazione

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<sup>14</sup>Municipal budget regulates local economic activity. It contains revenues and expenses accountable in a year. It is composed by two main documents: the estimated budget (“bilancio previsionale”) and the final budget (“bilancio consuntivo”). The former is an ex-ante document with the aim of political programming and planning. It has an authorization function and it contains the expected expenses and revenues. The “bilancio consuntivo” is a document redacted at the end of the period and it allows municipalities to certificate the revenues effectively collected and expenses effectively implemented. It has a particular structure. In the “gestione di competenza” there are revenues “accertate” and expenses “impegnate”, that are revenues and expenses juridical chargeable to that financial year but not effectively collectable or implementable. In the “gestione di cassa” there are collected revenues and implemented expenses. The third part represents the “gestione residui” which de facto calculates the difference between the two voices above.

principale”) are contained in the section dedicated to governmental grants<sup>15</sup>. These data are included in the main section of “other grants” (“Altri contributi generali”). They represent the amount of money that the government, under the Interior Minister, decided to transfer to the municipalities to compensate the abolition of the property tax on the main dwelling.

It is necessary to highlight that the data collected on municipal budget presents some weaknesses. For example, there are municipalities that do not communicate their budgets or that do not communicate the true values expressed into their budgets. There are municipalities that set the amount of some values in the revenues to zero, even when this is not the true amount. Obviously, this must be taken into consideration since our analysis is based primarily on these data. However, not all the zeros should be considered missing values because there could be municipalities that have enough resources to choose to eliminate a particular municipal tax, especially for political reasons. However, since declaring the amount of some values in the “Bilancio Consuntivo” (shown on the Interior Minister’s web-site) is not mandatory for the municipalities, we can assume that, most likely, some zeros may be not accurate data.

Several variables are treated in per-capita terms. Data on Italian population were collected from the web-site of ISTAT in the demographic section.

## 2.3 Theory behind the empirical model

### 2.3.1 The Regression Discontinuity Design (RDD)

The RDD is a quasi-experimental method. Its major use is studying the impact of a policy around a cut-off. It allows analysis of observations on both sides of the reference point and captures differences or analogies: observations just above the threshold are considered similar to observation just below the threshold. This method was first introduced, by Thistlewaite and Campbell (1960). The researchers Lee and Lemieux (2010), Imbens and Lemieux (2008), and Cook (2008) have provided reviews of the method and they worked to improve it.

The main advantages of the RDD are the weaker assumptions needed for its validity compared to other non-experimental impact evaluation methods. However one limitation of this approach is that, because the impact of the

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<sup>15</sup>The Interior Minister web-site has a section “Trasferimenti erariali e Attribuzioni di entrata da federalismo fiscale delle amministrazioni provinciali, nonchè attribuzione da fondo di solidarietà comunale e contributi per i comuni” in which are collected data on grants from central government to municipalities.

Table 2.1: Descriptive Statistics

	1	2	3	4
	Tarsu2009	Tarsu2008	Tarsu2009	Tarsu2008
p1	0	0	0.1115947	0.1196159
p5	0	0	9.079197	11.00483
p10	0	0	53.50593	50.28624
p25	62.72385	59.55059	73.04117	68.96069
p50	89.68059	84.32856	94.98754	89.54439
p75	119.177	112.3594	123.9235	116.5387
p90	160.3434	150.2434	165.4025	157.0129
p95	196.5185	186.1862	205.88	191.8956
p99	331.8708	319.8499	344	325.2356
Mean	93.48102	88.47558	105.2547	99.47927
N observations	6,687	6,690	5,939	5,950

The table shows descriptive statistics for the established per-capita waste tax in 2008 and 2009. Columns 1 and 2 describe summary statistic when we leave 0 in the waste tax observations; columns 3 and 4 describe summary statistic when we replace 0 in the waste tax observations by missing values.

policy is estimated locally at the threshold, it is difficult to generalise the RDD estimated effect results.

The RDD is defined as an estimation of whether or not the outcome variable exhibits a jump at the threshold of the rating variable. The magnitude of the jump can be estimated in two ways: by using all the observations in the sample or by using a local regression that reduces the observation to a bandwidth around the threshold of the rating variable, in which the functional form is most likely linear (Jacob, Zhu, Somers and Bloom, 2012). There are two types of strategies for specifying the functional form of the single-rating RD case (Jacob, Zhu, Somers and Bloom, 2012):

- Parametric approach: this approach uses all the observations in the sample to build the outcome as a function of the treatment and the rating variable.
- Nonparametric approach: this approach uses the observations in the sample close to the cut-point, called bandwidth, where the functional form is more likely to be linear.

The main issue with the last approach is how to choose the right bandwidth, which may be chosen arbitrarily in the following ways:

- by looking to the distribution of the rating variable;
- by applying methods that exist in the related literature.

When the analyst must choose between parametric and nonparametric analysis, he must keep in mind the trade-off between the two different strategies. The parametric approach, using all the observations in the sample, can offer greater precision than the nonparametric approach. On the other hand, the nonparametric method reduces the chances that bias will be introduced<sup>16</sup>. The caveat of this approach, however, is that nonparametric analysis has a more limited statistical power due to a smaller number of observations involved into the analysis.

### 2.3.2 The Regression Kink Design (RK Design)

An extension of this approach is the regression kink design (RKD). The idea behind regression discontinuity is an increase in the likelihood of being treated at a certain reference point. Similarly in the kink design there is a change in the slope at the likelihood of being treated at a certain point. So, instead of a jump in the variable, we expect a jump in the first derivative. This method has been used in the literature to evaluate the impact of the economic policies. Engstrom, Nordblom, Ohlsson and Persson (2014), for example, have used the RKD to test if taxpayers are loss averse when filling returns. They used regression kink and discontinuities to study the behaviour of 3.6 millions Swedish taxpayers for the income year 2006 and discovered that taxpayers experiencing a tax deficit are more likely to claim more deduction than the taxpayers experiencing a tax surplus. This finding is coherent with the loss aversion behaviour<sup>17</sup>.

In line with the parent theory named the RDD, when a policy is implemented with error or the probability of being treated is not one, then a fuzzy RK design can be used instead of a sharp design (Card, Lee, Zhuan Pei, Weber 2015)<sup>18</sup>.

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<sup>16</sup>The parametric approach has difficulties into ensuring that the functional form of the relationship between the conditional mean of the outcome variable and the rating variable is correctly specified and so, the potential bias may increase.

<sup>17</sup>They estimate the following model (Engstrom, Nordblom, Ohlsson and Persson, 2014):  $\Delta_i = \sum_{k=0}^k \alpha_k p_{i,k} + \sum_{k=0}^k \beta_k I_i p_{i,k} + \epsilon_i$  where  $\Delta_i$  is the outcome variable,  $I_i$  is an indicator of punished municipality,  $p_i$  is the measure of punishment (It means the punishment if positive, or the grant if negative), and  $\epsilon_i$  is an error term. The coefficient  $\alpha_0$  measures the intercept,  $\beta_0$  measures the discontinuity at the cut-off point and  $\beta_1$  measures a possible kink at the cut-off point. The polynomial k range from 0 (simply discontinuity at cut-off point ) to a number to 3 (Engstrom, Nordblom, Ohlsson and Persson, 2014).

<sup>18</sup>They consider nonparametric identification and estimation in a nonseparable model where a continuous regressor of interest is a known but kinked function of an observed assignment variable (Card, Lee, Zhuan Pei, Weber, 2015).

In addition, in line with the parent RDD, the difference between parametric and nonparametric analysis in both theories is held.

The estimation can be implemented using the polynomial regression. The equation must contain:

- an outcome variable
- the rating variable
- the kink
- the dummy variable for being to the right or to the left at the kink point.

It must be:

$$Y_i = \alpha_0 + \alpha_1 X_i + \beta_1 X_i D_i + \alpha_2 X_i^2 + \alpha_3 (X_i D_i)^2 \dots$$

The coefficient  $\beta_1$  describes the change of the slope of the outcome variable at the kink point. Next, we must run the same regression to get the change in the slope of the treatment variable at the kink point of the running variable and take the ratio between the two coefficients. The causal impact, that is the Kink coefficient, is found by dividing the change in slope for the outcome by the change in slope for the treatment.

### 2.3.3 The key assumptions for Regression Discontinuity design and Regression Kink Design

The assumptions of the RK design and those of the RD design can be considered very similar, namely:

- The existence of no jump/non-change in the slope at the reference point of the running variable for the covariates;
- The existence of non-manipulation of the assignment variable at the kink point (McCrary, 2008). This hypothesis can be tested using the McCrary test. If the agent can manipulate the threshold, but this manipulation is not deterministic for the presence of errors, then this kind of sorting can be allowed in the RK design (Card et al. 2015).
- For both designs Card, Lee, Zhuan Pei, Weber (2015) also suggest placebo test at non-kink point.

## 2.4 Empirical Model and Methodology

### 2.4.1 Set up and identification

This section describes the empirical strategy used to identify how being punished or rewarded affects the predetermined outcomes. In the previous section we have discussed the mechanism of the property tax abolition, the methodology of the grant allocation and the data. Now we seek to set up the empirical model in order to analyse the data.

We primarily estimate three models according to the outcome variable selected. The general model is represented by the following equation :

$$Y_i = \alpha_0 + \alpha_1 Dummy_i + \alpha_2 Punishment_i + \alpha_3 (Dummy_i * Punishment_i) + \epsilon_i$$

In these models  $Y_i$  represents the outcome variable chosen for the analysis.

The dummy variable tells us if the municipalities suffered a loss of resources, that is whether a municipality can be considered a “loser” or a “winner” after the property tax reform; the variable punishment defines the amount of resources gained or lost after the property tax reform; and the interaction term ( $Dummy_i * Punishment_i$ ) defines the municipalities that experienced a loss as well as the amount of that loss.

We replicate the estimation of the empirical model for each dependent variable of interest, namely, the waste tax, the building permits and the current expenditure.

### 2.4.2 The Methodology

**The Variables:** We start by explaining the main variable of interest: the rating variable. This variable comprises the difference between the three elements below:

- The per-capita revenues from the property tax (I.C.I.) on main dwellings collected (“riscosso”) in 2007;
- the per-capita grants transferred from the government to the municipalities in order to compensate the abolished property tax on main dwellings, as certified by the interior minister<sup>19</sup>; and

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<sup>19</sup>The data on collected property tax on the main dwelling in 2007 represented the benchmark for the definition of the amount of grant that each municipality must receive.



- the per-capita revenues from the property tax on main dwellings collected (“riscosso”) in 2008<sup>20</sup>.

The tax rate and the estimation of the amount collected are formulated in the estimated budget (“bilancio previsionale”) and successively re-written in the final budget<sup>21,22</sup>.

Using those data, we construct a variable capable of measuring the approximate degree of loss or gain for each municipality. This variable, which we call *Punishment*, will be the rating variable in our analysis. A positive value of this variable means that the amount no longer collected was more than the compensation grant received by the government. This means that these municipalities would have gained more if the abolition had not been implemented. So, it measures a sort of punishment. By contrast, a negative value means that the compensation was more than the amount no longer collected and the municipality would have had less if the property tax abolition had not been implemented. So, it measures a sort of reward.

For simplicity, in the following pages, we refer to the municipalities that experienced a loss of resources following the property tax reform as “losers” and to the municipalities that experienced a gain of resources following the property tax reform as “winners”. Furthermore, in the following lines we refer to the rating variable calling it simply “*Punishment*”. It is interesting to note that being punished or rewarded cannot depend on the municipalities willing, but it can be considered exogenous to the municipalities.

We construct the outcome variables using the following data:

1. Established (“accertato”) per-capita revenues from the waste tax in 2008 and 2009,
2. Established (“accertato”) per-capita revenues from building permits between 2008 and 2009,
3. and committed (“impegnato”) per-capita current expenses between 2008 and 2009.

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Indeed, municipalities must send data on this voice in the budget to the Court of Auditors (“Corte dei Conti”) that has the role of control on these data. Next the control, government must decide the amount of resource to transfer to each municipality.

<sup>20</sup>The collected property tax on the main dwelling in 2008, as said above, concerned the luxury houses.

<sup>21</sup>The municipalities that programmed an increase in taxation in the estimated budget for 2008 were not subject to the law n. 133/2008. This statement was established by the Court of Auditors in order to avoid budget unbalances (Deliberation n. 92/2008).

<sup>22</sup>The established (“accertate”) resources in the final budget should be more or less close to the amount programmed into the expected budget.

We mainly define the outcome variable as first difference because it strongly captures the change in taxation that follows the reform in property tax on main dwellings in 2008.

**Data cleaning** For completeness of our analysis, we must deal with the presence of incorrect data. Thus, we must deal with several zeros in the amount of revenues in our dataset. As mentioned before, the number zero at the voice of the tax in the budget municipality does not exactly mean that there is no taxation, but it may mean that there was a lack of communication of the correct data. Because of this, we propose treating the zeros in our dataset as missing values. Obviously, this kind of problem may undermine our analysis if the quantity of zeros is large enough. The number of zeros changes according to the variables but, all in all, it remains below 15% of the total sample.

In addition, we must deal with under-reported data, which could also cause distortion. Thus, the excessive zeros and/or the presence of under-reported data must be solved in order to guarantee the efficiency of the analysis.

Our data-cleaning strategy consists of not considering into the analysis all observations possessing zero for the dependent variable<sup>23</sup> and so treating them as missing values<sup>24</sup>. Because of the presence of suspicious zeros in the municipal budget, we may think that some observations could contain the wrong information. The consequence is that the results of our estimation using all the observations in the sample may not explain the reality.

In addition, the sample may contain some data with anomalies, that is, values that appear too low or too high for some municipalities. It can thus be very difficult to understand which data contain the wrong information and which do not. In order to exclude the first type of observations, we delete the outliers for all the variables that are more likely to contain wrong information. This strategy, in our opinion, eliminates the false information, leaving a considerable amount of true data in the sample.

We adopt the same procedures to deal with the same problem according to the outcome variable used in the estimation:

- For the first difference between the established (“accertato”) waste tax in 2009 and 2008, we exclude from the analysis the observations regard-

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<sup>23</sup>We do not delete zero in the revenues of the property tax on main dwelling because the fiscal reform in 2006 and 2008 caused a huge reduction for the revenues in that tax.

<sup>24</sup>The presence of zeros is also in the data used to construct the rating variable. We use the nonparametric analysis and thus the choice of the optimal bandwidth excludes outlier observations.

ing the per-capita waste tax below the 5 percentile and up to the 99 percentile. In so doing, we delete those values suspected to be wrong due to being too low or too high;

- For the committed (“impegnato”) current expenditure and established (“accertato”) revenues for the building permits, we simply provide the elimination from the analysis of the observations for the per-capita current expenditures below the 5 and up to the 95 percentile, in order to delete from the analysis values that are considered too low or too high. This report seems to be more accurate than the reports of the revenues from the waste tax. In particular, the missing values for the expenditures are much less than the ones for the building permits or the waste tax and in our opinion, they cannot manipulate the analysis.

We also eliminate observations below the 5 percentile and up to the 95 for the main dwelling property taxes collected in 2007; we eliminate observations up to the 95 percentile for the main dwelling property tax collected in 2008; and we eliminate observations below the 1 percentile and up to the 99 percentile for the per-capita grant for compensation of the abolition of the main dwellings property tax. Simultaneously, we apply a further deletion: we eliminate the observations below the 1 and up to the 99 percentile for the difference in the outcome variable selected.

With the issue of excessive zeros and wrong values in the dataset discussed, we proceed with the estimation of our empirical model. We adopt the local strategy, by preferring the nonparametric analysis to the parametric one. However, problems may arise concerning whether the municipalities in the treatment differ from the municipalities out of the treatment. The local strategy reduces the former problem.

We conduct the analysis not on all the municipalities in the non-autonomous regions<sup>25</sup> but on residual municipalities, that is the ones that remain after implementing our data-cleaning strategy.

Furthermore, we conduct the analysis by applying different empirical strategies in order to make our results more robust.

### 2.4.3 Nonparametric Analysis

This approach uses the observations close to the cut-off point and contained in an appropriate bandwidth, where the functional form is more likely to be linear. The choice of appropriate bandwidth for the local strategy is challenging for the analysis. Choosing the bandwidth accurately makes it possible to

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<sup>25</sup>The municipalities in non-autonomous regions are around 6700.

Table 2.2: Descriptive Statistics.

	TARSU(2008)	TARSU(2009)	ICI(2007)	ICI(2008)	Grant	Punishment	Delta_Tax
Population							
mean	88.47558	93.48102	58.03744	32.0346	39.36032	-13.23859	5.035189
sd	66.95789	69.88015	81.97757	86.94417	23.37985	107.5013	21.11357
N observations	6,690	6,687	6,687	6,690	6,684	6,670	6,682
Sample							
mean	97.66303	103.5166	44.94257	18.54305	36.45546	-10.05593	5.853569
sd	39.53888	41.28746	31.11183	40.32194	19.50684	45.20608	12.76352
N observations	4,624	4,624	4,624	4,624	4,624	4,624	4,624

The table shows descriptive statistics for the per-capita waste tax established in 2008 and 2009, the per-capita property tax on main dwelling collected in 2007 and 2008, the per-capita compensatory grant in 2008, the per-capita Punishment (rating variable) in 2008 and the first difference in the per-capita waste tax between 2009 and 2008.

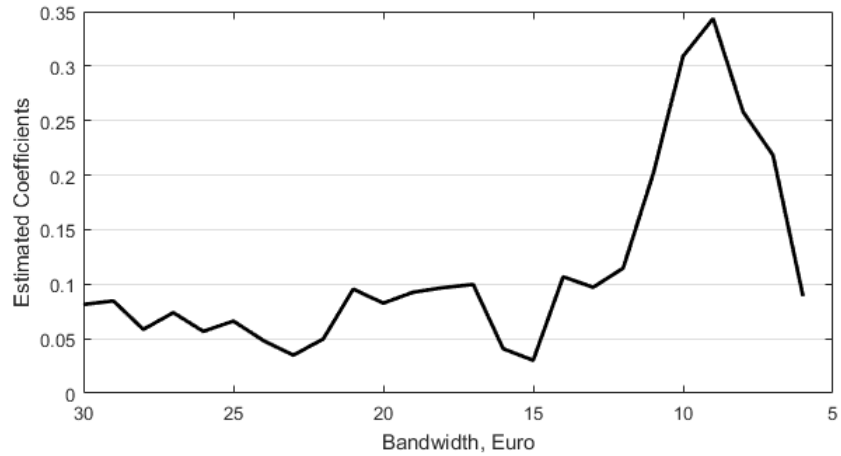


Figure 2.1: Kink estimates of the first difference in per-capita waste tax for all municipalities in ordinary regions.

solve the trade-off between precision and bias. In fact, a larger bandwidth may guarantee greater precision in the model's estimation. On the other hand, the linear specification may be less accurate, and it may lead to bias when the treatment effect is estimated.

Since our sample size could be considered large enough, particularly around the cut-off point, we use the nonparametric estimation as the principal method of analysis. Then, we use the parametric estimation as a robustness check. In addition, the restriction of the sample to those observations close to the

cut-off point may ensure the exclusion of “doubtful”<sup>26</sup> observations for the rating variable. Indeed, in this case the choice of the nonparametric procedure also appears to be strategically important. The local strategy views the estimation of the treatment effect as a local randomisation and it limits the analysis solely to the observations that are close to the cut-off, excluding those that are too far from that point. Adopting this strategy means excluding those observations that may contain wrong information and that are far from the reference point. The reasons for this are the same as those that we have discussed for eliminating values that are too low or too high: since the observations suspected to contain wrong information are those with very low or very high values, the choice of bandwidth automatically deletes those observations that are far from the cut-off point and thus are more likely to be incorrect.

The main decision in applying the nonparametric analysis concerns the choice of methodology for selecting the optimal bandwidth. The literature on regression discontinuity design (RDD) has proposed two procedures for choosing the bandwidth: the “cross-validation” procedure and the “plugs-in” procedure. Both procedures concern the concept of mean square error (MSE), which exactly measures the trade-off, discussed above, between bias and precision. In addition, both procedures are also computationally complicated. As stated before, the “plug-in” procedure defines the optimal bandwidth according to the sample data and it balances the degree of precision and bias. The concept is to find a formula that defines a bandwidth that minimises a particular function of precision and bias. Fan and Gijbels (1996) developed a method in the context of local linear regression that DesJardins and McCall (2008) and Imbens and Kalyanaraman (2009, 2012) modified for the RD setting.

Recently Calonico, Cattaneo and Titiunik (2014) elaborated a method for the optimal bandwidth selection for sharp RD, sharp kink RD, fuzzy RD and fuzzy kink RD. Thus we utilise the CCT method as the main reference. We also employ Imbens and Kalyanaraman’s (2012) procedure which, like the previous one, can be considered particularly intensive, in addition to the cross-validation procedure by Rice and Silverman (1991)<sup>27</sup>.

Fortunately, there are several programmes available on the Internet implanting the procedure for an optimal bandwidth selection.

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<sup>26</sup>We refer to “doubtful” observations as the ones too low or too high.

<sup>27</sup>However, we do not show the results for this method because they are in line with IK and CCT’s results.

#### 2.4.4 Testing the assumptions

The underlying assumption generating the local random assignment result is that each individual has imprecise control over the assignment variable. McCrary (2008) proposed a simple two- step procedure for testing whether or not a discontinuity exists in the density of the assignment variable. In the first step, the assignment variable is partitioned into equally spaced bins and frequencies are computed within those bins (McCrary, 2008). The second step treats the frequency counts as a dependent variable in a local linear regression (McCrary, 2008).

By definition of our rating variable, we exclude the possibility of manipulation around the threshold by municipal governments. We define the rating variable as the difference between the revenues from the main dwelling property tax collected by each municipality in 2007, the grant to the municipalities certified by the central government in 2008 and the revenues from the main dwelling property tax collected by each municipality in 2008. As a result, it is quite impossible for the municipalities close to the threshold to manipulate the rating variable in order to move to the left or the right of the reference point.

The revenues collected from the main dwelling property tax are consolidated in 2007 and no longer modifiable in 2008 and beyond. In addition, the municipalities have no power to influence the amount of grants in 2008, as the central governments decided the amount of resources for compensation in the annual budget law based on historical data. Thus, the compensation cannot be exactly calculated ex-ante due to the uncertainty regarding the total amount funded by the government as well as uncertainty regarding the data about the main dwelling property tax transmitted from the municipalities to the interior minister.

The only way that the municipalities had to manipulate the threshold was to modify the main dwelling property tax collected (“riscosso”) in 2008. However, the municipal government cannot change the tax rate during the year. The tax rate is defined in the expected budget and there is no room for changes after the approval of that document. The expected budget also contains the expected amount of revenues from the main dwelling property tax and all other voices in the budget. Obviously, this amount of money can change during the year and thus could differ than the amount included in the final budget. However, we cannot expect a tremendous change, especially for 2008, because the main dwelling property tax involved only the luxury dwellings.

For the reasons stated above, we can assume that the assumption of manipulation at the threshold is not violated even if we do not implement the

McCrary test.

We are dealing with cross-sectional data and, in conclusion, we are in the “sharp” design<sup>28</sup>, where the rating variable perfectly predicts the treatment status.

## 2.5 Empirical results

### 2.5.1 Cross-section analysis: Results for difference in per-capita waste tax

We use the optimal bandwidth selection methods most cited in literature: Calonico, Cattaneo and Titiunik (CCT) and Imbens and Kalayanaraman (IK). Then, we implement the OLS estimation on the local linear model for the selected bandwidths.

**CCT criterion** Here and below, we illustrate the results according to the outcome variable for the bandwidth selected using the CCT (Calonico, Cattaneo and Titiunik, 2014) criterion applied with the difference in the per-capita waste tax between 2009 and 2008 as the outcome variable.

The CCT bandwidth criterion selection provides the optimal bandwidth for our sample around 14 euros. Thus, we approximate it to 14 and we estimate the model with observations that lie in the bandwidth selected.

Kink and discontinuity estimates of the linear model are reported for a range of symmetric bandwidth.

Let’s focus on the estimated coefficient  $\alpha_3(Interaction)$ . This coefficient measures the change in the derivative at the cut-off point. It retrieves the change in slope in outcome at the kink point in the treatment variable. Hence, it represents a proxy of the kink point. The casual impact per unit is found by dividing  $\alpha_3$  by the difference in derivatives at the cut-off point which is calculated mathematically and not econometrically.

Thus, the kink in outcome needs to be scaled by the kink in treatment.

Obviously, we are also interested in whether or not a discontinuity at the reference point exists.

Table 2.3 illustrates the estimation results. Discontinuity is measured by the coefficient  $\alpha_1(Discontinuity)$ . The coefficients, for the selected bandwidth, have different signs: the kink coefficient is positive while the discontinuity

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<sup>28</sup>With the sharp design all subjects receive their assigned treatment or control condition while the with the fuzzy design some subjects do not.

Table 2.3: Nonparametric analysis, CCT Method

Method	CCT
Outcome	Delta_Tax
Punishment	-0.00537 (0.074)
Discontinuity	-0.958 (0.772)
Interaction	0.265** (0.123)
Constant	5.292*** (0.511)
Observations	2,755
R-squared	0.003

The table shows the results for the difference between the established (“accertato”) per-capita revenues from the waste tax in 2009 and 2008 (Delta\_Tax), using OLS estimation. The second column reports the estimation for the bandwidth  $\pm 14$ . RK sample contains Italian municipalities belonging to the non-autonomous regions that lie in the bandwidth selected. We are interested in the result for the the kink coefficient. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

coefficient is negative. In addition, the coefficient that indicates the discontinuity is not significant. By contrast, the coefficient that indicates the likely kink is statistically significant and positive (*Interaction* > 0). A positive kink means that municipalities to the right of the reference point (municipalities that experienced a loss after the property tax reform) increased more waste taxation than those to the left.

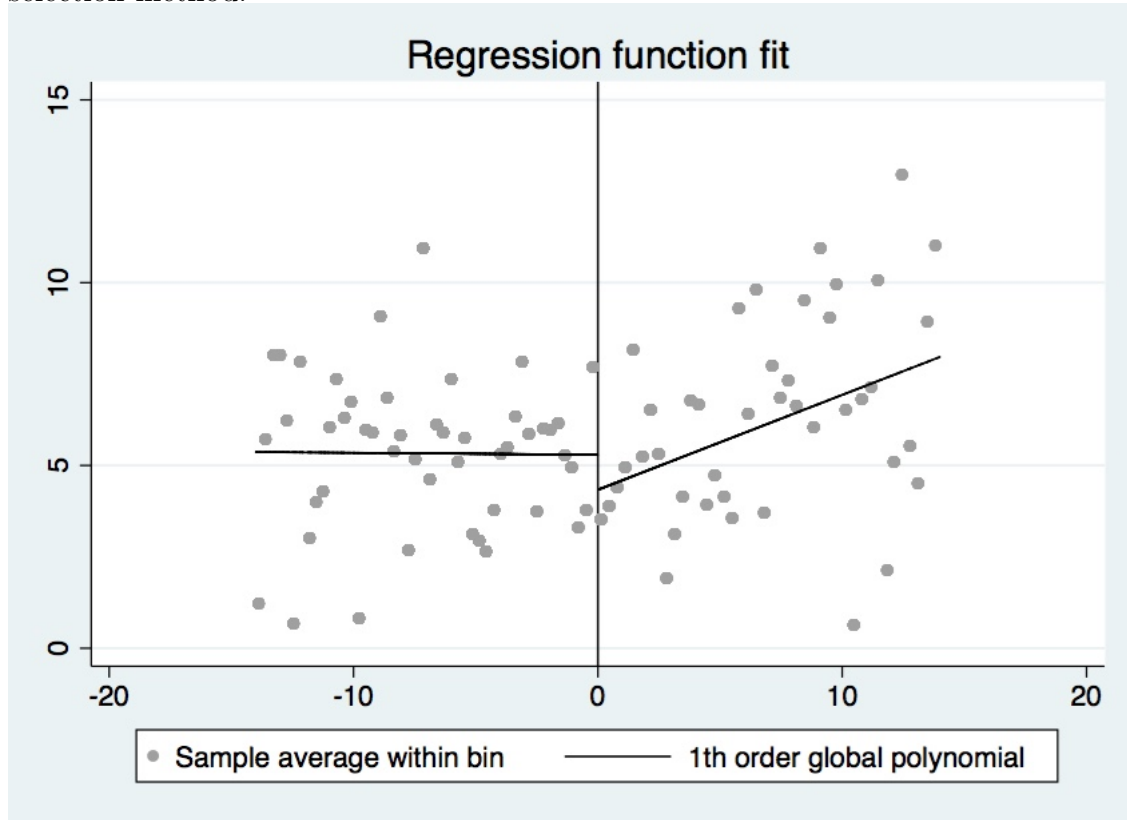
Looking at Figure 2.2 the kink appears evident. Indeed, the plot provides a different behaviour for municipalities on the left and on the right of the cut-off point. It clearly shows the different fiscal behaviour between better off and worse off municipalities.

Figure 2.2 shows an increase in the waste tax on both sides of the reference point. The general increase in waste tax could be explained by the need to face fiscal difficulties and/or by politicians opportunistic behavior. The finding support empirical literature on fiscal decentralization mechanism.

First, the reduction of fiscal autonomy reduces political accountability. In our case, local governments could gain rents from the increase in waste taxes because they were no longer politically responsible for the property tax on the main dwelling, and thus an increase in local taxation was less politically expensive. Indeed in the case of fiscal autonomy voters may better recog-



Figure 2.2: RDplot for the difference in waste tax, CCT optimal bandwidth selection method.



The figure shows the difference between the established (“accertato”) per-capita revenues from the waste tax in 2009 and 2008 (Delta.Tax) on the vertical axis and the punishment on horizontal axis. Negative value for the punishment means that municipalities gain from the reform.

nize the good politicians if they are allowed to set the tax rate (Bordignon, Turati and Gramalerio, 2013). Then, less fiscal autonomous municipalities may exhibit a less efficient fiscal behaviour than the more fiscal autonomous municipalities.

In addition, the substitution of the property tax on the main dwelling by a governmental grant may induce voters to underestimate the local fiscal burden. In our case, fiscal illusion generated by the switch between tax and grant may lead to an underestimation of the waste tax burden by voters. Therefore, the increase in local taxes becomes less expensive in terms of votes and local politicians may gain rents through expenditure channel.

In general, this framework may induce local politicians to increase local taxation regardless they have gained or lost resources after the property tax reform. However, the results of the estimation and the graph seem to sug-

gest that politicians in different scenarios behave in different ways.

The curve (Figure 2.2) that fits the points on the left of the cut-off point is almost horizontal; it means that politicians of better off municipalities did not set the tax on waste according to the degree of gain obtained after the property tax reform. The increase in waste tax was, on average, almost the same for all the “winners” municipalities, regardless the amount of extra-resources that they received following the property tax reform.

By contrast, the curve that fits the points on the right of the cut-off point has a positive slope. Politicians of worse off municipalities increased the level of waste taxation more than politicians in the opposite scenario; in addition, the more they lost the more they increased the waste tax.

In particular, local governments rewarded with extra-resources did not manage the extra amount to fund a decrease in waste taxes; possibly they used the extra resources from the grant (and the waste tax) to gain political rents. Rationally, we may expect a decrease in waste tax for those municipalities on the left of the cut-off point; this decrease may also be expected to be of similar magnitude as the increase for the municipalities in the opposite scenario.

However, Figure 2.2 shows an opposite fiscal behaviour by local politicians in the “good” state.

On the other hand, politicians of worse off municipalities reacted increasing the waste tax in the direction of the punishment: the farther they moved to the right of the reference point, the more they increased the waste tax.

Hence, in a scenario where Italian municipalities increased (on average) the waste tax, “loser” municipalities increased it more for the fear of the loss in revenues.

The finding suggests that local politicians may fear the loss of resources.

Differently, “winner” municipalities increased the waste tax but regardless of the degree of gain.

The finding suggests that more fiscal centralization may not lead to more fiscal discipline. In particular, local politicians may have used the extra grant and other fiscal instruments, such as the increase in waste tax, to deal with budget difficulties and/or to gain political rents.

**Results for IK bandwidth selection criterion:** Here and below, we describe the results according to the outcome variable for the bandwidth selected using the IK (Imbens and Kalayanaraman, 2012) criterion.

The IK bandwidth criterion selection provides the optimal bandwidth for our sample around 18 euros. We estimate the model with observations that

lie in the bandwidth selected and we approximate it to 18. The results are the same as those obtained using the CCT criterion (Table 2.4).

Table 2.4: Nonparametric analysis, IK Method

Method	IK
Outcome	Delta_Tax
Punishment	-0.00381 (0.0552)
Discontinuity	-0.896 (0.712)
Interaction	0.237** (0.0949)
Constant	5.299*** (0.461)
Observations	3,040
R-squared	0.004

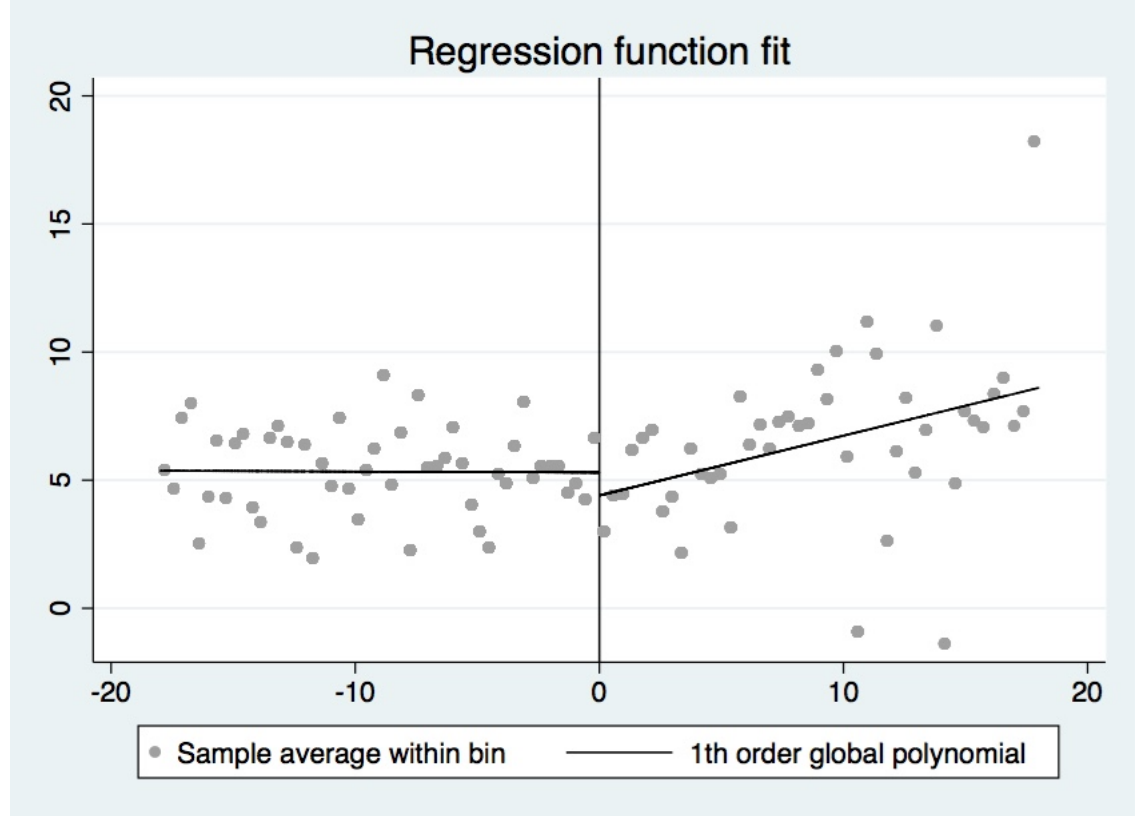
The table shows the results for the difference between the established (“accertato”) per-capita revenues from the waste tax in 2009 and 2008 (Delta\_Tax), using OLS estimation. The second column reports the estimation for the bandwidth  $\pm 18$ . RK sample contains Italian municipalities belonging to the non-autonomous regions that lie in the bandwidth selected. We are interested in the result for the the kink coefficient. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

**Kink-estimation:** Figure 2.4 reports our estimates of a possible kink at zero reference point for our outcome variable. The estimated kink demonstrates significant and positive results for all the bandwidths except around 15 euros and from 8 to 6 euros. The kink coefficients remain stable and positive in a wide range of bandwidth from 30 to 9 euros. The estimates start to fluctuate considerably for very narrow bandwidths.

### 2.5.2 Sensitivity analysis-placebo kink and discontinuities

It is interesting to ask whether or not kinks or discontinuities at the 0 reference point are more pronounced than kinks or discontinuities at other reference points. We provide estimates of the kinks and the discontinuities based on a range of different placebo reference points. We let the placebo reference

Figure 2.3: RDplot for the difference in waste tax, IK optimal bandwidth selection method.



The figure shows the difference between the established (“accertato”) per-capita revenues from the waste tax in 2009 and 2008 (Delta.Tax) on the vertical axis and the punishment variable on horizontal axis. Negative value for the punishment means that municipalities gain from the property tax reform.

points to vary between +10 and  $-10$ . The bandwidth is fixed at 14 euros<sup>29</sup> in all the regressions and it is symmetric around the placebo reference points. The analysis has an important goal. The evidence of casual effect is stronger if we obtain that the discontinuity and kinks for the difference in waste tax are more pronounced for the 0 cut-off point (that is the theoretically predicted reference point) than elsewhere (Engstrom, Nordblom, Ohlsson and Persson, 2014).

Table 2.5 shows the results for the discontinuity and kink coefficients estimation.

The kink-estimates remains positive and significant at reference points of 3,4, -1 and -2, which are very close to the 0 cut-off. However, these kink point are less pronounced than the 0 kink point. Instead, the remaining reference

<sup>29</sup>We use the CCT procedures for the optimal bandwidth selection.

Table 2.5: Discontinuity/Kink-placebo estimates of  $\alpha_1$  and  $\alpha_3$  for first difference in per-capita waste tax.

Reference Point	Discontinuity	Kink	Reference Point	Discontinuity	Kink
1	0.243 (0.853)	0.153 (0.124)	-1	-0.624 (0.743)	0.226* (0.118)
2	-0.451 (1.001)	0.206 (0.135)	-2	-0.202 (0.744)	0.201* (0.116)
3	-0.426 (1.069)	0.268** (0.125)	-3	0.1612 (0.78)	0.186 (0.115)
4	-0.266 (1.276)	0.254* (0.148)	-4	0.755 (0.84)	0.203 (0.115)
5	0.406 (1.523)	0.21 (0.156)	-5	-0.328 (1.066)	0.146 (0.121)
6	1.104 (1.823)	0.094 (0.171)	-6	-0.726 (1.235)	0.063 (0.129)
7	1.246 (2.18)	0.0374 (0.189)	-7	-0.591 (1.307)	-0.023 (0.132)
8	2.255 (2.487)	-0.12 (0.197)	-8	-1.308 (1.58)	-0.083 (0.136)
9	3.65 (2.887)	-0.268 (0.208)	-9	0.403 (1.703)	-0.022 (0.139)
10	0.588 (2.86)	-0.098 (0.203)	-10	-0.756 (2.078)	-0.08 (0.157)

The table shows the estimates of  $\alpha_1$  and  $\alpha_3$  for first difference in per-capita waste tax and different reference point, using OLS estimation. The bandwidth selected is  $\pm 14$ . RK sample contains Italian municipalities belonging to the non-autonomous regions that lie in the bandwidth selected. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

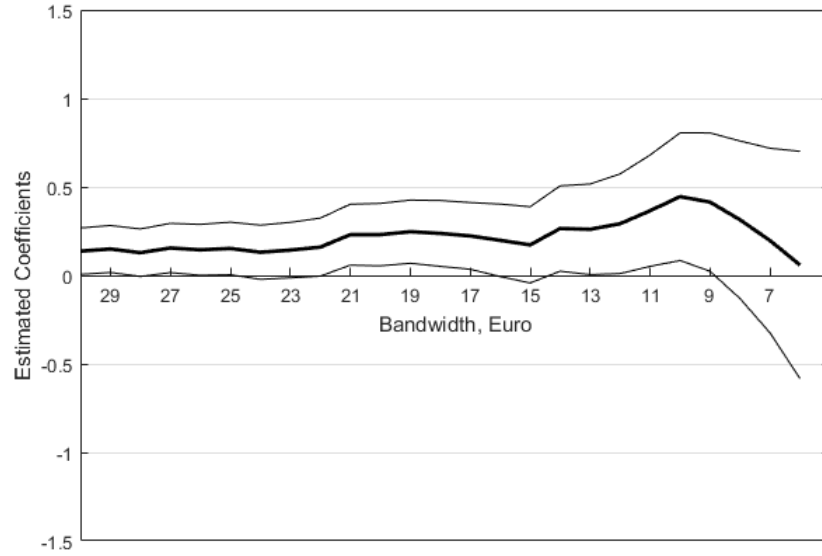


Figure 2.4: Kink estimates for the first difference in per-capita waste tax.

points show no evidence of the presence of kinks and/or discontinuities.

### 2.5.3 Cross-section analysis: Results for other outcome variables

Municipalities have different fiscal tools for facing the loss of resources after the property tax reform. In particular, municipalities may decrease the current expenditure and/or increase other voices of the revenues. We replicate the analysis with other outcome variables of interest.

**Results for difference in current expenditure:** We are also interested in the behaviour of municipalities in terms of current expenditure cuts. Indeed, municipalities may adjust their expenses instead of increasing taxes in order to face a fall in revenues side. This tool may be less distortive than manipulating taxation in terms of votes: people may fear more the rise in taxation than the cut in expenditure. In addition, a cut in the inefficient current expenditure may have a positive effect on economy<sup>30</sup> (Alesina and Ardagna, 2010 and 2013).

What emerges from the estimation indicates that there are no significant dif-

<sup>30</sup>Cut in the inefficiency current expenditure in the national budget had expansive effect (Alesina and Ardagna, 2010 and 2013).

ferences in the variation of the current expenses between the municipalities on the left and on the right of the cut-off point. No significant jumps and no significant kink (Table 2.6) largely suggest that Italian municipalities faced the resources uncertainty by manipulating the revenues. So, a cut to the current expenditures has not been a tool in the municipal fiscal policy, even if the municipality suffered a loss of resources.

The finding suggests the difficulties of local bureaucrats and politicians to reduce the current expenditure in the short-run. In addition, the substitution of a local tax by a governmental grant may have induced local politicians to increase the taxation since this fiscal instrument was less expensive in terms of votes than the cut in the local expenditures.

Furthermore, the fitted curves in Figure 2.5 are quite horizontal from both sides of the reference point. Politicians have the same behaviour for the current expenditures regardless they receive a gain or a loss from the abolition of the main dwelling property tax.

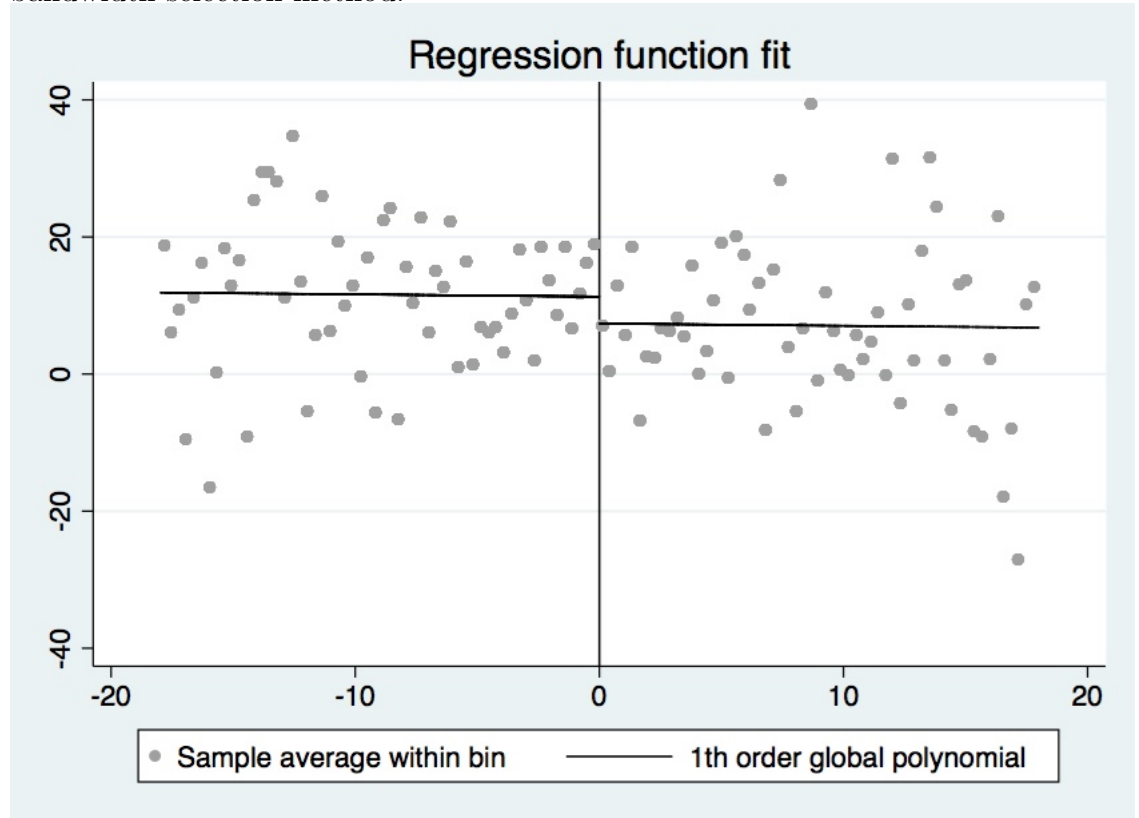
Table 2.6: Nonparametric analysis, CCT Method

Outcome	Delta_Expenditure
Punishment	-0.0328 (0.256)
Discontinuity	-3.928 (3.29)
Interaction	0.0001 (0.394)
Constant	11.29*** (2.335)
Observations	3,324
R-squared	0.002

The table shows the results for the difference between committed (“impegnato”) per-capita current expenditure between 2009 and 2008 (Delta\_Expenditure), using OLS estimation. The second column reports the estimation for the bandwidth  $\pm 18$ . RK sample contains Italian municipalities belonging to the non-autonomous regions that lie in the bandwidth selected. We are interested in the result for the the kink coefficient. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

**Results for building permits** We extend the analysis above to the building permits. Municipalities may react to the loss or gain of revenues as a consequence of the abolition of the main dwelling property tax by limiting or increasing the issue of building permits. In particular, municipalities that

Figure 2.5: RDplot for the difference in current expenditure, CCT optimal bandwidth selection method.



The figure shows the difference between the committed (“impegnato”) per-capita current expenditure between 2009 and 2008 (Delta.Expenditure) on the vertical axis and the punishment variable on horizontal axis. Negative value for the punishment means that municipalities gain from the property tax reform.

experienced a loss of resources are more likely to be boosted by increasing the issue of building permits in order to increase the revenues to face the loss. In addition, new dwellings increase the revenues from property taxes on dwellings. However, on the other hand the abolition of the main dwelling property taxes may negatively effect the issuing of building permits: the building of new main dwellings does not increase revenues and thus the “benefits” from issuing building permits may be less than the environmental costs related to the permits.

Mainly, the property tax reform may lead to two different effects on building permits:

1. Increasing them to compensate the loss of revenues;
2. Reducing them due to the lack of revenues from property tax on new



main dwellings.

In this scenario, municipalities that experienced a gain or a loss of resources after the reform on property tax may behave differently.

What emerges from the estimation is that there are no significant differences in the variation of the established (“accertato”) revenues from building permits between the municipalities on the left and on the right of the cut-off point. No jump and no kink largely suggest that Italian municipalities faced the resource uncertainty by manipulating other voices in the revenues.

## 2.6 Robustness check

### 2.6.1 Parametric analysis

We implement the parametric strategy for our sample as robustness check. The parametric strategy allows to use all the observations in the sample and not only those located close to the cut-off point, i.e. where the regression function is more likely to be linear<sup>31</sup> (Jacob, Zhu, Somers and Bloom, 2012). The following equation provides a simple way to make this estimation procedure optimal:

$$\bullet \quad Y_i = \alpha_0 + \alpha_1 Dummy_i + \alpha_2 Punishment_i + \alpha_3 Interaction_i + f(Punishment_i; Dummy_i) + \epsilon_i$$

In these models  $Y_i$  represents the difference in per-capita waste tax. The dummy variable tells us if the municipalities suffered a loss of resources, that is whether a municipality can be considered a “loser” or a “winner” after the property tax reform; the variable *Punishment* defines the amount of resources gained or lost after the property tax reform; and the interaction term ( $Dummy_i * Punishment_i$ ) defines the municipalities that experienced a loss as well as the amount of that loss.

The function  $f(Punishment_i; Dummy_i)$  is our control function. A variety of functional form can be tested to determine which fits the data best, so that biased will be minimized. In our model, we use polynomial function with

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<sup>31</sup>This method gains strength from observations far from the threshold point to estimate the average outcome for observations close to the threshold point. In order to minimize the bias, it can be used several functional forms for the rating variable (linear, quadratic, cubic, interaction terms, etc). The choice of the appropriate functional form is conducted by F-test on higher-order interaction terms and inspecting the residuals (Jacob, Zhu, Somers and Bloom 2012).

interaction term from 1st to 4th order.

Table 2.7 contains the estimation results for each equation. The *Kink* coefficient (*Interaction*) remains positive for all polynomial specifications and it maintains the significance in almost all the specifications. The results confirm the different behaviour for the “losers” municipalities: the municipalities that experienced a loss increased the level of taxation and the more they lost the more they increased the waste tax. Thus, the results of the estimation seems to suggest that municipalities did not behave similarly: punished municipalities increased the waste tax more for the fear of the loss in revenues.

Table 2.7: Parametric Analysis

Polynomial order	p(1)-interaction	p(2)-interaction	p(3)-interaction	p(4)-interaction
Outcome	Delta_Tax	Delta_Tax	Delta_Tax	Delta_Tax
Punishment	-0.0132* (0.00677)	-0.0391 (0.0238)	-0.0872* (0.0482)	-0.00963 (0.0779)
Discontinuity	0.341 (0.47)	-0.368 (0.574)	-0.226 (0.69)	-0.686 (0.795)
Interaction	0.0303* (0.0169)	0.199*** (0.0545)	0.287*** (0.109)	0.256 (0.178)
<i>Punishment</i> <sup>2</sup>		0.000203 (0.00018)	0.00118 (0.000882)	-0.00178 (0.00256)
<i>Interaction</i> <sup>2</sup>		-0.00215*** (0.000654)	-0.004550 (0.00329)	-0.0045700 (0.00955)
<i>Punishment</i> <sup>3</sup>			-0.000005 (0.000004)	0.0000293 (0.0000278)
<i>Interaction</i> <sup>3</sup>			0.000016 (0.000026)	0.0000408 (0.0001760)
<i>Punishment</i> <sup>4</sup>				-0.0000001 (0.0000001)
<i>Interaction</i> <sup>4</sup>				-0.0000002 (0.000001)
Constant	5.415*** (0.273)	5.155*** (0.332)	4.855*** (0.41)	5.192*** (0.486)
Observations	4,511	4,511	4,511	4,511
R-squared	0.001	0.004	0.005	0.005

The table shows the results for the difference between the established (“accertato”) per-capita revenues from the waste tax in 2009 and 2008 (Delta\_Tax), using OLS estimation. Each column reports the estimation for different forms in the control function: (1) the first-order polynomial case, (2) the second-order polynomial case, (3) the third-order polynomial case and (4) the fourth-order polynomial case. RK sample contains Italian municipalities belonging to the non-autonomous regions that lie in the bandwidth selected. We are interested in the result for the the kink coefficient. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

### 2.6.2 Panel analysis

In the second part of our robustness check, we replicate the analysis developed above, using an extended sample. We use the time series from 2008 to 2009.

The empirical model to estimate becomes:

$$WasteTax_{i,t+1} = \alpha_0 + \alpha_1 Dummy_{i,t} + \alpha_2 Punishment_{i,t} + \alpha_3 Interaction_{i,t} + \mu_i + \zeta_t + \epsilon_{i,t}$$

The outcome variable, in this case, consists in the established (“accertato”) per-capita revenues from the waste tax in 2009 and in 2010. Municipalities may set this kind of tax according to they were in the “winner” or “loser” status in the previous year. The dummy variable tells us if the municipalities suffered a loss of resources, that is whether a municipality can be considered a “loser” or a “winner” after the property tax reform; the variable *Punishment* defines the amount of resources gained or lost after the property tax reform; the *Interaction<sub>i,t</sub>* term (*Dummy<sub>i,t</sub>* \* *Punishment<sub>i,t</sub>*) defines the municipalities that experienced a loss and the amount of that loss.

$\zeta_t$  is the time dummy and  $\mu_i$  the municipality fixed effect. In particular, the fixed effect assumes an important role in our analysis. It captures characteristics for each municipality that remain fixed during time. The waste tax is calculated on the basis of the cost of waste disposal that mainly depends from fixed or quasi-fixed characteristics of each municipality (density of population, altitude, etc.). Thus, the fixed effect captures differences in municipalities that are allowed in cross-section analysis.

**Nonparametric strategy** We use the optimal bandwidth selection methods most cited in the literature: Calonico, Cattaneo and Titiunik (CCT) method. Then, we implement the OLS estimation on local linear model for the bandwidths selected. Even in this case both procedures (CCT and IK procedures) approximate the optimal bandwidth around 14 euros.

Table 2.8 shows the estimation results. The interaction coefficient  $\alpha_3$  remains positive and significant. Thus, the panel analysis confirms the cross-section estimated results.

**Kink-estimation** The Figure 2.6 shows the results for the kink coefficient  $\alpha_3$  for different bandwidth selected for the response of the municipalities to the loss or gain of revenues as consequence of the abolition of the property

Table 2.8: Panel analysis: nonparametric approach

Outcome	Waste_Tax
Punishment	-0.461*** (0.175)
Discontinuity	0.0339 (1.516)
Interaction	0.922** (0.37)
2009.year	8.918*** (0.363)
Constant	102.3*** (1.026)
Observations	5,719
Municipalities	3,374
R-squared	0.217

The table shows the results for the established (“accertato”) per-capita revenues from the waste tax in 2009 and 2010, using OLS estimation. RK sample contains Italian municipalities belonging to the non-autonomous regions that lie in the bandwidth selected of 14 euros. We are interested in the result for the the kink coefficient. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

tax on the main dwelling in 2008 and in 2009<sup>32</sup>.

The chart reports our estimates of a possible kink at zero reference point for our outcome variable. The estimated kink results significant and positive for all bandwidth except between 26 and 25 euros, between 20 and 18 euros, and around 12 euros and 7 euros. However, the kink coefficients remain stable and positive (approximately) for bandwidth from 30 to 6 euros. The estimates start to fluctuate hugely for very narrow bandwidths.

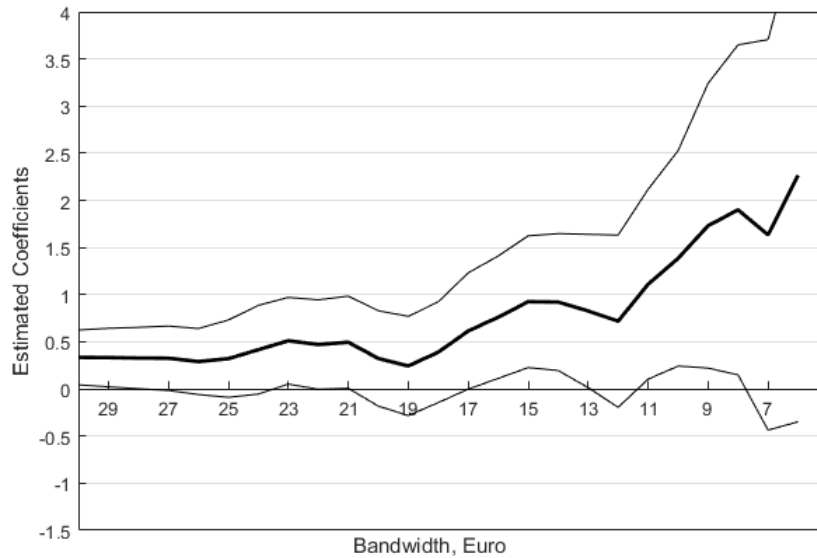


Figure 2.6: Kink estimates for per-capita waste tax.

## 2.7 Conclusion

In this chapter we have analysed the reaction of Italian municipalities to the property tax reform of 2008. In particular, we studied how the uncertain refund affects the budget and the choice of local fiscal policies. Uncertainty was also exacerbated by the vagueness of the method that the interior minister decided to implement to guarantee an efficient allocation of the resources. Thus, this muddling through represents a considerable weakness of the property tax reform. In addition, municipalities must apply broad and stringent domestic fiscal rules and in that period they were subject to the historic process of gradual reduction of the fiscal dependence on the central state. In

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<sup>32</sup>The outcome variable used is the established (“accertato”) revenues from waste tax in 2009 and 2010.

this scenario local governments must achieve two main goals: to commit the fiscal rule and to maintain the political consensus.

The exogenous shock generated by the abolition of the main dwelling property tax may have had either a positive or a negative effect on municipal budgets. For this reason, we split Italian municipalities in two types: 1) better off municipalities (“winners”), that managed more resources after the property tax reform and 2) worse off municipalities (“losers”), that managed less resources after the property tax reform.

The municipalities affected by the negative shock may have reacted either by increasing the revenues or by decreasing the expenses. On the revenues side, the only fiscal tools that could have been used by the municipalities was, primarily, the waste tax and/or the revenues from the building permits. Our findings are consistent with our initial hypothesis: municipalities used the waste tax to ensure themselves against the uncertainty from the main dwelling property tax reform. In general, Italian municipalities increased the revenues from the waste tax. However, municipalities that experienced a certain amount of resource gain behaved differently than municipalities that experienced an equivalent loss of resources.

Municipalities on the right of the cut-off point (worse off municipalities) set the waste tax according to the degree of loss. The farther they moved to the right of the reference point, the more they increased the waste tax. Hence, losers municipalities raised the taxation according to the degree of loss.

The “winner” municipalities, instead, experienced a constant increase in taxation regardless of the amount of gain that followed the property tax reform. Hence, for those municipalities the extra-resource did not translate into a waste tax decrease. It would have been reasonable to think that the extra-resources would have been used to reduce other municipal taxes as well as to improve the local services<sup>33</sup>. Thus, we can suppose they used the additional resources from the extra-grant plus the additional revenues from the waste tax to gain political rents.

In summary, local politicians did not seem to consider the gain from the property tax reform when they set the waste tax. On the contrary, they seemed to fear the loss from the property tax reform and they set the waste tax according to the degree of loss.

Analysing the electoral results for the municipalities in the treatment could constitute a further interesting research proposal. It could be interesting to understand whether or not the incumbent politicians benefited from the property tax reform in terms of votes. In brief, it may be interesting to test whether the mayors of the “winner” municipalities had a higher probability

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<sup>33</sup>At that time, the waste tax was one of the main tool for the local fiscal policy.

of being re-elected than the mayors of the “losers” municipalities.

In addition, what emerged from the analysis is that the main dwelling property tax was substituted, in part, by the waste tax. This substitution was stronger for municipalities clustered as “losers”. As a consequence, the substitution reduced the equality principle for the local taxation: a tax calculated based on the dwelling’s economic value was partially substituted by a tax that simply considered the size of the dwelling without concerning its economic value.

On the expenditure side, neither the “winners” nor the “losers” municipalities seemed to cut or increase their current expenses as reaction to the property tax reform. Reducing expenditures to face the expected revenue reduction was not the strategy chosen by local governments. The reason may involve the difficulties of further cutting the municipal expenditure as well as the related social cost that this process involves, especially if it has achieved its lower bound. In particular, municipal expenses had been subject to significant cut since the nineties and the process of transferring greater power to local entities empowered the same to guarantee a series of services that are very difficult to cut efficiently, so it may be extremely complicated for several municipalities to find room for further expenditures decrease in the short-term.

In addition, the main dwelling property tax reform also boost in this direction, that is to force the manipulation of the revenues side instead of the expenditures one. Indeed, the mechanism of reallocation of resources following the abolition of the main dwelling property tax incentives local politicians’ opportunistic behaviour. Substituting a local tax by a governmental grant reduced the political cost of increase local taxation and could incentive local government to increase the expenditures for political consensus.

In sum, instead of cutting the local expenditures local governments in the bad state preferred to increase local taxation to deal with the abolition of the main dwelling property tax. This could be occurred because in a scenario of more fiscal centralization reducing the current expenditure may be more expensive than rising local taxation.

We summarise the main findings as follows:

- Municipalities acted differently in terms of waste tax implementation. Their behaviour depended on the benefits or costs they assumed to have after the abolition of the property tax (I.C.I.) on the main dwelling. In particular, municipalities that suffered a loss of resources more greatly increased the waste tax;
- Municipalities in the bad state preferred to increase the taxation rather

than to cut the current expenditure in order to face low fiscal imbalances;

- The property tax reform led to an imperfect substitution between the property tax on main dwelling and the waste tax, with a related loss in equality for local taxation.

In short, the elimination of the property tax on the main dwelling may have led to an increase of waste tax for both “winners” and “losers” municipalities mainly because of an opportunistic behaviour by local politicians.

However, in this scenario emerges the different behaviour between the two types of municipalities in term of how much is the increase. This different behaviour could be explained by the fact that politicians of “losers” municipalities have feared the loss of revenues.



# Chapter 3

## The hidden effect of the reduction in fiscal autonomy and the partisan effect

### 3.1 Introduction

Fiscal transfers from government to municipalities should be motivated by efficiency and equity considerations. Governments transfer resources from the richest regions to the poorest ones for redistribution purposes. However, when allocating resources to municipalities politicians may be moved by opportunistic behaviour. Efficiency and equity may be underestimated compared to vote maximisation considerations. Indeed, what may emerge is that governments may allocate more resources to those municipalities politically aligned with them. Thus, governments may use a sort of ideological closeness criteria in determining resource allocation, generating what we define in our analysis the “partisan effect”<sup>1</sup>.

The empirical research on political economy has tested the existence of this opportunistic behaviour by politicians. In particular, literature has associated the implementation of this kind of policy to the cases in which the grant is not based on a formula or where rules regulating the grant allocation are ambiguous or not transparent. Based on literature, we test the existence of the so-called “partisan effect” after the 2008 fiscal reform regarding the abolition of the main dwelling property tax.

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<sup>1</sup>In this chapter, we use this definition to define the effect of the allocation of resources motivated by political reasons: an upper layer of government gives more resources to its subordinates if they belong to the same political party/coalition. Partisan effect means that politicians close to the party or coalition at the upper tier of government are rewarded. In our case, mayors connected to the governmental politicians receive more resources.

In 2008, the Italian political debate was monopolised by the argument about the abolition of the main dwelling property tax (I.C.I.). The centre-right premier candidate used this policy announcement as an instrument to win the election. When Berlusconi's government was in charge, it abolished the main dwelling property tax (I.C.I.). As a consequence, the amount of revenues no longer collected was substituted by grants. The government had to decide the amount of resources to be refunded to Italian municipalities and how the grant should be allocated. In particular, the rules regulating the amount of refund and the criteria for an efficient redistribution of those resources are defined in the annual budget law ("legge finanziaria"<sup>2</sup>).

In 2008, Berlusconi's government delegated the interior minister to calculate the grant to allocate to each municipality. It established that the new grant must be aligned to the 2007's data about the main dwelling property tax produced by local governments. Furthermore, the role of controlling and monitoring these data was delegated to the Court of Auditors (a non-political institution) while the residual control was delegated to the interior minister. While it seems difficult to find the discretionary role of governments, the higher degree of uncertainty regarding data certificated by municipalities and the crucial role played by the interior minister may allow the government to reward those municipalities politically linked to it. In this way, maximising votes could be considered a further driver in addition to efficiency and equity principles.

Rather than to discuss the effect of capital tax abolition on economy, the aim of this paper is to investigate whether or not the abolition of this tax has a hidden goal. Indeed, the abolition of the main dwelling property tax led to an increase in the amount of transfers from the centre to municipalities along with a decrease in fiscal autonomy. In brief, municipalities became more dependent on the government. Thus, this fiscal dependence from the centre distorts the behaviour of local politicians towards lobbying with the central government rather than efficiently providing public goods (Persson and Tabellini, 1994).

In this scenario, the government may have allocated a higher number of grants to municipalities, which were politically linked to it, that is belonging to the same party coalition as the government. Thus, this strategy may allow politicians of the majority to maintain and increase votes. Indeed, it may also confirm mayor loyalty: the mayor is motivated to demonstrate his loyalty and, in this way, he receives higher transfers that, in turn, could raise

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<sup>2</sup>From 2009 it has been named "legge di stabilità".

the probability of the mayor of being re-elected<sup>3</sup>. According to literature (see Nannicini, Brollo, 2012) an increase in transfers may make re-election more likely and may discourage entries from running in the electoral challenge. In this way, central and local governments may assure a good position in the elections within their mandate and reinforce themselves for the next governmental election.

However, this could generate a vicious cycle where bad politicians, and not good ones, gain support, just because they are connected with the government<sup>4</sup>.

Using a regression discontinuity (RD) approach, we empirically test whether the abolition of the main dwelling property tax and the subsequent increase in transfers led to the so-called “partisan effect”<sup>5</sup>, that is, if the government used the possibility of ruling on the distribution of resources to allocate more resources to mayors belonging to its coalition.

The approach here is to assume the existence of “backward-looking” politicians who reward their “core” voters. Bear in mind that, even if rewarding the “core” voters turns out not to be a motive for distributing transfers, this does not mean that the allocation is based solely on efficiency and equity. In some cases, governments may transfer resources to the richer municipalities in swing votes. So, as tested in literature (Johansson, 2003), the partisan effect may be substituted by the swing vote effect: politicians may use their role to gain swing votes.

As stated above, a shortcoming of this analysis is whether or not the government can influence the amounts of transfers to local administrations: does an operating space for the government exist? Is it big enough?

The law rules the grants; so in principle this may exclude the possibility for the government to affect local grants. However, the government makes the rules. For example, it may decide to transfer more resources to a specific geographic area, due to the presence of a local party in its coalition. Thus, in this case, it may affect the law in order to transfer more resources to the North, to the Centre or to the South. Equally, the government may distribute resources to compensate the property tax abolition with the aim of guaranteeing room for “pork-barrel” policies.

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<sup>3</sup>Having higher transfers means having higher revenues and to manage more resources for local economic policies.

<sup>4</sup>Obviously this strategy is very difficult (if not impossible) to implement. Government cannot modify the law on transfer introducing a sort of explicit partisan criteria, for example on the principle that municipalities belonging to the same political coalition have more money!

<sup>5</sup>See the definition in the notes above.

In short, this chapter strives to test whether or not the government has allocated resources to compensate the abolition of the main dwelling property tax according to political purposes.

## 3.2 Institutional Framework

### 3.2.1 Tiers of government and local public finance

Italy is a parliamentary republic and a fiscally decentralised country with four layers of government: municipality, province or metropolitan area (Upper-local), region and central State. These institutions are autonomous from each other, with their statute (“Statuto”), powers and functions defined according to the constitution. The lowest tier, the municipality (“Comune”), must act as a legislative body. It possesses its own government and the following governing bodies:

- the city council (“Consiglio Comunale”), which has the aim of control and guidance;
- the executive committee (“Giunta Comunale”), which has “residual jurisdiction” and manages functions that are not managed by other bodies; and
- the mayor, that is the executive and representative authority.

Italian municipalities must face expenditures and the revenues to fund their expenditure. The expenditures are largely spent in land and environment management, education, social services, local security and public transport. On the other hand, municipalities can provide revenues by means of grants (from central government, regions and provinces) and local taxes. Between local taxes, the I.C.I.<sup>6</sup>, introduced in 1992 and applied to the real estate in the municipality, represented the main source of revenue. Other important sources include the income-tax surcharge, the waste tax and fees in general. Part of the expenditure (approximately 30% of local expenses) is funded through intergovernmental grant, mainly transferred unconditionally. In principle, each year, central government define the total amount of grants to allocate to the municipalities in the budget law, in which they also define the criteria (according to equity and efficiency principles) for the allocation. The literature on the argument has focussed on the fact that these grants are

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<sup>6</sup>Mayors are free to set the tax rate between 0.4% and 0.7% of the real estate value.

largely not formula based (Bracco, Lockwood, Porcelli and Redoano 2015)<sup>7</sup> and thus are subject to political use<sup>8</sup>.

Municipalities have a specific electoral rule that was designed to guarantee local political stability<sup>9</sup>. The mayor is directly elected, he must be in charge for five years and he or she cannot be re-elected for more than two terms. The law states two different rules between municipalities with more than 15,000 inhabitants and municipalities with a population lower than the latter threshold. In the first case the mayor is elected through a single round race and the candidate that polls more votes wins (plurality voting system); in the second, the mayor is elected by a two-round system. In the first stage the voters cast two preferences: the mayor and the party list. The mayor is elected if he receives at least one vote more than 50% of the total vote. If nobody achieves this threshold, the second stage takes place: the vote is only for the mayor and the two most-voted candidates run against each other (Bordignon, Turati, 2014).

In our sample period the political scenario was dominated by two main coalitions: the centre-right coalition formed by parties linked to the conservative ideology, and the centre-left coalition formed by parties linked to the progressive ideology. From 2008 to 2010, the time involved in our analysis, the centre-right coalition was in charge<sup>10</sup>.

If the electoral run mainly between two coalitions was evident at the national level, then at the local level, the evidence decreases. Thus, it is difficult to ideologically classify the Italian mayors, especially for the small municipalities that are subject to the “first-past-the- post” system. However, it may be easier to classify the mayors of the biggest cities as “right” or “left”.

#### 3.2.2 The elimination of the property tax on the main dwelling

The abolition of the property tax on main dwelling (I.C.I.) was largely discussed in 2006’s electoral race. It represented the main tax reform in Silvio Berlusconi’s (the leader of the centre-right coalition) electoral programme.

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<sup>7</sup>The Italian legislators have recognized the weakness of political distortion in grant allocation system and the will to move toward a formula based system. The law n.32/2009 introduced the necessity to establish parameters to calculate standard expenditure needs.

<sup>8</sup>In the case of grant allocated for compensating the property tax abolition, the central government decided each year the amount of resources for compensation; in addition, the huge uncertainty in the data of the amount of revenues from the property tax gives room for political discretion in the allocation of that grant.

<sup>9</sup>Law 81/1993.

<sup>10</sup>In 2011, the center-right coalition was substituted by a government of national union in order to face the deep economic crisis.

By a tight margin, the 2006 electoral race was won by the centre-left coalition, the Union (“L’Unione”), led by Romano Prodi. Once elected, Prodi’s government reformed the property tax on main dwellings, decreasing the tax. In 2008, after Prodi’s government crisis, there was a new electoral race. The elections were won by the centre-right coalition; the winner coalition was formed by two parties, “Popolo della Libertà” and “Lega Nord” while the center-left coalition was formed by “Partito Democratico” and “Italia dei valori”. The election also involved a third coalition formed by the centrist party, “Unione di Centro, UDC”. The first act of Berlusconi’s government was to abolish the main dwelling property tax (I.C.I.) (Law n. 126, July 24 2008).

We argued in the introduction about the concerns due to the reform: how and how much should the refund be?

Italian government decided to fund 1,700 millions<sup>11</sup> to substitute the amount of I.C.I. no longer being collected<sup>12</sup>. In addition, it assigned the State-Municipalities and Local Entities Conference (“Conferenza Stato-città and enti locali”) to rule about the criteria and methods for regulating the amount of the new grant to allocate to the municipalities.

However, the lack of revenues from the property tax on the main dwellings led to fiscal stress for the municipal budget.

In this scenario, municipalities faced a further reduction in their fiscal autonomy. At the same time, Italian municipalities experienced considerable grant cuts due to both the local fiscal reform (and the will of improving the local taxation) and the austerity measures with the aim of eliminating the inefficiencies in local expenditures. To avoid fiscal stress, the government decided to transfer, immediately, to municipalities 50% of the amount of property tax (I.C.I.) collected for the main dwelling in 2007<sup>13</sup>. The Court of Auditors and the interior minister were the institutions with control aim<sup>14</sup> for the allocation mechanism. The rules about grant allocation remained the same for the entire time series while the amount of resources to fund the grants changed each year according to the budget law.

We test the presence of political distortion because we suspect weakness in the grant allocation mechanism. First of all, the manipulation may occur due to the high uncertainty in municipal data concerning the amount of revenues from the main dwelling property tax plus the uncertainty in the total amount of resources that government must refund to the municipalities. Indeed, past

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<sup>11</sup>The law regulated the duty to certificate revenues of the I.C.I. on the main dwelling no longer collected in 2008.

<sup>12</sup>This amount was added to 904 millions funded by Prodi’s government.

<sup>13</sup>Decree of June/19/2008.

<sup>14</sup>Decree n.154/2008, subparagraph 6 and 7, converted into law n. 189/2008.

municipal accounting rules allowed room for no transparent policies<sup>15</sup>. Thus data uncertainty was due to the structural caveats in the budget rules. In addition, the absence of a punishment mechanism for lying municipalities may induce moral hazard from local politicians into data communication. Indeed, the grant was mainly formulated according to the data on main dwelling property tax in 2007. Hence, politicians may overestimate those data in order to obtain more resources in grant.

## 3.3 Methodology and Empirical Model

### 3.3.1 Methodology

This section describes the empirical strategy used to identify how being aligned or not aligned to the government affects the predetermined outcomes. We utilise Lee's approach (2001 and 2008) for implementing the Regression Discontinuity Design (RDD) in a political context.

There are various ways of implementing the RDD strategy using both parametric and nonparametric analysis (Jacob, Zhu, Somers and Bloom, 2012). The parametric approach uses all the observations in the sample to build the outcome as a function of both treatment and rating variable. The nonparametric approach uses the observations in the sample close to the cut-point, called bandwidth, where the functional form is more likely to be linear<sup>16</sup>.

The regression discontinuity (RD) approach may be considered the best method for testing our hypothesis (Lee 2001, 2008). The RDD is a quasi-experimental method and its major use is in studying the impact of a policy around a cut-off. It makes possible to analyse the observations on both sides of the reference point and to capture differences or analogies: observations just above the threshold are considered similar to observations just below the threshold. In this way, we can identify the differences in response to a fiscal policy between municipalities in the treatment and municipalities in the control group.

The RDD is defined as an estimation of whether or not the outcome variable

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<sup>15</sup>The method of "competenza finanziaria" did not clearly define local revenues and local expenditures. In 2015 the government introduced the method of "competenza finanziaria potenziata" that better defines the debts of municipalities.

<sup>16</sup>The simplest approach is to compare observations very close to the threshold (non-parametric approach); however this method can produce unprecise estimate and it needs a large number of observations. Instead, given the relatively limited number of observations (that is the problem of several analysis) around the reference point, the alternative approach (parametric approach) based on the use of all available data together with a control function can be used.

exhibits a jump at the threshold of the rating variable. The magnitude of the jump can be estimated in two ways: by using all the observations in the sample, or by using a local regression that reduces the observation to a bandwidth around the threshold of the rating variable, where the functional form is most likely linear (Lee and Lemieux, 2010). There are two types of strategies for specifying the functional form of the single-rating RD case (Jacob, Zhu, Somers and Bloom, 2012):

- The parametric approach, which uses all the observations in the sample to build the outcome as a function of the treatment and the rating variable, and
- the nonparametric approach, which uses the observations in the sample close to the cut-off point, called the bandwidth, where the functional form is more likely to be linear.

We use both strategies for the Regression Discontinuity (RD) analysis; we compare the municipalities in which the mayor who won the election was aligned to the central government against the municipalities in which the mayor who won the election was not aligned to the central government. In particular, Lee(2001) explained the reasons why it is useful to use the mayor's margin of victory over the candidate that came second as a rating variable. He illustrated that this represents a quasi-random variation in party winners because in a very tight race the winning party is likely to be determined by pure chance. The randomness of the tight margin is added to the unpredictability in voting behaviour. Thus, it appears to be an appropriate method to test whether or not the government allocated resources to compensate the abolition of the main dwelling property tax according to political motives. As described in the following pages, we use the rating variable defined by Lee (2001) but we relax the definition of tight margin.

Bracco, Lockwood, Porcelli and Redoano (2015) represent the second main reference for the empirical strategy implemented in our paper. They tested whether or not the government had the ability to transfer more resources to those municipalities clustered as "politically linked to the government"<sup>17</sup>.

Their empirical strategy can also be used to test our hypothesis. However,

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<sup>17</sup>We have discussed it in Chapter 1. They provide a political agency model to test the alignment effect in the allocation of grants. They point on the following features: rational voter interpret public good provision as a signal of incumbent competence; grants are unobservable to voters (Bracco, Lockwood, Porcelli, Redoano, 2015). They use a regression discontinuity design on Italian municipalities data. They find that the alignment effect exists, so the national government will use the grant as a tool to benefit the aligned local incumbent and challengers. Furthermore, they also test the flypaper effect for Italian municipalities.



the main difference with Bracco, Lockwood, Porcelli and Redoano (2015)'s paper is the composition of the dependent variable. Indeed, our analysis employs the grant received by the municipalities for compensating the property tax on main dwelling abolition instead of the “classical” grants mainly used in the literature. Our time series last from 2008 to 2010 according to the property tax reform. However, it is important to highlight that abolition of the main dwelling property tax was not a structural reform in the fiscal Italian scenario and it was reintroduced by the 2011 budget law<sup>18</sup>.

In the next section we discuss in more detail the empirical model used to test our hypothesis.

### 3.3.2 The Empirical Model

Our paper uses the same approach as Bracco, Lockwood, Porcelli and Redoano (2015), but with a different type of grant. We are not interested in finding political motives behind the allocation of “classical” grants but in testing the possibility of a hidden effect due the main dwelling property tax reform: did it introduce political distortion?

In particular, the model we estimate is the following, for  $i = 1...N$  municipalities observed in the time periods (2008, 2009 and 2010):

$$(1) \quad Grant_{i,t} = \alpha_0 Aligned_{i,t} + f(Margin_{i,t}; Aligned_{i,t}) + \beta_0 + \beta_1 X_{i,t} + \mu_i + \zeta_t + \epsilon_{i,t}$$

where  $Grant_{i,t}$  represents the amount of resources that the government allocated to substitute the property tax (I.C.I.) on the main dwelling;  $Aligned_{i,t}$  is the dummy variable that takes a value of 1 if the mayor's party belongs to the government coalition and 0 otherwise;  $Margin_{i,t}$  (the rating variable<sup>19</sup>) represents the margin of alignment, which we will define in more detail in the lines below;  $X_{i,t}$  is the matrix of the control variables, containing the lag of the per-capita revenues collected from the property tax on the main dwelling:

$\zeta_t$  is the time dummy and  $\mu_i$  the municipality fixed effect.

Our empirical strategy is based on an alternative approach, as we employ a control function<sup>20</sup> in the equation (1). This control function consists in a

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<sup>18</sup>We can only test for short-run time-series (in 2011 Monti's government reintroduced the property tax on the main dwelling).

<sup>19</sup>We include the rating variable in our impact model to correct the selection bias due to selection of the sample.

<sup>20</sup>In general, our control function can be defined:  $f = \alpha_1 Margin_{i,t} + \alpha_2 Margin_{i,t}^2 + \dots + \alpha_p Margin_{i,t}^p + \beta_1 Margin_{i,t} Aligned_{i,t} + \beta_2 Margin_{i,t}^2 Aligned_{i,t} + \dots +$

pth-order polynomial to add to the binary treatment in the regression<sup>21</sup>. It also contains the interaction between the rating and the treatment variables. This can be important because it can control the fact that the treatment variable may also impact the slope of the regression line and not only the intercept.

We are interested in the estimation of the coefficient  $\alpha_0$ , which measures the discontinuity effect for treatment. In sum, it represents the marginal impact of the programme at the cut-point. The significance and positiveness of the coefficient proves the existence of the so-called “partisan effect”.

### 3.3.3 Data Description

For constructing our variables, we collect data from many sources. Our data are observed at the municipal level. We study the Italian municipalities belonging to regions that do not possess autonomous status, as the municipalities in autonomous regions feature different fiscal rules; thus, their exclusion guarantees homogeneity in municipal fiscal rules. Therefore, our sample is restricted to municipalities in 15 Italian ordinary statute regions (“regioni a Statuto Ordinario”): Piemonte, Lombardia, Veneto, Liguria, Emilia-Romagna, Toscana, Umbria, Marche, Abruzzo, Lazio, Molise, Campania, Puglia, Basilicata and Calabria.

We collect data regarding grants compensating for the main dwelling property tax<sup>22</sup> (“Trasferimenti compensativi I.C.I. abitazione principale, art. 1, c. 1, d.l. 93/08”) from the minister interior’s web-site<sup>23</sup>, specifically, at section “Trasferimenti erariali e Attribuzioni di entrata da federalismo fiscale delle amministrazioni provinciali, nonché attribuzione da fondo di solidarietà comunale e contributi per i comuni”. These data are included in the section “other grants” (“Altri contributi generali”).

We also collect data on the main dwelling property tax (I.C.I.) from the section “Finanza Locale”<sup>24</sup> of the the interior minister’s web-site. The data are included in “Certificati Consuntivi di Bilancio” in columns “Riscossioni in conto Competenza” and “Riscossioni in conto Residui”<sup>25</sup>.

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$+\beta_p \text{Margin}_{i,t}^p \text{Aligned}_{i,t}$ .

<sup>21</sup>Many functional forms can be tested to define which fits the data in the best way, in order to minimize the bias.

<sup>22</sup>They represent the amount of money that the government, towards the Interior Minister, decided to transfer to municipalities to compensate the abolition of the property tax on main dwelling.

<sup>23</sup>The Italian Interior Ministry dataset is available on internet.

<sup>24</sup>We use the per-capita amount of property tax on main dwelling as control.

<sup>25</sup>Before the reform of municipal budgets in 2015, the balance sheet of Italian municipalities were formed by three columns: “Accertamenti”, “Riscossioni in conto Competenza”

Data for municipal elections<sup>26</sup> are collected from the section “Archivio storico delle elezioni” from 2004 to 2010<sup>27</sup>. Furthermore, information about mayors and the executive committee (party, job, education etc.) are also collected from the section “Anagrafe degli Amministratori”.

Data on grants or the amount of property tax on main dwelling are treated in per capita terms. Therefore, data on the Italian population are collected from the demographic section of the Italian National Institute of Statistics (ISTAT) website. All others variables or statistics are obtained from ISTAT web-site.

#### 3.3.4 Variables Description

In this section, we describe the variables used in our empirical model.

The rating variable for the Regression Discontinuity Design (RDD) is the margin of alignment (Lee, 2001). It is defined as the difference between the percentage of votes gained by the winning candidate and the percentage of votes obtained by the runner-up if the winner is aligned with the central government and minus this difference if the mayor is not aligned (Bracco, Lockwood, Porcelli and Redoano, 2015). Since the electoral rule is not uniform for all Italian municipalities<sup>28</sup>, we calculate the margin according to Bracco, Lockwood, Porcelli and Redoano (2015):

- If the municipality has a population below 15,000 inhabitants the margin is calculated on the first-round,
- while if the municipality has a population greater or equal 15,000 inhabitants, it depends on whether the mayor is elected in the first round (because he obtained the absolute majority of votes). If so, then the first round’s results are used. If a second round occurred, then the second round’s results are used.

We exclude the municipalities in which the margin of victory is greater than the 99 percentile. In this way, we avoid using outliers for the margin variable by eliminating data that may be incorrect and/or pure ideological municipalities. In addition, a reasonable rate of margin allows for better comparing

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and “Riscossioni in conto Residui”.

<sup>26</sup>The Italian municipalities election are held each 5 years, unless particular events.

<sup>27</sup>We use these data for constructing Margin, that is our rating variable. The mayor elected in 2004 manages the municipality for 5 years. Thus, we start from 2004 because we need the *Margin* in 2008.

<sup>28</sup>See Chapter 1.

the two candidates since a candidate that wins the election by a tight margin could be seen by voters as similar to the loser candidate (Lee, 2001 2008).

Then, we define the treatment variable, which is the alignment variable. It consists of a dummy variable that takes a value of 1 if the mayor's party belongs to the government coalition and 0 otherwise<sup>29</sup>. That is, we define "aligned" as the municipalities where the mayor won the election (Lee 2001, 2008) and the mayor's party is in the government coalition.

In defining the treatment variable we deal with the considerable presence of civic parties ("lista civica"), apparently not directly linked with the national political coalitions. Small municipalities in particular are more likely to be governed by civic parties. So, in this case it remains very difficult to infer the mayor's ideology. Table 3.1 shows the Italian political parties; we cluster also Independent and we associate them to the left or the right according to the distribution of political parties in the local Executive Committee.

We decide to exclude from our analysis municipalities where the mayor or the executive committee member could not be associated with the right or the left coalition. We replicate our analysis also excluding municipalities with a population of less than 5,000 inhabitants. These municipalities are not subject to the Domestic Stability Pact (meaning, they have different fiscal rules) and for them a special status was guaranteed<sup>30</sup>. However, a high percentage of those municipalities is managed by a mayor belonging to a civic party, and so their exclusion cannot be considered a significant loss of power for our analysis.

Finally, we describe our outcome variable. It represents the grant (in per capita terms) that governments provided to municipalities to compensate the loss in revenues from the abolition of the main dwelling property tax. We exclude from the analysis the observations below the 1 percentile and up to the 99 percentile for the panel series of the grant per capita. In this way we minimise the number of likely incorrect data<sup>31</sup>.

We use as control only the lag of the revenues collected by the property tax on dwellings<sup>32</sup> (obviously, this variable is expressed in per capita terms).

We must highlight that we conduct the analysis not on all the municipalities

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<sup>29</sup>We consider two main Italian political actors, center-left and center-right coalitions. Since 2008 to 2010 the government were formed by the center-right coalition. This simply means that when the alignment dummy assumes value 1 the mayor is associated to the center-right coalition while when the alignment dummy assumes values 0 the mayor is associated to the center-left coalition.

<sup>30</sup>They received an extra-amount of compensative grant because of the lower population.

<sup>31</sup>As said in Chapter 2, data on local budgets may be missing or uncorrect.

<sup>32</sup>The analysis is limited to the abolition of the property tax on main dwelling.

in the non-autonomous regions<sup>33</sup> but on residual municipalities (that is the ones that remain after implementing our data-cleaning strategy).

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<sup>33</sup>The municipalities in non-autonomous regions are around 6,700.

Table 3.1: Political classification of parties (2008-2010)

Centre-left	Centre-right	Indipendent
cen-sin(ls.civiche)	alleanza nazionale	rinnovamento
comunismo	cdl	udc
comunisti	lega nord	cattolici liberali
dem.sin.	casa della libertà	ccd
democratici sinistra	cen-des	cdu
fed. Verdi	destra	centro
dipietro	forza italia	democratici popolari
rif.com	lg. Nord	popolari democratici
com.it	liga veneta	u.d.eur
partito democratico	nuovo psi	moderati
f.verdi	p. per la libertà	civica margherita
ulivo	fi-an-udc	
pci	an	ppi
pds	alleanza lombarda autonoma	
progressisti	polo per la libertà	unione democratica
rifondazione comunista	fi-an-udc	un.dem.
sinistra	fi	un. Pop
verdi	popolo della libertà	t.ccd
ds	cen-des(liste civiche)	unione di centro
dipie.occh.		bisotti
democr-progresso		
dl. Marg		
intesa democratica		
l'unione		
patto democratici		
riformista		

Note: independents are classified according to the political parties in local Executive Committee.

## 3.4 Empirical Analysis

In this section we test whether or not the “partisan effect” on grant allocation following the I.C.I. abolition exists. In this way, we test the presence of political distortion that followed the fiscal reform. We compare municipalities where the mayors (and/or the municipal committee) are aligned to the central government against those where they are not aligned (Bracco, Lockwood, Porcelli and Redoano, 2015).

Due to the difficulties in recognising a municipality as “partisan” and the few observations, we use the parametric analysis. However, we also replicate the same empirical strategy implemented by Bracco, Lockwood, Porcelli and Redoano (2015): we use the nonparametric analysis as a robustness check, choosing the IK criterion (Imbens and Kalayanaraman, 2012) and CCT criterion (Calonico, Cattaneo and Titiunik, 2014) procedure as the optimal bandwidth selection criterions.

### 3.4.1 Graphical Analysis

We use a graphical approach to make the research point clearly. Figures 3.1-3.4 show the margin of alignment on the horizontal axis and the per-capita compensatory grant to each municipality on the vertical axis. Each graph describes the existence of discontinuity for a specific th-order polynomial functions, from 1 to 4. The figures show a low jump in the distribution of grants between aligned and unaligned municipalities at  $Margin = 0$ .

Table 3.2: Descriptive statistics.

	Grant	Margin	Aligned
Population			
Mean	39.49393	0.2139752	0.4364346
sd	23.35023	0.180372	0.4959939
N observations	19,260	19,143	4,869
Sample			
Mean	45.41804	0.2124344	0.4441608
sd	21.71918	0.1595089	0.4969251
N observations	4,701	4,701	4,701

The table shows the descriptive statistics of compensatory grant (Grant), the absolute value of margin of victory (Margin) and the dummy aligned that assigns 1 if the mayor belongs to the same coalition of the government and 0 otherwise, from 2008 to 2010. Panel for population of Italian municipalities belonging to the ordinary regions exhibits different numbers in the observations. It occurs because some voices for the data are missing in some years. Panel for sample shows the descriptive statistics of the sample obtained after outliers delation.

### 3.4.2 Parametric Analysis: regression results

We adopt the parametric strategy mainly to deal with the problem of few observations<sup>34</sup> (Lee and Lemieux, 2010).

The parametric strategy allows to use all the observations in the sample and not only those located close to the cut-off point, i.e. where the regression function is more likely to be linear<sup>35</sup> (Jacob, Zhu, Somers and Bloom, 2012). We associate the elimination of outliers for the outcome variable (1 and 99 percentile) and the rating variable (99 percentile of its absolute value) to the specification of the functional form for the control function in order to minimize the analysis bias<sup>36</sup>.

Tables 3.3 and 3.4 report the results. They describe the estimation of the equation (1) and we regress it for four functional forms in the control function:

$$Grant_{i,t} = \alpha_0 Aligned_{i,t} + \beta_0 + f(Aligned_{i,t}; Margin_{i,t}) + \mu_i + \zeta_t + \epsilon_{i,t}$$

We are interested in whether or not a discontinuity at the reference point exists. This discontinuity is measured by the coefficient  $\alpha_0$  in the regression equation: it measures the change in the allocation of the per-capita grant due to the mayor political alignment with the central government (i.e. it measures the so-called “partisan effect”).

The results come from the estimation of OLS regression for all pth-order polynomial forms used in the control function.

Table 3.3 reports the regression results for the equation with polynomial control function without the interaction term. All regressions contain the municipality fixed effect and time dummies; standard errors are clustered at municipal level.

Firstly, we look at the columns in Table 3.3. Each column represents the regression results for each functional form in the following order: 1st-order polynomial (1), 2nd-order polynomial (2), 3rd-order polynomial (3) and 4th-order polynomial (4).

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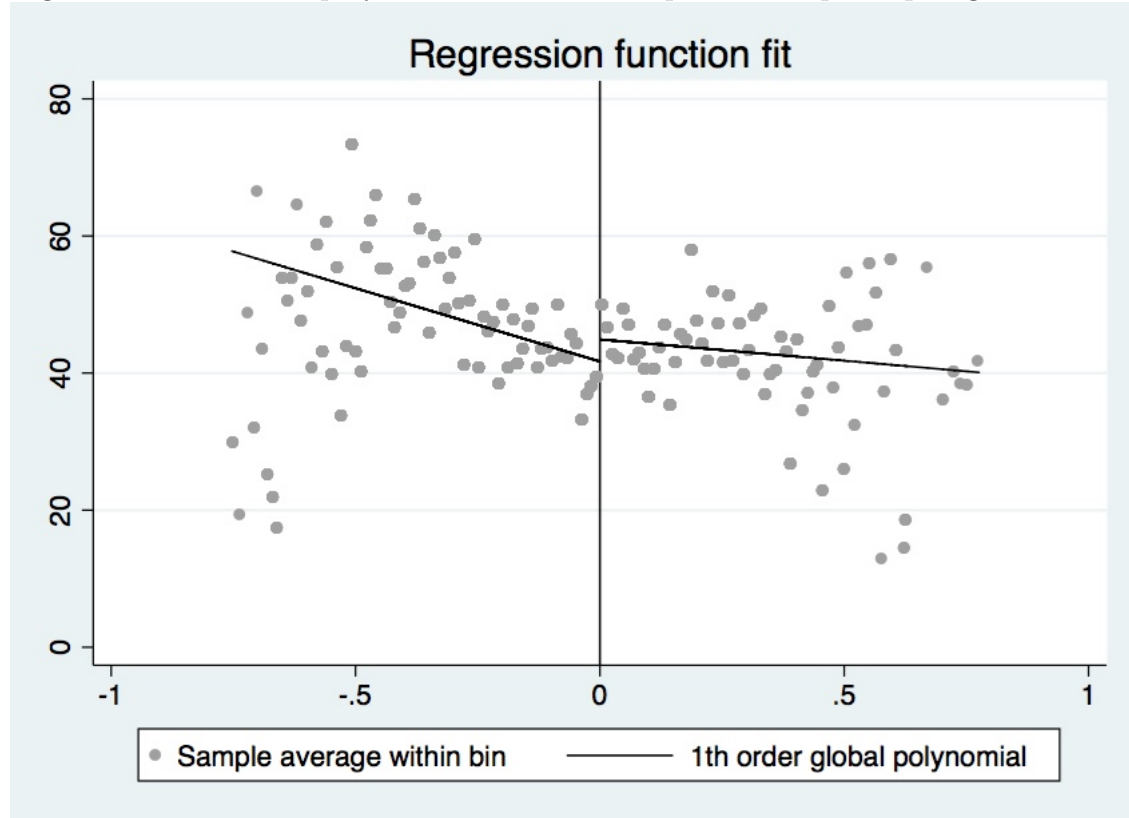
<sup>34</sup>We cannot consider in our analysis those municipalities that are not politically identifiable. This is the reason why we drop a huge number of observations.

<sup>35</sup>This method gains strength from observations far from the threshold point to estimate the average outcome for observations close to the threshold point. In order to minimize the bias, several functional forms can be used for the rating variable (linear, quadratic, cubic, interaction terms, etc). The choice of the appropriate functional form is conducted by F-test on higher-order interaction terms and inspecting the residuals (Jacob, Zhu, Somers and Bloom 2012).

<sup>36</sup>The trade-off consists in the difficulty to ensure whether or not the functional form of the relationship between the conditional mean of the dependent variable and the rating variable is well specialized. Thus, the issue increases the potential for bias (Jacob, Zhu, Somers and Bloom, 2012).



Figure 3.1: First-order polynomial function's RDplot for the per-capita grant.



The figure shows per-capita compensative grant on the vertical axis and the margin of victory on horizontal axis. Negative value for the margin of victory means that municipalities is not aligned with the central government.

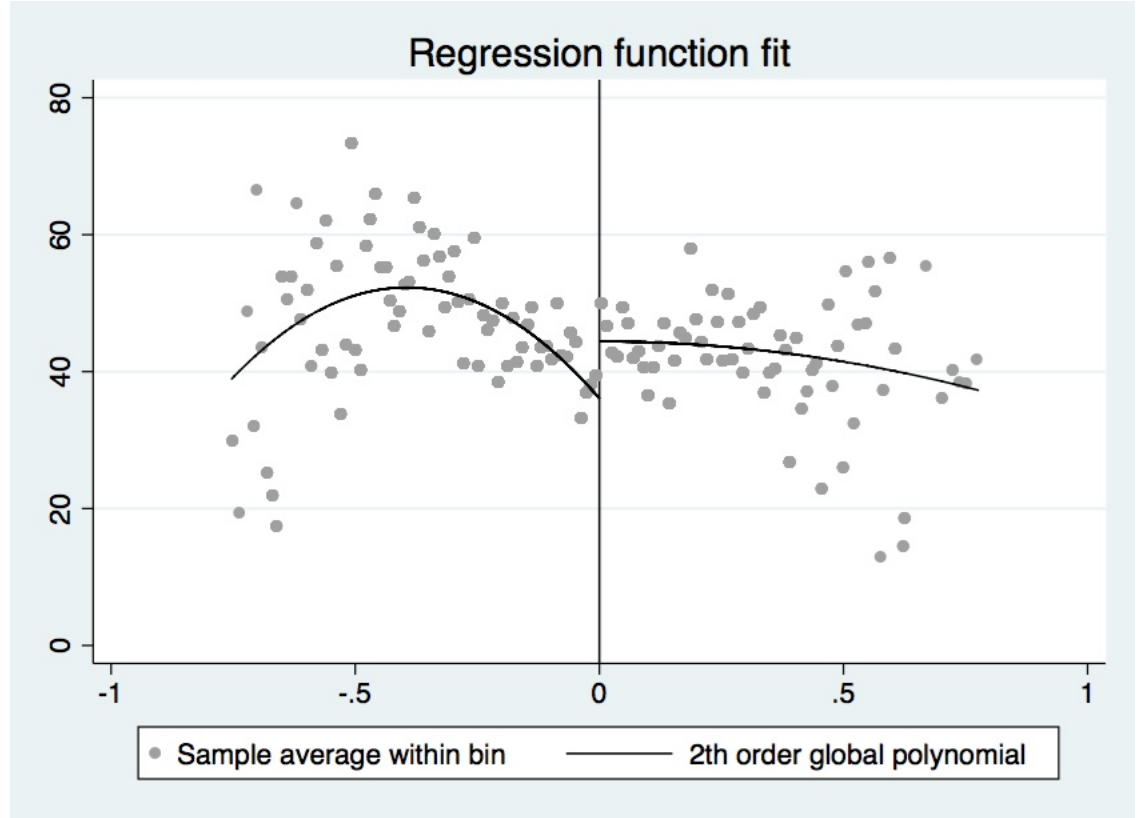
The results show that a discontinuity coefficient is positive, very low (it is between 0.15 and 0.05 euros in per-capita terms) and not statistically significant. Thus, there is no evidence for the existence of the “partisan effect”; this means that the center-right coalition at central government has not given more money to those municipalities politically aligned<sup>37</sup> to it.

Table 3.4, that reports the regression results for the equation with polynomial control function with interaction term, confirms the results shown in Table 3.3.

In short, the parametric approach used for estimating the empirical model statistically seems to confirm that the centre-right central government have behaved in a transparent manner in allocating the compensatory grants. It did not allocate more resources to those municipalities politically linked to

<sup>37</sup>We mean municipalities managed by a mayor (and a municipal committee) linked to the centre-right coalition.

Figure 3.2: Second-order polynomial function's RDplot for the per-capita grant.



The figure shows per-capita compensative grant on the vertical axis and the margin of victory on horizontal axis. Negative value for the margin of victory means that municipalities is not aligned with the central government.

it.

## 3.5 Robustness check

### 3.5.1 Nonparametric Analysis

The nonparametric (local) strategy uses the observations close to the cut-point, contained in an appropriate bandwidth, where the functional form is more likely to be linear<sup>38</sup>.

The choice of the appropriate bandwidth for the local strategy is challeng-

<sup>38</sup>The local strategy views the estimation of treatment effect as local randomization and it limits the analysis only to the observations that are close to the cut-point, excluding those that are too far from that point.

### 3.5 Robustness check

Table 3.3: Regression results: parametric analysis 1/2

	p(1)	p(2)	p(3)	p(4)
Outcome	Grant	Grant	Grant	Grant
Margin	-0.243 (0.206)	-0.177 (0.569)	0.0953 (1.253)	0.763 (2.594)
Aligned	0.136 (0.123)	0.125 (0.148)	0.0953 (0.178)	0.0502 (0.225)
<i>Aligned</i> <sup>2</sup>		-0.117 (0.963)	-1.219 (4.678)	-5.84 (16.46)
<i>Aligned</i> <sup>3</sup>			1.167 (4.872)	12.15 (37.37)
<i>Aligned</i> <sup>4</sup>				-8.294 (27.48)
2009.year	-0.229*** (0.0178)	-0.229*** (0.0179)	-0.228*** (0.018)	-0.229*** (0.018)
2010.year	0.270*** (0.0384)	0.270*** (0.0385)	0.270*** (0.0385)	0.270*** (0.0386)
Constant	45.34*** (0.0625)	45.34*** (0.0738)	45.36*** (0.0882)	45.38*** (0.113)
Observations	4,701	4,701	4,701	4,701
Municipalities	2,028	2,028	2,028	2,028
R-squared	0.1	0.1	0.1	0.1

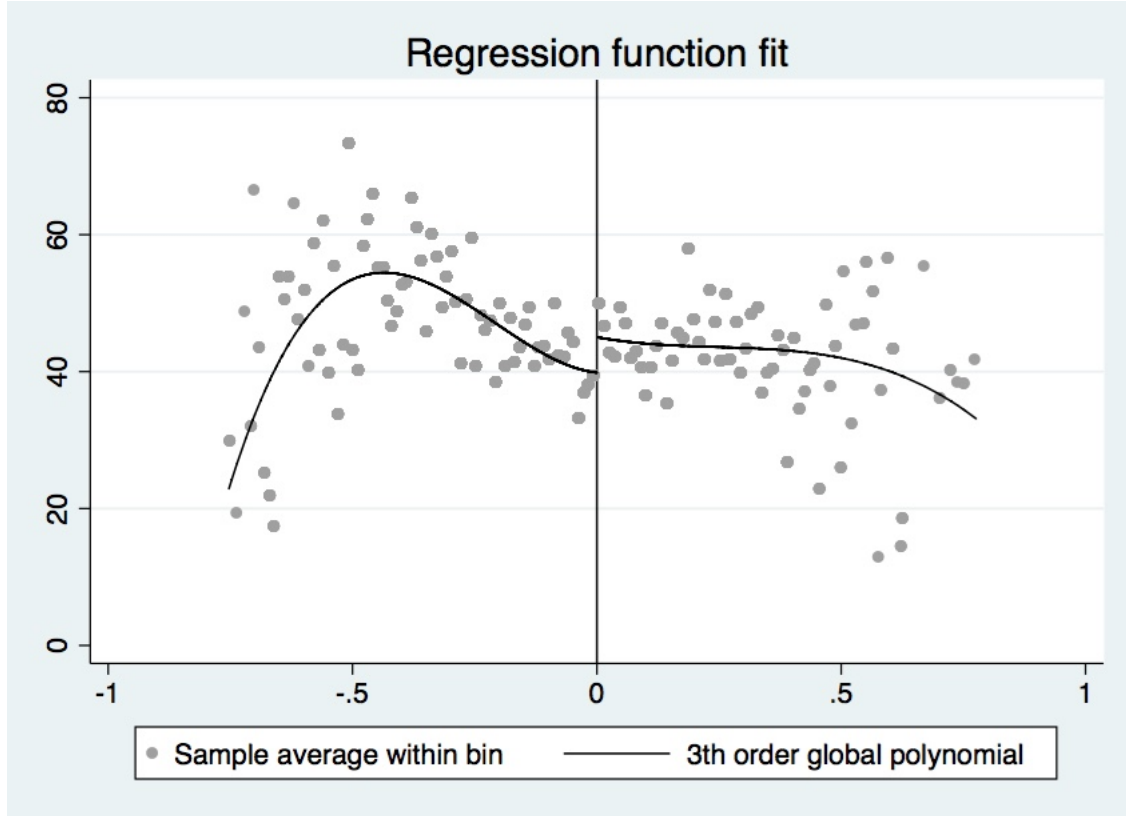
The table shows the results for the grant per-capita using OLS estimation with time and fixed effects. Each column reports the estimation for different forms in the control function: (1) the first-polynomial case, (2) the second-polynomial case, (3) the third-polynomial case and (4) the fourth-polynomial case. RD sample contains all local election where the winner belongs to the centre-left or the centre-right coalition. We are interested in the result for the coefficient on aligned dummy. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

Table 3.4: Regression results: parametric analysis 2/2

	p(1)-interaction	p(2)-interaction	p(3)-interaction	p(4)-interaction
Outcome	Grant	Grant	Grant	Grant
Margin	-0.353 (0.251)	-0.0348 (0.706)	0.819 (1.657)	2.966 (3.462)
Aligned	0.117 (0.124)	0.15 (0.147)	0.118 (0.178)	0.0334 (0.228)
<i>Aligned</i> <sup>2</sup>		-0.543 (1.167)	-3.878 (6.121)	-18.27 (21.54)
<i>Aligned</i> <sup>3</sup>			3.466 (6.335)	37.26 (48.76)
<i>Aligned</i> <sup>4</sup>				-25.46 (36.08)
<i>Interaction</i>	0.368 (0.38)	-0.759 (1.079)	-1.96 (2.395)	-3.919 (4.801)
<i>Interaction</i> <sup>2</sup>		2.167 (1.799)	7.045 (8.586)	20.23 (30.46)
<i>Interaction</i> <sup>3</sup>			-5.222 (8.475)	-36.38 (68.97)
<i>Interaction</i> <sup>4</sup>				23.64 (49.95)
2009.year	-0.228*** (0.0178)	-0.228*** (0.018)	-0.227*** (0.0181)	-0.227*** (0.0181)
2010.year	0.270*** (0.0384)	0.271*** (0.0385)	0.272*** (0.0385)	0.272*** (0.0386)
Constant	45.31*** (0.0709)	45.34*** (0.0892)	45.39*** (0.117)	45.46*** (0.156)
Observations	4,701	4,701	4,701	4,701
Municipalities	2,028	2,028	2,028	2,028
R-squared	0.1	0.101	0.101	0.101

The table shows the results for the grant per-capita using OLS estimation with time and fixed effects. Each column reports the estimation for different forms in the control function: (1) the first-polynomial case, (2) the second-polynomial case, (3) the third-polynomial case and (4) the fourth-polynomial case, with interactions term. RD sample contains all local election where the winner belongs to the centre-left or the centre-right coalition. We are interested in the result for the coefficient on aligned dummy. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level.

Figure 3.3: Third-order polynomial function's RDplot for the per-capita grant.



The figure shows per-capita compensative grant on the vertical axis and the margin of victory on horizontal axis. Negative value for the margin of victory means that municipalities is not aligned with the central government.

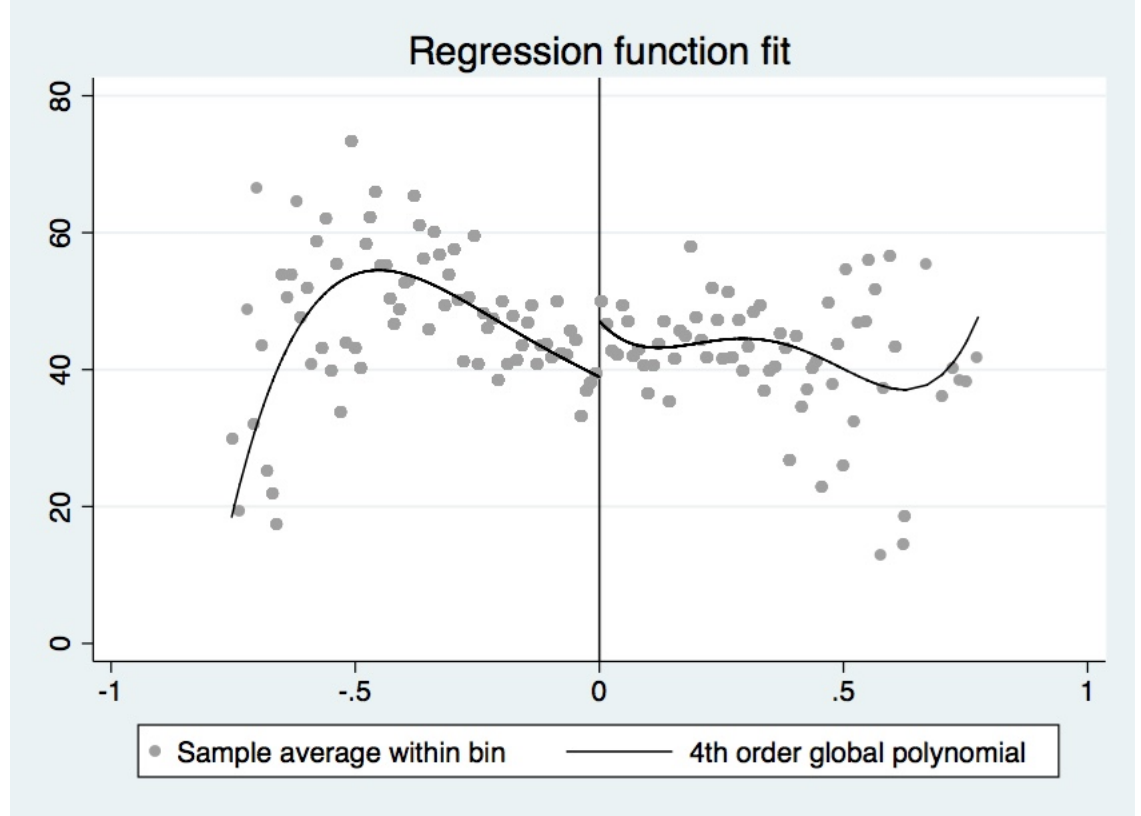
ing for the analysis. Choosing the bandwidth in an accurate way gives the possibility to solve the trade-off between precision and bias. In fact, a larger bandwidth may guarantee a greater precision in the estimation of the model. On the other side, the linear specification may be less accurate and it may lead to bias when treatment effect is estimated.

Since our sample size could be considered not so large, particularly around the cut-off point, we have used the parametric estimation as the principal method of analysis.

The main decision in the application of the nonparametric analysis regards the choice of the methodology for the selection of the optimal bandwidth<sup>39</sup>.

<sup>39</sup>The literature on Regression Discontinuity Design (RDD) proposed two procedures for choosing the bandwidth. The first is the “cross-validation” procedure and the second one the “plugs-in” procedure. Both procedures concern the concept of mean square error

Figure 3.4: Fourth-order polynomial function's RDplot for the per-capita grant.



The figure shows per-capita compensative grant on the vertical axis and the margin of victory on horizontal axis. Negative value for the margin of victory means that municipalities is not aligned with the central government.

We select the bandwidth using the IK method, by Imbens and Kalyanaraman's (2012) and CCT (Calonico, Cattaneo and Titiunik, 2014) criterion. Then, we implement the OLS estimation on the local linear model for the bandwidths selected.

The results of the parametric analysis are summarized in Tables 3.5. The

(MSE), which exactly measures the trade-off, discussed above, between bias and precision. In addition, both procedures are also computationally complicated. As stated before, the "plug-in" procedure defines the optimal bandwidth according to the sample data and it balances the degree of precision and bias. The concept is to find a formula that defines a bandwidth that minimizes a particular function of precision and bias. Fan and Gijbels (1996) developed a method in the context of local linear regression that DesJardins and McCall (2008) and Imbens and Kalyanaraman (2009) modified for the RD setting. Recently Calonico, Cattaneo and Titiunik (2014) elaborated a method for the optimal bandwidth selection for sharp RD, sharp kink RD, fuzzy RD, fuzzy kink RD.

second column in Table 3.5 describes the results of the equation (1) in the case of CCT bandwidth selector. The discontinuity is measured again by the coefficient  $\alpha_0$  and for a bandwidth around 15% (0.15) of the margin of victory (Margin). The regressions contain the municipality fixed effect, time dummies and standard errors are clustered at municipal level. The discontinuity coefficient remains low, positive and not statistically significant. Thus even the nonparametric approach does not confirm the existence of the so-called “partisan effect”.

We replicate the estimation of the model using the IK method, by Imbens and Kalyanaraman’s (2012). The estimation results (for a bandwidth around 9% (0.09) of the margin of victory (Margin), shown in third column of Table 3.5 did not change from the CCT selection criterion case. The discontinuity coefficient remains low, positive and not statistically significant. Thus it does not confirm the existence of the so-called “partisan effect”. In short, the nonparametric approach confirms what have emerged in estimating our model by the parametric approach: the centre-right central government have behaved in a transparent manner.

## 3.6 Conclusion

In this chapter we empirically tested the existence of the so-called “partisan effect” on the grant that the central government allocated to Italian municipalities to compensate the abolition of the main dwelling property tax.

The empirical model is built to test whether or not the municipalities politically aligned with the central government received more resources than municipalities that were not politically aligned. Aligned mayors may use these extra-resources to cut taxes or to rise the expenditures or they may face the lower reduction of resources with a lower increase in taxation or a lower decrease in expenditure<sup>40</sup>.

To test the “partisan effect”, we have used a dataset on Italian municipal public finance, local and national elections and politicians’ information<sup>41</sup> over the period of the abolition of the main dwelling property tax (2008-2010). Our empirical strategy is based on a RDD and we have estimated the model

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<sup>40</sup>The extra-resources (allocated for political connection motives) are not large enough. It is evident from the empirical results that it is equal approximately to a number much less than 1 euro per capita. However, we don’t simply focus on the extra-amount received by a municipality because we are in a scenario of reduction in grants. We want to test who wins and who loses from the property tax reform.

<sup>41</sup>Data are collected from the Interior Minister web-site.

Table 3.5: Nonparametric analysis		
	CCT	IK
Outcome	Grant	Grant
Margin	-0.0716 (1.68)	-1.523 (4.862)
Aligned	0.112 (0.286)	0.129 (0.583)
2009.year	-0.168*** (0.0292)	-0.122*** (0.0408)
2010.year	0.270*** (0.0572)	0.366*** (0.0774)
Constant	42.85*** (0.144)	42.99*** (0.294)
Observations	2,036	1,301
Municipalities	993	662
R-squared	0.084	0.086

The table shows the results for the grant per-capita using OLS estimation. Each column reports the estimation for different optimal bandwidth selection method: the IK (Imbens and Kalyanaraman, 2012) criterion ( $\pm 0.09$  of margin of victory) and the CCT (Calonico, Cattaneo and Titiunik, 2014) criterion ( $\pm 0.15$  of margin of victory). RD sample contains all local election where the winner belongs to the centre-left or the centre-right coalition. We are interested in the result for the the coefficient on aligned dummy. Time dummies and fixed effects are included in all regressions in columns 2 and 3. Significance at 1% is represented by \*\*\*, at 5% by \*\* and at 10% by \*. Robust standard errors in brackets clustered at municipal level. The number of observations change according to the bandwidth selector method.



through a parametric approach.

The empirical results demonstrate that the centre-right central government coalition did not allocate more resources to municipalities who were politically aligned to it. This means that the abolition of the property tax on the main dwelling did not achieve also an hidden goal: even if municipalities' increased fiscal dependence on the central state, the government did not allocate more resources to the municipalities politically aligned to it.

The main question was the following:

- Was there room for the government to allocate funds to aligned municipalities?

In our opinion, the manipulation may occur due to the high uncertainty in municipal data concerning the amount of revenues from the main dwelling property tax plus the uncertainty in the total amount of resources that government must refund to municipalities. In the first case, the data uncertainty was due to the structural caveats in budget rules. Thus, the rules that defined municipal revenues and expenditures allowed a sort of discretionary power to the bureaucrats to manipulate the data. In the second case, the central government decided the total amount of resource for the compensation in the budget law<sup>42</sup>.

In conclusion, these two characteristics as well as the weakness of the ex-post control<sup>43</sup> and the absence of a punishment mechanism for lying municipalities did not allow the existence of the so-called “partisan effect”. Thus the above empirical analysis demonstrates that mechanism of allocation of grant regarding the abolition of the main dwelling property tax was transparent. The main dwelling property tax reform did not leave room for political distortions.

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<sup>42</sup>In general, the government allocated less resource than the total amount of the collected I.C.I. in 2007, in line with the constant reduction in the amount of intergovernmental grants.

<sup>43</sup>In Chapter 1 we have discussed a-priori controls by the Court of Auditors about the data on the main dwelling property tax.

## Conclusion

This PhD thesis attempts to investigate two main issues:

1. The behaviour of Italian municipalities in terms of local fiscal policy as reaction to the property tax abolition and reduction of fiscal autonomy and
2. central government's opportunistic behaviour in formulating grants for municipalities to compensate the abolition of property tax on main dwelling.

We employ the empirical methods consolidated in the literature such as Regression Discontinuity Design (RDD) and Regression Kink Design (RKD). Both methods allow to compare observations close to a selected cut-off point. What emerges from the second chapter is that Italian municipalities reacted to the abolition of the main dwelling property tax by increasing revenues from the waste tax. In particular, we divide Italian municipalities into “winners”, if they gained in terms of revenues as a consequence of the property tax abolition, or “losers”, if they lost in terms of revenues as a consequence of the main dwelling property tax abolition. The “losers” municipalities increased the revenues from the waste tax more than the “winners” ones. In addition, the more they were punished the more they increased the revenues from the waste tax, demonstrating a fear of loss in revenues. We also investigate the likely use of other fiscal tools. In particular, we test whether or not Italian municipalities used the current expenditure or revenues from building permits as a reaction to the abolition of the main dwelling property tax. However, we find no evidence for the use of different fiscal tools from the waste tax. The reduction in fiscal autonomy yielded a switch, in part, between property tax and waste tax with subsequent loss in terms of equity (the property tax responds to the equity principle while the waste tax does not). This switch was stronger for “losers” municipalities.

The third chapter tests the presence of the so-called “partisan effect” in allocating grants for compensating the abolition of the main dwelling property tax. We define the “partisan effect” as the government's non transparent mechanism for providing more resources to municipalities politically aligned to it. This may be the result of the uncertainty that characterised the fiscal reform in 2008 and the absence of a system of controls and fines for the data communication from the municipalities to the centre.

Our analysis demonstrates that the presence of the “partisan effect” is not empirically proved. Thus we have concluded that the reform of main dwelling property tax was transparent in resources allocation.

Our paper suggests the need to improve the efficiency of the fiscal mechanism of substitution between a local tax and grant from the centre. In particular, it is necessary to find mechanism, based on both grants and local taxes that guarantees fiscal autonomy and mitigates the loss of resources, the loss of fiscal autonomy and the likely risk in equality loss.

Further research can elaborate a theoretical model able to fit the behaviour of local politicians. Furthermore, as noted by reviewers, future research can be directed also to investigate the expenditure side, such as whether or not during huge grant cuts from the centre, municipalities achieved the goal of minimising the current expenditure. This may explain the lack of evidence of further current expenditure cuts as a reaction to the abolition of the main dwelling property tax. By contrast, it is also possible that the policy makers prefer not to cut the expenditure in order to gain rents from it. They may use the further resources in a pork-barrel manner in order to maximise their votes and the probability of being re-elected.

We suggest that future researches should test the presence of these effects.



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