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The determinants of the local income tax: evidence from Portugal

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Abstract

Little is known about the determinant factors that drive mayors' decisions of setting the local income tax in Portugal. These may be of political, socio-demographic or financial nature. We explore a rich panel on mainland Portuguese municipalities from 2009 to 2017 to shed light onto the incentive scheme of incumbent individuals and parties when setting tax policy. We find that the turnout rate to local elections, the unemployment rate and the mean wage are negatively correlated with the local income tax rate. The tax rate tends to be lower when municipal revenues increase, and higher when municipal spending increases, although we cannot rule out that part of this effect is mechanical. We also find that, in election years, tax rates tend to be higher, which may suggest the local income tax is not deemed of great importance for voting decisions. Further research may include assessing spatial correlation between municipalities, and whether the change in the default tax rate in 2019 had any behavioral implications in tax policy decisions.

Keywords: Local Government; Taxation; Local Public Finance; Portugal

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1 Introduction

Little is known about local tax policy in Portugal. In a country with a high degree of centralization relative to other EU members (Magone, 2010), incumbent politicians in Portuguese municipalities do not dispose of many tools to conduct autonomous tax decisions with major impact on the local public accounts. In 2017, local-level taxes accounted for an average of only 29% of total municipal revenues in mainland Portugal, with the main source of financing consisting of transfers from the central government, which were up to almost 52% of total revenue.

The fiscal tools incumbents dispose of in terms of local tax policy are laid out in the reformed Local Finance Law (Law no. 73/2013 of September 3). The main ones are the local surtax on corporate income (*"derrama"*), the local property tax (*"imposto municipal sobre imóveis"*, or IMI) and the local personal income surtax (*"participação variável no IRS"*). Of the remaining taxes, most of which with both the tax base and tax rate being decided by the central government, only the tax on property transfers (*"imposto municipal sobre transmissão de imóveis"*, or IMT) has an expressive contribution for municipal revenues, but effectively is not a tax policy tool for mayors given that it does not lie within their powers to decide on changes on the tax rate.

The local personal income surtax, henceforth "local income tax" (LIT), was established as so in the 2008 reform of the Local Finance Law, and consists in a rate ranging from 0 to 5 percentage points that is yearly set by mayors to be collected as local government revenue, with the remaining of which (the difference between the chosen rate and 5 p.p.) resulting in a deduction from their income tax burden due to the central government. The rationale for the setting of this tax is multidimensional. On the one hand, setting a high rate provides a larger source of revenue, improving the financial status of the municipality and allowing for a provision of essential welfare services or paying off outstanding public debt. On the other hand, by deciding on a low rate local politicians may reap electoral benefit, particularly closer to local

election years (Golden et al., 1980). Empirical studies back the hypothesis that local tax hikes are negatively correlated with the popularity of mayors (Revelli, 2002).

Furthermore, Brueckner (2003) reviews the literature and argues that municipalities also compete with neighbouring jurisdictions in the scope of their fiscal policies. Tax revenue is the result of a given tax rate combined with the tax base. Competition between different jurisdictions may lead to migration of agents between them, which can be regarded as a mobile tax base (Edmark and Agren, 2008). Competing municipalities engage in this type of competition by using, at least, two different strategies, which have been named tax mimicking and yardstick competition. Tax mimicking is the strategy by which mayors anticipate political benefits from setting taxes lower than those of their neighboring municipalities, which are perceived as competitors, in what concerns attracting taxpayers (Wilson, 1999). Yardstick competition, conversely, is a strategy according to which voters and politicians enjoy different levels of information and voters judge their incumbents' performance by comparing their tax rate to that of neighbouring municipalities. Simultaneously, politicians can take advantage of certain particularities of the jurisdictions over which they rule, such as more desirable geographic traits or stronger political majorities, to charge their taxpayers higher rates. It was first defined referring to sub-central jurisdictions by Salmon (1987).

At the time of its implementation in 2008, the default tax rate was of 0 percentage points - meaning that mayors have the choice of not setting a rate in their municipality and consequently receiving no revenue from this tax, or setting a positive rate. Although our data does not cover this period, in 2019 the default rate was raised to 5 percentage points, which may change the behavioural incentives of mayors.

From 2009 to 2017, the vast majority of municipalities do not change their rate on a yearly basis. For instance, only 43 out of 278 municipalities changed their rate *vis-à-vis* 2009. The year with the most changes was 2014, with 45 changes, and the years with the least changes were 2013 and 2017, with 27 changes. Overall, there is a trend of reduction of this rate among municipalities over this time period. The average rate in 2009 was of 4.8 percentage points,

whereas in 2017 it was of 4.2 percentage points. Furthermore, there were substantially more municipalities charging the maximum rate of 5 percentage points in 2009 (234) than by 2017 (179). The reasons for this behaviour are unclear as of yet and, in particular, the determinants of the tax rate choice remain unknown.

This work project analyses the determinants of the local income tax rate. We explore a rich panel dataset with information about the demographics, the economy, and the political characteristics of the 278 Portuguese mainland municipalities. Our data spans the period from 2009 to 2017 and allows us to analyse the determinants of the tax rate choice by mayors, namely in terms of political variables, including the turnout rate for local elections, socio-demographic fundamentals, such as average wage and the age structure, and local public finance variables, including the municipal expenditure and revenue.

Our main results are as follows. We show that the LIT rate is negatively correlated with the turnout to local elections, which may suggest that when there is higher political scrutiny by voters, the LIT rate is lower. Moreover, in times of economic hardship, which may imply higher unemployment rates, the tax rates tend to be lower. Municipalities with a higher mean wage have lower tax rates, indicating that mayors may ensure a given tax revenue with lower tax revenue. With respect to local public finance, we find that municipal spending is positively correlated with the LIT rate, and the opposite is true for municipal revenue. As these coefficients have similar sizes and opposite signs, we cannot rule out that part of the effect is mechanical. The model with no fixed effects shows that coastal municipalities, which tend to be richer and may more easily dispose of other means to collect own revenues, also tend to charge lower LIT rates. Since there is a one-year lag between the decision and the period in which it is in place, for robustness we run our baseline specification using the lagged socio-demographic and local public finance variables. We find that the results remain stable for the turnout rate, mean wage, coastal municipalities, and the public finance variables.

Our baseline results may average out electorally-motivated behaviour by politicians. In order to assess this, we extend the model in two ways: first by adding a dummy variable which

equals 1 in local election years, and then by instead estimating the regression model only for the three local election years of 2009, 2013 and 2017. Higher tax rates are observed in election years - this either hints that mayors perceive the LIT as being negligible for voting behaviour, or that it is not set as a function of local elections.

The remainder of the paper is organized in the following manner: Section 2 presents findings of recent literature on the determinants of local taxes; Section 3 provides additional background on the legal history of the tax and how it fits within local tax policy; Section 4 explains the data we include in our study; Section 5 lays out our identification strategy for the baseline and extended models, along with the theoretical expectations for the estimated coefficients; Section 6 presents, interprets, and discusses our estimation results; and Section 7 concludes.

2 Literature Review

Santolini (2008) studies the local property tax rate in Italian municipalities for the year of 1994, and finds that the tax rate depends on the neighbouring municipalities' rates, along with the share of elderly people, the ideological positioning of the local government and the coastal location of each municipality. The author also shows that yardstick competition is supported by the data, namely for rightist governments which have a more apparent strategic behaviour, and which follow their neighbours of the same party to a significant extent.

When studying the same strategic interactions between Swedish municipalities, Edmark and Algren (2008) find a positive spatial correlation amongst neighbouring municipalities in terms of setting local income tax rates, which supports the theory of attracting a mobile tax base. Their results find no evidence, however, for the yardstick competition hypothesis.

Delgado et al. (2015) studied the determinants of local tax rates in Spain. They use data on the property tax and the motor vehicle tax, and found evidence of tax mimicking and yardstick competition across municipalities, as well as of political business cycles for both

leftist and rightist incumbents. Specifically, they find that the larger the political support for a given government, the less likely it is to mimic the tax rates set by neighbours, and that both left-wing and right-wing governments follow the changes in local tax policy of their neighbours of the same party.

With respect to other political determinants, Alt et al. (2011) find evidence that suggests it is easier for voters to tell good from bad mayors as their tenure increases, with fiscal policy choices making up one of the traits from which to judge their performances. On the other hand, the findings of Bordignon, Cerniglia and Revelli (2003) in their study of the local property tax suggest that strategic interaction is absent where mayors are term-limited or more confident in reelection.

We explore the determinants of the local income tax rate in Portugal, following insight from past literature which analyzed local taxes in other countries. Our approach differs from that of other papers in that we do not extend the study to account for tax reactions amongst municipalities.

3 Institutional Background

The local income tax (*"participação variável no IRS"* in Portuguese, henceforth LIT) is a variable rate decided on a yearly basis by the local government in each Portuguese municipality. The local income tax rate varies from 0 to 5 percentage points and applies to the municipality's residents in the form of a deduction to the taxable income - the higher the tax rate, the lower the corresponding deduction, and the higher the tax burden on the citizen. It was first written into law under the reform of the Local Finance Law (LFL), approved in the Portuguese parliament by Law no. 2/2007, and coming into effect in January 2008. The LFL foresees this rate to be deliberated by local governments and approved by the Municipal Legislature (*"Assembleia Municipal"*), by the end of each fiscal year; it functions as a variable amount which is charged to constituents of each municipality and collected by the central government, which then pays

the total amount collected from taxpayers from each municipality back to local governments, by means of a government transfer that is accounted for in the State Budget. Municipalities may choose to have a tax rate equal to 0, in which case the deduction of 5% from their gross annual income works as a subsidy awarded to them by their local government.

For illustration, take the example of a taxpayer from the municipality of Sintra with an income tax of 1000€ due to the central government in 2014, of which 5% (amounting to 50€) are deducted, part going back to the taxpayer and the remainder being collected by the municipality. As the local income tax rate in Sintra was of 4% in 2014, they will receive a deduction of 5%-4% = 1% on this tax amount, corresponding to 10€. The remainder of 40€ is regarded by the municipality as local government revenue.

Additionally, a default option was later provided for in the 2013 revision of the LFL, whereby the lack of deliberation by local governments would be taken as their forfeiting of the right to charge the local income tax, and to an effective rate of 0% in that year, with the 5% being fully returned to citizens. In a second revision of the law in 2018, the default option was set at 5%, with municipalities that don't communicate an LIT rate to the central government being entitled to receive the full 5% of the income tax on the individual, and consequently no deduction.

This legal change meant that the reduction in tax burden ceased to be regarded as a mere result of municipal inaction, but rather publicized as a tax break that local governments actively award to their constituents[1]. There were 106 municipalities providing their residents with some kind of reduction on the default rate in 2017, up from 44 municipalities that offered such a benefit in 2009.

Local elections in Portugal take place simultaneously in all municipalities at a fixed periodicity of 4 years since 1976, and the vast majority of the main contenders belong to major parties which are also elected to the national legislature - in our period of study of 2009 to 2017 only 2.9% of local elections were won by independent candidates. Furthermore, a term limit

[1]Retrieved on December 23rd 2020, from here.

law was passed in 2005, to bound politicians holding local office to a maximum of 3 consecutive terms; said law only became binding in 2013.

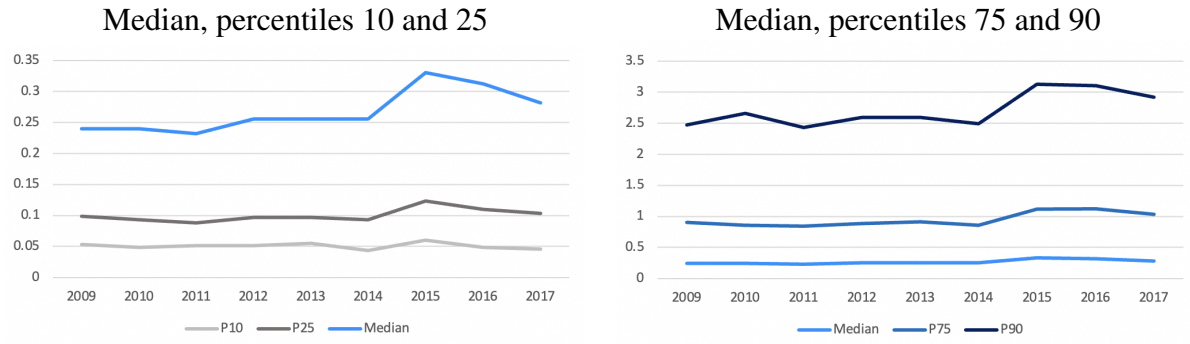
There are multiple streams of revenue for Portuguese municipalities, with a largely unchanged composition. Table 1 displays the composition of municipal current revenues in 2017, the last year of the period we study. Then, the largest source of revenue for municipalities are transfers from the central government, which made up an average of almost 52% of total municipal revenue. The second main stream of revenue are direct taxes such as the recurrent property tax, the municipal corporate tax or the circulation tax, and indirect taxes such as the property sale tax. In 2017 the collection of these taxes accounted for an average of around 26% of total municipal revenue. The local income tax revenue accounts for a mean of €1.3 million, which corresponds to 3.4% of total municipal revenue. However, 10% of the municipalities collected more than €2.9 million, and in 10% of them the revenue from this tax represented over 7.3% of their total revenue. The local income tax corresponded to a median of 12% of the total tax burden on citizens in 2017.

Table 1: Main sources of municipal revenue in 2017

	Mean M€	%	P25 M€	%	P90 M€	%	SD
Local income tax	1.3	3.4	0.1	1.4	2.9	7.3	3.1
Other taxes	9.8	25.8	0.9	12.5	22.8	51.4	30.7
Transfers	7.2	51.6	4.3	37.8	12.0	75.2	4.4
Others	5.0	7.2	1.2	14.6	10.3	28.9	15.3
Total revenue	23.2		7.6		47.4		49.4

Given the heterogeneity amongst Portuguese municipalities along dimensions such as area, population density and standards of living, there is great disparity in terms of the LIT revenue they collect. Figure 1 shows time series for a number of percentiles of the LIT revenue distribution. Namely, the series show that the 10^{th} percentile, collecting an amount of 50,000€, corresponds to one fifth of the median revenue; in turn, the median revenue is 10 times lower than the revenue collected by the 90^{th} percentile. These proportions remain stable over time. Besides, there is a generalized increase in LIT revenue observed in 2015, affecting all brackets

Figure 1: Revenue from local income tax (in M€)



of the revenue distribution. This may come as a result of the generalized tax hike that followed the European sovereign debt crisis, which left Portugal in a particularly fragile financial situation[2].

4 Data

Our aim is to study the determinants of the LIT. We consider political, economic, and local finance-related determinants. We follow the set of determinants considered in similar studies (Bordignon et al. (2003), Alt et al. (2001), Santolini (2008), Edmark and Algren (2008) and Delgado et al. (2015)).

We consider as political explanatory variables: a dummy variable for the alignment of the local and central governments, which takes the value of 1 if the ruling party in each municipality is the same as the party in government; the number of reelections of the incumbent; the turnout rate in the last local election as a measure of electoral distance (Vaishnav and Guy, 2018); and a dummy variable that measures hard power of the incumbent, which takes the value of 1 if the incumbent enjoys a majority both in the executive and legislative branches of local government (50% of all town councillors plus one).

We also include economic characteristics, to account for the different tax bases of the municipalities. Given that the socio-economic and demographic composition of the municipalities drives the size of the local public good demand and also its mix, we consider: the income

[2]Retrieved on May 20th 2021, from here.

level by way of the average take-home wage in each municipality as reported in the Personnel Records (*"Quadros de Pessoal"*), a mandatory yearly survey of all Portuguese firms (explained in Palic, 2017); the unemployment rate; and the share of the population over 65 years old as a measure of the age structure, which in Portugal varies widely within municipalities, and ranges in our sample from 10.1% to 45.6% of total population. We further control for geographic traits with a dummy variable which takes the value of 1 for coastal municipalities.

Finally, we control for factors affecting the soundness of local public finance. The composition of the municipal budget broadly depends on the revenue from individuals and firms, municipal current and capital expenditures and debt issuance. We control for two of these variables: the current municipal spending and the current revenue net of the local income tax. A positive coefficient for public spending suggests a more fiscally prudent stance by the mayor, in that they will react to an increase in municipal expenditure with an increase in the local income tax charged in their municipality - one of the fiscal policy tools available at the local level. Conversely, the same rationale applies to the coefficient of municipal revenue.

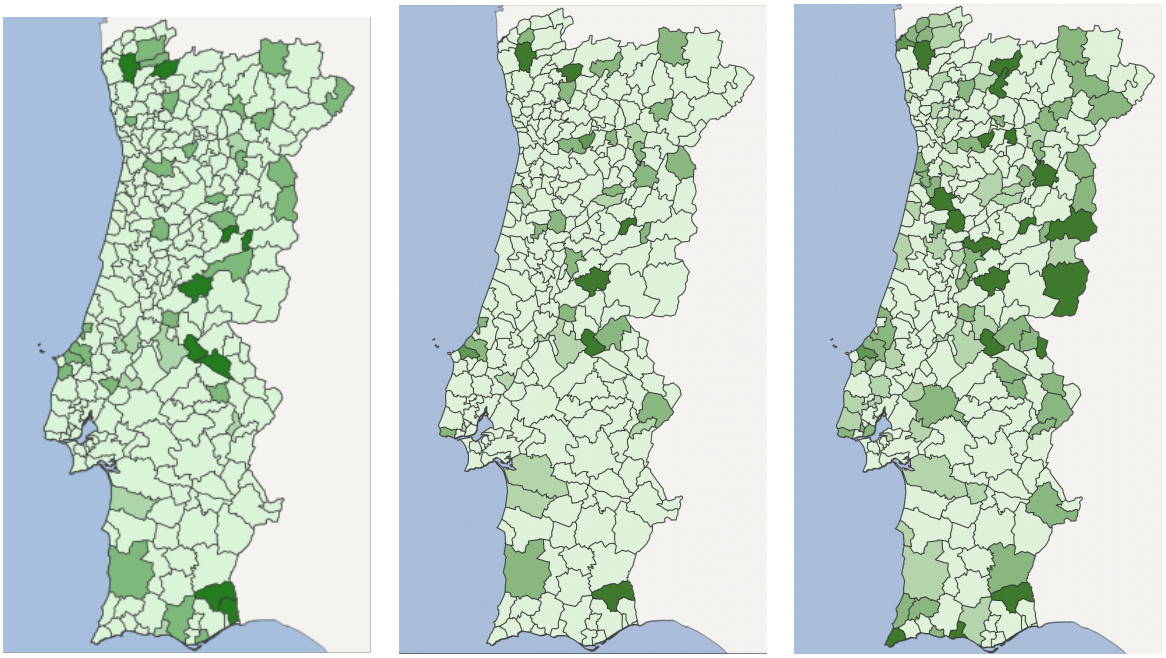
Our data spans the years 2009 through 2017. Recall that the tax was introduced in 2008, but for which year data on the rates is not publicly available. The period of analysis covers three election cycles, given the local elections in late 2009, 2013 and 2017.

With regard to the LIT, we adopt the provisional rates communicated to the central government, which are accounted for in every State Budget (*"Orçamento do Estado"* in Portuguese) as our dependent variable.

Figure 2 displays maps of the geographical distribution of the LIT in some of the years that belong to our analysis period. Local elections take place every 4 years in Portugal, and thus there were 3 elections in our period of study - in 2009, which coincides with the first year of our dataset; in 2013, which coincides with a year when a substantial tax hike took place, with the avergae tax burden rising by 33%; and in 2017, which is also the last year under analysis, by which time a generalized trend of lower rates is noticeable .

Besides a clear country-wide "darkening" trend in the map towards the end of the sample

Figure 2: Spatial Distribution of the Tax Rate



2009 2013 2017

Note: The 4 shades of green represent different intervals for the value of the tax rate. From lightest to darkest: the maximum rate of 5%; rates higher than 4%; rates higher than 0%; and the minimum rate of 0%.

period, meaning municipalities have recently come to adhere to lower tax rates, we can observe several different areas with similar tax rates, which suggests spatial correlation in tax setting.

For a better understanding of the variability within our sample, Table 1 displays the number of municipalities that changed their rate per year from 2010 to 2020.

Table 2: Number of municipalities where the LPIT rate changed per year

Year	2010	2011	2012	2013	2014	2015	2016	2017
Rate changes	43	44	28	27	45	33	37	27

Our estimation uses a panel dataset for the 278 municipalities of mainland Portugal, in the period from 2009 to 2017. Table 3 shows a set of summary statistics for all model variables.

5 Estimation Strategy

We use panel data on Portuguese municipalities to study the determinants of the local personal income tax. We estimate both pooled OLS regressions and fixed effects models, taking advan-

Table 3: Summary Statistics

VARIABLES	N	Mean	St dev.	Minimum	Maximum
LIT rate	2,502	4.445	1.236	0	5
CM aligned with central govt.	2,502	0.395	0.489	0	1
No. of reelections	2,502	2.298	1.694	1	10
Turnout	2,502	61.262	8.680	37.80	81.40
Majority in CM and AM	2,502	0.633	0.482	0	1
Log of average wage	2,502	6.772	0.158	6.424	7.454
Log of electrical consumption	2,502	4.194	1.299	1.551	8.151
Unemployment rate	2,502	7.971	2.631	2.293	18.296
Coastal	2,502	0.289	0.453	0	1
% of elderly population	2,502	24.145	6.293	10.123	45.568
Log of population	2,502	9.777	1.125	7.420	13.218
Log of municipal revenue net of LIT	2,502	9.427	0.838	7.756	13.492
Log of municipal spending	2,502	9.465	0.861	7.767	13.534
Local election year	2,502	0.333	0.471	0	1

Note: Sampling period is from 2009 to 2017. Data for this study was retrieved from the PORDATA database and Marktest Sales Index database.

tage of the panel structure of our dataset. The model we will estimate is as follows:

$$Y_{mt} = \alpha + \gamma_t + \delta_m + \beta_1 X^p_{mt} + \beta_2 X^d_{mt} + \beta_3 X^f_{mt} + \epsilon_{mt}$$

where Y_{mt} denotes the LIT rate in municipality m in year t, γ_t and δ_m denote year and municipal fixed effects, and X^d_{mt}, X^f_{mt} and X^f_{mt} are the vectors with the 3 classes of regressors - political, socio-demographic and local public finance.

A negative coefficient for political alignment means that provision of public goods is easier in municipalities that have the same party deciding over local and national policies. On the other hand, a positive coefficient for the number of reelections means that it is easier for a mayor with longer tenure to provide public goods for their municipality - this is especially relevant in Portugal, where the limit of 3 consecutive terms in local government was not binding until 2013, when mayors could not be reelected in 150 municipalities (Lopes da Fonseca, 2016), and with mayors in our dataset having served up to 10 terms in a row. A negative sign for the coefficient of turnout implies that tax policy is bounded by higher voter engagement in a

municipality, where voters react more to increases in the tax rate. Finally, a positive coefficient for a double majority in local government suggests that politicians read a stronger mandate as a permit to set a higher tax rate.

The expected effects for unemployment and the share of elderly population are positive, as these are groups of people who on average require a higher mobilization of government funds, with inherent increased pressure on municipal budgets.

The eligible period for local governments to decide on what rate to charge each municipality's citizens is not always synchronized with the electoral cycle. Mayors may notify the central government of the rate which will be in place in a given municipality and a given year from January 1 to December 31 of the previous year. However, in election years, the newly-elected mayors take office between late October and early November, having the power of deciding on a different rate than the one set by the previous incumbent. This allows for incumbents to lower the tax rate for electoral benefits, especially when they are at risk of losing a reelection. In order to control for this unsynchronized timeline, we will estimate the LIT rate not only in relation with the socio-demographic fundamentals of the year in which the rate is in effect, but also with the fundamentals of the previous year.

Additionally, we account for a difference in incentives for mayors setting the LIT rate in electoral years versus non-electoral years. We do this in two ways. First, by way of a robustness specification where a dummy variable which takes the value of 1 in local election years (2009, 2013 and 2017) is added to the baseline panel dataset. Second, through a specification where only local election years are included.

6 Results

6.1 Baseline model

We start with a streamlined pooled OLS estimation of the political, socio-economic and local public finance determinants of the local income tax rate, controlling for year fixed effects (FE),

followed by a set of more robust specifications where we apply both year and municipal FE.

The results of the baseline specifications are presented in Table 4. With respect to the political variables, we find a significant difference between municipalities in what concerns political alignment of the local government with the central administration. In municipalities where the mayor belongs to the same political party that is leading the central government in year t, the LIT rate is at least 0.1 percentage points lower than in municipalities where the local and central governments are led by different parties. Municipalities where the ruling party enjoys a majority, rather than a plurality, of town councillors also present an average LIT rate 0.06 percentage points lower than municipalities in which the local government is formed by a party with a weak majority. The effect of more tenured mayors on the tax rate is also significant, with each additional reelection of a given mayor leading to an average decrease of 0.04 p.p. on the LIT for the duration of their term. Turnout in the local elections is shown to have an uncertain relationship with the tax rate, both in terms of magnitude and significance.

The relationship of the LIT rate with its tax base-related determinants is less apparent - there is a significant correlation, albeit in an inconclusive direction, between the average wage and the tax rate. The same is true for electricity consumption, meaning that a larger tax base does not seem to be directly related with the mayor's decision when setting the tax rate for the following year. On the other hand, both the unemployment rate and the share of elderly population bear negative coefficients - respectively, -0.003 and -0.03. This means that an increase of 10 p.p. in the percentage of unemployed people within the labour force would be associated with a decrease in the LIT rate of 0.03 p.p., whereas a municipality in which 30% of the population is over 65 years old is expected to have a tax rate that is 0.3 p.p. lower than another municipality where only 20% of the residents are over 65 years old, *ceteris paribus*.

The latter effect is, moreover, consistently significant in explaining the variation in the outcome variable. In what regards the geographic location of municipalities within mainland Portugal, we find that coastal municipalities have a statistically significantly lower tax rate than countryside jurisdictions, with a mean difference of 0.2 percentage points. The impact of the

population size on the tax rate is inconclusive, be it in terms of sign, magnitude or significance.

Finally, the local budgetary determinants of the tax are both significant, although greatly offsetting of one another - namely, a 1% increase in the local government expenditures is associated with a 0.28 p.p. increase on the LIT, whereas a 1% increase in local government revenue drops the rate by 0.28 p.p.. The symmetrical behaviour of these variables suggests that the combined effect of the local budget decisions may have a negligible effect on the setting of the LIT rate.

The FE specifications largely confirm the results obtained in the pooled OLS model. Despite a number of determinants losing significance when time-variant features specific to each municipality are accounted for, both mayors who are aligned with the central government and those benefitting from a strong majority in the local assemblies charge a LIT rate that is on average 0.16 percentage points lower than the national average. As the number of times a mayor has been reelected rises, the tax rate they charge decreases too - roughly 0.25 percentage points per reelection. Higher turnout to the local election significantly explains a lower tax burden on citizens, suggesting that politicians subject to higher scrutiny by voters may face a higher cost of charging taxes.

In the FE model both the mean wage and electrical consumption, as proxies for the tax base, bear a negative effect on the tax rate. The negative effect of unemployment is stronger, and the two demographic regressors are shown to have a positive rather than a negative effect on the tax rate. finally, the combined effect of the municipal budget's revenue and spending displays a slightly positive tilt - if a mayor increases the municipality's expenditure by 1%, and compensates the extra spending by collecting 1% revenue from taxpayers, the overall effect in the LIT rate is an increase of 0.03 percentage points.

6.2 Robustness check

Given the temporal disparity between the time at which mayors decide on a given rate and the time in which it will be in effect, we test the robustness of our results to a lag-specification, the

Table 4: Baseline regression output

	(1) irs	(2) irs	(3) irs	(4) irs	(5) irs	(6) irs
Gov. alignment	-0.172***	-0.161***	-0.109**	-0.0886	-0.0850	-0.0436
	(0.0521)	(0.0510)	(0.0474)	(0.0618)	(0.0619)	(0.0456)
Number of reelections	-0.0361**	-0.0347**	-0.0430***	-0.0291	-0.0255	-0.0250
	(0.0154)	(0.0144)	(0.0142)	(0.0196)	(0.0204)	(0.0154)
Turnout rate	-0.0182***	-0.00459	0.000131	-0.0412***	-0.0266**	-0.0321***
	(0.00297)	(0.00411)	(0.00391)	(0.0112)	(0.0126)	(0.00986)
Majority in local gov.	-0.253***	-0.236***	-0.0590	-0.158	-0.119	-0.125
	(0.0531)	(0.0537)	(0.0540)	(0.105)	(0.101)	(0.0787)
Mean wage (log)		0.607***	-1.842***		-1.978*	-2.332***
		(0.206)	(0.270)		(1.116)	(0.814)
Electrical cons. (log)		-0.0196	0.224***		0.0821	-0.0916
		(0.0582)	(0.0553)		(0.265)	(0.195)
Unemployment rate		-0.0234**	-0.00363		-0.0541**	-0.0440**
		(0.0117)	(0.0102)		(0.0237)	(0.0176)
Coastal		-0.276***	-0.278***			
		(0.0646)	(0.0615)			
Share of elderly population		-0.0423***	-0.0399***		0.0387	0.0674**
		(0.00608)	(0.00652)		(0.0383)	(0.0287)
Population (log)		0.0525	-0.634***		0.626	1.996
		(0.0654)	(0.134)		(1.424)	(1.368)
Municipal spending (log)			28.48***			76.69***
			(2.021)			(10.37)
Municipal revenue net of LIT (log)			-28.45***			-73.04***
			(1.982)			(10.14)
N	2502	2502	2502	2502	2502	2502
adj. R^2	0.043	0.094	0.225	0.049	0.061	0.441
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Municipal FE	No	No	No	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

rationale for which lies in the fact that politicians only observe the economic and demographic conditions of year t when deciding the LIT rate of year t+1. Table 5 presents the results of this specification, where all variables except for the political ones are lagged by one period.

The coefficients of the lag-specification largely reiterate the ones previously obtained. The turnout rate, the mean wage and the coastal feature of municipalities are negatively correlated with the LIT rate, and the respective coefficients have the same rough magnitude. Municipal spending and municipal revenue maintain an almost symmetrical relationship with the tax rate. Unemployment is not a determining factor of the tax rate when the lagged variables are included. This may be due to the more volatile behaviour of the unemployment rate relative to most other variables, which may deem it a poor proxy of future unemployment. The FE lag model shows that population size is a determining factor of the LIT rate, namely in that jurisdictions with larger populations observe higher tax rates.

6.3 What about electoral years?

We allow for a different behavior by mayors in electoral vis-à-vis non-electoral years. By estimating the regression model with the original set of variables as well as a dummy variable which equals 1 in years when a local election takes place, we can disentangle this effect from the previous estimations. We find that an election year is a determining factor of higher tax rates. This contradicts the findings of Foremny and Riedel (2014), who show taxes are lower in local election years. Given that this policy is broadly regarded as a detractor of votes, the occurrence of higher rates in election years suggests that incumbents may perceive the LIT as a tax that is not prioritized by voters when deciding the criteria upon which to judge politicians' performance.

When this particularity is accounted for, two political effects are also observed, with respect to reelected mayors and local governments supported by a strong majority in their respective municipality. Firstly, as a mayor's tenure in office increases, they charge voters larger rates. Secondly, mayors with strong support also tend to charge higher rates.

Table 5: Regression output - robustness to the electoral cycle

	(1) irs	(2) irs	(3) irs
Gov. alignment	-0.149**	-0.0896	-0.0888
	(-2.84)	(-1.44)	(-1.56)
Number of reelections	-0.0467**	-0.0317	-0.0277
	(-2.85)	(-1.61)	(-1.38)
Turnout rate	-0.0000	-0.0396***	-0.0277*
	(-0.00)	(-3.55)	(-2.37)
Majority in local gov.	0.0366	-0.00387	0.0185
	(0.71)	(-0.05)	(0.23)
Mean wage (lag-1) (log)	-1.139***		-1.698*
	(-4.02)		(-2.29)
Electrical cons. (lag-1) (log)	0.159*		0.0984
	(2.53)		(0.50)
Unemployment rate (lag-1)	0.00326		-0.0226
	(0.29)		(-1.21)
Coastal	-0.210**		
	(-3.04)		
Share of elderly population (lag-1)	-0.0353***		0.0502
	(-4.81)		(1.21)
Population (lag-1) (log)	-0.289		3.198*
	(-1.86)		(2.26)
Municipal spending (lag-1) (log)	21.34***		32.56***
	(10.79)		(6.25)
Municipal revenue net of LIT (lag-1) (log)	-21.55***		-30.58***
	(-11.13)		(-6.09)
N	2225	2502	2225
adj. R^2	0.163	0.042	0.124
Year FE	Yes	Yes	Yes
Municipal FE	No	Yes	Yes

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Regression output - electoral years

	(1) irs	(2) irs	(3) irs	(4) irs	(5) irs	(6) irs
Gov. alignment	-0.100*	-0.0782	-0.0248	-0.0763	-0.0399	0.0221
	(-2.13)	(-1.25)	(-0.51)	(-0.95)	(-0.52)	(0.37)
Number of reelections	-0.0306*	0.0225	0.00899	-0.0202	0.0549**	0.0105
	(-2.24)	(1.41)	(0.63)	(-0.94)	(3.21)	(0.63)
Turnout rate	0.000815	-0.00270	0.00429	-0.00408	-0.00614	-0.00583
	(0.23)	(-0.33)	(0.64)	(-0.67)	(-0.65)	(-0.49)
Majority in local gov.	0.0549	0.00524	-0.0216	0.0778	0.0472	0.0287
	(1.16)	(0.07)	(-0.35)	(0.91)	(0.45)	(0.36)
Mean wage (log)	-1.735***		-2.172**	-1.504***		-4.020***
	(-6.72)		(-3.17)	(-3.33)		(-4.14)
Electrical cons. (log)	0.229***		-0.269	0.253**		-0.403
	(4.21)		(-1.24)	(2.95)		(-1.43)
Unemployment rate	0.0164		0.0418***	0.0210		0.0277
	(1.85)		(3.62)	(1.47)		(1.51)
Coastal	-0.234***			-0.321**		
	(-3.89)			(-3.07)		
Share of elderly population	-0.0343***		0.00208	-0.0310**		0.0175
	(-5.41)		(0.07)	(-2.90)		(0.46)
Population (log)	-0.502***		6.286***	-0.469*		5.834***
	(-3.99)		(4.98)	(-2.13)		(4.21)
Municipal spending (log)	28.11***		65.30***	26.30***		72.70***
	(14.45)		(8.23)	(7.67)		(6.55)
Municipal revenue net of LIT (log)	-28.24***		-63.55***	-26.46***		-69.62***
	(-14.79)		(-8.12)	(-7.88)		(-6.38)
Election year	0.0925*	0.0488*	0.103***			
	(1.98)	(2.00)	(4.26)			
N	2502	2503	2502	834	834	834
adj. R^2	0.213	0.003	0.354	0.198	0.009	0.389
Year FE	No	No	No	No	No	No
Municipal FE	No	Yes	Yes	No	Yes	Yes

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

7 Conclusions

This paper has studied whether a range of factors lie behind local incumbents' decision of setting the local income tax rate. We show that the LIT rate is negatively correlated with the turnout to local elections, which may suggest that when there is higher political scrutiny by voters, the LIT rate is lower. Moreover, in times of economic hardship, which may imply higher unemployment rates, the tax rates tend to be lower. Municipalities with a higher mean wage have lower tax rates, indicating that mayors may ensure a given tax revenue with lower tax revenue. With respect to local public finance, we find that municipal spending is positively correlated with the LIT rate, and the opposite is true for municipal revenue. As these coefficients have similar sizes and opposite signs, we cannot rule out that part of the effect is mechanical. The model with no fixed effects shows that coastal municipalities, which tend to be richer and may more easily dispose of other means to collect own revenues, also tend to charge lower LIT rates. Since there is a one-year lag between the decision and the period in which it is in place, for robustness we run our baseline specification using the lagged socio-demographic and local public finance variables. We find that the results remain stable for the turnout rate, mean wage, coastal municipalities, and the public finance variables.

Our baseline results may average out electorally-motivated behaviour by politicians. In order to assess this, we extend the model in two ways: first by adding a dummy variable which equals 1 in local election years, and then by instead estimating the regression model only for the three local election years of 2009, 2013 and 2017. Higher tax rates are observed in election years - this either hints that mayors perceive the LIT as being negligible for voting behaviour, or that it is not set as a function of local elections.

Further research may include assessing spatial correlation between municipalities, including the tax mimicking, benefit spillovers and yardstick competition hypotheses initially argued by Wilson (1999) and Salmon (1987), and whether the change in the default tax rate in 2019 had any behavioral implications in tax policy decisions.

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