

The Dark Side of Tax Progressivity: the Impact of Fiscal Flexibility on Tax Manipulation*

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Abstract

The goal of this paper is to study the impact of tax progressivity on the practice of political budget cycle, at the municipal level. In particular, we explore whether an increase in fiscal flexibility, *i.e.* the capacity of decision-maker to set different tax rates to distinct groups of tax-payers, leads to higher levels of tax manipulation. We exploit an Italian reform of the local personal income tax (PIT), flat before the intervention, allowing mayors to introduce different tax rates for distinct groups. We take advantage of the staggered timing of local elections to estimate a Diff-in-Diff model and we find that the reform consistently amplifies political budget cycle of local PIT: average pre-electoral tax rate declines by around 10% compared to tax mean. Furthermore, we estimate a Triple-Diff analysis where we use (pre-determined) income concentration level as a reform mediator and main results are confirmed. In terms of mechanisms, it emerges that flexibility plays a crucial role as mayors strategically increase it before elections and that politicians seem to *play different strategies* with diverse wage groups as high income rates are subject to larger manipulation than moderate ones. These results reveal a negative side of fiscal flexibility as it may lead to higher level of tax manipulation with larger amount of diverted public resources.

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1 Introduction

The strategic manipulation of fiscal tools in order to get electoral advantage, phenomenon known as the political budget cycle, is an important and salient issue for modern democracies. This phenomenon has been deeply studied in last twenty years and several results are now established. On the one hand, a large literature documents the relevance of this phenomenon from a cross-country perspective (Alesina et al. 1997) and describes how these patterns depend on electoral and political systems (Persson, Tabellini 2002). On the other hand, political budget cycle has been extensively documented at the local level focusing on local taxes (Kneebone, McKenzie 2001), transfers to local authorities (Akhmedov, Zhuravskaya 2004) and on public expenditure (Drazen, Eslava 2008): all these studies document, in different settings, the emergence of local balance sheets manipulation for electoral purposes. Nevertheless, despite the considerable attention to this phenomenon, very little is known about the interaction between political budget cycle and fiscal tools design. In particular, there is almost no evidence on the interaction between institutional features of taxes and the incentive to manipulate balance sheets, which is a vital issue for the policy-maker.

We want to focus on this issue. In particular, we concentrate on *fiscal flexibility*, defined as the ability of decision-maker to differentiate tax rate between tax-payers. An highly flexible fiscal instrument, differently from a flat tax, allows the decision-maker to tax differently distinct groups of population and this could attenuate incentives for fiscal manipulation: the incumbent could signal his ability with tax reductions targeted to specific groups, rather than cutting taxes to the entire population. This possibility of targeting specific electoral constituencies could reduce the amount of diverted resources for electoral purposes, mitigating the political budget cycle. Differently, an increase in fiscal flexibility could encourage and ease the practice: first, tax manipulation is now less expensive and so more affordable as it is possible to divert smaller amounts of public resources, than with a flat tax, for strategic purposes; second, the decision-maker can manipulate the balance sheet in a less visible way (according to the literature on "fiscal illusion" Oates 1988), as the reduction of a sub-rate is much less evident than decreasing tax to the entire population. Moreover, the possibility of target specific groups can make the practice more profitable in electoral terms for the incumbent. This could result in an exacerbation of political budget cycle at the local level.

In this paper we want to empirically test these hypotheses exploiting a natural experiment taking place in Italian municipalities. We concentrate on local personal income tax, the municipal surcharge, which is an important source of revenues and a salient fiscal instrument for voters. The tax is decided annually by the mayor and approved by the municipal council at the end of each year. The reform we want to exploit introduced tax progressivity with a consistent increase in flexibility degree of the surcharge: the tax was initially flat, *i.e.* tax rate was the same for the entire population, and the reform introduced the possibility to set a progressive rate structure, with different tax rates for distinct income groups and exemption thresholds, below which rate is zero. This intervention was sudden and unanticipated as it was part of a larger package approved to face 2011 sovereign debt crisis and it provided mayors with a much more powerful and complex fiscal instrument than before with the aim of increasing local revenues and promote fiscal equity.

In order to study the causal effect of the reform on the political budget cycle, we rely on the staggered timing of local elections in Italy: the over 8,000 municipalities can be divided into five groups according to their electoral schedule. The position of a municipality into a group, which determines his political cycle, is due to historical reasons, such as the substitution of war cabinets after Second World War in 1946, and it is unlikely to be correlated with current trends in fiscal variables. We estimate a difference-in-differences model comparing the degree of fiscal manipulation before and after the reform along five groups, controlling for time and entity fixed effects as well as a large set of economic and political variables and

using fluctuation in the political cycle of surcharge rate as dependent variable. To perform this exercise we make use of several datasets (data on municipal balance sheets and on surcharge rates, information on local income distribution, data on local political background and elections timing). Two main results emerge from the empirical analysis. On the one hand, there is no evidence of surcharge manipulation in the pre-reform period: fluctuation of the tax along the political cycle is very limited suggesting that mayors do not manipulate tax rate for electoral purposes before the reform. On the other hand, after the reform, a significant manipulation of the surcharge emerges as average tax rate fluctuates consistently in the political cycle: the rate gradually decreases as elections approach reaching the minimum in pre-electoral year, with a reduction between 8.6% and 11.6% points compared to tax mean depending on the dependent variable used¹, and then it raises again reaching the maximum in post-electoral year. This result suggests that the increase in fiscal flexibility consistently exacerbates tax manipulation in this context: giving more flexible (and so powerful) fiscal instruments to local administrators results in higher strategic use and a larger amount of diverted public money. Nevertheless, we estimate a second model with the aim of corroborating previous results: we make use of the fact that local income distribution works as a mediator for the reform as its impact reinforces with more uniform pre-determined levels of income distribution. We estimate a triple-differences model studying the effect of the reform along municipalities with different electoral schedules and characterized by different degrees of (pre-determined) income concentration. Estimates confirm previous results: the reform amplifies political budget cycle and income distribution works as a mediator, since tax manipulation increases as incomes are more uniformly distributed.

To shed further light on mechanisms under main results, we explore how municipalities make use of flexibility after the reform. First, we investigate whether flexible tax rates are used differently over time: it emerges that the fraction of municipality introducing a flexible rate along the political cycle raises, as elections approach. This suggests that flexibility facilitates tax manipulation as its introduction is simultaneous to strategic reduction of tax rates. Then, we explore how mayors make use of flexibility applying different tax rates to distinct wage groups in the political cycle. What emerges is that higher wages are subject to higher surcharge rates and they are characterized by more pronounced political budget cycle, compared to lower wages: this evidence suggests that the reform allows mayors to *play different strategies* with different wage groups. These pieces of evidence show that mayors make use of flexibility to manipulate fiscal variables and shed light on how it is used to gain further electoral support.

Finally, we study the political economy of tax flexibility in order to explore whether partisanship affects the extent to which mayors use flexible tax rates, introducing exemption thresholds or multiple rates. The analysis is set as a close election RDD where we focus on two aspects: first, we find that political mayors tend to use more flexible rates and to introduce more progressive tax schedules compared to civic mayors, which are not officially supported by any party. Second, same result emerges for the dichotomy left/right: left-wing mayors use more flexible rates and are more keen on introducing progressive tax schemes than right-wing administrators. These outcomes are coherent with recent contributions in the literature and suggest that partisanship affects the use of flexible rates mediating the effect of reform.

This study is related to several papers in Political and Public Economics. First, it is linked with the large literature studying the phenomenon of political budget cycle at the local level. These papers document the presence of consistent balance sheets manipulation along the political cycle and show that manipulation involves all aspects of public finance: Akhmedov, Zhuravskaya (2004) focus on transfers to voters and document an increase before

¹This corresponds to an average amount of diverted money between 0.77% and 1.0% of total fiscal revenues of Italian municipalities.

elections in Russian provinces; Kneebone, McCKenzie (2001) find that most visible taxes reduce before elections and public expenditures raise, in Canadian province; finally, Drazen, Eslava (2008) show how local Colombian incumbents modify expenditure composition for electoral purposes, raising targeted expenditure. Furthermore, Alesina, Paradisi (2015) explore political budget cycle in the Italian context: they focus on the introduction of a new real estate tax on main residency in Italian municipalities and document that tax rate in pre-electoral year is systematically lower. Nevertheless, there is a small literature focusing on the impact of institutional features on balance sheet manipulation. In this regard, an highly related paper is Repetto (2016), he studies the impact of a reform that increased voters information, as it forced Italian municipalities to disclose their balance sheets before elections. Findings show that when balance sheets are published before elections, strategic fluctuation of investment spending reduces, compared to the period when information were only available after polls. Our paper contributes to this literature as it evaluates the impact of fiscal tools design on the political budget cycle: in particular, we show that as tax flexibility raises local politicians increase tax manipulation. Given that tax flexibility is an issue in several other countries, these results are relevant from the policy-maker perspective and, to a certain extent, could be generalized to other locations.

Second, this paper is connected to the literature that studies the concept and effects of fiscal complexity. Seminal works argue that complexity makes taxes more difficult to evaluate from voters perspective and encourages strategic behaviour of politicians (Dollery, Worthington 1996)². On the other hand, another related concept is the one of tax visibility and salience. Several papers show that visibility matters for goods consumption. Chetty et al. (2009) show, in two field experiments, that consumers underreact to taxes that are not salient and Cabral, Hoxby (2012) focus on salience of property tax. Finally, this concept has been studied in the field of public finance, underlining that decision-makers take into account tax salience in their fiscal decision: Bracco et al. (2013) show, in the Italian context, that as electoral competition raises, local administrators tend to substitute more visible taxes with less salient ones and Bordignon et al. (2015) show that non-term limited politicians tend to manipulate more visible taxes *vis á vis* term limited ones. To the best of our knowledge, our paper is the first one studying how degree of complexity and visibility of a fiscal instrument modifies politicians incentive to manipulate it and affects overall level of political budget cycle.

The paper is organized as follows. Section 2 presents background information and introduces the reform. Section 3 describes the dataset. Section 4 presents the Diff-in-Diff analysis and section 5 shows main results. Section 6 contains Triple-Diff analysis whose main results are presented in section 7. Section 8 studies the impact of partisanship on tax flexibility. Section 9 discusses several robustness checks and Section 10 concludes.

2 Background information

2.1 Local income tax

We will focus on the Italian income tax, the *IRPEF* (*Imposta sul reddito delle persone fisiche*) which has been introduced in 1974 and has been reformed several times. This tax is a direct and personal tax and its taxable income is the sum of all gross incomes of an

²A related concept is the one of "fiscal illusion" defined by Oates (1988) as "the notion that systematic misperception of key fiscal parameters may significantly distort fiscal choices by the electorate". Dollery, Worthington (1996) conduct empirical studies to test fiscal illusion. This simple idea leads to the so called "output expansion hypothesis" where taxes are underestimated by the voters in fragmented tax systems and this leads to an expansion of public budget.

individual³; the final rate payed in municipality i in year t is the sum of three sub-rates:

$$IRPEF_{it} = (Nat_{it} + Reg_{it} + Mun_{it}) * Taxable\ Income_{it}$$

- The national rate (Nat_{it}) is decided by the national legislative body and the current rate structure has been introduced in 2007 (*Disposizioni per la formazione del bilancio annuale e pluriennale dello stato-legge finanziaria 2007*). Tax rates are progressive and move from 23% to 43%. The amount generated by this portion pertains to the national Treasury;
- The regional surcharge (Reg_{it}), *Addizionale Regionale Irpef*, is determined by the regional parliament every year with a regional law, rate structure can be progressive or flat with the rate varying in the range 0.9-1.4%. The amount belongs to the region Treasury;
- The municipal surcharge (Mun_{it}), *Addizionale Comunale Irpef*, is set by the municipal council (*Consiglio comunale*) every year and the rate structure can be progressive or flat with the rate varying in the range 0-0.8%. The generated amount pertains to the municipality.

In this project we will focus on the municipal surcharge which is the municipal component of the *IRPEF*. The tax has to be decided by the municipal council by December 20th of each year, otherwise the past rate is automatically applied for the following year. Moreover, as all income taxes, the rate decided in the year t will be payed in year $t + 1$ on taxable income of year t .

2.1.1 Importance of the surcharge as a source of revenues

The municipal surcharge plays an important role in municipal balance sheet. First, it is an important source of revenues. Figure 1 shows the evolution of three most important municipal taxes as percentage of total fiscal revenues, on average for all Italian municipalities. Three most important local taxes are the property tax (*ICI* before 2011, *IMU* after 2011), the waste tax and the municipal surcharge that account on average, respectively, for 43%, 23% and 7% of total fiscal municipal revenues (for instance fiscal revenue generated by municipal surcharge in 2015 was around 4.3 billions Euro). Second, it is evident from Figure 1 that relative importance of municipal surcharge is growing fast, relatively to other two fiscal instruments that are losing relevance: in 2001, two years after the introduction, municipal surcharge accounts, respectively, for 1/10 and 1/6 of property and waste tax, in 2015 it accounts for 1/3 and 1/2 of them.

Finally, and coherently with previous points, few municipalities decide not to using the municipal surcharge (setting a rate equal to zero) and the fraction is quickly decreasing over time: it goes from 62.7% in 2000 to 16.1% in 2015.

2.1.2 Saliency of the surcharge for tax-payers

The second important feature of the tax is that it is a salient fiscal instrument for tax-payers. In order to capture the attention to municipal surcharge and how it is distributed over time we study Google trend traffic⁴ for the keyword *Municipal surcharge (Addizionale comunale)* with monthly aggregation for the time span 2004-2016 for all Italian regions; Figure 2

³Taxable income is the sum of following incomes: self-employed, employee, capital, land, enterprise and other incomes (including capital gains).

⁴Google trend shows a measure of search activity, capturing the fraction of queries that include the term in question in the chosen geographical unit/moment in time, relative to the total number of queries (Stephens-Davidowitz, Varian 2015).

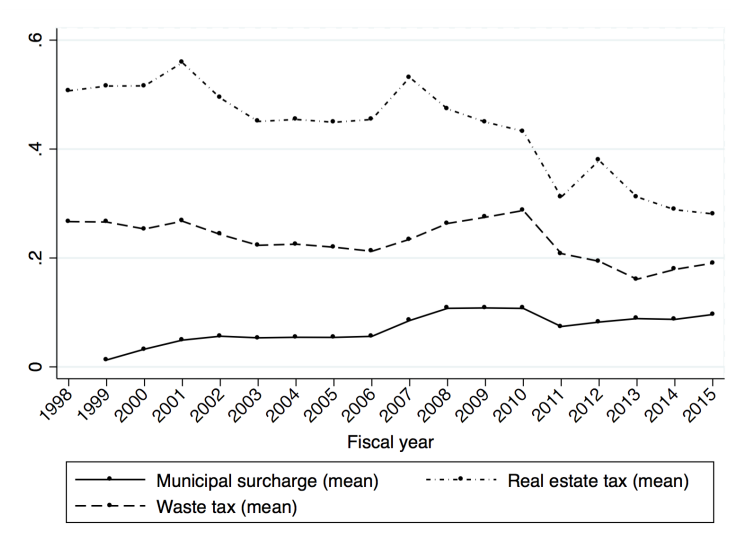


Figure 1: Average fiscal revenues by years of property tax, waste tax and municipal surcharge, as percentage of aggregate fiscal revenues.

contains traffic for this Google query; we can note that the attention is very volatile and that a strong seasonality emerges. On the one hand, the first and most important peak in attention is localized in the month of June of each year and this is due to the fact that the deadline for payment of main portion of municipal surcharge (the *saldo*) is in this month⁵. Left panel of Figure 2 underlines this attention peak. We may think that tax payers are very active to seek information on the municipal surcharge in this month because of the incoming deadline. On the other hand, there is a second peak in Google traffic in the month of January and this is probably due to the fact that deadline for municipal surcharge decision is set by December 20, and this stimulates attention in following days on this tax. Right panel of Figure 2 shows this second attention peak. A final remark is that traffic levels in 2007 and 2012 are higher than in other years, this is probably due to the fact that surcharge was reformed in those two years.

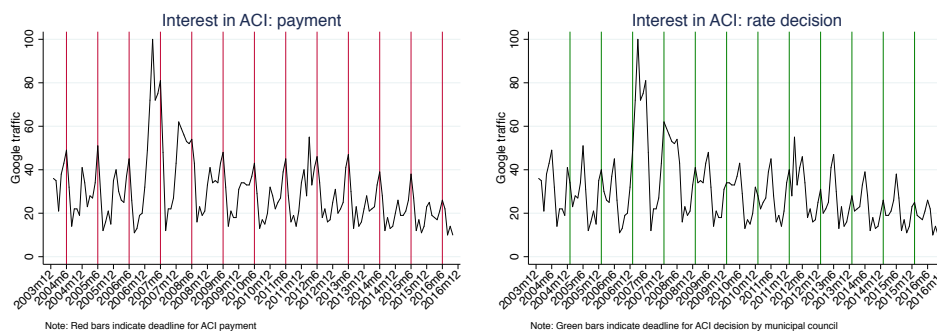


Figure 2: Attention to municipal surcharge in Italy.

⁵There is another smaller payment, the *acconto*, which is due within the end of November.

As a second inspection, we study whether the attention given to this tax is comparable respect to interest in other, traditionally more salient, taxes (Bordignon et al. 20152). In particular, we focus on other Italian income taxes (national and regional income taxes) and real estate tax. Left panel of Figure 3 shows Google traffic for keywords *Municipal surcharge*, *Regional surcharge* and *IRPEF tax rates* (respectively *Addizionale comunale*, *Addizionale regionale* and *Scaglioni IRPEF*); the picture seems to suggest that municipal surcharge is the most relevant rate, among other income taxes. Right panel of Figure 3 contains Google traffic for keywords *Municipal surcharge*, *ICI rate* property tax until 2011 and *IMU rate* property tax from 2011 (respectively *Addizionale comunale*, *Aliquota ICI* and *Aliquota IMU*). As expected, we can note that real estate taxes are more salient than the surcharge, but the difference in attention is not too wide; the unique exception is the interest in the *IMU* during 2012 and 2013 when the tax was introduced as an emergency measure by the technical cabinet.

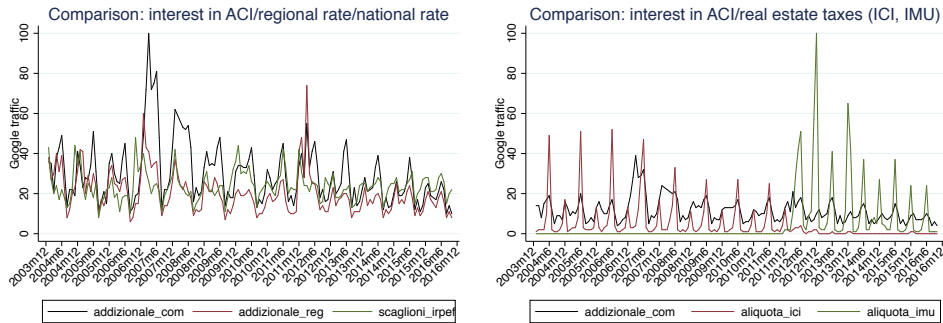


Figure 3: Comparison of attention to municipal surcharge, other income taxes and real estate tax.

Finally, we exploit the Bank of Italy survey "*Balance sheets of Italian families*", wave 2014, in order to shed light on which part of the population is more interested in the municipal surcharge. We make use of one question asking whether *Municipal surcharge is important for municipal revenues*. Table 1 shows percentage of individuals answering "yes" by income brackets: it seems that perceived importance of the surcharge raises with income levels. This is a reasonable evidence since employees, traditionally the category of tax-payers with low income, receive their wage already net of income taxes, differently from entrepreneurs or self-employed workers; and this could lead to an under-valuation of the importance of the surcharge. Second, Table 2 suggests that perceived importance of the surcharge raises with education as well: education is highly correlated with income but also with a better knowledge of fiscal instruments as well as an higher propensity to read newspapers and being updated on economics and politics. In general it seems that municipal surcharge is a salient tax but the relevance of this fiscal instrument varies much across the population.

2.2 The reform

2.2.1 Evolution of the tax

Municipal surcharge has been modified several times since its introduction and it evolved from a flat tax, where every tax-payers face the same marginal tax rate (proportional fiscal instrument) to a flexible tax, where different groups of tax-payers face different rates (progressive fiscal instrument). We can identify three different fiscal regimes:

- **Regime a** [1999-2006] flat tax: The surcharge has been introduced in 1998 (*Art.1 D.Lgs. n.360*) with the goal to provide municipalities with a more elastic source of revenues, compared to local property tax (Bordignon et al. 2011). Municipalities could set a single tax rate for every tax payers within the threshold of 0.5%, with maximal yearly increase of 0.2%⁶.
- **Regime b** [2007-2011] flat tax+exemption: The first reform of the surcharge has taken place in 2007 (*Disposizioni per la formazione del bilancio annuale e pluriennale dello stato-legge finanziaria 2007*) with two main novelties⁷ (1) the possibility for the municipal council to set an exemption threshold, *i.e.* an income threshold below which the surcharge rate is zero and (2) the increase of the maximum allowed rate to 0.8%.
- **Regime c** [2012-2015] differentiated rates: Finally, the second reform has taken place in 2012 (*D.L. n. 138/2011*, with modification of the *D.L. n. 201/2011*) and introduces the possibility for the council to set differentiated rates following wage brackets of the national income tax: this reform deeply modifies the municipal surcharge from a flat to a completely progressive tax.

In this paper we are interested in studying effects of 2012 reform that introduced tax progressivity raising fiscal flexibility of the municipal surcharge. The reform was a sudden intervention included in the package proposed by the technical government and it had two goals: the increase of municipal revenues and the strengthen of fiscal equity at the local level providing local administrators with a highly flexible instrument. In these regards, the timing of intervention can be easily considered as good as random with respect to local political variables as it was mainly driven by the harsh sovereign debt crisis that hit Italy in 2011 and 2012; it is difficult, for instance, that the timing of the reform has been strategically decided by the legislators for political reasons. Nevertheless, the reform was parallel to the introduction of the *IMU*, the property tax on *main residency*, I will discuss later why this contemporaneous policy change is not a problem for my identification strategy.

Finally, two minor interventions introduced a cap to rate increase in two different moments of time (2003-2006 and 2009-2010)⁸. By the way, these measures were temporary in both cases, and this was publicly known, and their application was limited⁹. I deal with this issue running, as a robustness check, main specification excluding cap years from the sample.

2.2.2 Effects of the reform

One important issue is whether municipalities used flexibility that was introduced with 2012 reform: from that year, indeed, each municipalities could choose among setting a flat rate, a flat rate plus an exemption threshold or a differentiated rate. Figure 4 represents the percentage of municipalities adopting some sort of flexibility over time, making distinction between the portion introducing an exemption threshold alone or a differentiated rate. The

⁶The payment of the municipal surcharge takes place in two moments of the year: the *saldo*, pertains taxes on previous year income with as deadline first days of July; the *acconto* an anticipation of the following year rate (accounting 30% of total amount), computed with the previous year surcharge: this has to be paid within first days of December (small wages) or in two rates one within first days of December, the other within first days of July (large wages).

⁷(1)<http://www.finanze.gov.it/opencms/it/fiscalita-regionale-e-locale/addizionale-comunale-allirpef/disciplina-del-tributo/> (2)http://www.camera.it/cartellecomuni/leg15/RapportoAttivitaCommissioni/testi/05/05_cap05_sch03.htm

⁸Another minor reform was the increase of the maximum rate to 0.9% for the city of Rome in 2011.

⁹On the one hand, the measures were temporary as in both cases the cap was set until the attainment of an agreement on fiscal federalism application at the local level (*Legge n. 289/2002, D.L. n. 112/2008*). On the other hand, the application of the cap was only partial as it involves only two thirds of Italian municipalities

figure suggests that adoption of flexibility raises quickly over time: until 2012 few municipalities adopt the exemption threshold; from 2012, instead, the portion raises and more than 30% of Italian municipalities have flexible rate in 2014 and 2015.

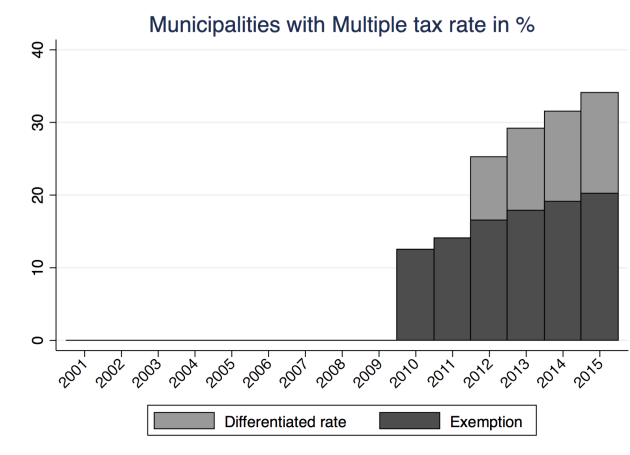


Figure 4: Percentage of municipalities adopting flexible rates (*i.e.* either *Exemption* or *Differentiated rates*), among all entities.

On the other hand, an important issue is how local administrators make use of the flexibility, *i.e.* whether flexible rates are used to decrease rate of certain population groups (for instance low income tax-payers), or to generate a progressive taxation scheme for the entire population. Figure 5 shows average surcharge rate per income level in three fiscal regimes: in regime a (1999-2006), the rate is unsurprisingly flat among income levels; in regime b (2007-2011) the rate is lower for income below €15,000 and it becomes flat for higher incomes; finally, in regime c (2012-2015) the rate follows a progressive scheme as it raises with income levels. This evidence suggests that flexibility is used by local administrators to structure taxation in a progressive way; on top of this, we can note that level of taxation, *i.e.* average rate, is different across regimes, this will be captured in the econometric analysis by time fixed effects. Nevertheless, we may wonder whether there are differences among municipalities adopting different fiscal methods after 2012 reform: *i.e.* whether marginal rate varies among municipalities that adopt exemption only or a flat tax after 2012. Figure 6 focuses on regime c and shows average surcharge rate by degree of flexibility introduced. Municipalities choosing the flat tax have the same rate for all tax payers; municipalities with exemption alone have a progressive structure for income below €20,000; finally municipalities with differentiated rates have a progressive scheme.

2.3 Local political and economic background

Municipalities are the smallest Italian administrative units; municipal government is composed of an elected mayor (*Sindaco*) that appoints an executive committee (*Giunta*), and an elected city council (*Consiglio Comunale*). The mayor and the committee propose annually all changes in fiscal policy to be voted by the city council, including the rate of the municipal surcharge. In Italy there were 8,046 municipalities in 2015, divided into 110 provinces and in 20 regions. The total number of municipalities changes slightly every years due to merges, incorporations or separations of administrative units.

Municipality revenues come from taxes, fees (*e.g.* public services, advertisement), capital

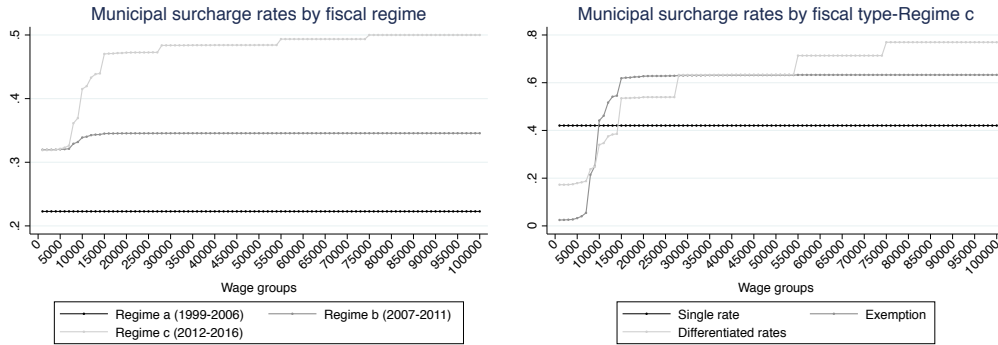


Figure 5: Municipal surcharge per income level, Figure 6: Municipal surcharge per income level by fiscal regime in Regime c, by fiscal type

transfers, sales of public assets, borrowing and transfers (from central or regional government or from the European Union). Taxes are the most important source of revenues, for instance they accounted for around 50% of total revenues in 2012; nonetheless, municipalities are still highly dependent on transfers, mostly from regional or national government (Carozzi, Repetto 2016). In terms of public spending, municipalities administer about 10% of total Italian public expenditure (Grembi et al. 2016); they manage several local public services, such as local welfare, waste management, municipal police, infrastructure and water supply. Moreover, municipalities are subject to domestic fiscal rules (*Patto di stabilità interno*) aimed at reducing local debt accumulation and deficit growth; these rules are structured according to several population thresholds and have been found to be effective to contain public deficit and to maintain adequate taxation levels (Grembi et al. 2016).

Mayors and city councils are replaced with municipal elections every five years (the term lasted four years until 2000). Mayors face a two-terms limit (starting from 2000)¹⁰. A large majority premium is granted to winning mayor in order to ensure local government stability. Municipal elections are staggered as they take place every year, and this divides Italian municipalities into five groups according to their election year. Repetto 2016 discusses reasons why municipalities are located in each group: these are mainly historical and pertains the substitution of war councils after Second World War in 1946¹¹. On top of this, the peculiar recent history of each municipalities contributed to locate it in a certain group: in particular, a municipality could change group due to early elections caused by early termination, governmental crisis or modification in the law (as it happened in 1993 and 2000). So, it is plausible to consider the position of a municipality in a certain election year as not being correlated with local public finance; I will discuss more extensively this issue in section 4.

¹⁰The constraint only applies to consecutive terms.

¹¹In 1946 first local elections took place in Italy, after the fall of fascist regime: the 71.6% of municipalities voted from March to November 1946. In 1947, 1948 and 1949 elections took place in municipalities with governmental crisis and in cities, such as Bolzano or Gorizia that joined Italy officially after 1946; in 1950 elections to renew local government elected in 1946 were postponed in order to approve a new electoral law (only municipalities with governmental crisis voted in that year) and they took place in 1951.

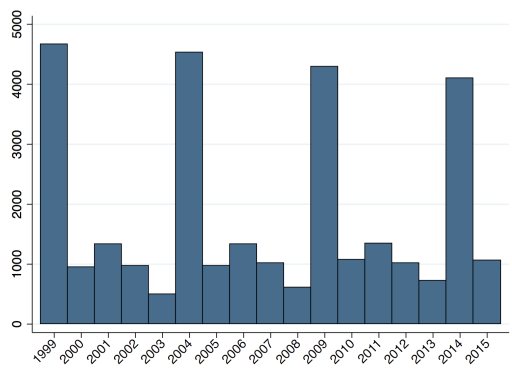


Figure 7: Number of municipalities having elections each year.

Figure 7 shows the distribution of all municipalities according to their election year: We can see that the group of municipalities having elections in 1999 is the largest one as it includes more than half of all them, among which all the ones that never experienced an early termination; then there are three comparable groups containing around 1,000 municipalities each and finally the smallest group with around 500 municipalities.

3 Data

3.1 Dataset

The dataset used in this study combined different sources. First, we make use of the data on balance sheets of Italian municipalities: the source is the Ministry of Internal Affairs (*Ministero dell'Interno*). These data contain detailed information on revenues and expenditures of municipalities: included data on revenues from main local taxes such as property tax, waste tax and municipal surcharge. Table 3, Panel A, shows descriptive statistics of municipal fiscal revenues: fees (the category including property tax and municipal surcharge) accounts, on average, for 65.7% while taxes (including waste tax) only for 24.3%. Moreover, average per-capita revenue of municipal surcharge is €27.6 which accounts for around one sixth and one third, respectively, of average per-capita revenue of the property and the waste tax¹².

Second, we make use of data on municipal surcharge, from Italian Fiscal Agency (*Agenzie delle entrate*). These data contain all information on municipal surcharge: the rate set for each wage group, the (eventual) exemption threshold, the day when city council set the annual surcharge level and eventual additional requirements to get the exemption¹³. Table 4 shows average surcharge rates, for the entire time span, depending on the type of surcharge chosen by the municipality: when the tax is flat the average rate is around .42% for the entire population, when it is flat plus an exemption the average rate is higher, .6%, and the average exemption amount is around €10,000; finally, when the municipality introduces a differentiated rate, marginal rate raises with the taxable income: the table reports average rate for 6 wage levels, the rate is very moderate for low incomes, .173% for €1,000, and it is large (close to the maximum) for high incomes, .766% for €75,000.

¹²An important remark is that fiscal variables for the year t are the ones approved by the city council in year t but decided in year $t - 1$.

¹³Sometimes, there are almost 500 cases, the surcharge exemption does not only depend on declared wage, but also on additional requirements, such as the number of components of the family or the age of tax-payers. By the way, I am not taking into account these requirement into the analysis.

Thirdly, we make use of data on distribution of wage in Italian municipalities over time: the source of the data is the Italian Ministry of Economics and Finance (*Ministero dell'Economia e delle Finanze*). We have data on wage distribution, from yearly declaration of tax-payers to fiscal authority, for every municipality, in the time span 2000-2015; in particular, this dataset contains information on the number of tax payers and on total wage declared for eight wage groups which are (in Euro): 1) less or equal to 0, 2) 0-10,000, 3) 10,000-15,000, 4) 15,000-26,000, 5) 26,000-55,000, 6) 55,000-75,000, 7) 75,000-120,000 and 8) more than 120,000. Wage distribution varies considerably across municipalities and across years. Figure 8 shows the aggregate frequency of the median tax-payers over time, for wage groups: the figure suggests that municipalities are heterogeneous in terms of their median tax-payers and that wage distribution changed significantly over time: in 2000 almost all municipalities have their median payer in the wage ranges €0-10,000 or €10,000-15,000, after fifteen years the situation is completely different as majority of municipalities have their median payer in the group €15,000-26,000, finally in every year very few municipalities have their median payer in the group €26,000-55,000, while other wage groups are not included in the picture as they never host the median payer.

Fourth, we utilize data on local politics from the Italian Ministry of Internal Affairs (*Ministero degli Interni*) for all Municipalities, in the time span in analysis. These dataset includes information on election dates, elected politicians (mayors, aldermen, councillors), their characteristics (education, age and gender), the votes each candidate gets and voter turnout. And finally, we include data from Italian Statistical Office (*ISTAT*) on population of municipalities over time.

The sample of the analysis consists in all Italian municipalities, both from ordinary and special regions, and the time span covered is 1999-2015. I keep in the analysis all terms ended prematurely due to a governmental crisis in order to avoid sample manipulation.

3.2 Measures of municipal surcharge

The dependent variable of the analysis is the overall level of municipal surcharge in a certain municipality/year. We measure this in three different ways: on the one hand, we exploit the revenue side and we adopt the surcharge per-capita revenue; this measure is peculiar since it incorporates economic conditions of the municipality and its dynamics. On the other hand, we rely on the tax rate and we compute two measures of overall rate for the entire population: the first one is simply the rate paid by the median tax-payer; the second one is the weighted average of the surcharge rate, *i.e.* the average rate weighted by the numerosity of each income group¹⁴. This last measure is the most precise as it takes into account both wage distribution and rate structure of a municipality. Nevertheless, the two rate measures are identical in case the municipality adopts a flat rate. Table 3, Panel A, includes the description of surcharge per-capita revenue, that has been already commented; Table 3, Panel B, contains the descriptive statistics of the rates: average values of both rates are close to .3% and weighted average version has a slightly lower mean and variance than the median version.

¹⁴To compute this weighted average we need to make some assumptions on the distribution of wages within each wage group: in order to do that we exploit all available information which is 1) how many people are contained in each wage group and 2) the total wage declared in each group. We generate a synthetic distribution within each wage group that has to be coherent with these two pieces of information. This approach is more precise than simply assuming that tax-payers are uniformly distributed within each group as it does not discard any piece of information.



Figure 8: Aggregate frequency of the median tax-payers over time, for wage-groups.

4 Empirical strategy: Diff-in-Diff

4.1 Identification strategy

In this paper we want to study the causal effect of introducing tax progressivity on the strategic use of tax, *i.e.* the tendency of decision-makers to adopt the practice of the political budget cycle in regard to municipal surcharge. For this analysis the ideal experiment would consist in allowing a group of municipality, the treatment group, to introduce a flexible surcharge rate opposed to the remaining set of municipalities, the control group, where the rate could only be flat. In this case, the two groups would only differ in the potential flexibility of the surcharge rate and the comparison of average levels of political budget cycle across the two groups would estimate the effect of interest.

To study this issue in our setting, we rely on a natural experiment consisting in the 2012 reform that allowed municipalities to introduce flexible rates from that year on and that affected municipalities in different position of their cycle. We want to construct the analysis as a difference-in-differences exploiting two distinct sources of variation (similarly as Repetto 2016): on the one hand, the time variation induced by the reform, before/after 2012; on the other hand, the variation in the position of municipalities across their electoral cycle: which means whether the municipality is in the electoral year, one, two or three years before elections¹⁵. The treatment consists in the possibility of introducing a flexible rate and

¹⁵We introduce a set of dummies in order to characterize the entire political cycle with the exception of the post-electoral year that is omitted and acts as a benchmark year; we will provide more details on this in the following section.

it affects differently municipalities in different position of their electoral cycle (*i.e.*, it affects a municipality in the pre-electoral year differently from another one in the post-electoral year). The idea at the basis of this identification consists in exploiting both cross sectional variation, with the comparison of entities in different position of their political cycle, and time variation, with the comparison of the same entity over time, *i.e.* the difference-in-differences estimator is obtained by comparing municipalities of a certain group with other municipalities in different groups, and with themselves before the reform; indeed, with such design treatment and control groups change over time.

The key identifying assumption in this identification strategy is that in the absence of the reform, budget cycle between treated and control groups would be comparable. In other words, we need to rule out the incidence of local factors affecting the use of the surcharge differently before/after the reform, across treated/control groups, defined with the position in the political cycle. In order to motivate this we rely on two arguments. On the one hand, the location of a municipality into a certain group is unlikely to be correlated with current local trends in fiscal variables, in particular in the use of municipal surcharge; differently, the five groups of municipalities would not be comparable relative to public finance. This is reasonable because, as already discussed in Section 2, the inclusion of a municipality in a group that determines his political cycle, is mainly due to historical reasons as well as to its remote political history; we will discuss some robustness checks in the result section. On the other hand, the reform was part of a larger package that was suddenly approved as an emergency measure to react to the sovereign debt crisis of 2011 and 2012; therefore, reform timing is unlikely to be strategically set or correlated with municipalities cycles.

In these regards, one potential concern about the reform is the fact that it comes along with other interventions on local finance: in particular, a reduction in transfers from central authority to local entities as well as an increase in the portion of local taxes pertaining central authority or the introduction of a new local tax on main residence, the *IMU* (Alesina, Paradisi 2015). This can be a concern if these other interventions affect the dependent variable differently between treated and control groups. We take this into account in the robustness checks section where we study whether the reform affects differently municipalities in different position of their political cycles in terms of main local taxes, *i.e.* real estate tax and waste tax, and of aggregate taxes and special fees. The analysis shows that none of these modifies significantly after 2012 between treatment and control: this seems to suggest that nothing but the reform in analysis hit local public finance in 2012 differently along the political cycle.

4.2 Specification

The dependent variable varies at the municipality/year level and consists in the group of three measures of the municipal surcharge rate (per-capita revenue, median tax rate and weighed average tax rate). The empirical model of the analysis is as follows:

$$y_{it} = \alpha + \beta_1 Post_t + \beta_2 C_{it} + \beta_3 C_{it} \cdot Post_t + \gamma' X_{it} + \delta_i + \zeta_{mt} + \mu_r \cdot \lambda_t + \epsilon_{it}$$

Where y_{it} is the dependent variable (for example per-capita surcharge revenue) for municipality i in year t , $Post_t$ the dummy indicating post-reform years equal to one from 2012 (included) on¹⁶, and C_{it} characterizes the position in the cycle of municipality i :

$$C = \begin{cases} c_{t-3} = 1 & 3 \text{ years before elections} \\ c_{t-2} = 1 & 2 \text{ years before elections} \\ c_{t-1} = 1 & 1 \text{ year before elections} \\ c_t = 1 & \text{election year} \end{cases}$$

¹⁶The reform in analysis was approved in 2011 and first year of application was 2012, with effects for taxpayers from 2013 on.

and zero otherwise, moreover c_{t+1} , the indicator for post-election year, is omitted to avoid multicollinearity and since it acts as a reference year¹⁷. \mathbf{C}_{it} characterizes the fluctuation of fiscal variables around the cycle and it varies across municipalities according to allocations in groups; moreover, early terminations leading to premature elections lead \mathbf{C}_{it} to vary within municipalities as well. The Diff-in-Diff estimator is obtained by the interaction term $\mathbf{C}_{it} \cdot Post_t$ which captures the effect of the reform on fiscal behaviour in different position of the political cycle.

The vector X_{it} contains a set of political, social and economic controls. On the one hand, we include a set of variables to capture local political background: characteristics of mayors such as age, education and gender as well as the dummy whether mayor is term limited, which is an important aspect in regard of the strategic use of fiscal variables (Bordignon et al. 2015). Moreover, we include a control for ideological position of the mayor to capture the effect of party affiliation on local public finance: Gamalerio (2016) shows that party affiliation has causal effects on fiscal behaviour of local politicians in Italy, notably partisan mayors are more fiscally responsible, compared to the ones elected from a civic list. Then we control for early termination and for extraordinary administration including the full mandate dummy and the dummy whether municipality has a commissioner. Finally, we include local turnout in last elections to control for political participation and competition. On the other hand, we control for the economic and social characteristics of municipalities. First, we include data on municipality population over time, in logarithm, to capture for city size and its evolution over time. Second, a crucial aspect in this analysis is the distribution of wages which is greatly related with effects of the reform, so data on income distribution at the municipal level are included to control for the local income structure and its evolution: share of taxpayer population in the eight wage brackets in addition to the total number of taxpayers and the yearly aggregate income declared. Moreover, we include municipality fixed effects, δ_i , to control for municipal-specific unobservable determinants of the dependent variable, for macro-region year fixed effects, ζ_{mt} , that account for common shocks in Italian macro-regions over time and for regional specific time trends $\mu_r \cdot \lambda_t$, to capture specific fiscal trends in different Italian regions. Finally, robust standard errors are clustered at the municipality level and assumed to be uncorrelated with the set of explanatory variable of interest.

5 Results: Diff-in-Diff

5.1 The impact of the reform on political budget cycle

Table 5 shows results of the difference-in-differences analysis for three main outcomes: surcharge weighted average rate, median rate and per-capita revenue. Columns (1) and (2) contain estimates for weighted average rate, respectively, with municipality and macro-region year fixed effects and with the complete set of political/economic controls and time trends. Focusing on column (2), un-interacted dummies describe the dynamics of tax in the political cycle before the reform and show that there is almost no strategic use of the tax

¹⁷The choice of using post-electoral year as reference is not arbitrary: it follows from two pieces of evidence. First, it emerges from the data that is the incumbent, and not newly elected mayor, that usually chooses tax rate in the election year, despite the fact that new elected mayor is allowed, by law, to modify an already decided tax. Indeed, old mayor chooses surcharge rate 71% of times while new mayors only 29%. The second evidence is that the rate in electoral year is highly manipulated for pre-reform period: it is indeed the lowest rate in the cycle compared to all other years. Meaning that this rate is the highly used to practice the political budget cycle. This piece of evidence is also documented by Bordignon, Grembi and Piazza (2015) that show this pattern for municipal surcharge for period 1999-2005. Moreover, an additional evidence is that when the incumbent set the rate in election year, he sets on average a lower rate (0.39%) compared to the one set by the new mayor (0.51%); and this seems to suggest that the incumbents choose the surcharge strategically in elections year, compared to newly elected mayors that instead do not manipulate it.

in this period, as the rate has very limited fluctuation: taxation level is almost constant in three years before the elections and positive given the benchmark of the post-election year, then there is a slight decrease in the electoral year, corresponding to an average 0.8% reduction, compared to rate mean. This evidence suggests that politicians don't manipulate much municipal surcharge in the pre-reform period and this is coherent with evidence found by Bordignon et al. (2015) that document very limited evidence of political budget cycle for the period 1999-2006.

On the other hand, interacted terms describe post-reform period. From these outcomes it is evident that the reform remarkably amplifies political budget cycle: average tax rates gradually decreases as elections approach, it reaches the minimum in the pre-electoral year, it raises again in election years and it has a positive spike in post-election year, when the cycle starts again. Notably, average level of surcharge rate reduces by 0.012%, 0.019% and 0.024% respectively three, two and one years before elections, compared to pre-reform years and by 0.014% in election year; with post-elections year working as a benchmark. Given that mean tax rate is 0.286% these reductions correspond to an average rate decrease of 4.5%, 7% and 8.6%, respectively, three, two and one years before elections, compared to mean value, and of 4.9% in the election year. These results indicate that the reform has a sizeable effect on the extent to which local incumbents manipulate the tax along the cycle. One important remark about the specification is that the impact of the reform weakens when we include economic/political controls and time trends moving from column (1) to column (2), suggesting that local variable such as political participation and competition or local wage distribution are important factors in affecting the political budget cycle. Nevertheless, the same pattern emerges if we use median surcharge rate (columns (3) and (4)) and in this case the magnitude of the effect is even stronger than with weighted average rate.

Finally, this result holds when we use per-capita surcharge revenues as dependent variable (column (5) and (6)): in particular, revenues decreases by €2.12, €2.17 and €3.19 respectively three, two and one years before elections and by €2.38 in electoral year (corresponding to a decrease of 7.7%, 7.9%, 11.6% and 8.6% along the political cycle compared to per-capita revenue average level).

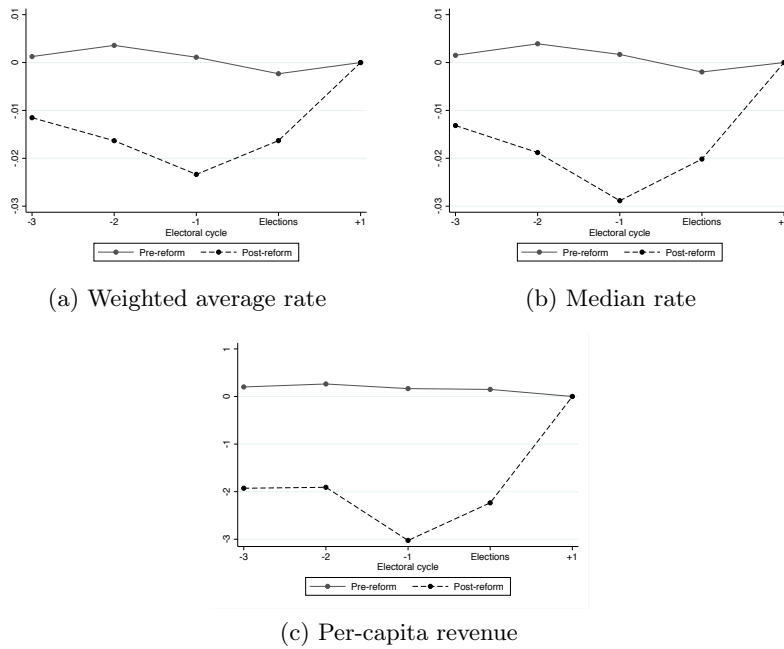
Figure 9 graphically represents average surcharge level in pre and post-reform periods for the complete specifications (columns (2), (4) and (6) of Table 5): panel (a) contains output for the weighted average rate, panel (b) for median rate and panel (c) for per-capita revenues. The amplifying impact of the reform on the political budget cycle emerges clearly from these figures for all the dependent variables.

5.2 Role of fiscal flexibility in tax manipulation

Main results from previous section indicate that the reform amplifies the strategic use of the municipal surcharge and exacerbates the practice of political budget cycle. Nevertheless, these are reduced form estimates and they are not informative on the channels under this relationship. Moreover, these pieces of evidence are obtained evaluating the entire set of Italian municipalities, we do not have further clues about the direct role played by fiscal flexibility and the extent to which different wage groups are subject to diverse tax rates.

In order to shed light on the importance of flexibility, we conduct two additional analyses. First, we analyse whether fiscal flexibility can play an important role as a channel to explain main results of section 5.1. In this regard, we study if the propensity of introducing fiscal flexibility is the same across years of the political cycle or there are moments where mayors find more convenient to set flexible rates, for instance when elections approach: we analyse the fraction of municipalities that introduce flexible surcharge rates in the political cycle. Figure 10 shows this piece of evidence for the post-reform period (2012-2015), for the entire set of municipalities: Panel (a) shows the fraction of municipalities adopting a flexible rate

Figure 9: Fluctuations of municipal surcharge along the political cycle (pre/post reform)

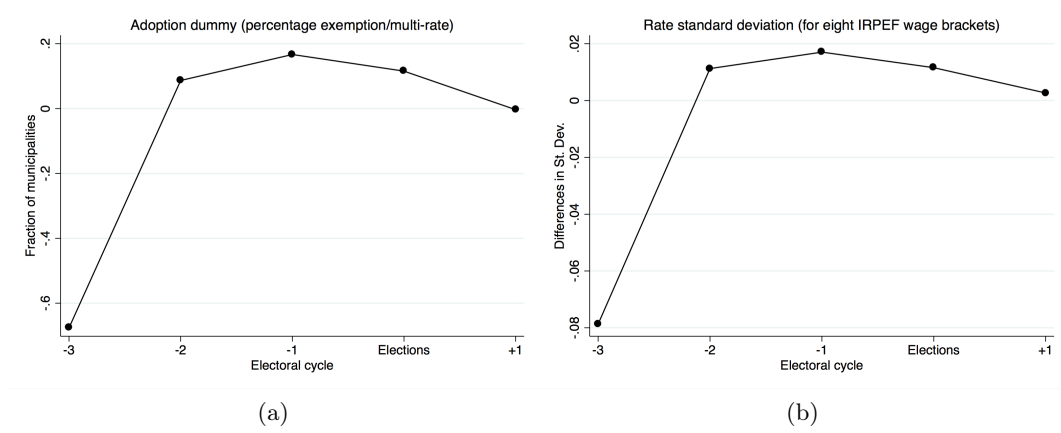


Notes: The graph plots coefficients of columns (2), (4) and (6) of Table 5. "Pre-reform period" line describes the cycle before the reform, 1999-2011: coefficient $\hat{\beta}_2$ of regression model; "Post-reform period" focuses on period after the reform, 2012-2015: coefficient $\hat{\beta}_2 + \hat{\beta}_3$ of regression model. Budget cycles lines are in deviation from the mean level in the post-electoral year.

(exemption or multiple rate) over the political cycle after removing time and entity fixed effects and political and economic controls. It is clear from the figure that flexibility raises as election approaches: it is very low three years from the election, then it starts raising, reaching the maximum in pre-electoral year and then it decreases further in electoral and post-electoral year, when the cycle starts again. This result shows that mayors strategically decide when to introduce fiscal flexibility since this systematically increases as elections approach; this suggests that flexibility facilitates tax manipulation and it can be considered a significant channel in the strengthening of political budget cycle after 2012 reform. Panel (b) contains a similar analysis conducted with a different dependent variable, that is highly correlated with former one: we analyse standard deviation of tax rates imposed on the eight wage groups averaged for all municipalities for the post-reform period. Unsurprisingly, the emerging pattern is similar to the one in Panel (a), even if reported in a different scale: fiscal flexibility increases as elections get closer and declines after pre-electoral year.

As a second analysis we want to figure out whether and how mayors make use of flexibility: *i.e.* if they indeed tax differently distinct wage groups and how they treat them along the political cycle. On the one hand, we want to check how differently wage groups are taxed, on average, and how their rate varies over time; we focus on the entire set of municipalities for the post-reform period. Table 6 shows the average surcharge rate for the eight wage brackets in analysis: as already underlined in Table 4, wage groups are subject to different tax rates and, unsurprisingly, higher wages pay higher tax rates. Second, we want to check which rates are more volatile over time within a certain city, *i.e.* whether mayor tend to change more often rates associated to rich or poor citizens. Table 7 shows average rate standard deviation for each group: to higher wages corresponds larger variation, meaning that rates associated to higher wages are more volatile. On the other hand,

Figure 10: Adoption of flexibility in the political cycle



Notes: Figure (a) represents average percentage of municipalities adopting a flexible rate, *i.e.* exemption or multiple rate, in correspondence of each position of the political cycle. Figure (b) shows the average standard deviation across the eight wage brackets in the political cycle. The analysis covers the post-reform period (2012-2015) and the entire set of municipalities is included. In both figures, we are plotting residuals after removing region/time and municipality fixed effects as well as the set of political/economic controls and time trends.

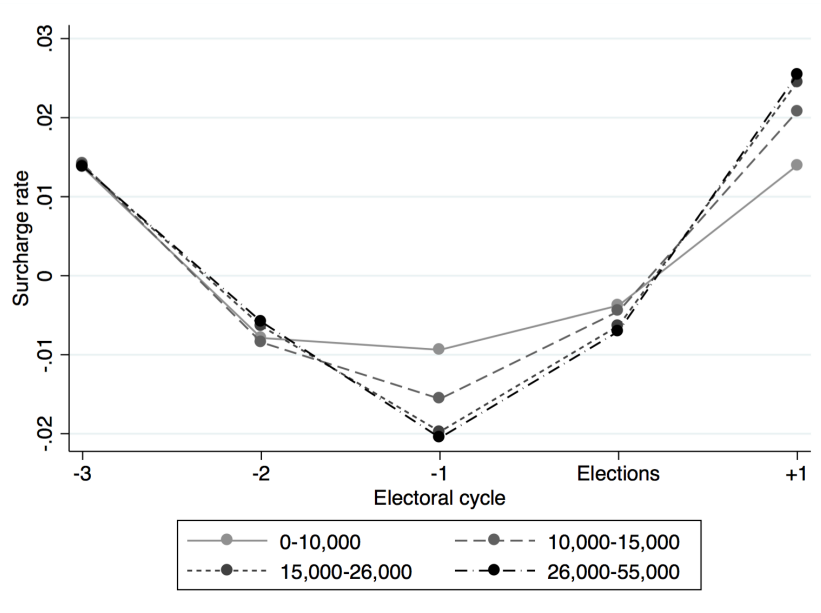
we want to explore whether mayors *play different strategies* with distinct wage groups: for instance, whether they manipulate only specific wage brackets or they favour differently distinct groups applying various tax schemes in the cycle. In order to examine this, we plot average surcharge rates along the political cycle for four most numerous groups (in Euros 0-10,000, 10,000-15,000, 15,000-26,000 and 26,000-55,000), considering post-reform period and the entire set of cities. Figure 11 shows the output, after removing time and entity fixed effects: first, we can note that the political budget cycle emerges for all groups, and this means that mayors want to please all sectors of the population. Second, and most importantly, it clearly emerges that the political cycle is much more pronounced for high wages compared to low ones; this piece of evidence along with that from Table 6 and 7 suggests that low wages have surcharge rates that are low and not very volatile along the political cycle, while high wages are taxed with high rates and oscillate significantly along the cycle. Emerging picture is one where rich people pay high tax rates in non electoral times and get significant rates reduction as elections approach while poor people face always low rates. Furthermore, this result is coherent with the evidence of Table 1 (left panel), suggesting that perceived importance of the surcharge rate raises with income level: consistently with this, it seems that politicians tend to be more strategic with richer groups which are the ones caring more about this tax.

6 Alternative empirical strategy: Triple-Diff

6.1 Income distribution as reform mediator

In this section we propose an alternative, more robust, identification strategy with the aim of corroborating main results found in section 4. This new strategy relies on the idea that income distribution of a municipality mediates the effect of the reform. In particular, the reform introduces the possibility to set different rates and its potential impact is higher where income distribution is highly uniform compared to places where it is highly dispersed: indeed, in the latter case, most of the population belongs to one single group and mayor's capability to set different rates to different portions of population is rather limited. Figure

Figure 11: Rate fluctuation of single wage brackets along the cycle



Notes: This figure shows the fluctuations of surcharge rate along the political cycle for four single wage brackets (in Euros): 0-10,000; 10,000-15,000; 15,000-26,000 and 26,000-55,000. The sample includes all cities and it cover the post-reform period. We are plotting residuals after removing region/time and municipality fixed effects.

12 provides a visual example: left panel shows the distribution of tax-payer population across the seven wage brackets in 2011 for the city of Segrate. We can note that income distribution is highly uniformly distributed (low income concentration), the reform has a sizeable potential impact on this municipality. On the other hand, right panel of Figure 12 shows income distribution of a similar municipality, Rosarno, that is highly concentrated in the first bracket: reform impact in this municipality is fairly limited as two thirds of population belongs to one single group and the mayor cannot differentiate much income tax rate across the population.

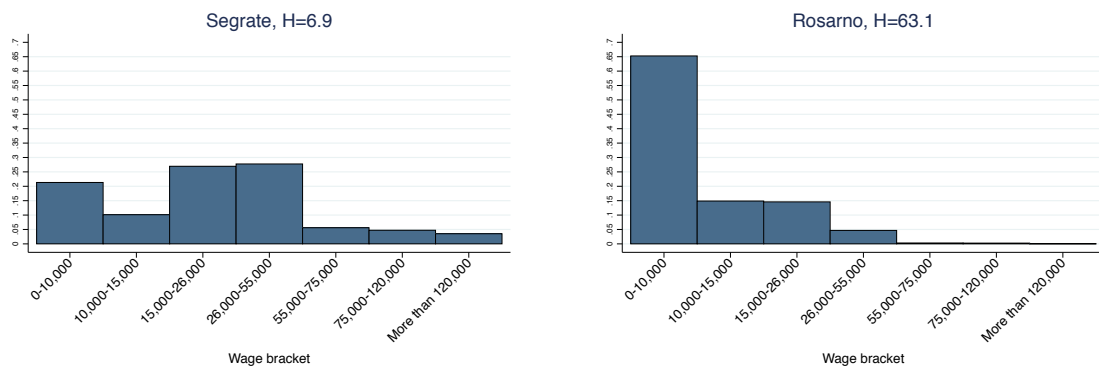


Figure 12: Left panels shows a municipality with uniform income distribution (**low concentration**), right panel shows a municipality with dispersed income distribution (**high concentration**).

We want to exploit this variation generated by income distribution at the local level to better identify the effect of the reform on strategic use of municipal surcharge. In these regards, we make use of income distribution of the year 2011, the most recent predetermined income distribution, to be sure this characteristic is not endogenous with the reform itself. In order to measure income concentration at the local level, we rely on an Herfindal index of concentration, that we calculate as follows:

$$H_{i,2011} = \sum_{j=1}^7 s_{ji,2011}^2$$

with $s_{ji,2011}$ the share of population in wage bracket j of municipality i in year 2011, higher values of the index correspond to higher levels of concentration and so lower potential impact of the reform¹⁸. Furthermore, we rescale the index in the scale 0-100. Figure 12 shows the index at work: Herfindal index for the city of Segrate (6.9), a city with low level of income concentration, is almost one tenth compared to the one of Rosarno (63.1), which is instead highly concentrated. Panel C of Table 3 shows descriptive statistics of the concentration index computed for year 2011: mean value is 25 with a non negligible level of average variation, around 10 points.

Nevertheless, in order to check that income concentration degree truly affects municipal surcharge rates, we present in table Table 8 some correlations between degree of income concentration and fiscal variables at the local level. We group municipalities in deciles of income concentration: cities in group one have highly uniform distributions while cities in group ten have highly concentrated ones. Several clues emerge from this table: first, as concentration raises number of municipalities that make use of flexibility decreases: in column 1 this is measured with the percentage of years the city introduces a flexible rate, and in column 2 with the portion of cities that set a flexible surcharge at least once. This seems to confirm the original conjecture that more concentrated income distributions mediates the effect of the reform lowering effectiveness of flexible rates and this translates into moderate use of flexible rates in these cities. Second, the number of cities that never introduced municipal surcharge raises as income concentration increases, although the relation is U-shaped; this seems to confirms original conjecture as well (column 3). Finally, taking into account average surcharge rate, both median and weighted averages, it does not emerge any clear pattern: tax rate is high for intermediate values of concentration and it is low for extreme ones (columns 6, 7) and this is motivated by the U-shaped dynamics of the fraction of cities that never set the surcharge higher than zero. In general it seems that, as supposed, municipalities with more concentrated income distributions make a lower use of fiscal flexibility.

6.2 Empirical specification

In previous section we show that income distribution prior the reform works as a mediator since the use of flexibility raises as distribution becomes less concentrated: we want to exploit this mediating factor in the empirical analysis. We structure the specification as a triple-differences study, where we introduce a new plausibly exogenous sources of variation across municipalities: the one in predetermined income distribution. This new exercise consists in studying effect of the reform across cities in different positions of the political cycle and marked by different degrees of concentration in their income distribution. The key identifying assumption is now more stringent: we need to rule out the presence of local events

¹⁸We compute alternative versions of the concentration index: first, one version including only 6/5/4 groups aggregating richest groups; second, a weighed version where we use as weighs the size of the wage group to capture relative dimension of each bracket.

contemporaneous to the reform that affect differently cities placed in different positions of their political cycle and characterized by different income distribution: this would be an event taking place in 2012 affecting solely cities in a specific political cycle position and with different impact between cities with uniform income distribution or concentrated one.

The new empirical model to be estimated is as follows:

$$y_{it} = \alpha + \beta_1 Post_t + \beta'_2 C_{it} + \beta_3 H_{i,2011} + \beta'_4 C_{it} \cdot Post_t + \beta_5 Post_t \cdot H_{i,2011} + \beta'_6 C_{it} \cdot H_{i,2011} + \beta'_7 C_{it} \cdot Post_t \cdot H_{i,2011} + \gamma' X_{it} + \delta_i + \zeta_{mt} + \mu_r \cdot \lambda_t + \epsilon_{it}$$

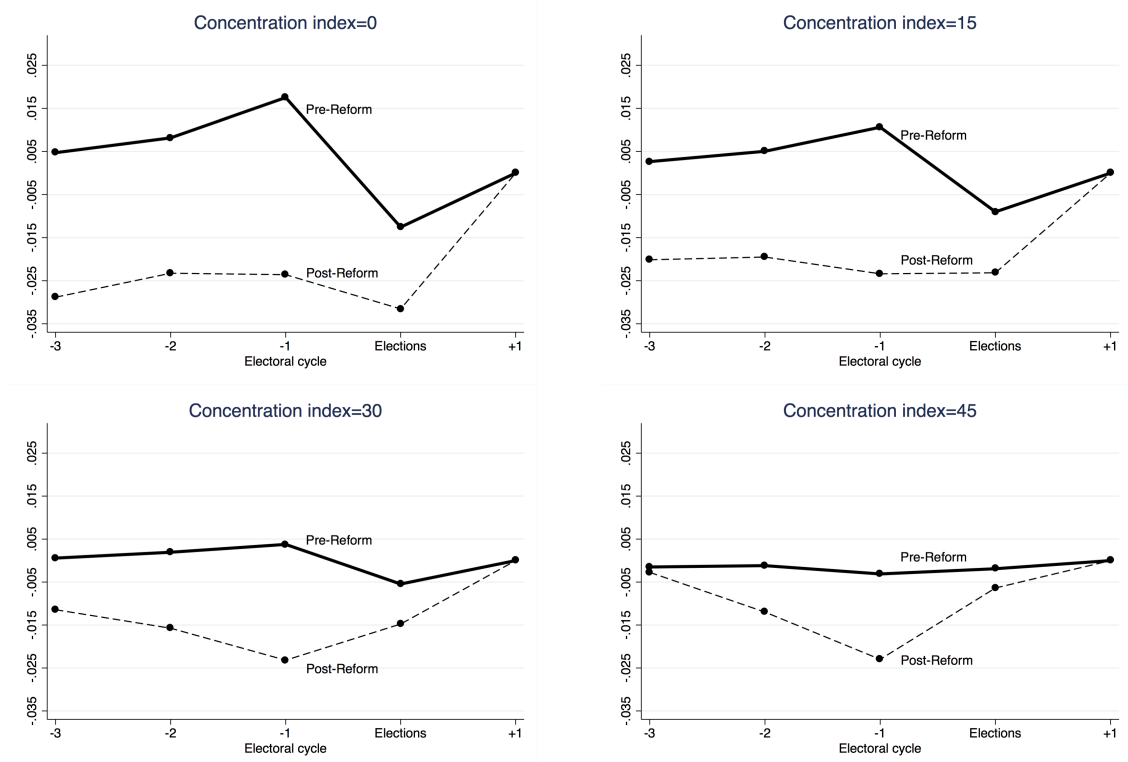
With y_{it} , $Post_t$ and C_{it} defined as in section 4.2 and $H_{i,2011}$ being the value of income concentration index in municipality i in 2011. The specification includes the complete set of double interaction terms between $Post_t$, C_{it} and $H_{i,2011}$ and the triple interaction $C_{it} \cdot Post_t \cdot H_{i,2011}$ which is the Difference-in-Difference-in-Differences estimator that captures the effect of interest: in case the associated coefficient, β'_7 , is positive, the interaction term means that the exacerbating impact of the reform on the political budget cycle is more attenuated for cities that have more concentrated income distribution *vis à vis* those with more uniform distribution. Moreover, the set of controls contains political (mayors' characteristics and information on the term), social (population) and economic variables (information on income distribution). Finally, fixed effects and time trends are the same as in the main analysis of section 4.2, and robust standard errors are clustered at the municipal level.

7 Results: Triple-Diff

Table 9 contains results for the triple-diff model discussed in the previous section for all dependent variables: column (1) shows result for weighted average rate, column (2) for median rate and column (3) for per-capita revenue. For the sake of brevity, we did not include in the table coefficients of un-interacted terms. Panel A contains the interaction between the dummy describing political cycle and the post-reform period, $C_{it} \cdot Post_t$: estimated coefficients confirm the result found in main analysis of Table 5 that the reform amplifies political budget cycle as interaction terms are negative and significant with coefficients magnitude higher than in main model. Panel B includes the interaction term between post-reform dummy and the concentration index, $Post_t \cdot H_{i,2011}$, and Panel C shows the interaction between political cycle dummies and concentration index, $C_{it} \cdot H_{i,2011}$: this relation is quite ambiguous as it seems that as income concentration raises tax rate in pre-electoral year, two and three years from elections goes down while the one in electoral year goes up; from this evidence the average effect of income concentration on tax manipulation is not clear. Finally, Panel D contains estimates of our interest showing the triple interaction between the dummy characterizing political cycle, the post-reform dummy and the index of income concentration: this terms describes how pre-determined income concentration mediates the effect of the reform on intensity of political budget cycle. Estimated coefficients for three dependent variables are all positive and significant, meaning that as income distribution is more concentrated, the amplifying effect of the reform, with negative sign, attenuates progressively: *i.e.* cities with more uniform income distribution face a larger amplification of their political budget cycle after 2012 reform compared to cities with more concentrated distributions. Focusing on the weighted rate (column (1)), in order to study the magnitude of this mediation, we can note that, *ceteris paribus*, a difference in concentration index by ten points (approximately one standard deviation of the index) implies, for more concentrated city, an average reduction in the effect of the reform by 2.4%, 1.7% and 1.7%, respectively, three, two and one years before elections, compared to dependent variable mean, and by 1.0% in election year. The same result emerges when we use median surcharge rate (column (2)) as

well as per-capita revenue (column (3)) as dependent variables of the analysis. Furthermore, we obtain similar results when we run this specification and we use different versions of income concentration measure, instead of this index varying in the range 0-100¹⁹.

Figure 13: Graphical evidence of Triple-Diff analysis - Weighted average surcharge rate.



Notes: The graph plots coefficients of column (1) of Table 9. "Pre-Reform" line describes the cycle before the reform, 1999-2011, and it varies only with income concentration: coefficient $\hat{\beta}'_2 + \hat{\beta}'_6$; "Post-Reform" line describes the cycle after the reform, 2012-2015, with different levels of pre-determined income concentration. Upper-left panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 0$; upper-right panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 15$; lower-left panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 30$; finally, lower-right panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 45$. Budget lines are in deviation from the mean level in the post-electoral year.

Figure 13 provides a graphical evidence of the result reported in Table 9 with the focus on weighted average surcharge rate. In particular, we simulate average rate along the political cycle for post-reform period varying the degree of concentration and we compare it with average rate in pre-reform period²⁰. We simulate four simple cases: perfectly uniform, highly uniform, weakly concentrated and highly concentrated income distribution (respectively concentration index equal to 0, 15, 30 and 45). From the figure, the mediating effect of income distribution emerges clearly: when distribution is perfectly uniform (upper-left panel of the figure) the political budget cycle after the reform is very pronounced; then, as income distribution becomes more concentrated the post-reform political cycle attenuates and gets closer to the one in the pre-reform period; finally when income concentration is very high (lower-right panel of the figure) two cycles get very close, meaning that the reform has very

¹⁹In particular, we have other three measures of income concentration: a dummy whether a city is above the median, another one dividing in quartiles and in deciles of income concentration.

²⁰In doing this simulation we are making the simplistic, and probably not very reliable, assumption that the positive effect of the mediator (income concentration) on reform impact is linear. Of course, we cannot rule out the presence of non-linearities in this relation and we would have to conduct *ad hoc* analyses to shed further light on this issue.

few effects for cities with such an high level of income concentration. Moreover, Figures 15 and 16, in the appendix, show some graphical pieces of evidence using median surcharge rate and per-capita revenue: in both cases similar results emerge as the reform loses effectiveness when incomes become more concentrated, in particular the reform is nearly ineffective for per-capita revenues when concentration level is very high.

8 Impact of partisanship on tax flexibility

8.1 Usage and degree of flexibility

In this paragraph we want to shed light on the political economy of tax flexibility. In particular, we explore whether partisanship of local administrators plays a role in determining whether and to what extent flexibility is introduced in a municipality. We explore two different angles of partisanship. First, we focus on the effect of having a "political mayor", officially part of a political party, rather than a "civic mayor", part of an independent movement, officially not supported by any party. This dichotomy is very important in Italian local politics; Gamalerio (2016) shows, in an RDD analysis, that party affiliation affects fiscal discipline. In particular, political mayors are more fiscally responsible with lower deficit, less debt and fewer expenditures, compared to civic mayors. We want to see whether this dichotomy matters in this context as well. Second, we inspect the classic left/right division in order to check which political force cares more about redistribution in this local context.

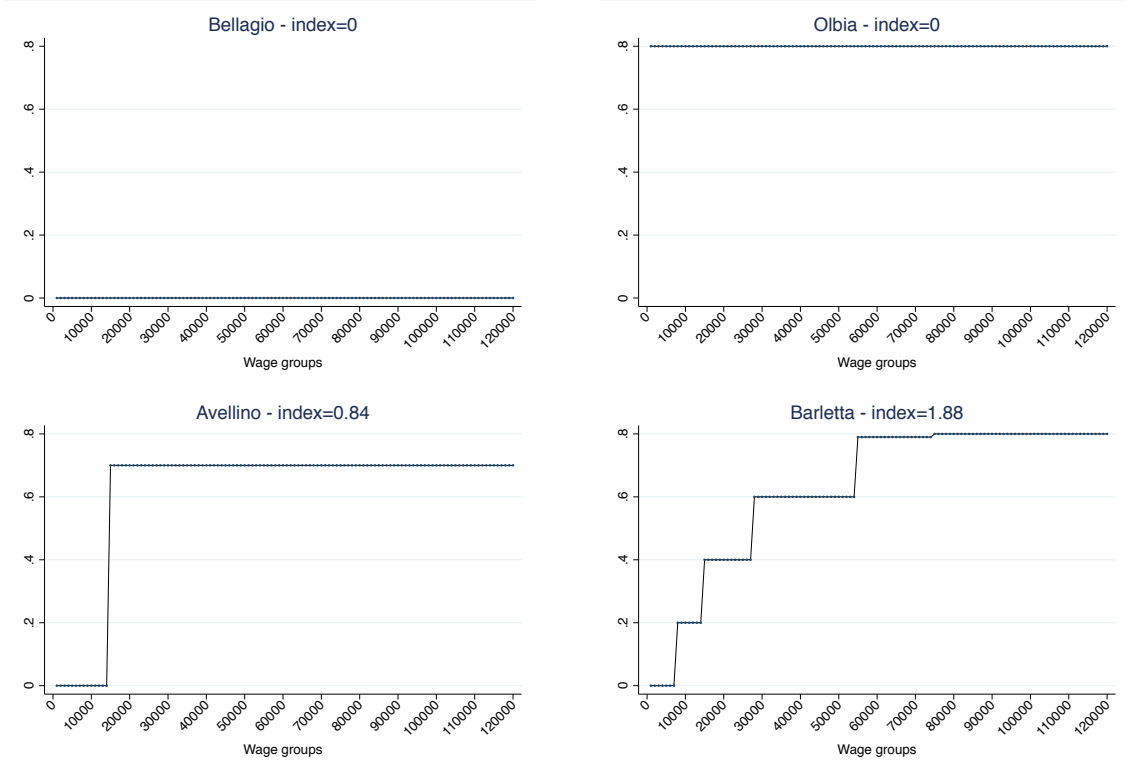
In terms of outcome variable, we focus on two aspects. On the one hand, we look whether partisanship affects the probability that a flexible rate, exemption or differentiated rate, is introduced, measured as the fraction of years in a legislature with a flexible rate. On the other hand, we focus on the degree of flexibility introduced, measured as the progressivity level of the tax schedule chosen by the mayor. After 2012 reform, local administrators have considerable freedom to modulate the tax schedule and they can choose among more or less redistributive systems. We want to measure how redistributive a fiscal system is, *i.e.* its degree of progressivity, and we want to see how this depends on mayor partisanship. To provide an instance, figure 16 shows the tax schedule of four Italian municipalities in 2015, ordered with increasing degree of progressivity. Starting from the upper-left figure, first two cities, Bellagio and Olbia, have a flat tax associated with no redistribution, degree of progressivity raises with the third city, Avellino, and raises again with the last city, Barletta. In order to create an index of progressivity, we rely on the literature of Public Finance dealing with measuring and comparing progressive tax systems (Govori 2015). The proposed index is as follows:

$$\sum_{i=2,000}^{120,000} (MRP_i)^{\frac{1}{2}}$$

With MRP_i the "Marginal Rate Progression" (Govori 2015 quoting Pigou 1960) from income level $i - 1,000$ to i , which is defined as the difference $t_i - t_{i-1,000}$, with t_i tax rate applied to the income level i . The index results from the summation of the square root of marginal rate progressions in the income range €1,000 - €120,000. This measure can be considered as the inverse of an Herfindal index as it weighs dispersion and it measures the degree of progressivity in the tax schedule of a municipality²¹. Figure 16 shows corresponding values of the index, as expected as progressivity raises the index is larger.

²¹Mean of the index is .082 with a standard deviation of .292, the index goes from a minimum of 0 to a maximum level of 1.99.

Figure 14: Index of progressivity - examples



Notes: These graphs plot surcharge rate for every wage groups in 2015 for four Italian municipalities with different degrees of "progressivity" index.

8.2 Close election RDD

The analysis is structured as a sharp regression discontinuity design (RDD), as in Gamalerio (2016). We could not simply compare, using OLS, outcomes of two groups of municipalities, respectively, civic/political and left/right, as these two groups are likely to differ in several observable and unobservable characteristics and this could generate biased estimates due to endogeneity issues. Thus, the analysis performed is limited to the set of close elections: we focus on mixed electoral competitions, where political mayors run against civic ones (or left-wing candidates run against right-wing ones), whose outcomes are decided by narrow margins. In these cases, it is plausible to assume that election results are determined by random factors rather than characteristics of municipalities that are likely to impact on local public finance variables. Following recent developments by Calonico, Cattaneo, Tutiunik (2014) and Gelmans, Imbens (2014) the RDD model, estimated by local linear regression (LLR), is as follows:

$$Y_{it} = \alpha + \beta_1 VM_{it} + \beta_2 P_{it} + \beta_3 MV_{it} \cdot P_{it} + \gamma X_{it} + \delta_t + \zeta_m + \epsilon_{it}$$

with Y_{it} the dependent variable of the analysis capturing either the usage of the flexibility (fraction of flexible years in the legislature) or the degree of progressivity introduced (value of the progressivity index) for municipality i at time t ; δ_t are year fixed effects, ζ_m macro-region fixed effects and X_{it} is a vector controlling for political background (turnout, number of candidates, number of lists, share of civic lists, vote share, concentration index, vote share of most voted candidate, dummy for term limit, education, age and gender of mayor

and councillors) and economic control of election year (surcharge weighed average rate, lagged current expenditures, lagged real estate and lagged waste tax rate). The unit of analysis is the legislature, which starts in the election year and ends in the pre-electoral year, included. The treatment of the analysis is captured by the dummy P_{it} which is equal to zero, in case of a civic (left-wing) mayor and one in case of a political (right-wing) mayor. The forcing variable of the RDD is the variable VM_{it} , victory margin of municipality i at time t , which is calculated as the difference between vote shares of two most voted candidates. At the threshold $VM_{it} = 0$ the treatment changes sharply: in municipalities where $VM_{it} < 0$ a civic (left-wing) candidate barely wins, $P_{it} = 0$, while where $VM_{it} > 0$ a political (right-wing) candidate barely wins, $P_{it} = 1$. The RDD model is estimated in the sub-sample of municipalities where VM_{it} belongs to the interval $[-h, +h]$, where h is the optimal bandwidth, computed according to Calonico, Cattaneo and Titiunik (2014), Calonico, Cattaneo and Farrell (2017), and Calonico, Cattaneo, Farrell and Titiunik (2017). In the proposed model the coefficient of interest is β_3 representing the average treatment effect (ATE) of the impact of partisanship. Finally, robust standard errors are clustered at the municipality level.

Main identifying assumptions of this RDD model require that there is no discontinuity of other covariates around the threshold and that there is not manipulation at the cutoff; we test these two assumptions later. For the analysis we consider all Italian municipalities for the time span 2010-2015, the period where mayors were allowed, and actually started, to introduce flexible rates. The sample of the analysis includes all mixed races civic/political and left/right where the mayor wins with a narrow margin: the final sample includes, respectively, 1,235 and 436 elections.

8.3 Results

As a first step, we test main assumptions of the RDD model in our local framework. First identifying assumption requires that pre-determined covariates vary smoothly around the threshold $VM_{it} = 0$. We test for this running main model using as dependent variables a set of characteristics of municipality and elected mayors from the last year of previous term. We run the same test for both samples, for the analysis civic/political and for the one left/right. Table 13 shows main outcomes of this test. From Panel A, focusing on the analysis civic/political, it is evident that there is no discontinuity in municipal characteristics such as population, share of immigrants, number of candidates, number of taxpayers and aggregate income declared, first row. Same results emerge if we focus on mayor's characteristics as education, age, gender and term limit, second row, as well as with local public finance variables, third row. The only exception seems to be that at the cutoff municipalities where political mayors barely win have lower current expenditure, but the estimate is almost non-significant and this problem does not emerge in other fiscal variables. From Panel B, focusing on left/right analysis, the same result emerges for all municipalities characteristics, with the only exception of total fiscal revenues. Second identifying assumption is that there is no manipulation around the threshold, meaning that municipalities do not self-select around the cutoff. In case of evidence of manipulation, this would suggest that voters are capable to choose between a civic/political mayor (or a left/right in the second analysis) even when margins are narrow; and this would weaken the assumption that electoral outcome is due to random factors around the cutoff. Figure 17 shows the McCrary test performed following Cattaneo, Jansson and Ma (2017): the figure confirms that there is no sizeable discontinuity in municipality density around the cutoff and this is evident for the civic/political analysis (left panel) as well as for the left/right one (right panel).

As a second step, we focus on main outcomes of the analysis. Table 14 shows the causal impact of partisanship on the propensity of introducing a flexible rate, defined as the

fraction of years in the term with exemption or differentiated rates. Columns (1)-(3) deal with the effect of having a civic rather than a political mayor focusing on elections within, respectively, the optimal bandwidth h , half of the optimal bandwidth $h/2$ and two times the optimal bandwidth $2h$. All specifications show that political mayors tend to introduce more flexible rates compared to civic mayors. The effect is large and significant: focusing on column (1) political mayors average flexibility is 13.5% points higher than civic ones and this corresponds to an increase of 61% of the variable mean. This result can be interpreted in terms of electoral targeting and in terms of political experience: first political mayors consensus is generally eradicated in specific groups of the society, compared to civic mayors whose consensus is more general. This could motivate why political mayors are more willing to tax differently different groups of tax-payers, using more tax flexibility. As a second motivation, political mayors are more likely to have political experience or to have access to political experts and this makes more desirable for them to use flexibility for strategic purposes. Columns (4)-(6) study the causal effect of having a left-wing mayor rather than a right-wing one and suggest that left-wing administrators use more flexible rates, despite the relation not being significant in the specification with $h/2$. Focusing on column (4) the effect is sizeable as having a left-wing mayor raises average flexibility in the term by 23,9% corresponding to an increase of 108% of the variable mean. This result is coherent with the classical view about political forces where redistributive policies are usually prerogative of the left, and flexibility can be used as a redistributive tool in this context. Secondly, Table 15 studies the causal impact of partisanship on the degree of progressivity introduced, measured with the progressivity index introduced in previous section. Two main results emerge from this table: first, political mayors tend to introduce more progressive schemes rather than civic ones (columns 1-3) and, focusing on political forces, there is weak evidence that left-wing mayors introduce more progressivity than right-wing ones (columns 4-6). These results are coherent with previous explanations and show that partisanship affects the degree of progressivity introduced in a municipality.

These outcomes suggest that partisanship affects both *whether* and *how* flexibility is used by local administrators. In particular, it emerges that political (left-wing) mayors are more willing to introduce flexible rates and to choose more progressive tax schemes compared to civic (right-wing) mayors. These outcomes represent a causal evidence that partisanship matters for the use of flexibility at the local level.

9 Robustness analysis

There can be several threats to identification that could undermine empirical strategies presented in previous section: here we discuss some of these threats providing evidence for the robustness of our results. First, there were other minor reforms affecting municipal surcharge before the 2012 reform evaluated in this paper. Second, there can be interventions, contemporaneous to the surcharge rate reform, that may have affected local public finance differently for municipalities in different years of their political term.

9.1 Other reforms of the surcharge rate

The reform evaluated in this contribution is the most important recent intervention to the municipal surcharge after its introduction in 1999. Nevertheless, there have been other minor modifications over time: we want to check whether and how these additional interventions contributed to the result we found here.

The first minor intervention was the introduction of a cap to surcharge increases that was applied twice²²: these changes were temporary and they affected only a subset of Italian

²²These modifications were introduced by following laws: *legge n. 289/2002, Art. 3* and *D.L. n.*

municipalities. The first cap was introduced in 2003, partially relaxed in 2004 and removed in 2007, and the second was introduced in 2009 and removed in 2011. These interventions prevented local administrators to raise surcharge rates and, despite the absence of limitations for rate reductions, overall volatility of the tax rate could have decreased due to the cap. One possible concern is that as caps took place in pre-reform period these could have mechanically decrease volatility of surcharge rate compared to post-reform period and this could amplify the effect of 2012 reform. In order to exclude this possible distortion, we run main specification of the Diff-in-Diff model excluding cap years from the sample, *i.e.* 2003-2006 and 2009-2011. Table 10 shows the results: two main remarks can be noted. First, estimates are very similar to the ones obtained in the full sample analysis. The political budget cycle before the reform is very weak: the rate is almost flat until election year when it slightly reduces. And after the reform the cycle amplifies with the same shape as in the analysis with full sample. Second, the exacerbating effect of the reform is slightly milder as, for instance, average rate in pre-electoral year decreases by 0.0215% while the coefficient was 0.0245% in the main specification.

The second minor reform took place in 2006 and it increased rate higher bound from 0.5% to 0.8%²³. This raises rate fluctuation starting from 2006 and it could contribute to the volatility increase after 2012. In order to control for this, we run main specification for the reduced time span 2006-2015 excluding the set of years when the maximum rate was 0.5%. Table 11 shows estimates: results are very similar to the previous check. On the one hand pre-reform cycle is very mild and almost flat; on the other hand, the reform is still effecting in amplifying political budget cycle, despite coefficients being a bit weaker than estimates obtained with the complete sample. We can conclude that we do not have sufficient evidence to think that these minor interventions to the municipal surcharge confound estimates obtained in the main analysis of section 5.

9.2 Simultaneous public finance intervention

Another potential threat to identification can be the presence of alternative reforms, taking place simultaneously to the one we study here, and that affected differently municipality in different position of their political cycle: this would be a violation of main identifying assumption of the model presented in section 5. Starting from 2011, Italy experienced a deep sovereign debt crisis that led to early termination of Berlusconi IV government and to the technical cabinet held by Mario Monti. This was an intense reform season aimed at consolidating Italian public accounts with attention both to national and local level²⁴.

We want make sure that main outputs are not, even partially, the result of these simultaneous reform. In order to check for this, we run the main specification of section 5, using as dependent variable a set of public finance variables to see whether after 2012 they modify along their political cycle. If this was the case this would suggest that there are interventions that affect municipality differently along the cycle and this could violate Diff-in-Diff identifying assumption. The set of public finance variables considered is large: main local taxes such as real estate and waste tax, aggregate revenues from taxes and special fees (excluding revenues from municipal surcharge) and the amount of current expenditure and investments, all considered in aggregate terms. Table 12 contains estimates for this check: it seems that there is nothing affecting differently the dependent variable in different position

²³112/2008, Art. 77 bis.

²³This modification was introduced by *legge n. 296/2006, Art. 1, c. 142*; beyond that the reform removes maximum yearly increase of the surcharge rate, originally set at 0.2%.

²⁴Main interventions at the local level include the introduction, in 2011, of the property tax on main residency, *IMU* that has been studied by Alesina, Paradisi (2015), and the reform of Italian cadastres with revaluation of property tax base; finally, another important intervention was the reduction in transfers from the central governments to municipalities.

of the cycle, and this is valid for the entire set of public finance variables in analysis. This seems to suggest that there are no other interventions, simultaneous to the 2012 surcharge reform, that could confound our Diff-in-Diff estimates.

10 Conclusions

In this contribution we explore whether fiscal tools design affect the practice of political budget cycle modifying incentives of politicians to manipulate taxes. In particular, we focus on the concept of fiscal flexibility, defined as the capability of the politician to differentiate the tax rate among different tax-payers and we concentrate on Italian municipalities. We exploit a reform affecting local personal income tax, which was flat before, that allowed mayors to introduce differentiated tax rates or exemption thresholds. This unique natural experiment allows to test the effect of raising fiscal flexibility on tax manipulation. What emerges, in a Diff-in-Diff setting, is that flexibility consistently affects the extent to which mayors manipulate taxes, as average fluctuation of the tax rate along the political cycle raises significantly; and this suggests that political budget cycle amplifies after the reform. The reform affects all years of the cycle and its effect is not negligible, average tax rate in pre-electoral year, for instance, declines between 8.6% and 11.6%, compared to pre-reform period. We complement results from the Diff-in-Diff model studying a different specification where we exploit the role of local income concentration as a mediating factor for the reform: we implement a Triple-Diff model studying the impact of the reform along the political cycle between cities with different degrees of (pre-determined) income concentration and main results are confirmed.

In order to shed light on main channels driving these results, we directly test the role played by flexibility. First, we document that as elections approach mayors use more often flexibility which seems to move together with fiscal manipulation in the cycle. Moreover, it emerges that the reform allows mayors to *play different strategies* with different wage groups. In particular, tax rate for low income groups are low and fluctuate little along the political cycle, while average rate is higher and fluctuates more in the cycle as income raises: this suggests that tax rates for low incomes are not highly manipulated as they remain always moderate, while rates for high incomes are strongly manipulated as they oscillate consistently along the political cycle. Furthermore, we raise the issue whether partisanship of administrators affects the use of fiscal flexibility: we perform an RDD analysis focusing on close elections and we find that political (left-wing) mayors tend to use more flexibility and to introduce more progressive tax schemes than civic (right-wing) mayors.

These pieces of evidence confirm the hypothesis that increasing fiscal flexibility stimulates strategic behaviour in terms of taxes. The result could be due to the fact that higher flexibility makes tax manipulation easier and less expensive for local administrators. Indeed, it is now possible to divert smaller amounts of money while with a flat tax the manipulation implied to pay the high cost of decreasing tax rate to everyone. In addition to this, a further mechanism is that with higher flexibility manipulation becomes less visible and this further decreases the cost of being strategic: the reduction of a single flat tax is highly visible and its negative impact on the balance sheet is unambiguous, while reducing one out of seven tax rates is much more difficult to evaluate in terms of negative effect on public accounts. This could further reduce costs of being strategic. The results of this paper underline how complex and subtle can be the effect of innovating taxes: fiscal flexibility has several evident positive aspects being an important tool for the reduction of income inequality as well as a way of enriching the set of fiscal tools at the disposal of the mayor. Nevertheless, the outcomes of this analysis underline how flexibility can have some drawbacks, leading to higher levels of tax manipulation with a larger amount of diverted resources and to the amplification of the political budget cycle at the local level.

Table 1: Percentage of respondents thinking municipal surcharge is important, by income bracket.

Income bracket	mean
0-10,000 €	.327
10,000-15,000 €	.336
15,000-26,000 €	.426
26,000-55,000 €	.580
55,000-75,000 €	.639
75,000-120,000 €	.733
More than 120,000 €	.710
Total	.415
<i>N</i>	13533

Table 2: Percentage of respondents thinking municipal surcharge is important, by education level

Education level	mean
No education	.323
Elementary	.302
Lower middle-school	.382
Higher middle-school	.399
High school	.500
Bachelor degree	.525
Master degree	.608
PhD	.540
Total	.413
<i>N</i>	19366

Table 3: Descriptive statistics

	mean	sd	max
Panel A: fiscal revenues			
Total fiscal revenues	3,284,045	2.85e+07	3.33e+09
Total fees	2,156,478	2.02e+07	2.11e+09
Total taxes	798,860	7,190,968	9.81e+08
Municipal surcharge revenue	294,197	3,422,755	4.28e+08
Municipal surcharge revenue (per-capita)	27.6	29.4	1420.3
Real estate tax (per-capita)	172.0	177.0	9577.4
Waste tax (per-capita)	84.5	71.0	1518.5
Panel B: surcharge rates			
Municipal surcharge rate (weighted average)	.286%	.248	.921
Municipal surcharge rate (median)	.295%	.261	.9
Panel C: income concentration			
Herfindal Index-income concentration	24.9833	10.56599	100
<i>N</i>	137560		

Note: All amounts in Panel A are expressed in Euro. Municipal surcharge rates are in percentage terms. Income concentration index is rescaled between 0 and 100.

Table 4: Municipal surcharge average rate for three fiscal types.

Fiscal regime	Av.rate	St.dev.
flat tax	.419 %	.189
flat tax+exemption av. threshold: € 10,560	.601 %	.189
differentiated tax:		
€ 1,000	.173 %	.234
€ 5,000	.180 %	.236
€ 10,000	.340 %	.235
€ 25,000	.540 %	.150
€ 50,000	.633 %	.127
€ 75,000	.766 %	.083

Note: Average tax rates are computed for the time span 1999-2015, according to the fiscal type adopted by each municipalities. Municipalities that set the surcharge equal to zero are excluded from this sample.

Table 5: Effect of the reform on surcharge manipulation

Dependent variable: Municipal surcharge	weighted average rate		median rate		per-capita revenue	
	(1)	(2)	(3)	(4)	(5)	(6)
3 years before elections	0.000884 (0.000655)	0.00125 (0.000683)*	0.000929 (0.000679)	0.00151 (0.000708)**	0.138 (0.100)	0.201 (0.104)*
2 years before elections	0.00204 (0.000919)**	0.00358 (0.000951)***	0.00213 (0.000923)**	0.00391 (0.000962)***	0.149 (0.114)	0.263 (0.117)**
1 year before elections	0.00491 (0.000941)***	0.00110 (0.000969)	0.00559 (0.000944)***	0.00169 (0.000975)*	0.546 (0.115)***	0.166 (0.119)
Election year	-0.00633 (0.000712)***	-0.00234 (0.000772)***	-0.00603 (0.000707)***	-0.00197 (0.000770)**	-0.188 (0.0980)*	0.149 (0.104)
3 years before elections*Post-reform	-0.0158 (0.00232)***	-0.0128 (0.00242)***	-0.0166 (0.00273)***	-0.0147 (0.00283)***	-2.055 (0.360)***	-2.129 (0.364)***
2 years before elections*Post-reform	-0.0202 (0.00209)***	-0.0199 (0.00217)***	-0.0225 (0.00243)***	-0.0227 (0.00252)***	-2.103 (0.421)***	-2.171 (0.438)***
1 year before elections*Post-reform	-0.0290 (0.00229)***	-0.0245 (0.00236)***	-0.0356 (0.00261)***	-0.0305 (0.00267)***	-3.510 (0.350)***	-3.191 (0.354)***
Election year*Post-reform	-0.0104 (0.00192)***	-0.0140 (0.00201)***	-0.0146 (0.00218)***	-0.0182 (0.00227)***	-1.951 (0.415)***	-2.384 (0.430)***
Mean of the dep. variable	0.286	0.286	0.295	0.295	27.6	27.6
Municipality & Macro-region Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Time trends & Political/Economic controls	No	Yes	No	Yes	No	Yes
Observations	137472	127896	137477	127896	131459	126272
Adjusted R ²	0.769	0.773	0.761	0.767	0.699	0.708

Notes: The dependent variables are the three measure of surcharge rate. All specifications include municipality and macro-region year fixed effects. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Average surcharge rates of single wage groups.

Wage group	mean	sd	min	max
€ 0-10,000	.331	.292	0	.8
€ 10,000-15,000	.429	.278	0	.8
€ 15,000-26,000	.472	.269	0	.9
€ 26,000-55,000	.483	.271	0	.9
€ 55,000-75,000	.494	.275	0	.9
€ 75,000-120,000	.500	.279	0	.9
more than € 120,000	.500	.279	0	.9
<i>N</i>	32287			

Notes: The table shows average surcharge rate of each wage group, for the post-reform period (2012-2015), for all municipalities.

Table 7: Average variation of surcharge rates of single wage groups within cities.

Wage group	mean	sd	min	max
€ 0-10,000	.043	.084	0	.520
€ 10,000-15,000	.044	.079	0	.462
€ 15,000-26,000	.046	.078	0	.462
€ 26,000-55,000	.047	.080	0	.462
€ 55,000-75,000	.049	.084	0	.462
€ 75,000-120,000	.050	.088	0	.462
more than € 120,000	.050	.088	0	.462
<i>N</i>	32278			

Notes: The table shows surcharge rate standard deviation across time for each wage group, for the post-reform period (2012-2015), for all municipalities.

Table 8: Characteristics of municipalities across income concentration (deciles)

Concentration index - deciles	Flexibility adoption (1)	Flexibility mun. (2)	Never set surcharge (3)	Median surcharge rate (4)	Weighed average surcharge rate (5)
1	.139	.552	.174	.267	.287
2	.129	.511	.134	.291	.308
3	.121	.491	.123	.292	.308
4	.108	.449	.107	.306	.320
5	.091	.379	.115	.315	.327
6	.076	.323	.114	.313	.322
7	.068	.284	.135	.302	.311
8	.053	.227	.175	.284	.292
9	.041	.183	.206	.257	.256
10	.034	.163	.243	.229	.222
<i>N</i>	137375	137375	137375	137288	137290

Notes: *Flexibility adoption* indicates fraction of municipalities that set a non flat rate, *Flexibility mun.* indicates municipalities that set a non flat rate at least once, *Never set surcharge* indicates municipalities that never set the surcharge >0. All variables are in percentage points.

Table 9: Triple-Diff analysis with income concentration as a mediator

Dependent variable: Municipal surcharge	weighted average rate	median rate	per-capita revenue
	(1)	(2)	(3)
Panel A: $C_{it} \cdot Post_t$			
3 years before elections*Post-reform	-0.0336 (0.00607)***	-0.0400 (0.00700)***	-6.488 (0.950)***
2 years before elections*Post-reform	-0.0314 (0.00542)***	-0.0434 (0.00629)***	-5.401 (1.356)***
1 year before elections*Post-reform	-0.0411 (0.00600)***	-0.0619 (0.00681)***	-7.538 (0.915)***
Election year*Post-reform	-0.0190 (0.00468)***	-0.0318 (0.00524)***	-5.153 (1.031)***
Panel B: $Post_t \cdot H_{i,2011}$			
Post-reform*Concentration index	-0.00185 (0.000274)***	-0.00427 (0.000304)***	-0.588 (0.0316)***
Panel C: $C_{it} \cdot H_{i,2011}$			
3 years before elections*Concentration index	-0.000138 (0.0000627)**	-0.000118 (0.0000659)*	-0.00179 (0.00795)
2 years before elections*Concentration index	-0.000208 (0.0000881)**	-0.000146 (0.0000902)	-0.0127 (0.00919)
1 year before elections*Concentration index	-0.000458 (0.0000885)***	-0.000444 (0.0000920)***	-0.0440 (0.00920)***
Election year*Concentration index	0.000237 (0.0000608)***	0.000270 (0.0000633)***	0.0290 (0.00825)***
Panel D: $C_{it} \cdot Post_t \cdot H_{i,2011}$			
3 years before elections*Post-reform*Concentration index	0.000718 (0.000212)***	0.000883 (0.000238)***	0.158 (0.0268)***
2 years before elections*Post-reform*Concentration index	0.000458 (0.000205)**	0.000816 (0.000235)***	0.126 (0.0422)***
1 year before elections*Post-reform*Concentration index	0.000472 (0.000226)**	0.00103 (0.000255)***	0.151 (0.0272)***
Election year*Post-reform*Concentration index	0.000323 (0.000171)*	0.000651 (0.000188)***	0.118 (0.0277)***
Mean of the dep. variable	0.286	0.295	27.6
Municipality & Macro-region Year FE	Yes	Yes	Yes
Time trends & Political/Economic controls	Yes	Yes	Yes
Observations	128837	128837	127067
Adjusted R^2	0.771	0.767	0.709

Notes: The dependent variables are the three measure of surcharge rate. This output does not show uninteracted terms. All specifications include municipality and macro-region year fixed effects. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Effect of the reform on surcharge manipulation - Excluding cap years

Dependent variable: Municipal surcharge	weighted average rate		median rate		per-capita revenue	
	(1)	(2)	(3)	(4)	(5)	(6)
Post-reform	0.348 (0.162)**	14.06 (7.281)*	0.335 (0.189)*	19.00 (7.509)**	64.62 (27.24)**	2564.4 (862.9)***
3 years before elections	0.00188 (0.00189)	0.00449 (0.00195)**	0.00305 (0.00192)	0.00601 (0.00198)***	0.334 (0.211)	0.601 (0.213)***
2 years before elections	-0.00116 (0.00227)	0.000909 (0.00234)	-0.00123 (0.00227)	0.00123 (0.00235)	-0.438 (0.235)*	-0.182 (0.241)
1 year before elections	0.0118 (0.00269)***	-0.000507 (0.00282)	0.0119 (0.00268)***	-0.000348 (0.00284)	0.876 (0.268)***	-0.115 (0.275)
Election year	-0.0156 (0.00185)***	-0.00597 (0.00195)***	-0.0155 (0.00188)***	-0.00514 (0.00200)**	-1.085 (0.207)***	-0.214 (0.220)
3 years before elections*Post-reform	-0.0166 (0.00275)***	-0.0144 (0.00285)***	-0.0184 (0.00307)***	-0.0173 (0.00317)***	-2.100 (0.386)**	-2.361 (0.392)**
2 years before elections*Post-reform	-0.0161 (0.00272)***	-0.0157 (0.00282)***	-0.0180 (0.00293)***	-0.0181 (0.00304)***	-1.319 (0.428)***	-1.492 (0.443)***
1 year before elections*Post-reform	-0.0346 (0.00321)***	-0.0215 (0.00331)***	-0.0403 (0.00339)***	-0.0263 (0.00348)***	-3.595 (0.404)***	-2.647 (0.409)***
Election year*Post-reform	-0.000389 (0.00253)	-0.00869 (0.00269)***	-0.00423 (0.00272)	-0.0131 (0.00291)***	-0.928 (0.464)**	-1.862 (0.489)***
Mean of the dep. variable	0.286	0.286	0.295	0.295	27.6	27.6
Municipality & Macro-region Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Time trends & Political/Economic controls	No	Yes	No	Yes	No	Yes
Observations	80787	75114	80792	75114	76939	73923
Adjusted R^2	0.745	0.752	0.740	0.750	0.694	0.708

Notes: The dependent variables are the three measure of surcharge rate. Cap years (2003-2006 and 2009-2011) are excluded from the sample. All specifications include municipality and macro-region year fixed effects. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 11: Effect of the reform on surcharge manipulation - Excluding years 1999-2005

Dependent variable: Municipal surcharge	weighted average rate		median rate		per-capita revenue	
	(1)	(2)	(3)	(4)	(5)	(6)
Post-reform	0.0827 (0.227)	3.792 (5.549)	0.0665 (0.261)	6.192 (5.509)	-2.949 (17.92)	-301.7 (782.3)
3 years before elections	0.00366 (0.000979)***	0.00372 (0.00105)***	0.00446 (0.00107)***	0.00443 (0.00115)***	0.638 (0.168)***	0.630 (0.176)***
2 years before elections	0.00390 (0.00130)***	0.00399 (0.00138)***	0.00526 (0.00134)***	0.00463 (0.00144)***	0.833 (0.182)***	0.748 (0.192)***
1 year before elections	-0.00228 (0.00121)*	-0.00248 (0.00132)*	-0.000198 (0.00122)	-0.00126 (0.00137)	0.572 (0.174)***	0.429 (0.190)**
Election year	-0.00885 (0.00137)***	-0.00909 (0.00148)***	-0.00798 (0.00135)***	-0.00860 (0.00146)***	-0.0189 (0.181)	-0.0140 (0.194)
3 years before elections*Post-reform	-0.00884 (0.00225)***	-0.00721 (0.00238)***	-0.00995 (0.00263)***	-0.00887 (0.00278)***	-1.390 (0.356)**	-1.428 (0.369)***
2 years before elections*Post-reform	-0.0147 (0.00227)***	-0.0128 (0.00235)***	-0.0177 (0.00259)***	-0.0154 (0.00270)***	-1.967 (0.446)***	-1.814 (0.470)***
1 year before elections*Post-reform	-0.0137 (0.00232)***	-0.0120 (0.00244)***	-0.0209 (0.00260)***	-0.0179 (0.00273)***	-2.563 (0.362)***	-2.388 (0.379)***
Election year*Post-reform	-0.000352 (0.00215)	-0.0000305 (0.00226)	-0.00462 (0.00231)**	-0.00376 (0.00244)	-1.319 (0.437)***	-1.408 (0.459)***
Mean of the dep. variable	0.286	0.286	0.295	0.295	27.6	27.6
Municipality & Macro-region Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Time trends & Political/Economic controls	No	Yes	No	Yes	No	Yes
Observations	72760	67291	72765	67291	69690	66482
Adjusted R^2	0.855	0.857	0.843	0.846	0.780	0.780

Notes: The dependent variables are the three measure of surcharge rate. Years before 2007 reform are excluded from the sample. All specifications include municipality and macro-region year fixed effects. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 12: Placebo - Effect of the reform on other local public finance variables (aggregate)

Dependent variable:	Real Estate tax (1)	Waste tax (2)	Taxes (3)	Special fees (4)	Current expend. (5)	Capital expend. (6)
Post-reform	-65137824.4 (16524700.4)***	-3511773.5 (16563270.5)	18193967.5 (22790365.7)	48896056.0 (33995837.0)	-375390953.5 (143580616.5)***	-285523137.3 (152839965.3)*
3 years before elections	-18520.9 (14297.7)	-29611.8 (43065.2)	-22435.2 (41834.6)	-61083.4 (29713.6)**	-74175.0 (77892.0)	-249234.2 (286915.3)
2 years before elections	-61924.7 (26396.6)**	43202.1 (40084.3)	71785.6 (44351.8)	46850.8 (54554.1)	-7390.2 (53854.8)	-177222.7 (360375.4)
1 year before elections	3159.8 (25486.0)	-6073.4 (13965.5)	14144.3 (15812.1)	9767.6 (29061.0)	-52727.8 (30783.6)*	217144.4 (206555.7)
Election year	-2277.8 (14337.2)	19.26 (13766.6)	12169.1 (13497.7)	59095.0 (34843.7)*	-131812.0 (181200.5)	-305391.0 (160723.8)*
3 years before elections*Post-reform	-52170.8 (52055.1)	136730.1 (84088.3)	169991.9 (83373.9)**	66002.8 (68096.6)	299078.3 (203281.8)	-131561.2 (245212.8)
2 years before elections*Post-reform	-202495.3 (90650.6)**	-110625.6 (124681.7)	-115120.8 (123417.7)	-202307.0 (94631.1)**	-173624.3 (211332.5)	550775.2 (474060.9)
1 year before elections*Post-reform	66509.5 (163288.8)	137554.7 (190618.0)	113155.7 (187960.0)	-128853.2 (69023.6)*	412205.8 (388608.9)	-97517.1 (371948.9)
Election year*Post-reform	-53045.3 (74340.7)	-68092.5 (54554.6)	-90835.1 (32112.3)***	-155507.8 (100650.0)	13123.9 (227498.2)	931444.9 (646014.2)
Municipality & Macro-region Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Time trends & Political/Economic controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	126273	126274	126274	126274	126315	126315
Adjusted R^2	0.939	0.646	0.676	0.380	0.970	0.672

Notes: The set of dependent variables includes several public finance indicators (aggregate). All specifications include municipality and macro-region year fixed effects. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 13: Test for continuity of municipalities and mayors characteristics

Panel A: Civic/Non-civic analysis					
	Population (1)	Share of immigrants (2)	Number of candidates (3)	Number of taxpayers (4)	Aggregate income declared (5)
RD_Estimate	2810.1 (2647.6)	0.00345 (0.00536)	-0.123 (0.258)	1736.6 (1487.2)	44290129.8 (37129937.0)
Year/Macro-region FE	Yes	Yes	Yes	Yes	Yes
Observations	1278	1278	1316	1318	1318
Bandwidth	0.107	0.184	0.191	0.096	0.094
	Education mayor (1)	Age mayor (2)	Gender mayor (3)	Mayor term limited (4)	
RD_Estimate	-0.0856 (0.0999)	0.0454 (1.582)	0.00962 (0.0549)	-0.0906 (0.0687)	
Year/Macro-region FE	Yes	Yes	Yes	Yes	
Observations	1264	1307	1309	1318	
Bandwidth	0.185	0.178	0.216	0.205	
	Current expenditure (PC) (1)	Capital expenditure (PC) (2)	Total fiscal revenues (PC) (3)		
RD_Estimate	-81.13 (49.27)*	-7.276 (92.17)	-4.586 (30.61)		
Year/Macro-region FE	Yes	Yes	Yes		
Observations	1255	1255	1273		
Bandwidth	0.188	0.226	0.183		
Panel B: Left/Right analysis					
	Population (1)	Share of immigrants (2)	Number of candidates (3)	Number of taxpayers (4)	Aggregate income declared (5)
RD_Estimate	19930.6 (15546.7)	-0.00366 (0.00854)	0.0376 (0.521)	5034.3 (6749.4)	52840792.6 (169167672.1)
Year/Macro-region FE	Yes	Yes	Yes	Yes	Yes
Observations	446	446	479	479	479
Bandwidth	0.084	0.208	0.167	0.083	0.08
	Education mayor (1)	Age mayor (2)	Gender mayor (3)	Mayor term limited (4)	
RD_Estimate	0.0653 (0.169)	3.200 (3.125)	0.0755 (0.103)	-0.0838 (0.120)	
Year/Macro-region FE	Yes	Yes	Yes	Yes	
Observations	459	468	474	479	
Bandwidth	0.123	0.124	0.128	0.187	
	Current expenditure (PC) (1)	Capital expenditure (PC) (2)	Total fiscal revenues (PC) (3)		
RD_Estimate	-17.24 (67.57)	-26.01 (85.04)	-93.20 (39.69)**		
Year/Macro-region FE	Yes	Yes	Yes		
Observations	438	438	444		
Bandwidth	0.133	0.107	0.178		

Notes: Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) optimal bandwidth h selector. The unit of observation of the analysis is the legislature over a time span 2010-2015. Dependent variables refer to the last year of previous term. All specifications include year and macro-region fixed effects. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Use of flexibility - Close election RDD.

Dep. Var.	Civic/Political mayor			Left/Right mayor		
	(1)	(2)	(3)	(4)	(5)	(6)
Proportion of year with flexible rate (in a legislature)						
RD_Estimate	0.135 (0.0721)*	0.200 (0.0981)**	0.0964 (0.0545)*	-0.239 (0.145)*	-0.0304 (0.160)	-0.244 (0.108)**
Outcome variable mean	0.221	0.221	0.221	0.221	0.221	0.221
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth	0.162 (\hat{h})	0.081 ($\hat{h}/2$)	0.324 ($2\hat{h}$)	0.12 (\hat{h})	0.06 ($\hat{h}/2$)	0.24 ($2\hat{h}$)
Observations	1235	1235	1235	436	436	436

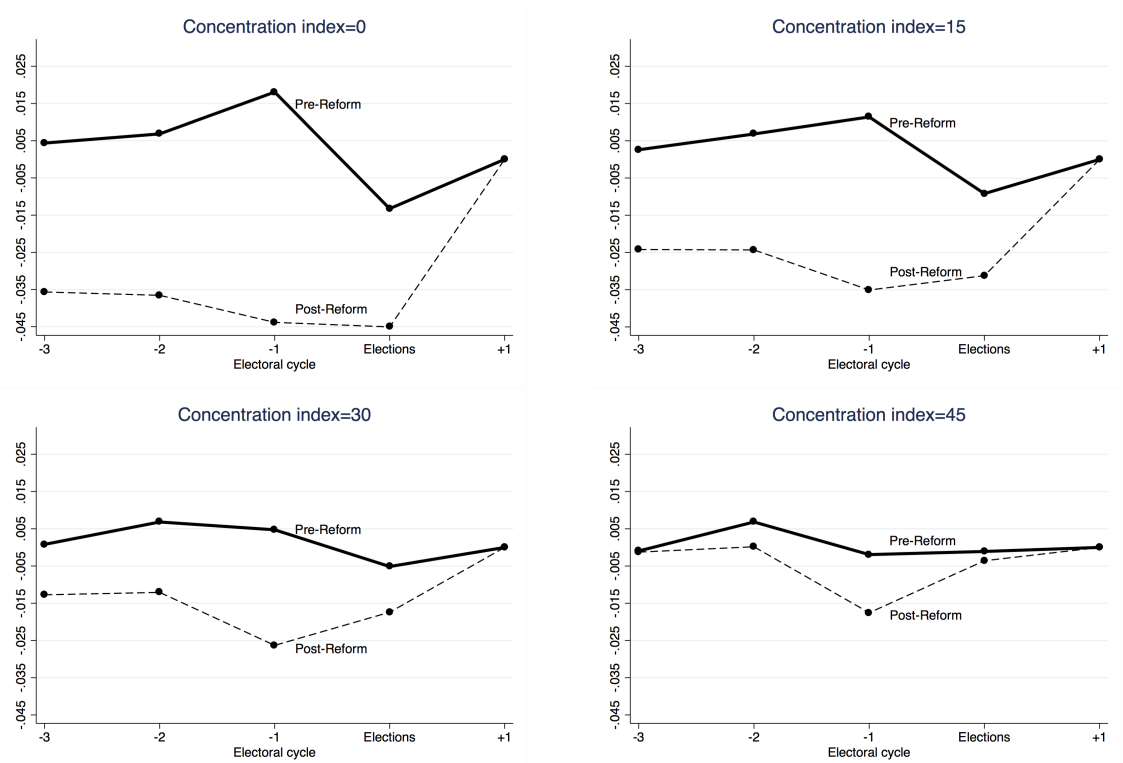
Notes: Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) optimal bandwidth h selector; a local polynomial of order one is used to construct point estimate, and a local polynomial of order two is used to construct the bias correction. The unit of observation of the analysis is the legislature over a time span 2010-2015; dependent variable is the fraction of years in a legislature where a flexible rate (*i.e. exemption or multiple rate*) is introduced. All specifications include political controls (turnout, number of candidates, number of lists, share of civic lists, vote share concentration index, vote share of most voted candidate, dummy for term limit, education, age and gender of mayors and councillors) and economic controls of election year (municipal surcharge weighed average rate, lagged current expenditure, lagged real estate and lagged waste tax rate); finally year and macro-region fixed effects are included. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 15: Degree of flexibility - Close election RDD.

Dep. Var.	Civic/Political mayor			Left/Right mayor		
	(1)	(2)	(3)	(4)	(5)	(6)
Degree of progressivity introduced (in a legislature)						
RD_Estimate	0.145 (0.0847)*	0.212 (0.120)*	0.112 (0.0613)*	-0.236 (0.178)	-0.299 (0.215)	-0.248 (0.118)**
Outcome variable mean	0.459	0.459	0.459	0.459	0.459	0.459
Covariates	Yes	Yes	Yes	Yes	Yes	Yes
Bandwidth	0.172 (\hat{h})	0.086 ($\hat{h}/2$)	0.344 ($2\hat{h}$)	0.147 (\hat{h})	0.0735 ($\hat{h}/2$)	0.294($2\hat{h}$)
Observations	1235	1235	1235	436	436	436

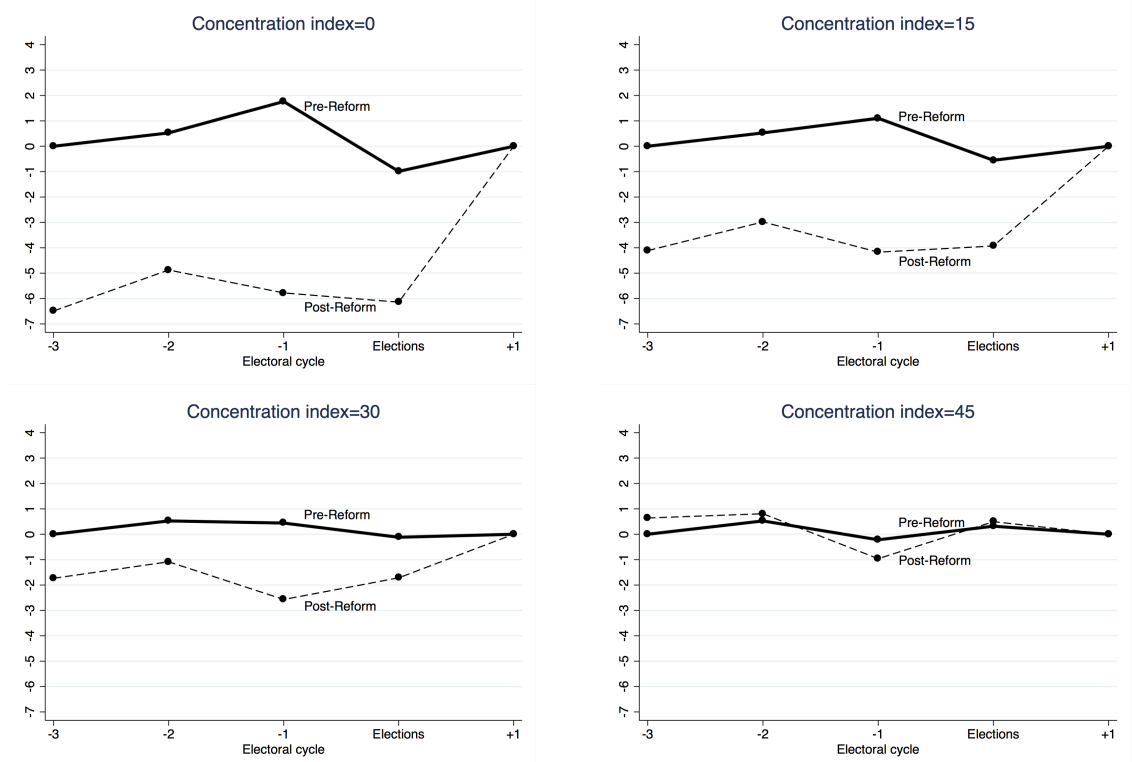
Notes: Estimation by RDD-LLR using the Calonico, Cattaneo and Titiunik (2014) optimal bandwidth h selector; a local polynomial of order one is used to construct point estimate, and a local polynomial of order two is used to construct the bias correction. The unit of observation in the analysis is the legislature over a time span 2010-2015; dependent variable is the degree of progressivity introduced in a legislature, measure with the index presented in section 8. All specifications include political controls (turnout, number of candidates, number of lists, share of civic lists, vote share concentration index, vote share of most voted candidate, dummy for term limit, education, age and gender of mayors and councillors) and economic controls of election year (municipal surcharge weighed average rate, lagged current expenditure, lagged real estate and lagged waste tax rate); finally year and macro-region fixed effects are included. Robust standard errors clustered at the municipality level are in parentheses: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 15: Graphical evidence of Triple-Diff analysis - Median surcharge rate.



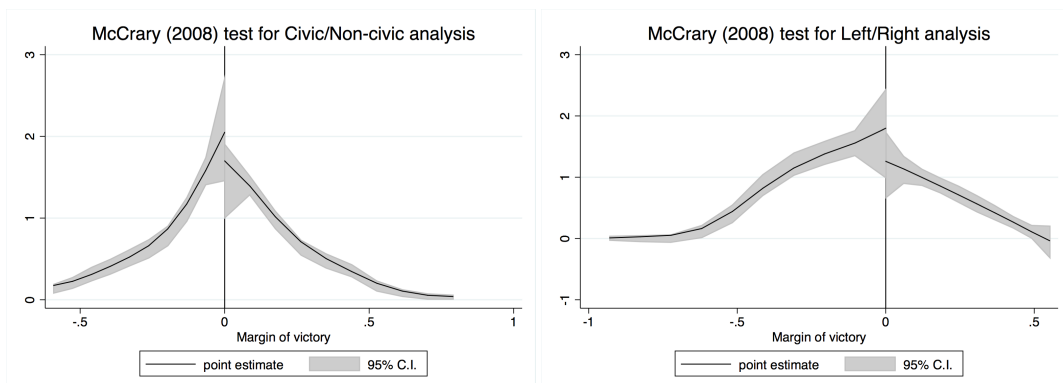
Notes: The graph plots coefficients of column (2) of Table 9. "Pre-Reform" line describes the cycle before the reform, 1999-2011, and it varies only with income concentration: coefficient $\hat{\beta}'_2 + \hat{\beta}'_6$; "Post-Reform" line describes the cycle after the reform, 2012-2015, with different levels of pre-determined income concentration. Upper-left panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 0$; upper-right panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 15$; lower-left panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 30$; finally, lower-right panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 45$. Budget lines are in deviation from the mean level in the post-electoral year.

Figure 16: Graphical evidence of Triple-Diff analysis - Per-capita surcharge revenue.



Notes: The graph plots coefficients of column (3) of Table 9. "Pre-Reform" line describes the cycle before the reform, 1999-2011, and it varies only with income concentration: coefficient $\hat{\beta}'_2 + \hat{\beta}'_6$; "Post-Reform" line describes the cycle after the reform, 2012-2015, with different levels of pre-determined income concentration. Upper-right panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 0$; upper-left panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 15$; lower-left panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 30$; finally, lower-right panel represents coefficient $\hat{\beta}'_2 + \hat{\beta}'_4 + (\hat{\beta}'_6 + \hat{\beta}'_7) \cdot 45$. Budget lines are in deviation from the mean level in the post-electoral year.

Figure 17: Manipulation test



Notes: Frequency of municipal election in the time span 2010-2015. Manipulation testing has been performed using the local polynomial density estimators proposed in Cattaneo, Jansson and Ma (2017). Left panel shows the outcome for civic/non-civic analysis, point estimate: -1.555. Right panel shows the outcome for left/right analysis, point estimate: -1.056.

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