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Political and Non-Political Officials in Local Government*

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Abstract

This paper investigates the impact of non-political administrators on the financial management of local governments. The activity of prefectorial officials is compared with the activity of elected mayors exploiting data extracted from a panel of 7826 Italian municipalities from 2007 to 2018. To address the potential confounding effects and selection biases, we combine a Difference in Difference strategy with machine learning methods for counterfactual analysis. Results show that non-political administrators bring higher financial autonomy and higher collection capacity, raising more revenues at local level. This is consistent with the hypothesis that, since they do not respond to electoral incentives, non-political administrators have lower motivations to behave strategically, not taking their own interests about electoral successes into account when they have to choose the proportion of local versus external revenues for financing local expenditure.

Keywords: Local Government; Electoral Incentives; Accountability.

JEL Classification: D7; H2; H77.

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1 Introduction

There are specific reasons why a political official may act differently from a non-political official. The Downs (1957) model and the seminal work of Nordhaus (1975) put forward the idea that politicians may be driven by private interests and, differently from non-politicians, may care about their reelection prospects. As the economic conditions influence election results (Kramer, 1971; Fair et al., 1975), a politician who wants to be reelected has an incentive to manipulate the economy in order to gain votes. The most clear and immediate instruments involved in this manipulation are benefits to voters which imply modifications to the public budget.

The existence of political budget cycles (cycle in macroeconomic variables induced by the electoral cycle) has been widely documented in both central and local governments (Alesina et al., 1997; Drazen, 2000; Cioffi et al., 2012; Alesina and Passalacqua, 2016). Several studies so far have been focused on empirically testing the hypothesis of political budget cycle in Latin America (Ames, 1990; Remmer, 1993; Nieto Parra and Santiso, 2009; Neto and Borsani, 2004), Africa (Block, 2002), East Europe (Hallerberg et al., 2002), and industrial democracies (Klomp and De Haan, 2011, 2013; Mink and De Haan, 2006; Alesina et al., 1997). Overall, these studies suggest that the occurrence of political business cycles depends on different factors such as the level of development and democracy, government transparency, the country's political system, membership of a monetary union, and the degree of political polarization.

At central level, the government can pursue an expansive budgetary policy while temporarily hiding the harmful consequences from the agents by means of a budget deficit. The government creates the illusion of prosperity until the time when voters realize that they will have to reimburse the deficit thus caused. Even supposing that voters are rational, they don't have complete information about the government's capacity to efficiently provide public goods and transfers, so that the government leverages the informational advantage that it has over voters (Alesina, 1988; Persson and Tabellini, 2002).

At local level, there is an additional source of financing worthy of attention which is a grant from the central government, i.e., intergovernmental transfers (Gilbert and Rocaboy, 2004). Intergovernmental transfers are financed by broad-based taxation but generate local benefits (Veiga and Veiga, 2013). The presence of transfers from central government is justified by the fact that central government addresses territorial redistribution and insures local governments against shocks (Persson and Tabellini, 1994; Boadway, 2004; Lockwood, 1999). However, it has been shown that a large share of intergovernmental transfers undermines the autonomy and accountability of decentralized decision-making, and it generates fiscal illusion, a phenomenon which arises when the link between taxes and benefits is distorted and voters are less likely to

sanction inefficient behaviours of politicians (Oates, 1993; Rodden, 2004; Bird, 1999). Several studies have shown that local politicians make a strategic use of intergovernmental grants, taking their own interests about electoral successes into account when they have to choose the proportion of local revenues versus central transfers for the financing of local expenditure (Brollo and Nannicini, 2012; Bracco et al., 2015; Brollo et al., 2013; Alesina et al., 2019). These phenomena may represent a serious problem for the economic systems as the electoral motivations in intergovernmental transfers generate welfare losses, excessive government spending, and inequities (Boadway and Shah, 2007).

A political use of intergovernmental transfers has been widely documented in municipalities (Bee and Moulton, 2015). Solé-Ollé and Sorribas-Navarro (2008) suggest that partisan alignment has a positive effect on the amount of grants received by municipalities in Spain. Brollo and Nannicini (2012) find that municipalities in which the mayor is affiliated with the party of the central president receive larger discretionary transfers in Brazil. Veiga and Veiga (2013) find that the distribution of transfers is affected by the political cycle in Portugal. Herwartz and Theilen (2014) find a role for political affiliation of the state governor in determining the distribution of transfers in Germany. Bracco et al. (2015) find that municipalities ruled by a mayor affiliated to one of the parties in power at the central level receive a larger amount of grants in Italy. Carozzi and Repetto (2016) have proven that the municipal governments of Parliament members' birth towns receive larger transfers in Italy. Muraközy and Telegdy (2016) find that municipalities with a mayor endorsed by the governing coalition take higher grants for projects visible to voters in Hungary. Chortareas et al. (2016) find strong evidence of pre-electoral budget manipulation in Greek municipalities. Alesina et al. (2019) find that political budget cycles in Italian municipalities are more likely to occur when the career concerns of local politicians are stronger.

This paper contributes to this literature by empirically testing the difference in the financial management between political and non-political officials in local governments. We focus on the Italian case by comparing municipalities administrated by commissioners (officials of the prefectorial career nominated by higher level of government) with municipalities administrated by political mayors. The Italian municipalities are worthy of attention, as they show a large heterogeneity in private sector, revenues from taxation and public expenditure, partly explained by the unresolved social-economic dualism between northern and southern regions, partly by the presence of large fiscal imbalances among the different level of governments (Porcelli, 2014; Lagravinese et al., 2018; Greco et al., 2018; De Simone and Liberati, 2020). From an empirical perspective, we implement a Differences-in-Differences (DiD) design on a panel of 7826 municipalities monitored yearly from 2007 to 2018. To address the selection bias due to the intrinsic differentiation between municipalities administrated by commissioners and municipalities administered by elected mayors, we resort

to machine learning methods in the building of the counterfactual scenario. To generate the artificial control group, we predict the commissioner in municipalities using a set of institutional, demographics and geographical data observed the year before the commissioner is in charge by means of the Gradient Boosting Machines (GBM). Once the predictions have been validated out of the sample, only municipalities with the same predicted commissioner are considered in the DiD estimates. Results show that non-political administrators are associated with higher financial autonomy which implies less external financing. Non-political administrators also show higher collection capacity which expresses the institution's ability to collect their revenue forecast earlier in the year. Overall this evidence shows that non-political administrators take more revenues locally, and this is consistent with their lower incentives to behave strategically in response to an electoral stimulus.

The remainder of the paper is structured as follows. Section 2 presents the institutional framework and the data; section 3 shows the empirical strategy; section 4 presents results; in section 5, the results of robustness checks are presented; and section 6 concludes the paper.

2 Institutional Framework and Data

In the Italian system, the Prefectorial Commissioner (*Commissario Prefettizio* hereafter referred to as commissioner) is the monochromatic organ of extraordinary administration of the municipality.¹ The commissioner, usually an official of the prefectorial career, is appointed following the dissolution of the municipal council with the same act, adopted by the President of the Republic on the proposal of the Minister of the Interior, following a procedure initiated by the prefect of the territory.²

The dissolution of the political municipal council can be ordered for the following reasons (Legislative Decree 267/2000): (i) when he has committed acts contrary to the Constitution or for serious and persistent violations of the law; (ii) when the normal functioning of the municipality cannot be ensured; (iii) when the financial budgets are not approved within the terms; and (iv) when the body does not have the general urban planning instruments and these are not adopted within eighteen months from the date of election of the bodies. An additional reason for the dissolution of the municipal council is the connection of local administrators with organized

¹Italy is divided into 20 regions: 15 are ordinary statute regions and 5 are special statute regions (Trentino Alto Adige, Friuli Venezia Giulia, Valle d'Aosta, Sicilia, and Sardegna). In the special statute regions the Commissioner is called the Extraordinary Commissioner *Commissario Straordinario*.

²In the five special statute regions, the Extraordinary Commissioner is instead appointed by the decree signed by the President of the Region, upon preliminary investigation by the councilor for local autonomy. Usually an official of the regional administration is chosen for the position.

crime (Daniele and Geys, 2015; Daniele, 2019).³ In practice, the office of elected mayors and councillors can end prematurely for: political conflicts, which can lead to the resignation of the mayor or the majority of councillors; the inability to approve the budget; the forfeiture or death of the mayor; and the infiltration of organized crime.⁴

The commissioner has the task of administering the municipality until the election of the new council and the new mayor, to be held in the first electoral round available (usually in the Spring). During the dissolution period, the commissioner exercises the powers conferred on him, he normally unites in himself all the powers of the elected bodies of the municipality: mayor and council. He can carry out any act, both of ordinary and extraordinary administration.

Open-Data about local administrators in Italy from 1986 are available on the Minister of Interior website.⁵ Each year, the database collects information related to local administrators in office as of December 31st. In this paper we only consider data from 2006, as the 2007 is the first year that Istat (2021) provides data concerning financial indicators. Figure 1 shows that from 2007 to 2018 there has been an average of about 100 commissioners per year with a peak (133) in 2013. The map in Figure 2 shows a quite heterogeneous spatial distribution: the top three regions for numbers of commissioners in the 2007-2018 time interval are Campania (203), Lombardia (155), and Calabria (120); the bottom three regions are Valle d'Aosta (1), Trentino-Alto Adige (7), and Umbria (13). The highest prevalence of commissioners in the 2007-2018 time interval is concentrated in Southern regions (689 municipalities, 2.5 per cent of the total), while lower prevalences can be observed in Central (151 municipalities, 1.3 per cent of the total) and Northern regions (368 municipalities, 0.7 per cent of the total).

As far as the financial aspects are concerned, municipalities' revenues in Italy come from two main sources: transfers from upper levels of government (mainly the central government) and own revenues (from own taxes and fees). Central transfers are, in turn, composed of two parts, one with common elements for all municipalities (historical and standard expenditure criterion), and one additional ad-hoc part, which can even follow political criteria (Bracco et al., 2015, 2019). Table 1 reports mean and standard deviation of the main variables monitored at municipal level in the 2007-2018 interval. As for the budget, we consider the financial autonomy and the collection capacity. Financial autonomy is the ratio of local revenues (tax and non-tax) on total revenues. By construction it ranges between 0 and 1 and it measures the financial autonomy with respect to the central government transfers (Degni, 2019; Corte dei Conti, 2019). Collection capacity is estimated as the ratio of cash-based revenues on accruals revenues. This indicator expresses the institution's ability to

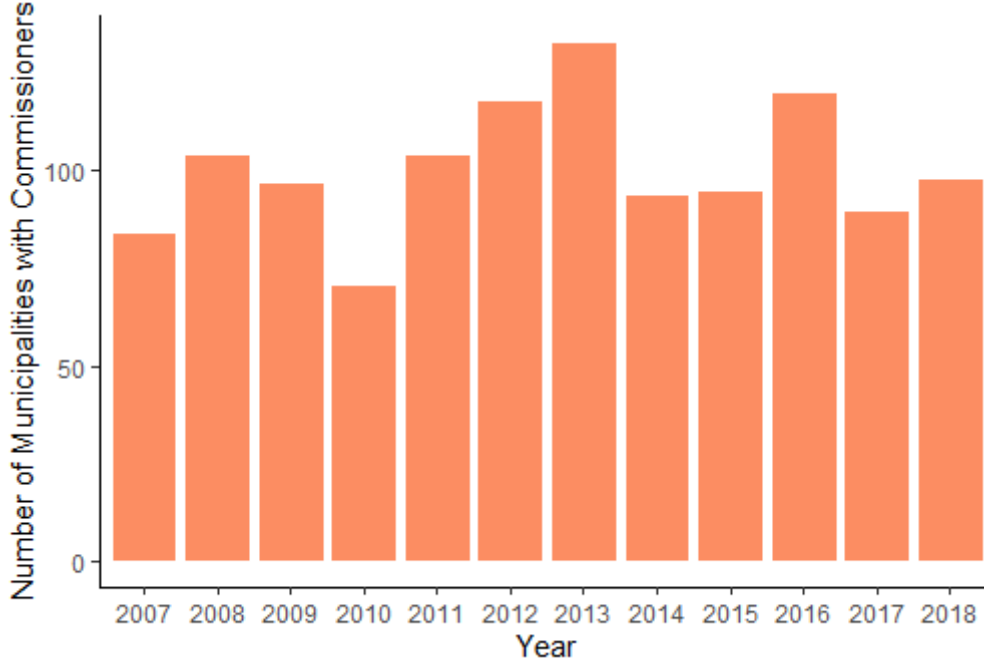
³This also applies in special statute regions.

⁴<https://www.openpolis.it/comuni-commissariati-cosa-e-successo-nel-2020>

⁵<https://dait.interno.gov.it/elezioni/anagrafe-amministratori>

collect their revenue forecast earlier in the year, and it can be interpreted as a measure of performance, because the higher the share of revenue collected is, the greater is the body's efficiency in this activity (Degni, 2019; Corte dei Conti, 2019).

Figure 1: Number of Municipalities with Commissioners in charge at the end of the previous year (2007-2018)



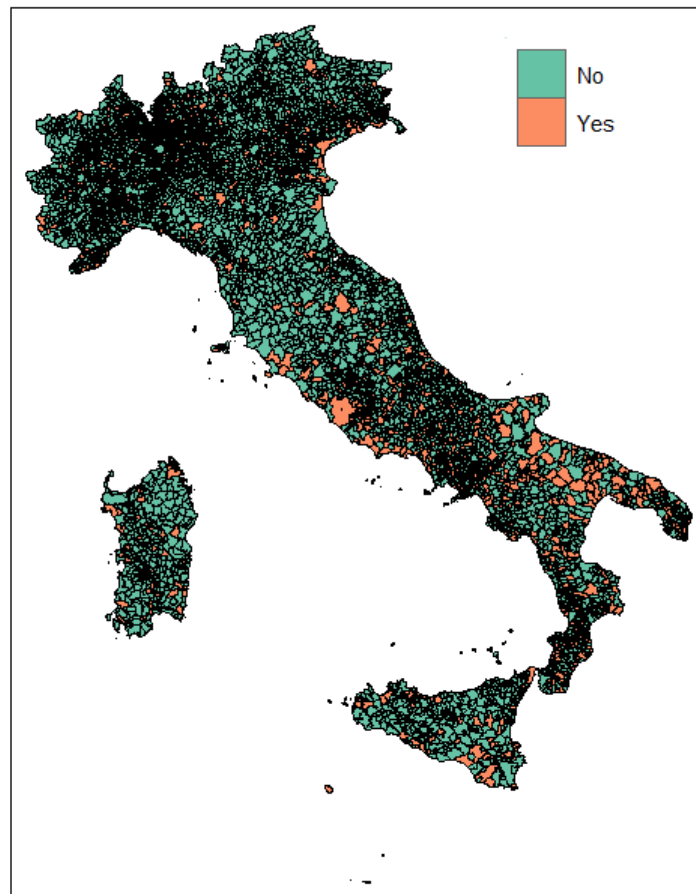
Source: Authors's elaborations on data from Italian Ministry of Interior

Table 1 shows that financial autonomy has been increasing on average from 0.395 to 0.552 in the 2007-2015 time interval (2015 is the last available year for financial autonomy in Istat, 2021). This trend may be partially due to the ongoing process of reform oriented towards the autonomous use of tax leverage by municipalities (Corte dei Conti, 2019). Collection capacity also increases from 0.651 to 0.795 in the 2007-2018 time interval reflecting a general improvement in the efficiency of municipal revenues collection systems. As for the economic features, Table 1 shows an increase in income per-capita and a decrease in poverty (proximate by the share of taxpayers with income up to 10,000 euros on the total taxpayers from the data provided by the Italian Ministry of Economy and Finance) in the 2007-2018 time interval. A substantial increase from 2007 to 2018 can also be observed in average population, and this may be due to the phenomenon of municipal mergers (*Fusioni tra comuni*) which shows an increasing trend in the last decade (Degni, 2019). Regarding the population structure, from 2007 to 2018 there has been an average decrease of the population of under 3 years old and an increase of the population of over 65 years old. This is connected to the general ageing of the population which is characteristic of the Italian

population and is in line with many European populations (Rechel et al., 2013).

In order to control for a differentiation in the municipal body characteristics connected to productivity, we also consider data about human resources for which Istat (2021) provides data from 2007 to 2017. For each municipality, we take the share of employees with higher education (at least secondary school), the proportion of females among employees, the proportion of employees with less than 20 years experience in the same body, and the proportion of employees under 35 years old (Table 1). Over the 2007-2017 time interval, there has been an increase in the proportion employees with higher education and in the proportion of females among all employees (from 0.68 to 0.77 and from 0.43 to 0.47 respectively). In contrast, the proportion of employees with less than 20 years experience in the same body, and the proportion of employees under 35 years old have been decreasing in the same time interval (from 0.56 to 0.49 and from 0.11 to 0.03 respectively).

Figure 2: Spatial distribution of Municipalities with at least one Commissioner in the 2007-2018 time interval



Source: Authors's elaborations on data from Italian Ministry of Interior

Table 1: Descriptive statistics of Budget, Economics, Demographics, and Human resource data in municipalities administered by elected mayors and commissioner (years 2007-2018)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Budget												
Financial Autonomy	0.395 (0.159)	0.372 (0.148)	0.380 (0.151)	0.385 (0.153)	0.554 (0.21)	0.598 (0.21)	0.559 (0.181)	0.609 (0.209)	0.552 (0.213)			
Collection capacity	0.651 (0.142)	0.662 (0.141)	0.672 (0.145)	0.672 (0.142)	0.687 (0.135)	0.701 (0.135)	0.705 (0.136)	0.705 (0.16)	0.766 (0.121)	0.794 (0.108)	0.774 (0.107)	0.795 (0.117)
Economics												
Income per-capita	19682.720 (2976.675)	19760.980 (2980.984)	19867.250 (2960.156)	20174.780 (3089.772)	20445.670 (3055.974)	20727.920 (3087.342)	20971.800 (3178.3)	21129.610 (3210.016)	21467.970 (3266.226)	21742.160 (3317.542)	22027.360 (3336.149)	22480.150 (3433.944)
Poverty	0.628 (0.346)	0.573 (0.303)	0.556 (0.282)	0.546 (0.273)	0.527 (0.262)	0.238 (0.058)	0.236 (0.066)	0.497 (0.247)	0.480 (0.236)	0.474 (0.235)	0.494 (0.243)	0.468 (0.232)
Demographics												
Population	6814.188 (27826.87)	6909.258 (27681.91)	6965.394 (27572.77)	6975.592 (27495.7)	6941.984 (27418.88)	6997.910 (27523.02)	7012.384 (27720.01)	7078.924 (28661.54)	7227.703 (28964.62)	7251.047 (29098.3)	7308.287 (29235.9)	7299.870 (29184.89)
Pop. under 3 yo	0.026 (0.008)	0.026 (0.008)	0.026 (0.008)	0.026 (0.008)	0.026 (0.008)	0.025 (0.007)	0.025 (0.007)	0.024 (0.007)	0.023 (0.007)	0.022 (0.007)	0.022 (0.007)	0.021 (0.006)
Pop. over 65 yo	0.223 (0.063)	0.223 (0.061)	0.223 (0.06)	0.224 (0.059)	0.224 (0.059)	0.215 (0.056)	0.218 (0.055)	0.221 (0.056)	0.226 (0.055)	0.229 (0.055)	0.232 (0.054)	0.235 (0.053)
Human resource												
Higher education	0.681 (0.174)	0.690 (0.17)	0.699 (0.17)	0.710 (0.172)	0.719 (0.168)	0.729 (0.168)	0.733 (0.168)	0.740 (0.171)	0.750 (0.169)	0.758 (0.172)	0.769 (0.172)	
Females	0.432 (0.205)	0.440 (0.203)	0.445 (0.203)	0.452 (0.204)	0.456 (0.204)	0.460 (0.204)	0.460 (0.203)	0.462 (0.204)	0.464 (0.205)	0.465 (0.208)	0.469 (0.212)	
Under 20 exp.	0.559 (0.244)	0.560 (0.239)	0.550 (0.239)	0.548 (0.239)	0.545 (0.238)	0.538 (0.238)	0.526 (0.234)	0.514 (0.234)	0.508 (0.235)	0.498 (0.235)	0.491 (0.234)	
Under 35 yo	0.107 (0.139)	0.103 (0.135)	0.093 (0.126)	0.087 (0.121)	0.077 (0.116)	0.068 (0.11)	0.059 (0.106)	0.049 (0.097)	0.041 (0.091)	0.034 (0.084)	0.032 (0.083)	

Mean and (*Standard Deviation*); **Sources:** Authors's elaborations on data from Italian Ministry of Interior, Italian Ministry of Economy and Finance, and Istat (2021)

3 Empirical Strategy

To estimate the effect of a commissioner on municipal budget, we set up a DiD study design. The basic approach of DiD is to compare the difference in outcomes after and before the intervention between two groups (treated and untreated). The use of DiD allows to avoid the endogeneity problems typical of comparisons between heterogeneous groups (Meyer, 1995).

The estimated model is as follows:

$$Y_{it} = \theta_i + \lambda_t + \beta_0 X_{it} + \beta_1 Treat_{it} + \varepsilon_{it} \quad (1)$$

Where:

- Y_{it} is the outcome of interest in municipality i at year t , where $t = [2007 : 2018]$. We test the effect of commissioner on two main outcomes:
 1. Financial autonomy, computed as the ratio of local revenues on total revenues;
 2. Collection capacity, estimated as the ratio of cash-based revenues to accruals revenues;
- θ_i is municipal-level fixed effect;
- λ_t is time-level fixed effect;
- X_{it} is a vector of time-variant municipal level covariates that includes the socio-demographic, economic, and human resource context of municipalities. In this vector, we include: income per capita; proportion of poverty; population; proportion of population under 3 years old; proportion of population over 65 years old; proportion of employees with higher education; proportion of females among employees; proportion of employees with less than 20 years experience in the same body; proportion of employees under 35 (see Table 1 for descriptive statistics);
- $Treat_{it} = 1$ if municipality i is exposed to the treatment (has a commissioner at the end of the previous year) in time t , and $Treat_{it} = 0$ otherwise. In the present analysis we evaluate commissioners in office on December 31st on the municipal performance the following year, as the commissioner is in charge until new elections which is usually in the Spring (see Section 2).

The specification in equation (1) defines the generalized DiD (Bertrand et al., 2004). The parameter of interest is β_1 which captures the effect of the commissioner on the outcomes considered here: financial autonomy and collection capacity. To strengthen the plausibility of the exogeneity assumption, since unobservable local-level variables and time common trends may bias the coefficient associated to the commissioner

dummy, our model accounts for municipal and year fixed effects (Cohen and Einav, 2003).

Within the DiD framework, the identification of the effect of a commissioner on the financial autonomy and collection capacity of municipalities is based on the assumption that the presence of a commissioner is exogenous with respect to the financial outcomes (Besley and Case, 2000). In this case study, the assumption of the exogenous assignment of the commissioner may be considered to be too strong as there is a selection bias: the fact that a municipality is administered by a commissioner depends on a number of features described in Section 2 that are likely to also affect the trend in budget management and, consequently, the estimated difference between treatment and control groups (β_1 in Equation 1).

To address this selection bias we resort to machine learning methods in the building of the counterfactual scenario. A new strand of economic literature increasingly uses machine learning procedures for predictions (Kleinberg et al., 2015). In particular, the predictive power of machine learning is now increasingly exploited to counterfactual building (Varian, 2016; Cicala, 2017). Following this literature, we use a machine learning approach to generate an artificial control group and a counterfactual trend in the no-treatment (no-commissioner) scenario (Cerqua et al., 2020). The aim is to address the potential selection bias due to the intrinsic differentiation between municipalities administered by commissioners and municipalities administered by elected mayors. Using a machine learning control method, the selection bias is reduced, balancing treatment and comparison groups on a set of observed baseline characteristics (Varian, 2016).

To achieve the aim of obtaining the control group, we adopt the GBM in the prediction of the commissioner in municipalities using a set of institutional, demographics and geographical data from the previous year. GBM models work in an iterative way where, at each stage, new learner corrects the pseudo-residual of its predecessors (Friedman, 2001). Recently, GBM has been empirically shown to be a competitive method for structured tasks, in particular for municipality classifications (Antulov-Fantulin et al., 2021). As in Antulov-Fantulin et al. (2021) to address the presence of an imbalanced database (i.e., commissioners are much less than mayors), we combine GBM with four different strategies (Menardi and Torelli, 2014; Lunardon et al., 2014; López et al., 2013; Chawla et al., 2004, 2002): (i) Class weights: impose a heavier cost when errors are made in the minority class; (ii) Up-sampling: randomly replicate instances in the minority class; (iii) Random Over-Sampling Examples (ROSE): Artificial balanced samples are generated according to a smoothed bootstrap approach; and (iv) SMOTE which artificially generate new examples of the minority class using the nearest neighbors of these cases.

Formally, every municipality i at time t has an associated target binary variable $Treat_{it}$ (Commissioner) that takes values 1 if there is a commissioner, and value 0 if there is an elected mayor. The prediction task is formulated as follows, based on the set of features ($Features_{it-1}$), find function $f(.)$ (machine learning model) that predicts the commissioner $Treat_{it}$:

$$pred(Treat_{it}) = f(Features_{it-1}) \quad (2)$$

We randomly divide the database as 80 percent for training and 20 percent for out-of-sample testing set (test). The hyper-parameter optimization is only carried out on the training set. Features included in the prediction task are all referring to the year before the commissioner is in charge, selected among those likely to affect both the presence of a commissioner and the trend in financial management. Institutional features included in this step are: the age of the mayor, the education of the mayor (a dummy for higher education), the gender of the mayor, proportion of females in the municipal council, the average age of municipal council, years in charge for the mayor, a dummy for local government of center left, and a dummy for local government of center right (civic list is the baseline). We include institutional features since the presence of a commissioner in a municipality can be due to institutional factors such as political conflicts leading to the resignation of the mayor or the majority of councillors, and the literature has shown that institutional features are also associated with the financial management of local government. Regarding the age of the mayor and councillors members, Alesina et al. (2019) noted the tendency of younger politicians to behave strategically and obtaining more transfers from higher levels of government. Regarding gender, an increasing literature is showing that the gender composition of local governments matters in the financial performance (Chattopadhyay and Duflo, 2004; Holman, 2014; Brollo and Troiano, 2016; Hernández-Nicolás et al., 2018; Cabaleiro Casal and Buch Gómez, 2018), and it is also associated with the duration of the legislature (Gagliarducci and Paserman, 2012). Regarding the mayor’s political colour, previous studies have generally accepted that differences can be observed between the financial management of left and right governments (Herwartz and Theilen, 2020). In addition to institutional features, we included geographical and demographic variables in the prediction task: surface (km²), altitude, a dummy for littoral zone, a dummy for islands, a dummy for southern regions, and population. Geographical features in the prediction task have been included to balance the treated and control group for the recognised spatial heterogeneity which in Italy involves the private sector, revenues from taxation and public expenditure, partly explained by the unresolved dualism between the Northern and Southern regions (Greco et al., 2018; Lagravinese et al., 2018; De Simone and Liberati, 2020; Antulov-Fantulin et al., 2021).

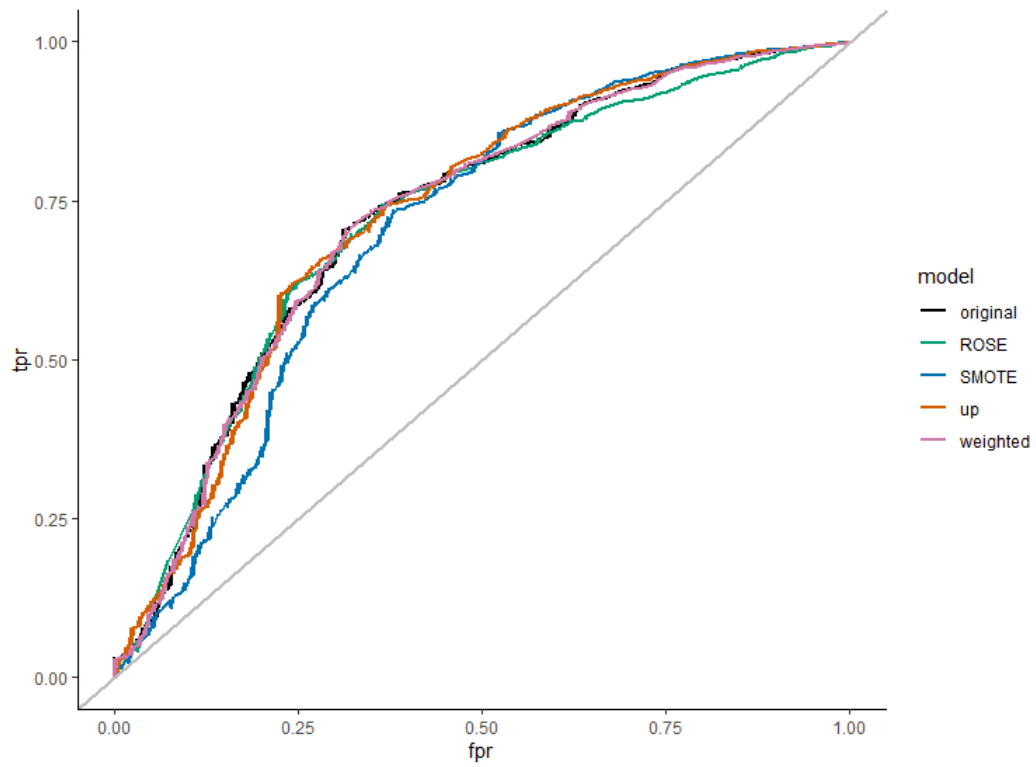
The performance of commissioner classification prediction is assessed by analyzing the Receiver Operating Characteristics curve (ROC) (Fawcett, 2006). In our binary classification problem, the positive class is defined as the presence of a commissioner

in a municipality and the negative class is the presence of an elected mayor. The ROC curve shows the classifier diagnostic ability by plotting the true positive rate (TPR) on the y-axis against the false positive rate (FPR) on the x-axis since its discrimination threshold is varied (Antulov-Fantulin et al., 2021). When the classification task is completely unpredictable, the negative class theoretical distribution over feature space coincides with the positive class theoretical distribution over feature space. This implies that the ROC curve would be the diagonal line with an Area Under the Curve (AUC) of 0.5. A perfect classifier has AUC equal to 1.0, the higher the AUC, the more predictive is the model.

The AUC in Figure 3 shows that the Up-sampling GBM model outperforms all the other models (Up-sampling = 0.7275; Original = 0.7242, Weighted = 0.7239, ROSE = 0.7198, and SMOTE = 0.7036). As the best model, the $pred(Treat_{it})$ of Up-sampling GBM is used to obtain the treated and control group, i.e., we only select *Treated* and *Untreated* municipalities with $pred(Treat_{it}) = 1$ for estimating difference between treatment and control groups (β_1 in Equation 1). In other words, we use the true positives as *Treated* and the false positives as *Untreated*. Having the same *predicted* commissioner in both groups, the new sample of municipalities used in the DiD estimates has lower selection bias due to the intrinsic differentiation between municipalities administrated by commissioners and municipalities administrated by elected mayors.

Table 2 shows descriptive statistics of the features used in the predictive task for municipalities with mayors and commissioners, on the whole sample and on the sample with $pred(Treat_{it}) = 1$. As expected, municipalities with mayor and commissioner are more balanced in all features when $pred(Treat_{it}) = 1$. Before the balancing, substantial differences between municipalities administrated by mayors and municipalities administrated by commissioners can be observed in both institutional, and geographical and demographic variables.

Figure 3: ROC curve for five Gradient Boosted Machine models



Gradient Boosted Machine trained on 70% of observations and tested on the remaining 30%.

AUC: Original = 0.7242, Weighted = 0.7239, ROSE = 0.7198, SMOTE = 0.7036, and Up-sampling = 0.7275. **Resampling:** Cross-Validated (10-fold, repeated 5 times)

Table 2: Descriptive statistics of features used in the predictive task for municipalities with mayors and commissioners on the whole sample and on the municipalities with $pred(Treat_{it}) = 1$

	All Municipalities		$pred(Treat_{it}) = 1$	
	Mayor	Commissioner	Mayor	Commissioner
Age of the Mayor (Degree =1)	55.438 (9.904)	57.136 (9.543)	57.554 (9.173)	57.839 (9.28)
Education of the Mayor	0.411 (0.492)	0.513 (0.5)	0.554 (0.497)	0.591 (0.492)
Gender of the Mayor (Female =1)	0.110 (0.313)	0.097 (0.296)	0.065 (0.247)	0.065 (0.246)
Share of females in the council	0.217 (0.086)	0.180 (0.081)	0.165 (0.069)	0.153 (0.068)
Average age of the council	50.566 (3.297)	50.514 (2.97)	50.438 (2.828)	50.500 (2.803)
Years in charge of Mayor	1.889 (1.379)	1.864 (1.239)	1.690 (1.265)	1.806 (1.152)
Centre right	0.068 (0.251)	0.130 (0.336)	0.126 (0.332)	0.170 (0.376)
Centre left	0.110 (0.312)	0.124 (0.33)	0.159 (0.366)	0.161 (0.368)
Surface (Km2)	36.707 (47.489)	49.428 (63.159)	55.557 (66.251)	59.804 (71.292)
Altitude	358.708 (295.291)	312.081 (287.654)	298.763 (267.417)	263.349 (264.834)
Littoral zone	0.072 (0.258)	0.177 (0.382)	0.195 (0.396)	0.253 (0.435)
Island	0.004 (0.064)	0.007 (0.086)	0.008 (0.088)	0.008 (0.087)
South	0.303 (0.46)	0.570 (0.495)	0.690 (0.463)	0.764 (0.425)
Population	6989.580 (28267.53)	12513.730 (23718.05)	16190.890 (46595.59)	17570.780 (27758.71)

4 Results

Table 3 reports the DiD estimates regression results using financial autonomy as dependent variable in equation (1). The effect of the commissioner on the municipal financial autonomy is positive and significant in all the model specifications: the baseline (Model 1); with the inclusion of socioeconomic, demographic (Model 2), and human resources controls (Model 3). Furthermore, the positive effect of the commissioner on the financial autonomy of the municipality is confirmed when *Treated* and *Untreated* municipalities are balanced by $pred(Treat_{it}) = 1$ (Model 4, Model 5, and Model 6). It is worth mentioning that in this latter case both the magnitude and the significance of the coefficient associated with commissioner decrease, confirming the necessity to control for the selection bias in the DiD frameworks. These results show that non-political administrators are more likely to take revenues locally. This is in line with Alesina et al. (2019) and Bracco et al. (2015), which show that there is a strategic behavior in municipal politicians concerning the choice of the proportions of external transfers versus local revenues for financing local expenditure in the Italian case. For instance, as the intergovernmental transfers are financed by broad-based taxation and generate local benefits, they are preferred to local revenues by political administrators. This is also in line with what has been observed in different systems such as those in Portugal, Brazil, and Germany (Veiga and Veiga, 2013; Brollo and Nannicini, 2012; Herwartz and Theilen, 2014).

The role of additional contextual factors in explaining financial autonomy is also consistent with previous literature. Table 3 shows a positive association between financial autonomy and the municipal income per-capita since higher levels of income can contribute to higher fiscal capacities and consequent higher local revenues (Lagravinese et al., 2018; De Simone and Liberati, 2020; Di Liddo et al., 2016). In similar vein, Table 3 shows a negative and significant association between financial autonomy and poverty. An additional negative and significant association can be observed between financial autonomy and proportion of population under 3 years old and over 65 years old. This may be partially due to the fact that the segment of the population under 3 and over 65 are more likely to ask for municipal services (Geys et al., 2010; Boetti et al., 2012), and it has been documented that children’s families express more qualified demand for costly services connected to schooling and pre-schooling services associated with municipalities (Agasisti et al., 2019).

Table 3: Regression results using Financial autonomy as dependent variable

	Whole Sample					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Commissioner	0.018 *** (0.004)	0.017 *** (0.004)	0.017 *** (0.004)	0.011 * (0.005)	0.012 * (0.005)	0.011 * (0.005)
Income per-capita		0.000 *** (0.000)	0.000 *** (0.000)		0.000 * (0.000)	0.000 * (0.000)
Poverty		-0.034 *** (0.005)	-0.037 *** (0.005)		-0.067 *** (0.008)	-0.071 *** (0.008)
Population		-0.000 (0.000)	-0.000 (0.000)		0.000 ** (0.000)	0.000 * (0.000)
Share of population under 3 yo		-0.549 *** (0.139)	-0.553 *** (0.141)		-0.567 (0.404)	-0.499 (0.406)
Share of population over 65 yo		-0.273 *** (0.060)	-0.283 *** (0.061)		0.042 (0.154)	0.055 (0.154)
Share of employees with higher education			-0.002 (0.007)		-0.003 (0.017)	-0.003 (0.017)
Share of females in employees			-0.008 (0.009)		-0.045 (0.026)	-0.045 (0.026)
Share of employees under 20 years appointed			-0.012 * (0.005)		-0.029 ** (0.010)	-0.029 ** (0.010)
Share of employees under 35 yo			-0.038 *** (0.007)		-0.049 * (0.020)	-0.049 * (0.020)
Municipal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	66115	52124	51728	18598	17313	17287

All continuous predictors are mean-centered and scaled by 1 standard deviation. *** p < 0.001; ** p < 0.01; * p < 0.05.

Table 4: Regression results using Collection capacity as dependent variable

	Whole sample			pred(Treat _{it}) = 1		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Commissioner	0.011 *** (0.003)	0.012 ** (0.004)	0.013 *** (0.004)	0.011 * (0.004)	0.012 ** (0.004)	0.013 ** (0.005)
Income per-capita		-0.000 (0.000)	-0.000 (0.000)		-0.000 ** (0.000)	-0.000 * (0.000)
Poverty		0.022 *** (0.004)	0.023 *** (0.005)		0.009 (0.007)	0.012 (0.008)
Population		-0.000 *** (0.000)	-0.000 *** (0.000)		-0.000 (0.000)	-0.000 (0.000)
Share of population under 3 yo		0.442 *** (0.113)	0.437 *** (0.125)		0.895 ** (0.314)	0.746 * (0.338)
Share of population over 65 yo		-0.343 *** (0.043)	-0.363 *** (0.050)		-0.222 * (0.110)	-0.257 * (0.122)
Share of employees with higher education			-0.003 (0.006)		0.029 * (0.014)	0.029 * (0.014)
Share of females in employees			0.014 (0.007)		0.030 (0.021)	0.030 (0.021)
Share of employees under 20 years appointed			0.029 *** (0.004)		0.061 *** (0.009)	0.061 *** (0.009)
Share of employees under 35 yo			-0.005 (0.006)		0.029 (0.018)	0.029 (0.018)
Municipal Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87581	69216	62913	25191	22873	21323

All continuous predictors are mean-centered and scaled by 1 standard deviation. *** p < 0.001; ** p < 0.01; * p < 0.05.

Regarding human resource characteristics of municipalities employees, a negative and significant association with financial autonomy is found in the case of proportion of employees with less than 20 years of experience in the same body, and share of employees under 35 years old (Table 3). Of course younger and new human resources have higher motivation and can bring new competences that can help municipalities in services delivery, but hiring young people also increases the costs and this can undermine the financial autonomy.

Table 4 reports the results of the regression in equation (1) using collection capacity as the dependent variable. The effect of having a commissioner is positive and significant in all the model specifications: the baseline (Model 1); including socio-economic and demographic features (Model 2); and human resources characteristics of the municipalities (Model 3). Results are also robust considering only the group of municipalities with $pred(Treat_{it}) = 1$ (Model 4, Model 5, and Model 6). This is additional evidence of the positive effect of a non-political administrator in the municipal budget indicators. The additional information of collection capacity with respect to financial autonomy is that collection capacity is independent of the level of income in the municipality. This is because the denominator (asserted revenues) includes and adjusts for the differentiation in fiscal capacities (Di Liddo et al., 2016). This is also confirmed by the non-significant association between collection capacity and income and the positive association between collection capacity and poverty reported in Table 4.

Regarding the remaining features included in the models, Table 4 shows a positive and significant association between collection capacity and the proportion of the population under 3 years old, and between collection capacity and the proportion of employees with less than 20 years experience in the same body. In contrast, negative and significant associations can be observed between collection capacity and population, and between collection capacity and the proportion of the population over 65 years old.

5 Robustness

This section presents the results of the principal robustness checks performed to validate our results. The first part (Rob. 1, Rob. 2, and Rob. 3) verifies the robustness of the results to changes of the considered sample. The first sample split is performed in terms of population: we test the commissioner effect below and above 15000 inhabitants which is the threshold for a different electoral rule, i.e., the election of mayors of municipalities with at least 15000 inhabitants takes place by means of a ballot between the two candidates with the most votes in the first round, while in municipalities below 15000 population, only the first round is used to select the mayor. Results in Table 5 and in Table 6 show that the positive effect of the commissioner on

financial autonomy and on collection capacity is significant both below and above this threshold (Rob. 1 and Rob. 2 respectively). The second sample split is performed excluding municipalities belonging to special statute regions because in these regions the commissioner is appointed by the regional government and not by the central government. Results in Table 5 and Table 6 show that the effect of the commissioner on this sample is positive and significant for both financial autonomy and collection capacity (Rob. 3).

The second part of the robustness verifies the consistency of the results excluding from the sample municipalities having commissioners for the connection of local administrators with organized crime. We conduct this additional test because in the case of crime there may be additional factors explaining municipal performances which can bias our estimates (Ferrante et al., 2021; Daniele, 2019; Daniele and Geys, 2015). Results in Table 5 and Table 6 shows that, even excluding municipalities dissolved for connection to crime, the effect of commissioners is positive and significant on both financial autonomy and collection capacity (Rob.4).

The last part of the robustness check is connected to the empirical identification strategy. The possibility to interpret the estimated parameters as causal effects relies on the assumption of the presence of equal trends of municipal financial autonomy and collection capacity in the absence of a commissioner. A formal test for the assumption of common trends is provided in Angrist and Pischke (2008) and is used alongside others in Boschi et al. (2014). The idea is to include the treatment dummy for the pre-treatment period. This way, if the outcome trends between treatment and control groups are the same, then the coefficient associated with those dummies should be insignificant, i.e., the DiD is not significant between the two groups in the pre-treatment period. Adapting this test to our case study, we have augmented the commissioner dummy by one lead. Results in Table 5 and in Table 6 show that the coefficient associated with the lead of the commissioner is not significant, confirming the robustness of previous findings (Rob. 5).

Table 5: Robustness checks using Financial autonomy as dependent variable

	Rob. 1	Rob. 2	Rob. 3	Rob. 4	Rob. 5
Commissioner	0.015 ** (0.005)	0.019 ** (0.006)	0.018 *** (0.004)	0.019 *** (0.004)	
Income per-capita	0.000 *** (0.000)	0.000 (0.000)	0.000 *** (0.000)	0.000 *** (0.000)	0.000 *** (0.000)
Poverty	-0.036 *** (0.005)	-0.057 *** (0.017)	-0.061 *** (0.005)	-0.037 *** (0.005)	-0.038 *** (0.005)
Population	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Share of population under 3 yo	-0.567 *** (0.145)	-0.338 (0.966)	-0.504 ** (0.155)	-0.549 *** (0.142)	-0.582 *** (0.143)
Share of population over 65 yo	-0.273 *** (0.064)	0.068 (0.279)	0.027 (0.066)	-0.286 *** (0.061)	-0.269 *** (0.062)
Share of employees with higher education	-0.002 (0.007)	-0.018 (0.035)	-0.005 (0.008)	-0.001 (0.007)	-0.002 (0.007)
Share of females in employees	-0.008 (0.009)	-0.133 (0.069)	-0.003 (0.010)	-0.008 (0.009)	-0.009 (0.009)
Share of employees under 20 years appointed	-0.010 (0.005)	-0.057 ** (0.020)	-0.024 *** (0.005)	-0.012 * (0.005)	-0.012 * (0.005)
Share of employees under 35 yo	-0.034 *** (0.007)	-0.201 *** (0.044)	-0.042 *** (0.007)	-0.038 *** (0.007)	-0.039 *** (0.007)
lead(Commissioner)					-0.005 (0.004)
Municipal Fixed Effects	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	45881	5847	44264	50985	50974

Rob. 1 = only municipalities below 15000 inhabitants; Rob. 2 = only municipalities with at least 15000 inhabitants; Rob. 3 = excluding special stature regions; Rob. 4 = excluding crime as motivation; Rob. 5 = lead test. All continuous predictors are mean-centered and scaled by 1 standard deviation. *** p < 0.001; ** p < 0.01; * p < 0.05.

Table 6: Robustness checks using Collection capacity as dependent variable

	Rob. 1	Rob. 2	Rob. 3	Rob. 4	Rob. 5
Commissioner	0.012 ** (0.005)	0.015 ** (0.005)	0.013 *** (0.004)	0.014 *** (0.004)	
Income per-capita	-0.000 (0.000)	-0.000 * (0.000)	-0.000 ** (0.000)	-0.000 (0.000)	0.000 (0.000)
Poverty	0.032 *** (0.005)	0.071 *** (0.014)	0.005 (0.005)	0.021 *** (0.005)	0.020 *** (0.005)
Population	-0.000 *** (0.000)	0.000 (0.000)	-0.000 *** (0.000)	-0.000 *** (0.000)	-0.000 * (0.000)
Share of population under 3 yo	0.439 *** (0.129)	1.723 * (0.687)	0.407 ** (0.134)	0.453 *** (0.125)	0.178 (0.136)
Share of population over 65 yo	-0.367 *** (0.053)	0.198 (0.185)	-0.381 *** (0.053)	-0.361 *** (0.050)	-0.347 *** (0.057)
Share of employees with higher education	-0.003 (0.006)	0.041 (0.025)	-0.011 (0.007)	-0.004 (0.006)	0.006 (0.007)
Share of females in employees	0.013 (0.008)	0.106 * (0.048)	0.019 * (0.008)	0.015 * (0.008)	0.006 (0.009)
Share of employees under 20 years appointed	0.026 *** (0.004)	0.051 *** (0.014)	0.017 *** (0.004)	0.029 *** (0.004)	0.019 *** (0.005)
Share of employees under 35 yo	-0.007 (0.006)	0.040 (0.032)	0.004 (0.007)	-0.005 (0.006)	-0.018 ** (0.007)
lead(Commissioner)					0.004 (0.004)
Municipal Fixed Effects	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	55718	7195	54049	62006	55901

Rob. 1 = only municipalities below 15000 inhabitants; Rob. 2 = only municipalities with at least 15000 inhabitants; Rob. 3 = excluding special stature regions; Rob. 4 = excluding crime as motivation; Rob. 5 = lead test. All continuous predictors are mean-centered and scaled by 1 standard deviation. *** p < 0.001; ** p < 0.01; * p < 0.05.

6 Conclusions

This paper studies the role of a non-politician in the financial autonomy and the collection capacity of local governments. From an empirical perspective, a Difference in Difference study design is combined with machine learning models on a panel of 7826 Italian municipalities monitored yearly from 2007 to 2018. Municipalities administered by commissioners (officials of the prefectorial career nominated by higher levels of government) are compared with municipalities administered by political mayors. Results show that non-political administrators are associated with higher financial autonomy and higher collection capacity. These results are consistent with the hypothesis that, having lower incentives to behave strategically in response to electoral stimulus, non-political administrators take more revenues locally.

From policy perspective, this study confirms that mayors respond to political incentives in local governments. The evidence provides support for policies aimed at avoiding the fiscal illusion, facilitating the discovering of opportunistic behaviours, and fostering the accountability of policy makers. Over the last decades, such policies in Italy have mainly declined in fiscal rules (Bonfatti and Forni, 2019). However, the evidence provided here shows that the differentiation between political and non-political local governments is impervious to the post-Maastricht reforms and constraints. Our results call for a different strategy, which in addition to economic incentives and fiscal rules, reviews the entire system of local governance and representatives.

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