



# Manipulating municipal budgets: unveiling opportunistic behavior of Italian mayors

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## Abstract

We examine the political budget cycle hypothesis using revenue data from Italian municipal administrations. By leveraging on the staggered schedule of local elections and employing a difference-in-differences strategy, we find evidence of opportunistic behavior by mayors. In pre-election years, mayors reduce total accrued revenues from municipal solid waste fees and property taxes, which are the primary sources of revenue in municipal financial statements. Non-term-limited mayors who seek re-election engage in such opportunistic behavior, while those facing a binding term limit do not manipulate revenues for electoral purposes. Our findings remain robust across various specifications and controls. Heterogeneity analysis suggests that the observed results are primarily driven by smaller municipalities, as well as by those situated in the South of Italy that exhibit low levels of social capital. Mayors employing political budget cycles also strategically offset reductions in highly salient fees and taxes by raising less salient non-tax revenues. This study contributes to the understanding of political budget cycles in the context of Italian municipal administrations and has implications for the broader literature on electoral behavior and public finance.

**Keywords** Local political budget cycle · Real estate tax · Waste disposal tariffs · Clientelism · Fiscal manipulation · Electoral incentives

**JEL classification** C23 · D72 · H20 · H71

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Extended author information available on the last page of the article

## 1 Introduction

This article extends the existing literature on political budget cycles (PBCs), defined as the strategic manipulation of tax rates or fiscal policies by incumbents aiming for re-election (Nordhaus 1975; Rogoff 1988; Dubois 2016). In pursuit of this objective, we gathered budget and electoral data from Italian municipalities over the period 2000–2015, a context uniquely suited for this study due to its significant heterogeneity. This temporal range, spanning both periods of economic growth and deep recession, reveals that strategic manipulation in anticipation of elections is a consistent behavior, maintained across a variety of economic contexts. Our data allow us to explore mayors' incentives, focusing on the two main own revenues for Italian municipalities: property tax and municipal solid waste (MSW) fee. Our findings contribute to a broader understanding of how these revenues are employed strategically within the realm of PBCs. This is particularly relevant, as the opportunistic behaviors of politicians can lead to suboptimal policies in terms of citizens' welfare and may undermine the effectiveness of the electoral process in selecting and disciplining politicians.

Our research distinguishes itself from previous studies along two significant dimensions. First, we conduct a comprehensive examination of the presence of PBC among incumbents subject to binding term limits, contrasting them with those under slack term limits. Within the latter category, we further differentiate between incumbents seeking reelection and those opting not to run again. Term limits generally function as a regulatory mechanism designed to curb the opportunistic behavior of incumbents who might otherwise exploit their advantage in office. According to the theoretical framework of opportunistic fiscal cycles, one would expect a loosening of fiscal discipline during the terminal years of a mandate—particularly in election years—for incumbents eligible for reelection. This should stand in contrast to incumbents in their final term, who are legally barred from running for office again. However, this framework warrants scrutiny. Incumbents in their final term may still have incentives to engage in opportunistic behavior, such as securing their party's electoral success or positioning themselves favorably for post-term political opportunities. Furthermore, last-term incumbents may have a strategic interest in bequeathing a challenging fiscal landscape to successor governments, particularly if those successors represent opposing political factions. These contrasting effects render it pertinent to examine whether term limits truly serve as a deterrent against opportunistic fiscal cycles, thereby reducing the incentives for short-term fiscal manipulation at the expense of long-term fiscal stability.

Second, extant literature has yet to conduct an in-depth analysis of the PBC effect on MSW fees. Prior studies utilizing Italian data have predominantly focused either solely on property tax or on aggregate revenue figures. MSW fees and property taxes are both paid in one or two large lump-sum payments directly to the municipality, while other revenue sources are either less significant or combined with non-municipal tax payments. This makes MSW fees and property taxes highly salient and a transparent accountability tool for voters (Chetty and Looney 2009; Bordignon and Grembi 2017). MSW fees are particularly noteworthy because, unlike property taxes, their revenues are strictly earmarked for waste-related expenditures and are levied on all residents, whether homeowners or tenants. This creates an engaging context for examining how mayors may manipulate different revenue streams. Contrary to the perception that visible expenditures at the local level—mainly tied to specific national or regional transfers or associated with rigid current expenditures (Carozzi 2016)—have a relatively higher electoral impact, reductions in visible local taxes

and fees like property taxes and MSW fees exert an immediate and direct effect on individual household budgets. Such reductions are typically more transparent and noticeable to the public than intricate budgetary expenditures (Strate and Wolman 1993; McCaffery 2004). In addition, compared to spending policies, revenue policies may elicit strong reactions rooted in perceptions of fairness and equity, significantly influencing voting behavior (Tyran 2006). More specifically, fees like MSW, whose revenues are directly earmarked for a particular municipal service (i.e., waste collection), enhance residents' ability to discern the value they receive for their money and to evaluate its alignment with their expectations (De Jaeger 2013).

The analysis provides robust evidence of a conspicuous pattern: incumbent mayors aiming for re-election tend to significantly reduce property taxes and MSW fees in the final year of their tenure. This pattern sharply contrasts with incumbents who are term-limited or choose not to seek re-election. Our results hold true also when employing more advanced econometric techniques. Specifically, calculating the average treatment effects (ATEs) across all groups (such as municipalities experiencing an election versus those not-yet treated) and years through the conventional two-way fixed effects (TWFE) model could inadvertently include negative weights (de Chaisemartin et al. 2019), potentially biasing the estimates. We address this issue by employing the novel estimator proposed by de Chaisemartin (2022), a tool we anticipate will become integral for robustness checks in this strand of literature. The results eventually corroborate the robustness of our findings. Furthermore, our research takes an all-encompassing approach by extending to a heterogeneity analysis that accounts for Italy's extensive economic and social diversity. The findings reveal that the occurrence of PBC is chiefly concentrated in smaller municipalities, often characterized by reduced levels of social capital, and typically from Southern regions, where political clientelism is more prevalent. Our study also unveils sophisticated strategies employed by incumbents engaged in PBCs. We observe that these mayors strategically offset reductions in highly visible fees and taxes by subtly increasing less noticeable non-tax revenues, including a wide array of smaller fees and charges. This approach further emphasizes the depth and complexity of the strategic behavior at play.

In the literature, two main theoretical underpinnings explain PBCs. The first asserts that voters are generally myopic, form expectations adaptively, and may suffer from a sort of fiscal illusion, whereby they can be deceived into overlooking the cost of future deficits (Buchanan 1977). The second theory posits that voters are rational, but imperfectly informed about the incumbent's attributes (e.g., competence) or actions (e.g., strategically spending on more or less visible items or reducing taxation). In such situations, a politician may manipulate policy instruments, which become observable to voters only with a delay due to information lags or complexity. This allows the incumbent to project competence or congruence, while concealing the increased deficit incurred by the government (e.g., Rogoff 1988; Persson 2002; Shi 2006).

The main hypothesis derived from theoretical models concerning the PBC has been the subject of empirical tests at both the national and local levels. The emphasis of these studies has been on the spending side—particularly investment spending—reflecting the belief that incumbent politicians typically exercise more control over expenditures than over revenues and potentially create a stronger impact on electoral outcomes, given their supposedly immediate visibility to the electorate. Within the scope of local government, several key empirical analyses illustrate this phenomenon. Akhmedov (2004) in Russia find public spending increases prior to elections and declines immediately afterward without corresponding changes in local tax revenues. Veiga (2007) identify a decline in fiscal balance and local taxes with increased spending during election years in Portugal. In Colombia,

Drazen (2010) note an increase in infrastructure spending ahead of elections. Sakurai (2011) report rising expenditures and falling local tax revenues in election years in Brazil, while Guillamón and Bastida (2013) reveal increased local police spending before elections in Spain. Conversely, Bee (2015) find no significant changes in total expenditures or taxes in U.S. local election years, but observe a rise in municipal employment sectors such as police, education, and sanitation. In the context of Italian municipalities, Alesina (2017) examine property taxes during the 2012 fiscal consolidation and sovereign debt crisis, finding evidence of PBC on property tax rates. Giommoni (2019) finds mayors set lower (sur) tax rates for their own income bracket, and that both tax rates and progressivity are affected by the electoral cycle. Repetto (2018) identifies a pronounced PBC effect in the capital account, along with a more modest impact on various aggregates of current revenue. These effects are moderated by the level of voter attentiveness and access to information. Lastly, Bonfatti (2019) focus on investment spending, identifying a weaker budget cycle in municipalities unconstrained by fiscal rules but no evidence of a cycle in revenues.

In summary, while numerous studies have investigated the phenomenon of PBCs, most have found strong evidence of their impact on diverse investment and expenditure decisions, with more varied results concerning revenues. Our research contributes to this field by providing robust evidence concerning "everyday" highly salient budget items such as MSW fees and property taxes. By investigating these two distinct revenue sources, we have deepened our understanding of mayors' opportunistic behavior, revealing nuanced strategies that may have previously been overlooked. This all-encompassing analysis, combined with the rigorous methodologies employed, underscores the significance of our study in the ongoing exploration of political and fiscal dynamics at the local level.

The remainder of the paper is organized as follows. Section 2 offers an overview of the institutional setting, highlighting the significance of waste and property taxes in the municipal budget and describing the electoral system in local Italian elections. In this section, we also introduce the dataset and main variables. Section 3 outlines our empirical methodology, presenting the baseline results and several robustness checks of our primary findings. In Sect. 4, we delve into the mechanisms underlying the opportunistic PBC. Finally, in the concluding section, we provide our closing remarks.

## 2 Institutional setting and data

### 2.1 Institutional context

Italy is divided into nearly 8,000 municipalities, which represent the smallest administrative units in the country. Municipalities are responsible for providing local public goods and services such as transportation and traffic management, elderly care, nursery schools, and local law enforcement. The mayor oversees the municipal administration, while the city council holds limited legislative authority. Key decisions regarding the allocation of municipal resources and the distribution of municipal investments fall under the mayor's purview. However, the city council must approve all policy decisions, including the budget.

Mayors are directly elected for five-year terms with a two-term limit (three terms for municipalities under 3,000 inhabitants since 2014). The electoral system depends on the population of the municipality: mayors of municipalities with fewer than 15,000 residents are elected through a plurality system with a single round, while mayors of municipalities with more than 15,000 residents are elected through a runoff system with two rounds. In

the latter case, if no candidate receives 50 percent of the vote in the first round, the top two candidates compete in a second round. The city council is elected using an open-list proportional representation system based on a single at-large district. Council candidates must endorse mayoral candidates, and the winning mayor is always granted a solid majority in the council (two-thirds in smaller municipalities, 60 percent in larger ones). In the event of death, resignation, or a vote of no confidence by the council, new elections are called. Municipal elections typically take place between April 15 and June 15, and the election year varies across municipalities. Most mayors do not openly belong to national parties; this is particularly common in small municipalities, where nonpartisan voter associations predominate. Ninety-eight percent of municipalities with more than 15,000 residents and 20 percent of those with fewer than 15,000 residents have partisan mayors.

Italian municipalities possess substantial budgetary autonomy. Their revenues are divided into three distinct categories: tax revenues (*entrate tributarie*), current transfers from higher levels of government, and non-tax revenues (*entrate extratributarie*). Tax revenues, which comprise roughly 50% of total revenues, are derived from various levies and duties that citizens and businesses must pay to the municipality. Examples of these taxes include the municipal property tax (IMU, formerly known as ICI), the MSW fee (TARI, formerly known as TARSU), the public space and area occupation tax, the advertising and billboard tax, and the municipal personal income tax surcharge. Current transfers, accounting for approximately 25% of total revenues, primarily come from central and regional governments. Non-tax revenues, which constitute the remaining 25%, encompass all other revenues not originating from tax collection. Some examples of non-tax revenues include proceeds from public services, fines and administrative penalties, profits and dividends from special and participating companies, and proceeds from the disposal and management of municipal assets.

Municipalities primarily rely on the municipal property taxes as a significant source of revenue, often accounting for 20% to 30% of total revenues. Municipalities determine the applicable tax rate within a government-set range. As noted by Cabral (2012), the municipal property taxes have frequently been perceived as a burdensome obligation, sparking heated political debate in Italy over the past two decades. In 2006, owner-occupants were granted a substantial tax credit, and by 2008, they were entirely exempted. Due to the financial crisis, the municipal property tax for owner-occupants was reinstated in 2012–2013, but subsequently abolished. Throughout the majority of the years encompassed by our dataset, owner-occupants have been exempted from the municipal property tax. Consequently, most municipal property tax receipts are derived from second (rental or holiday) homes and small business premises.

Municipalities in Italy also collect a MSW fee, which serves as an essential revenue source for funding waste management services. This fee may account for approximately 5% to 15% of total revenues and is paid by the occupiers of a property, or by the owners in the case of an empty or holiday home. The MSW fee is generally determined based on the number of occupants and the square footage of the property. The compliance rate for the MSW fee can vary significantly across different municipalities and regions, as it is influenced by factors such as the efficiency of the local waste management system, the socio-economic characteristics of the population, and the effectiveness of monitoring and enforcement mechanisms.

A municipality in Italy has the authority to apply a surcharge of up to 0.5 percent to the income tax rate for its residents. This additional tax is collected through payroll deductions or as part of the general income tax bill. Consequently, voters may not directly associate this tax with the performance of the municipal administration, as it is embedded within

the broader income tax framework (see Bracco and Porcelli 2019). The relative obscurity of this tax within the overall income tax payment process may result in a reduced level of scrutiny or accountability concerning the municipality's spending decisions and service delivery.

Municipalities in Italy also receive grants from the central government, which serve to compensate those with lower fiscal capacity and higher historical expenditure patterns. These grants help to level the playing field and ensure the provision of essential public services in less affluent areas. Access to debt for Italian municipalities is significantly constrained. Since 1999, the majority of municipalities have been subject to fiscal guidance under the so-called Domestic Stability Pact. This pact mandates adherence to national public finance objectives, including limits on deficit and expenditure. The Domestic Stability Pact is designed to ensure fiscal responsibility at the local level, in line with the country's overall financial goals. Given their already limited spending capabilities, very small municipalities have been exempted from these fiscal constraints.<sup>1</sup>

The final significant component of municipal revenue comes from non-tax sources, generated mainly through various fines and fees. The common characteristics of these components include their relatively small individual amounts and their potentially irregular nature throughout the year. As a result, it can be difficult for voters to assess the cumulative impact of such payments accurately. For instance, fees should ideally be directly linked to the cost of providing the service. However, this is not always the case in Italian municipalities. Apart from MSW fees, there are virtually no legal restrictions on the amount or origin of revenue that municipalities can generate through fines and fees, nor are there specific regulations on how these revenues should be allocated.

Each December, the municipal government prepares a budget for the upcoming year. This planning document outlines the allocation and distribution of municipal expenditures for the forthcoming fiscal year, as well as the financing sources, including tax rates and tariff structures. The budget undergoes discussion in the council and must be approved by year-end. Conversely, the financial statement serves as the ex-post record of the municipality's actual expenditures and receipts for the previous fiscal year. Accessible to the public, the balance sheet must be approved by April 30<sup>th</sup> each year.<sup>2</sup>

## 2.2 Data description

Table 1 provides a summary of the descriptive statistics for the sample. Due to the lack of availability of municipal financial statement data from the autonomous regions of Valle d'Aosta and Trentino-Alto Adige, these regions have been excluded from the dataset. Collectively, these regions constitute less than 5 percent of all Italian municipalities. The final sample encompasses 7,512 municipalities from 2000 to 2015.

The final dataset is compiled from multiple sources, with all financial values expressed in euros per capita. Data pertaining to municipal financial statements are obtained from the Ministry of Internal Affairs' website and adjusted for inflation (2019 constant prices). From these data, we construct our primary outcome variables: MSW fee revenues and municipal

<sup>1</sup> Since 2002, municipalities with populations below a specified threshold have been exempted from certain fiscal constraints. This threshold has evolved over time: from 2002 to 2004, the population limit was set at 3,000; from 2005 to 2012, it increased to 5,000; and as of 2013, the threshold has been reduced to 1,000.

<sup>2</sup> Starting in 2009, as mandated by Law 189/2008, municipalities were required to approve and report their financial statements within the period from April 30 to June 30.

**Table 1** Descriptive statistics

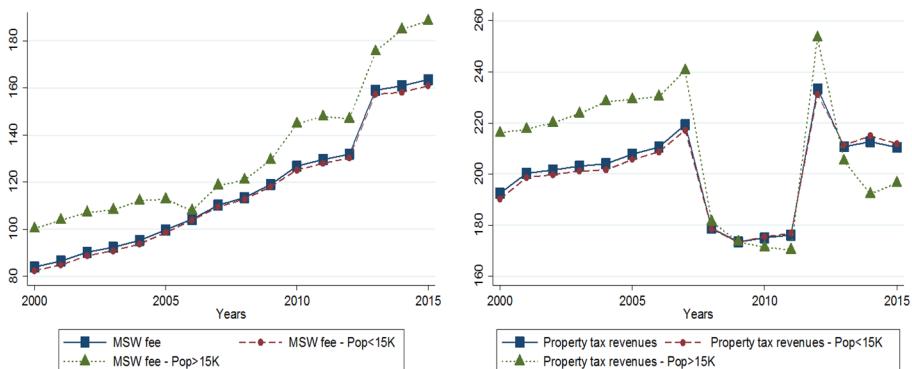
Variables	Obs	Mean	St. dev	Min	Max
<i>Outcomes</i>					
MSW fee revenues per capita	97,375	113	72.4	36.4	1,680.9
Property tax revenues per capita	106,234	201.2	194.9	22.1	9,950.9
National transfers per capita	103,909	513.6	1439.8	10.7	93,052.9
Regional transfers per capita	77,641	366.9	1249.3	6.2	92,690.7
Other tax revenues per capita	86,032	144.0	137.4	11.3	5,370.5
Non-tax revenues per capita	104,045	195.8	347.8	22.8	26,710.8
<i>Controls</i>					
Preelection	106,234	0.2	0.4	0	1
Population size/1,000	106,234	7.2	39.2	0.03	2,872.1
Average income	106,234	18.1	4.2	6.2	79.9
%Elderly	106,234	22.1	6.2	4.4	63.3
Population density	106,234	282.4	613.8	0.9	15,564.5
Population education	106,234	7.8	0.9	3.8	12.6
Mayor education	85,557	14.1	3.1	5	19
Female mayor	87,518	0.1	0.3	0	1
Mayor age	87,518	50.8	9.9	19	87
Right wing	106,222	0.1	0.3	0	1
Full term	106,234	0.9	0.2	0	1
Binding term limit	106,215	0.3	0.5	0	1
South	106,234	0.5	0.5	0	1
Social capital 1: blood donation	98,072	0.03	0.02	0	0.1
Social capital 2: turnout at referenda	98,072	0.8	0.08	0.6	0.9
Social capital 3: divorce	98,072	0.9	0.07	0.7	0.97

All data pertaining to elections and municipal financial statements have been obtained from the Ministry of Internal Affairs' website. Municipal control variables are sourced from ISTAT. Lastly, proxies for social capital are derived from Guiso and Sapienza (2004)

property tax revenues. Additionally, we incorporate information on: (i) grants that municipalities receive from both the central government and regions, (ii) revenues generated from other taxes (*entrate tributarie*), and (iii) non-tax revenues (*entrate extratributarie*).

In our analysis, we opt for financial values recorded using the accrual accounting method over the cash accounting method. This choice is motivated by the fact that accrual accounting better captures the outcomes of political decision-making, as it recognizes revenues at the moment they are enacted and implemented.<sup>3</sup> Conversely, the cash accounting method records revenues only upon receipt of cash payments. This difference can lead to significant discrepancies between accrued and cashed revenues, as collection and payment regulations may permit tax payments to be made in subsequent years. Empirical research supports the notion that cash-based revenues and expenses are not interchangeable with accrual-based measures and, thus, should not serve as suitable proxies for decision-making

<sup>3</sup> To prevent issues with zero values, which might arise from balance-sheet information misreporting by administrative staff, we have recoded MSW fee revenues, property tax revenues, and transfers as missing.



**Fig. 1** Evolution of MSW fee and Property tax revenues. Note: Data pertaining to municipal financial statements are obtained from the Ministry of Internal Affairs' website and adjusted for inflation (2019 constant prices). The left (right) panel plots MSW fee (property tax) revenues for municipalities according to the population size

and resource allocation (Cohen 2012). Moreover, cash figures may be more closely tied to citizens' behavior regarding the fulfillment or postponement of payments, rather than truly reflecting political decisions (Raffer 2020).<sup>4</sup>

Figure 1 provides an overview of the changes observed in the two primary sources of revenue addressed in the empirical analysis over the sample period. Specifically, panel (a) illustrates the mean value over time of MSW fee revenues, while panel (b) focuses on property tax revenues. Regarding MSW fees, we observe an upward trend for both small municipalities (those with a population below 15,000) and larger ones (with populations exceeding 15,000). However, the average revenue is consistently higher for the latter group. In contrast, property tax revenues experienced a significant decline from 2008 to 2012 across all municipality sizes, a result of legislative changes discussed in the previous section. From 2013 onward, the average revenue for larger municipalities decreased at a more pronounced rate.

Drawing on the electoral historical archive of the Ministry of Internal Affairs, we extracted data on election results. Based on this information, we constructed the variable *Preelection*, which is assigned a value of 1 in the year prior to an election and 0 otherwise. We also created the *Full term* variable, a dummy that takes the value of 1 if the election is not called prematurely and 0 otherwise, and the *Binding term limit* variable, which assumes a value of 1 if mayors cannot re-run for office by law and 0 if they face a slack term limit. Furthermore, this data source enabled us to collect information on mayors' characteristics, such as years of schooling, gender, age, and the political leaning of their supporting coalition.

Data on social capital are sourced from Guiso and Sapienza (2004) and are cross-sectional at the provincial level. We consider three proxies for social capital: (1) the number of 16-ounce blood bags collected by AVIS (the Italian association of blood donors)

<sup>4</sup> As a result, accrual accounting has seen increasing adoption by governments across various administrative levels worldwide, as it is believed to offer a more accurate depiction of a government's financial situation while facilitating better assessments of present and future risks (Cohen 2012).

per inhabitant at the province level in 1995; (2) voter turnout at the province level for the divorce referendum in June 1978; and (3) voter turnout for all referendums that occurred in Italy between 1946 and 1989 (including the divorce referendum), also at the province level. Lastly, we use ISTAT statistics for all remaining data at the municipal level. Specifically, we have information on the size of the resident population, the average educational attainment of the population, population density, the proportion of individuals aged 65 or above, and the average income earned within each municipality.

### 3 Empirical methodology and results

#### 3.1 Identification strategy

Our analysis capitalizes on the staggered nature of municipal elections in Italy, a feature that can be traced back to the post-World War II restoration of democracy in the country. In 1946, the majority of municipalities held elections for the first time. However, since then, municipal councils have not adhered to a uniform five-year renewal cycle for various reasons, such as the mayor's resignation or death, motions of no confidence, failure to approve financial statements, corruption scandals, or suspected mafia infiltration in the council. Crucially, the Ministry of Internal Affairs exogenously determines the election date each year, thereby precluding any strategic manipulation of the election date by incumbent mayors. Furthermore, the geographic location of the municipality has no bearing on the election schedule.

To evaluate the role of the political budget cycle, we exploit the panel structure of our dataset and estimate a panel fixed effects model at the municipal level, employing a staggered difference-in-differences strategy as follows:

$$y_{it} = \beta Preelection_{it} + \gamma' X_{it} + \mu_i + \delta_t + \epsilon_{it} \quad (1)$$

where the outcome variable is either the per-capita revenues from MSW fees or the per-capita revenues from property taxes in municipality  $i$  at time  $t$ . As in Bracco (2018), our main variable of interest is  $Preelection_{it}$ , which, as previously mentioned, is a dummy variable that takes the value  $1$  in the pre-electoral year and  $0$  otherwise. In estimating equation (1), we conduct a comparison of the outcome variable across municipalities belonging to distinct groups—resulting from the staggered nature of elections—and between years within the same municipality.

In equation (1), we introduce the vector  $X_{it}$ , which encompasses municipal characteristics potentially correlated with our outcome, including population size, the proportion of elderly residents, average taxable income, population density, and the average educational attainment of the local population. Furthermore,  $\mu_i$  denotes municipality-level fixed effects, while  $\delta_t$  represents year-level fixed effects. Notably, municipal fixed effects account for time-invariant attributes of municipalities that may be associated with tax revenue levels, and year dummies capture potential common shocks affecting the economies of municipalities. Although not explicitly presented in the equation, we consistently incorporate a set of linear municipal-specific trends because certain unobserved factors may contribute to divergent tax revenue evolutions across municipalities. Finally,  $\epsilon_{it}$  denotes the stochastic error of our econometric model.

In light of recent econometric literature, employing a standard TWFE specification may result in biased estimates (e.g., Borusyak 2017; Callaway 2021; Goodman-Bacon

2021; Sun 2021; de Chaisemartin 2022). A primary identification concern arises from potential bias in cases of heterogeneous treatment effects over time, as TWFE models with staggered adoption consolidate treatment effects into a single coefficient. More precisely, de Chaisemartin et al. (2019) demonstrate that when computing the regression coefficient—a weighted sum of the ATEs for each group and period—some ATEs may be assigned negative weights, yielding a biased coefficient estimate.

To address this issue, we also employ an alternative estimator proposed by de Chaisemartin (2022), which proves robust to heterogeneous or dynamic treatment effects. As such, we compare municipalities that have not yet been treated at a specific time with those undergoing treatment for the first time within the same period. This approach ensures a more rigorous identification strategy, in line with the recent advancements in the econometric literature on causal inference.<sup>5</sup>

### 3.2 Baseline results

Table 2, panel (a), presents the TWFE baseline results for the entire sample. In each specification, standard errors are robust to heteroskedasticity and clustered at the municipal level to account for serial correlation. We consistently consider municipalities' time-variant characteristics, municipal-year fixed effects, and a linear municipal-specific trend. The outcome in column (1) represents MSW fee revenues per capita, while the outcome in column (2) indicates property tax revenues per capita. As a contextual robustness check, to assess the potential for biased coefficient estimates in the TWFE results, Table 2, panel (b), presents the findings derived from the application of the alternative estimator proposed by de Chaisemartin (2022) in its static version, which accounts for heterogeneous treatment effects.

Our findings reveal that the pre-election year has a negative and significant impact on MSW fees and property tax revenues. The findings from both panels exhibit remarkable congruence regarding both sign and statistical significance. In pre-election years, based on the TWFE, we observe an approximate 1% decrease in MSW fee revenues and a 1.05% decline in property tax revenues, using the average values from our sample. The static robust estimator suggests a steeper decline, registering at 1.12% for MSW fee revenues and 2.79% for property tax revenues. These percentages gain clearer economic significance when contrasted with average effects derived from more specific sample subsets, as elaborated upon later in this section. These average effects also align with findings from existing literature on local PBC and revenues, such as Repetto (2018), which examined per-capita tax, non-tax, and total revenues, and Alesina (2017), which focused on the property tax rate as the primary variable of interest.

Both MSW fee and property tax revenues are larger in municipalities with higher income per capita, reflecting that wealthier areas may have larger estates or more

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<sup>5</sup> The estimator suggested by Callaway (2021) is not appropriate for our case for two reasons: (1) it precludes the inclusion of covariates in the model, and (2) it is only applicable to DiD setups where treated units maintain their treated status in subsequent periods. Additionally, Sun (2021)'s approach is tailored to interpret estimates from two-way fixed effects specifications exclusively when "dynamic" indicators pertaining to the time relative to treatment are incorporated. Consequently, we choose to employ the more general DiD estimator developed by de Chaisemartin et al. (2019) and de Chaisemartin (2022), which addresses potential issues arising from negative weights and is suitable for both "static" and "dynamic" specifications of TWFE.

**Table 2** PBC on MSW fee and property tax revenues: full sample

	(1)	(2)
	MSW	Property
<i>Panel (a): TWFE estimates</i>		
Preelection	−1.078*** (0.290)	−2.030** (0.855)
Population/1,000	0.099 (0.283)	−1.444 (0.950)
Average income	2.951*** (0.283)	7.104*** (0.784)
%Elderly	0.045 (0.207)	−2.439*** (0.561)
Pop. Density	−0.040*** (0.009)	−0.100*** (0.023)
Education Pop	4.124*** (1.516)	−6.268* (3.612)
Municipal FE	Yes	Yes
Year FE	Yes	Yes
Municipal trend	Yes	Yes
Observations	98,666	106,234
R-squared	0.795	0.830
No. municipalities	7,512	7,508
% ATTs with negative weights	0.0008	0.0004
Sum of negative weights	−0.00013868	−0.00008569
$\bar{\sigma}_{fe}$	3.0894	6.1831
<i>Panel (b): de Chaisemartin (2022)</i>		
Preelection	−1.272*** (0.406)	−5.623*** (1.127)
N	87,415	96,127
Switchers	35,443	38,989

The dependent variable is indicated at the top of each column and is measured by MSW fee revenues per capita (column 1) and property tax revenues per capita (column 2). Standard errors are robust to heteroskedasticity and clustered at the municipal level (shown in brackets)

Significance levels are represented as follows: \* for 10%, \*\* for 5%, and \*\*\* for 1%

commercial entities contributing to the MSW fee, as well as more valuable properties or multiple properties that increase property taxes. Conversely, municipalities with a higher percentage of elderly residents might have stable or declining property values and potentially exemptions or reductions in property taxes for seniors, all of which can explain the negative association with property tax revenues. The negative correlation with population density may point to greater efficiency in providing services such as waste collection in densely populated areas, possibly due to economies of scale, and to a higher concentration of owner-occupiers with smaller or less valuable properties, resulting in lower property tax revenues. The positive association of average education levels with MSW fees could suggest that more educated residents may demand better waste services or be more willing to pay for environmentally responsible disposal methods. However, it is essential to

recognize that these interpretations are conditioned by the presence of municipal and year fixed effects in the analysis, which absorb a substantial amount of variation and control for unobserved heterogeneity across municipalities and time.

In Table 2, panel (a), we estimate the weights attributed to each of the average treatment effects to compute the comprehensive  $\hat{\beta}_{fe}$  estimate. For both outcomes, we observe an irrelevant percentage of ATTs with negative weights, resulting in a cumulative sum of negative weights equal to approximately  $-0.0001$ .<sup>6</sup> Additionally, we provide the diagnostic statistic,  $\bar{\sigma}_{fe}$ , which evaluates the validity of the  $\hat{\beta}_{fe}$  estimate concerning treatment heterogeneity across municipalities and throughout electoral years. This diagnostic statistic corresponds to the minimum value of the standard deviation required for the actual parameter to be zero, notwithstanding the presence of a statistically significant effect of  $Preelection_{it}$ . In particular,  $\bar{\sigma}_{fe}$  implies that  $\hat{\beta}_{fe}$  and the ATTs may exhibit different signs if the standard deviation of the ATEs of  $Preelection_{it}$  across treated municipalities and years exceeds 3.0894 and 6.1831, respectively, for MSW fee and property tax revenues. Nonetheless, a glance at Table 2, panel (a), reveals that the standard deviations of the coefficients remain comfortably beneath these delineated limits. In essence, the minor negative weights of the ATTs do not pose a challenge to the validity of the TWFE estimates.<sup>7</sup>

In Fig. 2 we illustrate the dynamic pattern of both outcomes. Panel (a) illustrates the TWFE estimation of equation (1), where we have substituted our variable of interest with a set of dummies for both outcomes. These dummies are set to the value of 1 for each year of the term (three, two, and one year prior to elections, as well as one year post-election), and 0 otherwise. In Panel (b), we offer the visualization of the dynamic pattern derived from the de Chaisemartin (2022) method.<sup>8</sup> Using the election year as time  $t$  for panel (a), and two years before the election as  $-1$  for panel (b) as reference points, the point estimates presented in Fig. 2 depict a trend in line with the presence of the PBC at the local level for both sources of revenue.<sup>9</sup>

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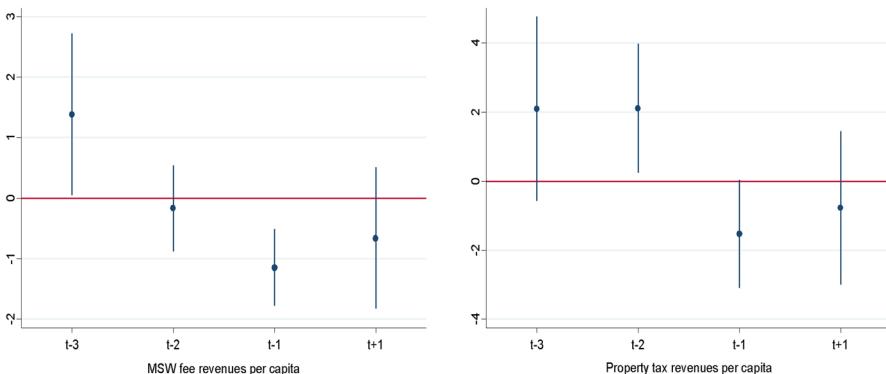
<sup>6</sup> We employ the *twowayfeweights* command, as devised by de Chaisemartin et al. (2019) and de Chaisemartin (2022).

<sup>7</sup> A key assumption of the DiD approach is that in the absence of treatment, the evolution of our outcome across municipalities would have proceeded along parallel trajectories. We recognize that examining outcome differences in pre-electoral years does not work as a placebo in our context, since the comparison is within the same municipality over time, by controlling for municipal-year fixed effects. Still, the diagnostic test in Table 2, panel (a), revealing a very small fraction of negative weights, underscores the robustness of TWFE estimates to heterogeneity across municipalities and over time.

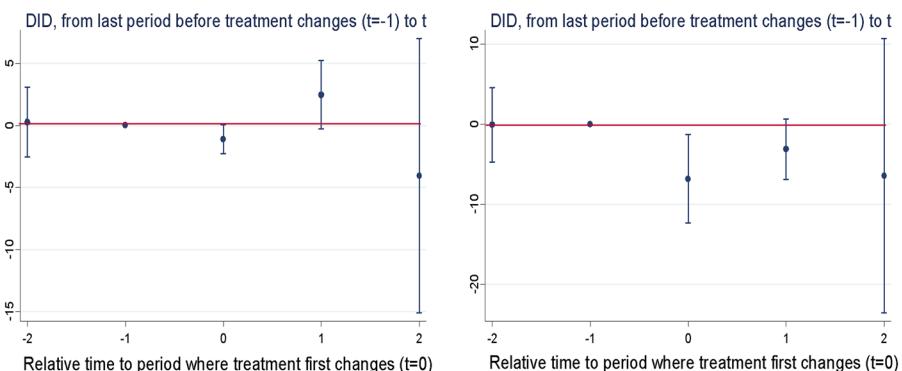
<sup>8</sup> Specifically, we applied the “*dynamic\_robust*” approach in Stata. In other words, we allowed the dynamic estimator to contrast the outcome evolution of first-time switchers with those yet to switch. This comparison extends from the last period before the first-time switchers’ treatment changes to the  $l^{th}$  period following that change.

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(a) TWFE



(b) de Chaisemartin &amp; D'Haultfoeuille (2022)



**Fig. 2** Full sample - Dynamic effect. Note: Panel **a** illustrates the results of the event study implemented via the OLS estimator, while Panel **b** displays the point estimates derived from the application of the estimator developed by de Chaisemartin (2022). The dependent variable for both panels is the MSW fee revenues per capita (on the left side) and property tax revenues per capita (on the right side). The coefficient estimates are presented alongside their respective 95 percent confidence intervals

from the de Chaisemartin (2022) method.<sup>10</sup> Using the election year as time  $t$  for panel (a), and two years before the election as  $-1$  for panel (b) as reference points, the point estimates presented in Fig. 2 depict a trend in line with the presence of the PBC at the local level for both sources of revenue.<sup>11</sup>

<sup>10</sup> Specifically, we applied the “dynamic\_robust” approach in Stata. In other words, we allowed the dynamic estimator to contrast the outcome evolution of first-time switchers with those yet to switch. This comparison extends from the last period before the first-time switchers’ treatment changes to the  $l^{\text{th}}$  period following that change.

<sup>11</sup> The observation that MSW fee and property tax revenues may be lower in the year following the election compared to the election year itself is not entirely unexpected. The full impact of adjustments to MSW fees and property tax rates typically materializes in the second half of the year, i.e., post-election. This temporal dynamic renders not only the year preceding the election but also the year succeeding it as potentially more consequential than the election year itself. After securing electoral victory, incumbents may perceive that they have both a mandate and ample political capital to enact fiscal measures that are more favorable to

In an effort to explore the underlying channels responsible for our findings and to account for the potential influence of mayors' re-election incentives on the PBC, we utilize the extensive information available in our dataset and segment the sample based on the mayor's status. In Italy, mayors are restricted to two consecutive terms in office.<sup>12</sup> Consequently, PBCs should be more pertinent for non-term-limited mayors, who are likely to strategically manipulate revenues prior to elections to optimize their likelihood of success. Conversely, such incentives are expected to be less salient—or potentially absent—for term-limited mayors. Table 3 displays the results for the disaggregated term limits, specifically the TWFE in panel (a) and the static robust estimator in panel (b).

For both MSW fee and property tax revenue patterns, the results consistently indicate that only municipalities under a slack term limit (columns 1 and 5) register a statistically significant decline in revenue outcomes in the year preceding the elections, with decreases of 1.18% (1.26% in panel (b)) and 1.44% (3.09% in panel (b)) for MSW fee and property tax revenues, respectively. This pattern is primarily driven by those municipalities where the incumbent mayor opts to run for re-election (columns 2 and 6) with a reduction of approximately 1.90% (2.05% in panel (b)) for MSW fee revenues and, again, 1.44% (4.44% in panel (b)) for property tax revenues. We observe a consistent increase in the average percentage effect as the sample more precisely captures mayors who have a genuine incentive to manipulate revenues to gain electoral consensus. Conversely, we do not observe a PBC in municipalities where the mayor chooses not to run again (columns 3 and 7), or when the term limit is binding (columns 4 and 8).

Finally, consistently with Figs. 2, 3 illustrates the point estimates of the dynamic effect of the disaggregation of term limits. This figure underscores a pattern consistent with the presence of the PBC at the local level for slack-term limits, specifically driven by incumbent mayors seeking re-election. These results are robust for both revenue sources.

In summarizing the magnitude of the coefficients, an apparently small percentage change in revenues, though statistically significant and aligned with prevailing local PBC literature, does not necessarily denote that its impact is negligible or inconspicuous in the scope of the PBC, particularly when juxtaposed against potential expenditure manipulation. The literature, in fact, suggests the contrary: the PBC shows a more pronounced proportional effect on expenditures than on revenues. Specifically, in the PBC literature, we often observe more substantial positive percentages (averaging between 5% and 20%) when expenditures are the manipulated variable (e.g., Akhmedov (2004), found a 5% increase in total expenditure; Veiga (2007), reported a 5% rise in current expenditure and 7% in capital expenditures; Sakurai (2011), observed a 5% upsurge in total expenditures; Repetto (2018), noted a 19% uptick in investment expenditures; Bonfatti (2019), identified a 10-20% increase in capital spending). This stands in marked contrast to the more modest negative percentages observed when the focus shifts to revenues. For instance, Veiga (2007) reported a 10% reduction in total revenues. This aligns more closely with findings similar to our own, such as the 1-2% decrease in various per-capita revenue items documented by

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Footnote 11 (continued)

residents. Such a scenario could involve a strategic rebalancing, wherein the incumbent opts to reduce these fees and taxes, accepting a constrained budget as a trade-off for fulfilling electoral promises or enhancing public sentiment. It is, however, crucial to emphasize that the coefficients corresponding to the year following the election are not statistically significant at conventional levels.

<sup>12</sup> Under Law n. 56 of April 2014, mayors in municipalities with fewer than 3,000 residents are now eligible for a third term. This legislative change was prompted by the challenges small municipalities faced in securing qualified candidates for the mayoral office.

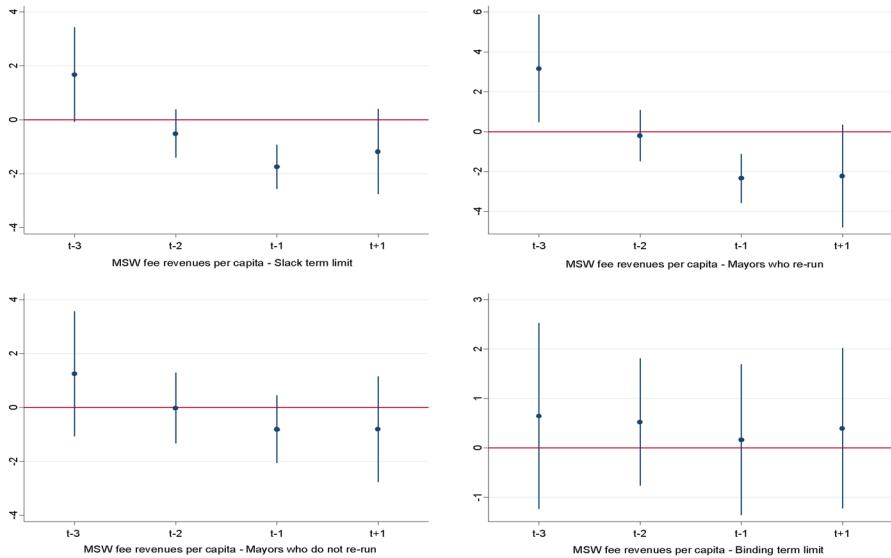
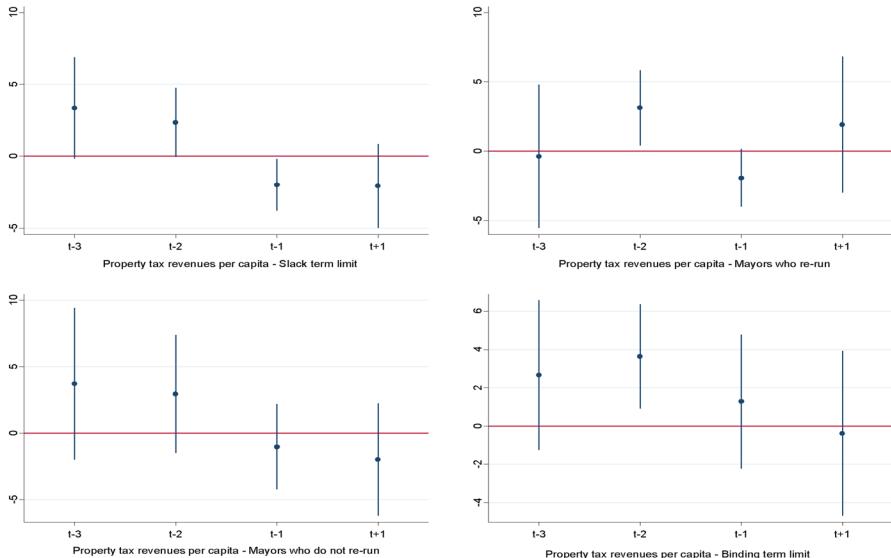
**Table 3** PBC on MSW fee and property tax revenues: Slack vs. binding term limit

	(1) MSW	(2) MSW	(3) MSW	(4) MSW	(5) Property	(6) Property	(7) Property	(8) Property
Slack term limit	Mayors who <i>re-run</i>	Mayors who <i>do not re-run</i>	Binding term limit	Slack term term limit	Mayors who <i>re-run</i>	Mayors who <i>do not re-run</i>	Mayors who <i>re-run</i>	Binding term limit
<i>Panel (a): TWFE estimates</i>								
Preelection	-1.398*** (0.376)	-2.249*** (0.611)	-0.360 (0.492)	-0.290 (0.506)	-2.846*** (0.816)	-2.904*** (0.975)	-2.044 (1.300)	0.166 (2.288)
Population/1,000	0.289 (0.228)	-1.468* (0.770)	0.453*** (0.088)	-1.286* (0.692)	-1.130 (0.773)	-9.409*** (2.200)	-0.498** (0.219)	-5.142* (2.699)
Average Income	2.639*** (0.307)	2.56*** (0.509)	1.742*** (0.402)	2.449*** (0.548)	7.512*** (1.056)	6.023*** (1.199)	5.869*** (1.719)	5.569*** (1.050)
%Elderly	-0.005 (0.240)	-0.211 (0.395)	-0.067 (0.380)	-0.190 (0.434)	-2.658*** (0.795)	-5.044*** (1.409)	-1.032 (1.042)	0.339 (0.855)
Pop. Density	-0.033*** (0.010)	-0.047*** (0.014)	-0.016 (0.010)	-0.047*** (0.012)	-0.093*** (0.027)	-0.068* (0.037)	-0.083*** (0.025)	-0.071*** (0.020)
Education Pop	3.614*** (1.595)	4.194 (2.758)	3.764* (2.129)	5.186*** (2.162)	-5.932 (4.094)	-2.521 (6.973)	-8.434 (5.481)	-1.500 (4.458)
Municipal FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	69,056	36,709	31,837	30,102	73,947	39,467	33,962	32,786
R-squared	0.808	0.838	0.846	0.870	0.837	0.860	0.852	0.867
<i>Panel (b): de Chaisemartin (2022)</i>								
Preelection	-1.495*** (0.384)	-2.430*** (0.927)	-0.992 (0.561)	-1.062 (0.935)	-6.114*** (1.660)	-8.943*** (2.477)	-4.284*** (2.026)	-1.449 (4.450)

**Table 3** (continued)

	(1) MSW	(2) MSW	(3) MSW	(4) MSW	(5) Property	(6) Property	(7) Property	(8) Property
<i>Slack term</i>			<i>Mayors who</i>		<i>Slack term</i>	<i>Mayors who</i>	<i>Mayors who</i>	<i>Binding</i>
<i>limit</i>		<i>re-run</i>		<i>do not re-run</i>	<i>term limit</i>		<i>re-run</i>	
<i>N</i>	54,941	24,692	24,682	20,632	59,937	28,098	26,877	24,867
Switchers	19,425	6,950	8,259	5,833	21,140	7,613	9,037	12,596

The dependent variable is indicated at the top of each column and is measured by MSW fee revenues per capita (columns 1-4) and property tax revenues per capita (columns 5-8). Standard errors are robust to heteroskedasticity and clustered at the municipal level (shown in brackets). Significance levels are represented as follows: \* for 10%, \*\* for 5%, and \*\*\* for 1%

(a) *MSW fee revenues*(b) *Property tax revenues*

**Fig. 3** Slack vs. binding term limit - Dynamic effect. *Note:* The panels show the event study results, implemented through the OLS estimator. The dependent variable is MSW fee revenues per capita (Panel a) and property tax revenues per capita (Panel b). The coefficient estimates are presented alongside their respective 95 percent confidence intervals. The reference category is the year of the election

Repetto (2018), and the 2-4% reduction in the property tax rate (expressed in percentage terms) observed by Alesina (2017). Given that property tax schedules typically feature a single flat rate for each asset category (e.g., residential, business), there should be minimal

conceptual divergence between examining tax revenues and tax rates.<sup>13</sup> Lastly, it is worth noting that Bonfatti (2019) found no statistically significant effects on either current or capital revenues.

Such insights compel a reassessment of our perspective. We posit that, beyond specific fiscal constraints, the manipulation of revenues bears more significance than that of expenditures. Simply put, subtle revenue shifts during pre-electoral periods are perceived by incumbent mayors as having significant economic influence on voting taxpayers. Furthermore, within the Italian context, MSW fees and municipal property taxes are particularly salient (as per Bordignon and Grembi 2017); for example, property tax is often referred to as a "hated tax" (Cabral 2012). Both the MSW fees and property taxes are usually paid as one or two lump-sum amounts directly to the municipality, contrasting with other revenue sources like income tax rate surcharges or various fees, which are either less significant or merged with non-municipal tax payments. Such a characteristic is known to significantly increase salience, as emphasized by Chetty and Looney (2009).

In conclusion, our baseline findings reveal a PBC in Italian municipalities for both MSW fees and property tax revenues, as these outcomes decrease near elections compared to other years. This suggests that mayors strategically modify municipal policies to advance their re-election objectives.

### 3.3 Robustness checks

We conducted a series of robustness checks to validate our baseline findings. First, a potential concern within our framework is the legislative changes exempting owner-occupants from property tax payments—particularly during the 2008–2011 period—which could coincide with municipal election patterns, thereby potentially confounding the estimated local PBC. To address this, we refined our model by omitting the years 2008 and 2009, both separately and together. Additionally, in light of the discernible drop in property tax revenues between 2008 and 2011, as evidenced in Fig. 1, we conducted a replication excluding the entire four-year span. These adjustments did not alter our core findings.

Second, we incorporated additional political controls, such as the mayor's age, gender, education, and a dummy variable for right-wing coalitions. Despite their inclusion, these controls did not yield significant effects, and crucially, their integration into the model did not change our primary findings in any meaningful way.<sup>14</sup>

Third, we examined the impact of mandate duration on the results, restricting our empirical analysis to full-term mandates without prematurely called elections. As expected, our primary findings remained consistent with this constraint, given that less than 5% of the total sample comprises mandates expiring before the 5-year term.

<sup>13</sup> The property tax bill is calculated as the product of the land-registry value and the applicable tax rate. For owner-occupants, a tax allowance set by the central government is also factored in, potentially introducing non-linear relationships between tax rates and tax revenues. However, it should be noted that most owner-occupants are fully exempt from this tax. While tax revenues encapsulate the entire array of policy instruments available to a mayor—including varying tax rates for different categories, tax allowances, and exemptions—tax rates may serve as a more effective metric for examining "headline" policies, which often assume a prominent role in electoral campaigns.

<sup>14</sup> We decided to omit these political controls from our primary specification, given that pertinent data is available for merely 80% of the elections within our dataset.

Fourth, we examined outcomes not easily manipulated by local politicians, such as vertical transfers from both the central government and the regions, to underscore that the observed decline in both MSW fees and property tax revenues is solely attributable to the incumbent's intention to manipulate budget decisions leading up to elections. We found that the PBC does not impact these transfers.

We finally conducted a series of supplementary robustness checks: these involved controlling for province-level fixed effects in lieu of municipal fixed effects; omitting the municipal-specific linear trends; representing our dependent variables in logarithmic form, given that both MSW fees and property tax revenues are censored at zero; and including a dummy variable for municipalities adhering to the Domestic Stability Pact within our controls. Across all these tests, the sign, magnitude, and significance of our primary variables of interest persistently aligned with the baseline results, underscoring their robustness.<sup>15</sup>

## 4 Mechanisms

The PBC may manifest differently across various regions of Italy, given the country's significant diversity in terms of economic and social conditions. Northern regions tend to be wealthier and possess greater social capital compared to Southern regions. In areas characterized by poor economic conditions, as discussed by Putnam (1993), incumbents are more prone to fostering clientelistic relationships, while citizens may exhibit a heightened inclination for free riding and abstaining from protesting government misconduct.

In principle, clientelism at the municipal level should be mitigated due to citizens' enhanced ability to monitor local governments compared to central governments. However, when social capital is low, citizens are more inclined to free ride, allowing politicians to readily implement policies aimed at bolstering their electoral support (Jimenez 1999; Mookherjee 2001; Bardhan 2005). In contrast, in areas with high levels of social capital, clientelism is less pervasive, thereby undermining incumbents' attempts to manipulate the information in municipal budgets for electoral purposes.

To ascertain whether the PBC on MSW fees and property tax revenues varies between the South and Center-North of Italy, we carried out separate regressions based on the municipalities' location. Table 4 presents the results. As anticipated, we observe a pronounced negative effect of our variable of interest on both outcomes in the Southern part of Italy (columns 1 and 3). However, no such effect is detected in the Northern part of the country (columns 2 and 4). These findings imply that the PBC is more prevalent in less developed areas of Italy.

Although the primary distinction in social capital endowment in Italy lies between the Center-North and the South, differences also exist within each regional area and there are areas in the Center-North with levels of social capital below those of the South. We employ blood donation as a proxy for social capital, defined by the number of 16-ounce blood bags collected by AVIS (the Italian association of blood donors) per provincial resident in 1995 (Guiso and Sapienza 2004).<sup>16</sup> Specifically, in Table 5, we estimate equation (1) by dividing

<sup>15</sup> The complete results from all robustness checks, including tables and additional information, can be provided upon request.

<sup>16</sup> We additionally examined two alternative indicators: provincial voter turnout for the divorce referendum and voter turnout for all Italian referendums between 1946 and 1989. The findings are strikingly consistent with those discussed in the main body of the paper and can be provided upon request. However, several factors informed our choice towards blood donation. Notably, in 2004, 2009, and 2014, European Parlia-

**Table 4** PBC on MSW fee and property tax revenues: center-North vs. South and slack term limit

	(1)	(2)	(3)	(4)
	MSW	MSW	Property	Property
	South	Center-North	South	Center-North
Preelection	-1.739*** (0.500)	-0.030 (0.548)	-2.172** (0.946)	0.001 (1.235)
Municipal controls	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes	Yes
Observations	23,187	45,869	23,937	50,010
R-squared	0.768	0.827	0.808	0.829

The dependent variable is indicated at the top of each column and is measured by MSW fee revenues per capita (columns 1-2) and property tax revenues per capita (columns 3-4). We control for municipal-year fixed effects and a linear municipal trend, focusing on the 2000–2015 period. Standard errors are robust to heteroskedasticity and clustered at the municipal level (shown in brackets)

Significance levels are represented as follows: \* for 10%, \*\* for 5%, and \*\*\* for 1%

the sample of mayors facing a non-binding term limit based on the median value of our social capital measure, and we do so separately for the South and Center-North regions. This approach aims to ascertain whether the regional disparities in PBC effects on MSW fee and property tax revenues, as highlighted in Table 4, can be attributed to variations in social capital endowments. Consistent with the findings presented in Table 4, the results indicate that PBCs are predominantly active in southern municipalities characterized by low levels of social capital. In this area, the coefficient for the variable  $Preelection_{it}$  remains negative across both sub-samples but attains statistical significance only when below the median threshold for both outcomes. In contrast, for municipalities situated in the Center-North, the coefficient of our variable of interest exhibits a negative (positive) value when below (above) the median level of the blood donation distribution, although these results do not reach statistical significance.

We also investigate whether population size impacts the PBC. On the one hand, larger municipalities might be under greater scrutiny from a more diverse and informed electorate, as well as more comprehensive local media. On the other hand, in smaller municipalities, individual actions of the local government might be more visible and directly felt by voters. To explore this aspect, we split the sample based on the 15,000 inhabitant's cut-off, which the electoral law uses to differentiate between large and small municipalities. The results in Table 6 reveal that the PBC associated with MSW fee revenues is detectable exclusively in small municipalities, but not in large ones, while for property tax revenues the PBC is present in both sub-samples. The contrasting patterns

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Footnote 16 (continued)

ment elections coincided with municipal ones, boosting turnout due to the perceived importance of municipal elections by Italian voters. This overlap could distort turnout as a standalone proxy for social capital. Additionally, we preferred a social capital measure established before our sample's starting year to sidestep unexpected behavioral influences. Moreover, our chosen measure is well-validated in prior research (e.g., Nannicini et al. 2013).

**Table 5** PBC on MSW fee and property tax revenues: Blood donation and slack term limit

	(1) MSW	(2) MSW	(3) MSW	(4) MSW	(5) Property	(6) Property	(7) Property	(8) Property
	South	South	Center-North	Center-North	South	South	Center-North	Center-North
	$\leq median$	$> median$	$\leq median$	$> median$	$\leq median$	$> median$	$\leq median$	$> median$
Preelection	-1.654*** (0.513)	-2.202 (2.084)	-0.020 (1.111)	0.118 (0.616)	-2.073** (0.978)	-2.313 (3.740)	-1.720 (1.741)	0.821 (1.552)
Municipal controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,477	1,710	11,426	34,443	22,233	1,704	11,918	38,092
R-squared	0.764	0.823	0.824	0.830	0.825	0.689	0.851	0.825

The dependent variable is indicated at the top of each column. We control for municipal-year fixed effects and a linear municipal trend, focusing on the 2000–2015 period. Standard errors are robust to heteroskedasticity and clustered at the municipal level (shown in brackets). Significance levels are represented as follows: \* for 10%, \*\* for 5%, and \*\*\* for 1%.

**Table 6** PBC on MSW fee and property tax revenues: Population size and slack term limit

	(1) MSW <i>population≤ 15K</i>	(2) MSW <i>population&gt;15K</i>	(3) Property <i>population≤ 15K</i>	(4) Property <i>population&gt;15K</i>
Preelection	-1.366*** (0.399)	-1.168 (1.255)	-2.692*** (0.885)	-4.595*** (1.328)
Municipal controls	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes	Yes
Observations	63,650	5,406	67,908	6,039
R-squared	0.820	0.676	0.842	0.764

The dependent variable is indicated at the top of each column and is measured by MSW fee revenues per capita (columns 1-2) and property tax revenues per capita (columns 3-4). We control for municipal-year fixed effects and a linear municipal trend, focusing on the 2000–2015 period. Standard errors are robust to heteroskedasticity and clustered at the municipal level (shown in brackets)

Significance levels are represented as follows: \* for 10%, \*\* for 5%, and \*\*\* for 1%

observed between MSW fees and property taxes in municipalities of larger sizes in Italy can be understood through various lenses. The distinct nature of MSW fees, being directly linked to waste collection, contrasts with the broader connection of property taxes to municipal functions. Property tax revenues might be more elastic and easier to adjust without causing significant disruptions in general services or budget balances. In contrast, MSW fee adjustments in larger municipalities might upset waste management services given the administrative complexities and scales involved. In smaller towns, the visibility of individual actions is higher, making both MSW fee and property tax adjustments more noticeable. While for larger municipalities, a possible comparatively higher salience of property taxes with respect to MSW fees, provides more incentives to mayors for manipulation.

We finally investigate the revenue composition of municipal budgets in the year preceding the election. Our baseline findings demonstrate that mayors opportunistically reduce more salient taxes, such as property taxes and MSW fees, ahead of elections. Bordignon and Grembi 2017 argue that "other" taxes, such as the municipal personal income tax surcharge and electricity surcharge, are less salient, as they are not paid directly to the municipality. Similarly, non-tax revenues (*entrate extratributarie*) are applied for specific services provided by the municipality and are considered less salient (Bracco and Porcelli 2019). We directly test whether the pre-election decrease in more salient tax revenues is compensated by an increase in less salient municipal taxes (*entrate tributarie*) and non-tax (*entrate extratributarie*) revenues. We focus on *other tax revenues* per capita, measured by total tax revenues net of MSW fee and property tax revenues per capita, and *non-tax revenues* normalized by municipal population size. The results in Table 7 show that, for the sub-sample of mayors facing a slack term limit, our main variable of interest has a positive and statistically significant impact on non-tax revenues, whereas other tax revenues remain unchanged. As expected, no effect is detected on both revenue sources for the sub-sample of mayors facing a binding term limit. In light of these findings, it is evident that mayors who engage in PBCs strategically offset the reduction in highly salient fees and taxes by

**Table 7** PBC on other tax and non-tax revenues: slack vs. binding term limit

	(1)	(2)	(3)	(4)
	Other tax revenues	Non-tax revenues	Other tax revenues	Non-tax revenues
	per capita	per capita	per capita	per capita
	<i>Slack term limit</i>	<i>Slack term limit</i>	<i>Binding term limit</i>	<i>Binding term limit</i>
Preelection	-0.621 (0.991)	3.988*** (1.425)	-0.112 (1.362)	2.915 (1.729)
Municipal controls	Yes	Yes	Yes	Yes
Municipal FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Municipal trend	Yes	Yes	Yes	Yes
Observations	59,928	74,031	26,522	32,525
R-squared	0.680	0.856	0.737	0.884

The dependent variable is indicated at the top of each column. We control for municipal-year fixed effects and a linear municipal trend, focusing on the 2000–2015 period. Standard errors are robust to heteroskedasticity and clustered at the municipal level (shown in brackets)

Significance levels are represented as follows: \* for 10%, \*\* for 5%, and \*\*\* for 1%

increasing less salient non-tax revenues, thereby maintaining fiscal balance while minimizing voter backlash during the pre-election period.<sup>17</sup>

## 5 Concluding remarks

This paper presents evidence supporting the existence of PBCs in Italian municipalities, demonstrating that incumbent mayors strategically manipulate MSW fee and property tax revenues in the year preceding an election. In pre-election years, we observe an approximate decrease of up to 1.12% in MSW fee revenues and up to a 2.79% decline in property tax revenues. This pattern is primarily driven by those municipalities where the incumbent mayor opts to run for re-election, with reductions of approximately up to 2.05% for MSW fee revenues and up to 4.44% for property tax revenues. While the percentage changes in revenues might seem small, they align with local PBC literature and hold substantial meaning within the scope of PBC, especially when compared to expenditure manipulation. Existing literature demonstrates a more pronounced proportional effect on expenditures than on revenues, with substantial positive percentages for expenditures and more modest negative percentages for revenues. We argue that revenue manipulation bears more significance than expenditure manipulation, as subtle revenue shifts in pre-electoral periods can greatly influence voting behavior. This is particularly true for MSW fees and municipal

<sup>17</sup> As for the composition of municipal spending, the results (not reported here but available upon request) show that there is no PBC on current expenditures. However, in the year before the election, capital expenditures per capita increase by 6.95%. This increase in spending does not seem to be financed by either own revenues or transfers from the central government or regions (as no political cycle emerged from our analyses), suggesting that Italian municipalities tend to increase their level of debt before elections.

property taxes in Italy, which are highly salient and often paid in lump-sum amounts, a characteristic that significantly increases their noticeability.

The empirical evidence remains consistent across a range of tests and specifications. These include analyzing full-term mandates without prematurely called elections; considering the potential concern about legislative changes exempting owner-occupants from property tax payments, which could potentially confound the estimated local PBC; accounting for time-invariant characteristics at the provincial level; adjusting for budgetary constraints or omitting the municipal-specific linear trends; incorporating personal characteristics of the mayors; employing dependent variables expressed in logarithmic terms; and examining vertical transfers, which represent revenues not easily manipulated by local politicians.

Furthermore, we conducted a heterogeneity analysis to account for Italy's economic and social diversity. Results indicate that the PBC is primarily driven by smaller municipalities, municipalities in the South, especially with low levels of social capital, where clientelism is more prevalent. We have also shown that mayors employing PBCs strategically counterbalance reductions in highly salient fees and taxes by raising less salient non-tax revenues, demonstrating incumbents' calculated efforts to bolster re-election chances while managing public finance complexities.

PBCs can undermine democratic processes, as incumbent politicians opportunistically manipulate revenues and expenditures to improve their re-election chances. We conducted a preliminary analysis examining the connection between revenue manipulation and the likelihood of re-election; the results offer weak support for this hypothesis. However, determining causality is difficult due to unobserved confounding factors correlated with both MSW fee and property tax revenues. Future research should employ valid instruments to explore the existence of a causal relationship between revenue manipulation and re-election outcomes.

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