Composition of Municipal Executive Councils and Yardstick Competition

Composição dos Executivos Municipais e Concorrência «Yardstick»

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Abstract/Resumo

In Portugal the composition of municipal executive councils has a special feature that is not common in other countries. The municipal executive councils integrate representatives of different parties/candidacies in proportion to their electoral results. Therefore, opposition representatives have more information and more influence on municipal decisions then if they were only represented in the Municipal Assembly. According to the empirical evidence in the literature, yardstick competition is associated with smaller majorities and the need to compete in the political market. The evidence gathered in this paper for the Portuguese case shows that, in a situation where municipal executive councils integrate opposition representatives, mayors with majorities have more capacity to engage in competition in the political market.

A composição dos conselhos executivos municipais (câmaras municipais) em Portugal tem uma particularidade que não é usual noutros países. Os conselhos executivos municipais integram representantes de diferentes partidos/candidaturas na proporção dos resultados eleitorais. Consequentemente, os representantes da oposição têm mais informação e mais influência do que numa situação em que estivessem apenas representados na Assembleia Municipal. De acordo com a evidência empírica na literatura, a concorrência do tipo *yardstick* é associada a executivos em minoria ou com maiorias mais pequenas que necessitam mais de concorrer no mercado político. A evidência empírica obtida neste trabalho para o caso português mostra que, numa situação em que os conselhos executivos integram representantes da oposição, os presidentes de câmara com maioria têm maior capacidade para se envolver em concorrência no mercado político.

Keywords: Yardstick Competition; Strategic Interaction, Local Taxes, Local Governments; Portugal.

JEL codes: H71; H73

Palavras-chave: Concorrência do tipo *Yardstick*; Interação Estratégica, Impostos Locais, Governos Locais; Portugal.

Códigos JEL: H71; H73

1. INTRODUCTION

With the studies by Case et al. (1993) and Besley and Case (1995), an increasing interest in studying tax mimicking among local governments emerged among academics and local politicians. The combination of abundant data available at local level, the possibility to use new econometric techniques, and an increasing interest for fiscal policy at local level, led to the publication of a significant number of empirical papers on the strategic interaction among local governments when setting rates of local taxes. The papers published cover a wide range of countries: USA (Case et al. 1993 and Besley and Case 1995); the Netherlands and Belgium (Vermeir and Heyndels 2006; Gerard et al. 2010; Gerard and Van Malderen 2012; Geys and Revelli 2009); Spain (Sollé-Ollé 2003; Bosh and Sollé-Ollé 2007; Delgado and Mayor 2011; Delgado et al. 2011); France (Binet 2003; Elhorst and Fréret 2009); Germany (Allers and Elhorst 2005); Norway (Carlsen et al. 2005, Fiva and Ratso 2007); Italy (Bordignon et al. 2003); United Kingdom (Revelli 2002), Finland (Kangasharju et al. 2006; Lyytikainen 2012); Czech Republic (Sedmihradská 2013); Portugal (Coimbra et al. 2011, and Costa et al. 2011). Many of the papers study interaction among local governments when setting rates of local taxes and go a step further testing if tax mimicking is determined by competition for economic resources or by the competition in the political market (yardstick competition).

Sleifer (1985) is the first author introducing the concept of yardstick competition applying it to firms in an oligopoly. Salmon (1987) generalized the concept to local governments when choosing rates of local taxes. According to Salmon, in a context of incomplete information voters evaluate the quality of local politicians' decisions comparing the level of taxes in neighbour jurisdictions. If the local government where the voter resides increases taxes, the evaluation is more favourable if the other jurisdictions that serve as reference also increase the taxes. Otherwise, they will penalize the local executive in local elections. Therefore, decreases in rates of local taxes puts further political pressure on local executives to do the same otherwise they will be perceived as bad performers. Strategic interaction among municipalities is of the type "yardstick competition".

In the specialized literature a way to test the yardstick hypothesis is to analyse if the strategic interaction among municipalities when setting rates of local taxes is different when municipalities are governed by a solid majority and when they are not governed by a solid majority. Solid majorities are usually associated with less yardstick competition because mayors with significant electoral advantage do not need to be involved so much in yardstick competition.

Local governments in Portugal have a special feature generating, in our view, an opportunity for an empirical contribution in the specialized literature. As a matter of fact, municipal executive councils in Portugal integrate councillors belonging to the party/parties supporting the mayor as well as councillors of the opposition parties. Our central hypothesis is that, in such case, solid majorities are expected to be associated with more yardstick competition, a result contrary to the empirical literature on the subject. To this purpose we estimate spatial lag models with two spatial dependency regimes (municipalities with and without a solid majority in the executive council) and cross-section fixed effects coefficients. The models were estimated using the case of urban property tax (IMI).

2. THE COMPOSITION OF MUNICIPAL EXECUTIVE COUNCILS IN PORTUGAL

Portugal has 308 municipalities (278 in Continental Portugal) which are very diverse in population, area of jurisdiction and budget. As we observe in table 1, the diversity is very high in terms of scale, geographic and demographic attributes. Such diversity generates very different situations concerning the financial autonomy of Portuguese municipalities.

As a consequence of such diversity, the composition of municipal executive councils takes into account the number of registered voters in each municipality. In table 2 we present the number of members according to the number of registered voters in each municipality.

The mayor sets the number of councillors full or part time till the limit defined in the legislation. Usually, councils in full time or part time are councillors elected in the electoral lists supporting the mayor. These councillors

Table 1 – Characterization of Portuguese Municipalities (2013)

Dimension	Variable	Average	Standard Deviation	Maximum	Minimum
Scale	Population	33, 952.5	55,217.9	520,549.0	456.0
	Area (km2)	299.2	277.8	1,720.6	8.3
Geographic and demographic attributes	Altitude variation (meters)	624.2	441.3	2,351.0	17.0
	Population density	297.4	823.1	7,480.5	4.64
Financial Structure	Own revenue as a % of revenue*	37.4	18.1	86.0	3.6
	Central Government transfers as a % of revenue*	50.7	16,3	94.3	9.9

*Total revenue excluding revenue associated with debts and sale of financial assets. Source: adapted from Veiga et al. (2015)

have delegated executive competences. There are exceptional cases where the mayor delegates executive competences to councillors elected in opponent lists. Usually, the councillors elected by opponent lists do not have delegated competences and are not full or partial time councillors.

Table 2 – Number of members of the Municipal Executive Councils

Municipalities	Limit of number of members full time	Total number of members
Lisbon	1+4=5	1+16=17
Porto	1+4=5	1+12=13
Municipalities with 100 000 registered voters or more	1+3=4	1+10=11
Municipalities with more than 50 000 and less than 100 000 registered voters	1+2=3	1+8=9
Municipalities with more than 20 000 and less than 50 000 registered voters	1+2=3	1+6=7
Municipalities with more than 10 000 and less than 20 000 registered voters	1+1=2	1+6=7
Municipalities with 10 000 or less than 10 000 registered voters	1+1=2	1+4=5

Notes: The government of Portuguese municipalities is assured by tow elected bodies: *Câmara Municipal* (municipal executive council) and *Assembleia Municipal* (deliberative council); Number of members of municipal executives = mayor + number of other councillors (two councillors part-time are equivalent to one councillor full-time).

The councillors are elected in lists presented by political parties (or coalitions) as well as independent citizens. The method of election is proportional to the number of valid votes using the Hondt method (the mayor is the first member of the most voted list).

Table 3 – Composition of Municipal Executive Councils

Election	Executive councils with majority	Left wing parties	Number of Municipalities in Continental Portugal
2001	250	131	278
2005	252	133	278
2009	252	149	278

The municipal executive decisions are taken by all councillors. There is more political control in this type of executive councils, but the managerial capacity to take quick decisions is somehow reduced which creates the conditions for a debate on the benefits and costs of changing the composition of municipal executives to assure they are politically homogeneous. The method of election using proportionality – method of Hondt is seen as a method that generates majorities with more difficulty. Despite this fact, given the political proximity of voters to their municipal executives at municipal level there is a significant number of municipal executives with majority. The voters seem to understand the need of solid majorities at municipal level and tend, in a very practical way, to concentrate their votes and do not follow in many cases their ideological orientation.

3. THE PANEL SPATIAL LAG MODEL

In this study we adopt an assumption of geographic interaction, which may be represented through a specification denominated by Anselin (1995) as panel spatial autoregressive model (SAR model) or panel spatial lag model. Taking into consideration the panel structure of the data, the regression assumes the form of a panel SAR model or panel lag model. According to Anselin (1995) the spatial lag dependence can be introduced into the cross-sectional dimension of traditional panel data models in a straightforward way:

$$Y_t = X_t\beta + \rho WY_t + \varepsilon_t \qquad \textbf{(1)}$$

where Y_t, X_t and ε_t refers to the n-spatial unities at the time period t. $X_t\beta$, ρWY_t and ε_t represent, respectively, the regressive influence of exogenous control factors, the spatial autoregressive factor associated to geographic interaction and uncontrolled disturbances.

Allers and Elhorst (2005) points out that a positive and significant coefficient ρ in the spatial lag model may be interpreted as evidence of tax mimicking. However, to evaluate if tax mimicking results from a yardstick competition process, we need to test the existence of a link between the spatial interaction of tax rates and the political process.

Inspired on Rietveld and Wintershoven (1998), Bordignon et al. (2003) and Allers and Elhorst (2005) spatial lag models with two regimes, we also estimate the following alternative models, represented in the form of t-period specific equations:

$$Y_t = \propto l_N + X_t\beta + \rho_1 WY_t + \rho_2 M_t WY_t + \delta + \varepsilon_t \qquad \textbf{(2)}$$

$$Y_t = \propto l_N + X_t\beta + \rho_1 WY_t + \rho_2 M_t WM_t Y_t + \delta + \varepsilon_t \qquad \textbf{(3)}$$

Y_t, a vector Nx1 of property tax rates in year t for the N=278 municipalities of Continental Portugal, represents the endogenous variable under study, which is analysed in both property tax systems covering evaluated and non-evaluated properties. The parameter $\propto$ is an unknown constant term and l_N is an n-element unit vector, representing the influence of relevant factors taken as invariant for all set of N=278 municipalities and the overall T=9 years (2003 until 2011) under analysis. X_t is a matrix NxK of exogenous factors observed at year t, which includes a set of explicative factors named TAX CHANGE, WORKING AGE POPULATION, PURCHASING POWER, DEPENDENCY,UNEMPLOYMENT, ELECTION YEAR and LEFT-WING PARTIES. β is a Kx1 vector of impact coefficients of exogenous factors included as control variables. δ is a Nx1 vector of local constant terms containing all N cross-section fixed effects, $\delta' = (\delta_1, \delta_2, \ldots, \delta_N)$. δ_i represents the i-municipal time invariant local specific factors.

The panel fixed effects option is considered in order to control that local specificities do not interfere in the evaluation of spatial interaction factor and the yardstick explaining hypothesis. To avoid a problem of perfect multicollinearity related to the presence of an overall constant term, the fixed effects δ_i are assumed to be as centred coefficients by considering the restriction $\sum \delta_i = 0$.

The presence of spatial autoregressive terms in the right-end of the model represent an assumption of spatial interaction in the moment of setting the properties tax rates. The existence of two regimes in the spatial interaction factors correspond to the hypothesis under study that spatial dependency in the political decision process is explained by a yardstick competition effect.

Spatial interaction is represented by WY_t, M_tWY_t and $M_tWM_tY_t$ factors, where W is a NxN matrix of spatial contiguity weights and $M_t = \mathrm{diag}(m_{it})$, is a NxN diagonal matrix who-

Table 4 – List of Explanatory Variables

Variable	Description	Rationale
TAX CHANGE	Dummy variable representing the structural changes introduced in 2008 in the rates of property tax: it is equal to one for 2008 and following years and it is equal to zero in the years before.	Attending to the fact that the structural changes introduced in 2008 led to an overall decrease on the maximum tax rates, it is expected a negative sign for the coefficient estimate of this variable.
WORKING AGE POPULATION	Resident population aged from 15 to 64 years old subjected to a logarithm transformation in order to mitigate the scale effect.	This variable captures the influence of agglomeration economies on municipal decisions concerning the rates of IMI. Agglomeration economies diminish the pressure of yardstick competition. Municipalities benefiting from agglomeration economies will have a higher degree of freedom on the decision to follow the decrease of tax rate by other jurisdictions. Thus, this variable is expected to have a negative coefficient estimate.
PURCHASING POWER	Index of municipal per capita purchase power defined on a per capita base.	The per capita purchase power index reflects the relative tax basis capacity. For the same number of taxpayers, when the per capita purchase power increases the tax base increases, and therefore , the tendency to lower tax rates is higher. Consequently, we expect a negative sign for the coefficient estimate of the purchase power variable.
DEPENDENCY	Resident population under 15 years old added with the resident population older than 64 years as a proportion of the working age population.	Because residents of municipalities with high dependency rates are socially more vulnerable and have less ability to pay we expect lower tax rates in municipalities with higher dependency.
UNEMPLOYMENT	Total number of unemployed people registered in local employment centers in proportion to the working age population.	The unemployment rate as a social vulnerability factor affects the ability of residents to pay taxes. Consequently, we expect a negative coefficient estimate for this variable.
ELECTION YEAR	Dummy variable representing years influenced by local government elections: it is equal to one in years of municipal elections and it is equal to zero in the remaining years.	As we know from the political business cycle literature, the management of the political cycle is expected to be reflected in lower tax rates in electoral periods, and therefore the coefficient estimate for this variable is expected to be negative.
LEFT-WING PARTIES	Dummy variable representing local governments led by left-wing parties: it is equal to one in municipalities led by a left-wing party and it is equal to zero in those led by a right-wing party.	Traditionally, left-wing parties tend to favour higher property tax rates compared with municipalities dominated by right-wing parties. So, the estimate coefficient for this variable is expected to have a positive sign.

se diagonal elements m_{it} are equal to one in municipalities governed by a solid majority in year t and otherwise are equal to 0. Two spatial contiguity matrices are used, measuring the degree of connection, nearness or contiguity between municipalities: a symmetric spatial weight matrix (W1) and a row-stochastic spatial weight matrix (W2). Both are distance-based contiguity matrices. W1 is a symmetric spatial weight matrix, based on Euclidian distances between municipalities' centroids, with maximum eigenvalue equal to one. W2 is a row-stochastic spatial weight matrix, being each of their elements between zero and 1 and each of their rows sum to one. Unlike W1, W2 is no longer symmetric, but as their rows sum to 1, W1Y would contain the average value of the neighbouring Y for each municipality.

The yardstick effect occurs if spatial interaction effects are different in municipalities with different political regimes. The first hypothesis (equation 2) is that in municipalities governed by a solid majority, the interaction effects are distinguished from those of municipalities without such majority. The parameter ρ_1 represents the impact of spatial interdependency for all municipalities with and without majority. The parameter ρ_2 represents the differential impact of spatial interaction in municipalities governed by a majority. The parameter ρ_1 is expected to have a positive estimate, meaning that property tax rates are set according to municipal neighbourhood tendencies. In the hypothesis of yardstick competition ρ_2 is expected to be positive. This assumption is related with the fact that in Portugal munici-

pal executives are composed by representatives of different parties. So, in municipal executives with a solid majority, the mayor has more capacity to influence decisions with the purpose to favour his re-election. On the contrary, in municipalities where the mayor has not a majority he has to negotiate with the opposition and therefore we expect decisions to be less influenced by competition in the political market. In the literature, the traditional argument is that in municipal executives with solid majorities we should expect less yardstick competition. Furthermore, considering that voters know if the mayor is supported by a solid majority we expect they will be more demanding with mayors when they have full capacity to decide on the subjects. Therefore, we expect for the Portuguese case that municipalities with more solid majorities to be more involved in yardstick competition.

In equation 3 we use as independent variable $M_tWM_tY_t$ meaning that such differential is related to the comparison of political processes involving only neighbourhood municipalities with solid majorities.

As demonstrated by Anselin (1995), the spatial lag term must be treated as an endogenous variable and the proper estimation methods must account for this endogeneity. The endogeneity of the spatially lagged dependent variable can be addressed by approaches like those based on *two stage least squares* (2SLS) or on the principles underlying the *generalized method of moments* (GMM). Both methods imply the use of instrumental variables. We follow Kelejian and Robinson (1993) to choose instrumental variables. From the conditional expectation of Y_t in the reduced form:

$$E(Y_t) = \propto l_N + X_t\beta + \sum_{j=1}^{+\infty}\left(\rho_1^j W + \rho_2^j M_t W\right) \quad (\propto l_N + X_t\beta + \delta) \qquad \textbf{(4)}$$

$$E(Y_t) = \propto l_N + X_t\beta + \sum_{j=1}^{+\infty}\left(\rho_1^j W + \rho_2^j M_t WM_t\right) \quad (\propto l_N + X_t\beta + \delta) \qquad \textbf{(5)}$$

Stopping in lag j=1 we have chosen as instrumental variables, the exogenous part of the models as well their first spatial lags: l_N, X_t, Wl_N, WX_t, M_tWl_N and M_tWX_t for model 1 and l_N, X_t, Wl_N, WX_t, $M_tWM_tl_N$ and $M_tWM_tX_t$ for model 2. The models under study can be represented algebraically as follows:

$$Y_{it} = \widetilde{X}_{it}B + \gamma_i + \varepsilon_{it} \qquad \textbf{(6)}$$

where $\widetilde{X}_{it}$ includes both exogenous and endogenous regressors and γ_i represents non centered fixed effects.

In situations where the errors are influenced by spatial autocorrelation or spatial heteroscedasticity the classic assumptions of $E(\varepsilon_{is}\varepsilon_{jt}) = 0$ for is≠jt and $E(\varepsilon_{it}\varepsilon_{it}) = \sigma^2$ are no longer valid. Thus, we have to substitute such assumptions by a more general one of $E(\varepsilon_t\varepsilon_t') = \Omega_N$. The errors are spatial heteroscedastics if the elements of the main diagonal σ_{ii} are not constant and they are spatial auto-correlated if there are nonzero elements σ_{ij} (i≠j). Consequently we adopted the methodology proposed by Beck and Katz (1995) called *Panel Corrected Standard Error* (PCSE), which is robust to unrestricted unconditional covariance matrices Ω_N.

4. EMPIRICAL RESULTS

Portuguese municipalities benefit from revenue of the following municipal taxes: property tax (on rural land and urban property (IMI); tax on transactions of real estate (IMT); tax of circulation (IUC); municipal tax on businesses (DERRAMA). The revenue of these taxes reverts to municipalities with the exception of IMI where the tax collected from rural property reverts 50% to municipalities and 50% to *freguesias* (lowest level of local governments in Portugal). Since 2007, municipalities also receive 5% of income tax collected by central government from their resident tax payers, an amount that municipalities can decide to return in part or totally to tax payers.

Portuguese municipalities can set rates of urban property tax (IMI) in a pre-defined range of rates (municipalities under a special program of financial assistance have to set maximum rates of IMI). These ranges are different for evaluated and non-evaluated urban property. The municipalities can also set the rates of municipal business tax (DERRAMA) in a pre-defined range and to decide to return to their residents up to 5% of income tax (IRS) collected from their residents by central government. Concerning user charges, municipal fiscal competences are significant but are subject to economic demonstration that user charges are in proportion with costs of provision or benefit of users.

In table 5 we present the maximum and the minimum rate that municipalities can set for ta-

Table 5 - Municipal Fiscal Competences (choice of rates)

Tax	Period	Incidence	Minimum rate	Maximum rate
Property Tax (IMI)	From 2003 till 2007	Rural land	0.80%	
		Non- evaluated urban property	0.40%	0.80%
		Evaluated urban property	0.20%	0.50%
	Since 2008	Rural land	0.80%	
		Non- evaluated urban property	0.40%	0.70%
		Evaluated urban property	0.20%	0.40%
	Since 2012	Rural land	0.80%	
		Non- evaluated urban property	0.50%	0.80%
		Evaluated urban property	0.30%	0.50%
Business Tax (DERRAMA)	From 1998 till 2006	Business tax	0%	10%
	Since 2007	Profit	0%	1.50%
Income Tax (IRS)	Since 2007	Income	0%	5%

xes where municipalities have the competence to set the rate.

Considering the fiscal competencies of municipalities in Portugal, the urban property tax is adequate for our empirical analysis of the yardstick hypothesis. The Income Tax could be an alternative, but the possibility to return income tax to residents is still very recent, reason why we only consider the case of IMI.

The table 6 resumes descriptive information about the dependent variables (non-evaluated properties tax and evaluated properties tax) and regressors used along the period of analysis (2003 to 2013). Variables are described using average, minimum values (Min) maximum values (Max) and relative standard deviation (RSD) statistics.

The perception of fiscal interaction among municipalities is growing and an increasing number of municipalities are decreasing rates of IMI (both on evaluated and non-evaluated urban property). Municipalities with a better financial situation are expected to signal managerial competence by decreasing rates of IMI. This tendency is further reinforced by the fact that urban real estate property has been subject to re-evaluation in 2012. Although rates of IMI for evaluated urban property are lower than for non-evaluated urban property, it is expected an increase in revenue of IMI, and therefore many municipalities will be in a better position to set lower rates of IMI. This movement toward more fiscal competition is restrained by the loss of fiscal revenue resulting from the current economic crisis in Portugal and by the fact that IMT was espected to be progressively abolished (with a decrease of 1/3 in the years of 2017, 2018, and 2019).

In the analysis we have used spatial lag models with two spatial dependency regimes (municipalities with and without a solid majority) and cross-section fixed effects coefficients. The models were structured throughout two spatial contiguity matrix options: a row-stochastic spatial weight matrix (W1) and a symmetric spatial weight matrix (W2).

Furthermore, two distinct assumptions were considered for the spatial dependency diffusion process, both stating that local powers governed by a solid majority are more closely influenced by the decision processes of other neighbourhood municipalities. A distinction is considered in terms of neighbourhood referential since we admit that comparisons are made in relation to all other neighbourhood municipalities (MWY) or only to those neighbourhood municipalities governed by majorities (MWMY).

In compliance the assumption of yardstick competition, it was tested the hypothesis that local governments are particularly aware of neighbourhood municipalities decisions in electoral moments (Salmon, 1987; Besley e Case, 1995). To do it was considered additionally and interaction variable combining the variables election year with WY. However this hypothesis was abandoned having in consideration that it was clearly no significant for all models.

Table 6 – Descriptive information from 2003 to 2011

Variable	Statistic	2003	2004	2005	2006	2007	2008	2009	2010	2011
Non-evaluated properties tax	Average	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7
	Min	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Max	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7
	RSD	0.152	0.177	0.169	0.150	0.148	0.127	0.135	0.134	0.131
Evaluated properties tax	Average	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
	Min	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Max	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
	RSD	0.216	0.239	0.238	0.219	0.217	0.187	0.197	0.195	0.189
Working age population	Average	24110	24236	24320	24397	24452	24465	24426	24383	24299
	Min	1129	1118	1102	1091	1073	1062	1048	1031	1018
	Max	351348	342812	333761	326196	318320	310566	304767	309023	312810
	RSD	1.627	1.619	1.611	1.606	1.601	1.597	1.594	1.591	1.588
Purchasing power	Average	70.5	70.5	71.6	75.7	75.7	75.3	75.3	76.0	76.0
	Min	36.2	36.2	41.8	47.3	47.3	45.9	45.9	47.4	47.4
	Max	220.2	220.2	277.9	216.0	216.0	235.7	235.7	232.5	232.5
	RSD	0.387	0.387	0.356	0.326	0.326	0.330	0.330	0.319	0.319
Dependency	Average	0.562	0.562	0.563	0.560	0.557	0.555	0.554	0.554	0.555
	Min	0.374	0.380	0.385	0.391	0.397	0.392	0.388	0.385	0.383
	Max	1.018	1.024	1.032	1.023	1.014	1.000	0.992	0.982	0.961
	RSD	0.198	0.197	0.196	0.190	0.186	0.182	0.177	0.173	0.167
Unemployment	Average	0.058	0.065	0.063	0.065	0.061	0.054	0.057	0.069	0.072
	Min	0,016	0,014	0,014	0.015	0.017	0.019	0.017	0.023	0.025
	Max	0,167	0,172	0,137	0.142	0.144	0.131	0.137	0.169	0.173
	RSD	0,383	0,377	0,356	0.362	0.340	0.356	0.337	0.322	0.326

The table below presents the estimation results for non-evaluated and evaluated urban property tax rates according the final models fixed for the analysis. All estimates have the expected sign and almost all have significant t-statistics. The variables UNEMPLOYMENT and ELECTION YEAR are not significant for evaluated urban property, while the variable LEFT-WING PARTY is not significant for non-evaluated properties models. All other control regressors, cross-section fixed effects coefficients and spatial interaction factors revealed to be significant.

The variable TAX CHANGE, representing the structural changes introduced in 2008 in national property tax systems, is significant in all hypotheses under evaluation and their impact estimates reveal a general decrease on properties tax rates explained by an overall decrease introduced in legal boundaries.

The variable WORKING AGE POPULATION, as an agglomeration economy proxy factor, has significant negative impact coefficients. All other factors constant, we conclude that the higher the number of residents in working ages the lower the properties tax rates. This tendency is explained as an agglomeration economy phenomenon related to the fact that the higher the tax bases of most populated municipalities the higher degree of freedom to decrease tax rates by municipal executives.

Similarly to the variable WORKING AGE POPULATION, the variable PURCHASING POWER is a factor having significant negative impact coefficients. Among municipalities with similar control characteristics, those with higher per capita purchasing power tend to set lower property tax rates. This tendency is also explained as an agglomeration economy phenomenon. Defined on a unitary basis, the index of municipal per capita purchasing power reflects the relative tax base capacity. In municipalities with a similar number of taxpayers, as the per capita purchasing power increases the

tax base increases and, for the reasons explained above, it increases the tendency to reduce the property tax rates.

The level of significance is represented by the usual star symbol (*, ** or *** as the coefficient is significant at 0.05, 0.01 or 0.001, respectively). The cells without star symbols correspond to the coefficients having p-values greater than 5% (dependency for all evaluated urban properties models and election year for model A1W1) or greater than 10% (unemployment for all models, except A2W1, election year for all models except A2W1 and B2W1 and left-wing party for non-evaluated urban properties). All other coefficients are clearly significant.

Table 7 - TSLS/GMM Estimation Results

Variables		Evaluated urban properties (A)			Non-evaluated urban Properties (B)			
	Model (1)		Model (2)		Model (1)		Model (2)	
	W1	W2	W1	W2	W1	W2	W1	W2
Constant	1.736 (4.314) ***	1.489 (3.534) ***	1.645 (4.114) ***	1.378 (3.319) ***	1.821 (3.645) ***	1.443 (2.649) **	1.729 (3.496) ***	1.332 (2.478) *
Tax change	-0.030 (-4.541) ***	-0.022 (-2.916) **	-0.027 (-4.335) ***	-0.019 (-2.627) **	-0.040 (-4.148) ***	-0.026 (-2.198) *	-0.038 (-4.094) ***	-0.024 (-2.058) *
Working age population	-0.152 (-3.687) ***	-0.132 (-3.120) **	-0.145 (-3.525) ***	-0.124 (-2.939) **	-0.127 (-2.609) **	-0.106 (-2.110) *	-0.119 (-2.460) *	-0.098 (-1.950) *
Purchasing power	-0.074 (-3.155) **	-0.061 (-2.507) *	-0.069 (-2.976) **	-0.055 (-2.301) *	-0.072 (-2.668) **	-0.057 (-2.008) *	-0.072 (-2.642) **	-0.055 (-1.949) *
Dependency	-0.107 (-1.790)	-0.110 (-1.827)	-0.106 (-1.762)	-0.110 (-1.824)	-0.210 (-2.802) **	-0.188 (-2.459) *	-0.212 (-2.825) **	-0.190 (-2.479) *
Unemployment	-0.139 (-1.568)	-0.116 (-1.293)	-0.116 (-1.303)	-0.091 (-1.006)	-0.216 (-1.926) *	-0.158 (-1.351)	-0.181 (-1.632)	-0.120 (-1.035)
Election year	-0.004 (-1.710)	-0.003 (-1.227)	-0.003 (-1.491)	-0.002 (-0.970)	-0.006 (-2.177) *	-0.004 (-1.384)	-0.006 (-2.077) *	-0.004 (-1.240)
Left-wing party	0.017 (4.389) ***	0.017 (4.278) ***	0.017 (4.426) ***	0.017 (4.298) ***	0.006 (1.372)	0.006 (1.263)	0.007 (1.422)	0.006 (1.321)
WY	0.498 (4.421) ***	0.627 (4.895) ***	0.544 (5.107) ***	0.685 (5.766) ***	0.352 (2.216) *	0.573 (2.919) **	0.365 (2.330) *	0.599 (3.091) **
MWY	0.029 (2.584) **	0.029 (2.489) *	-	-	0.024 (3.047) **	0.023 (2.760) **	-	-
MWMY	-	-	0.037 (3.128) **	0.036 (2.949) **	-	-	0.038 (4.382) ***	0.036 (3.976) ***
R^2	0.762	0.759	0.761	0.757	0.758	0.753	0.759	0.752

The variables DEPENDENCY and UNEMPLOYMENT have, as expected, negative coefficient estimate. All other factor remaining constant, as dependency or unemployment increases, municipalities tend to decrease the property tax rates. Nevertheless, such evidence is not conclusive concerning unemployment since the coefficient estimate is not statistically significant. Anyway, both variables are included in the model as social vulnerability factors, reflecting less ability to pay and social pressure to lower property tax rates.

The variables ELECTION YEAR and LEFT-WING PARTY are both political context variable included in the analysis. The results reveal a general tendency of municipalities to reduce properties tax rates in electoral periods. Such result is clearly significant only for non-evaluated property models adopting a row-stochastic spatial weight matrix (W1). The other political context variable (LEFT-WING PARTY) is significant for evaluated property models, but it is not significant for non-evaluated property models. Our results bring empirical evidence that municipalities governed by left-wing parties set higher rates of property tax than those municipalities governed by right-wing parties.

Spatial interaction factors are significant in all models. There is strong empirical evidence that municipal decisions concerning property tax rates take into consideration rates of property tax in neighbourhood municipalities. This conclusion is solid because in our models we consider a set of fixed effects to avoid interference of local specificities in the evaluation of the spatial interaction factor and the corresponding yardstick explicative hypothesis.

The yardstick effect assumption was evaluated by testing the hypothesis that spatial interaction dependency patterns are different in municipalities with different political regimes (municipalities governed by a solid majority or otherwise). All models are significantly conclusive about the presence of a yardstick effect. In municipalities governed by a solid majority, interaction effects are likely to be more intense than those observed in municipalities having no such kind of majority. According to our results the interaction between municipalities is even stronger when both municipalities are governed by majorities. The estimated parameter for the regressor $M_tWM_tY_t$ is higher than the estimated parameter for the regressor M_tWY_t both for distance matrix W1 and W2 and for evaluated and non-evaluated property.

5. CONCLUSIONS

In recent years Portuguese municipalities have taken into consideration competition on the revenue side when setting rates of municipal taxes. Two major reasons contribute to this change. On the one hand, competition on the expenditure side is less important because most of the needs on infrastructure are satisfied. On the other hand, voters are more sophisticated and look not only to the expenditure side, but also to the revenue side, and in special to the burden of municipal taxes. Furthermore, they have more information on neighbour jurisdictions rates of taxes and consequently they use such information to evaluate local politicians (yardstick hypothesis).

In this paper we gather empirical evidence on the existence of strategic interaction among Portuguese municipalities when they set rates of property tax and in particular if we are in the presence of yardstick competition. To this purpose, we adopt the assumption of geographic interaction among Portuguese municipalities when setting rates of property tax. We estimated, for evaluated and non-evaluated urban property, spatial lag models with two spatial dependency regimes (municipalities with and without a solid majority) and cross-section fixed effects coefficients. The models were structured throughout two spatial contiguity matrix options: a row-stochastic spatial weight matrix (W1) and a symmetric spatial weight matrix (W2).

The yardstick effect occurs if spatial interaction effects are different in municipalities with different political regimes. The interaction effects in municipalities governed by a solid majority are distinguished from those in municipalities without such majority. In the specialized literature solid majorities are usually associated with less yardstick competition because mayors with significant electoral advantage do not need to be involved so much in yardstick competition. On the contrary, our hypothesis in our model is that yardstick completion is stronger for municipalities governed by majorities. This may be explained by the composition of municipal executive councils in Portugal that include representatives of different parties, including opposition parties. Our hypothesis is that in municipal executives with a solid majority, the mayor has more capacity to influence decisions with the purpose to favour his re-election. On the contrary, in municipalities where the mayor has not a majority he has to negotiate with the opposition and therefore we expect decisions to be less influenced by competition in the political market. According to our empirical results, in municipalities where mayors do not have a majority must negotiate with the opposition the approval of municipal policies and therefore executive decisions seem to be less influenced by competition in the political market. Furthermore, political competition seems to be stronger when mayors have identical capacity to influence the executive council decisions.

In this paper we also provide empirical evidence of the influence of economic context factors and political variables on municipal decisions concerning rates of property tax. The results obtained confirm our theoretical expectations. In general we conclude that left-wing parties set higher rates of property tax and that municipalities manage the political business cycle setting lower property tax rates in election years. Municipalities with larger fiscal base, all other factors constant, set lower rates of property tax. Municipalities with higher dependency rate, all other factors constant, set lower rates of property tax.

REFERENCES

Allers, Maarten A. and J. Paul Elhorst (2005), "Tax Mimicking and Yardstick Competition among Governments in Netherlands", International Tax and Public Finance, 12, pp. 493-513.

Anselin Luc (1995), New Directions in Spatial Econometrics, Spinger-Verlag, Berlin.

Baltagi, Badi H. (2005), Econometric Analysis of Panel Data, Third Edition, John Wiley & Sons, West Sussex, England.

Beck, Nathaniel and Jonathan N. Katz (1995), "What to Do (and Not to Do) With Time-series Cross-section Data", American Political Science Review, 89(3), pp. 634-647.

Besley, T. and A. Case (1995), "Incumbent Behavior: Vote Seeking, Tax Setting and Yardstick Competition", American Economic Review, 85(1), pp. 25-45.

Binet, Marie-Estelle (2003), "Testing For Fiscal Competition among French Municipalities: Granger Causality Evidence in a Dynamic Panel Data Model", Journal of Regional Science, no. 82, pp. 277-289.

Bordignon, Massimo, Floriana Cerniglia and Federico Revelli (2003), "Property tax rates and electoral behaviour in Italian Cities", Journal of Urban Economics no.54, pp.199-217.

Bosch, Núria and Albert Solé-Ollé (2007), "Yardstick Competition and the Political Costs of Raising Taxes: An Empirical Analysis of Spanish Municipalities", International Tax and Public Finance, vol. 14, no. 1, pp. 71-92.

Carlsen, Fredrik, Bjorg Langset and Jorn Rattso (2005), "The Relationship between Firm Mobility and Tax Level: Empirical Evidence of Fiscal Competition between Local Governments", Journal of Urban Economics, no. 58, pp. 273-288.

Case, A. C., H. S. Rosen and J. R. Hines (1993), "Budget Spillovers and Fiscal Policy Interdependences: Evidence from the States", Journal of Public Economics, 52 (3), pp. 285-307.

Coimbra, Maria Luísa, José da Silva Costa and Armindo Carvalho (2011), "Fiscal Competition Among Portuguese Municipalities", Revista Portuguesa de Estudos Regionais, no. 28, pp. 26-38.

Costa, José da Silva, Armindo Carvalho and Maria Luisa Coimbra (2011), "Is There Yardstick Competition Among Portuguese Municipalities?", Urban Public Economics Review, 15, pp. 33-62.

Delgado, Francisco J. and Matías Mayor (2011), "Tax mimicking among local governments: some evidence from Spanish municipalities", Portuguese Economic Journal, vol. 10, no. 2, pp. 149-164.

Delgado, F.J., S. Lago-Peñas and M. Mayor (2011), "On the determinants of local tax rates: new evidence from Spain", Working Paper 2011/4, Institut d´Economia de Barcelona.

Elhorst, J. Paul and Sandy Fréret (2009), "Evidence of Political Yardstick Competition in France Using a Two Regime Spatial Durbin Model with Fixed Effects", Journal of Regional Science, vol. 49, Issue 5, pp. 931-951.

Fiva, John H. and Jorn Rattso (2007), "Local Choice of Property Taxation: Evidence from Norway", Public Choice, Vol. 132, pp. 457-470.

Gerard, Marcel, Hubert Jayet and Sonia Paty (2010), "Tax interactions among Belgian municipalities: do interregional differences matter?", Regional Sciences and Urban Economics, 40, pp. 336-342.

Gerard, M. and L. Van Malderen (2012), "Tax Interaction Among Walloon Municipalities: Is there Room for Yardstick Competition, Intellectual Trend and Partisan Monopoly Effect?", CESifo Working Paper Series, no. 4025.

Geys, Benny and Federico Revelli (2009), "Decentralization, Competition and the Local Tax Mix: Evidence from Flanders", Working Paper, no. 2/2009, Department of Economics, University of Torino.

Hsiao, C., Li, T. (2004), "Robust Estimation of Generalized Linear Models with Measurement Errors", Journal of Econometrics, 18, no. 1, pp. 51-65.

Lyytikainen, T. (2012), "Tax competition among local governments: Evidence from a property tax reform in Finland", Journal of Public Economics, 96(7-8), pp. 584-595.

Kangasharju, Aki, Antti Moisio, Emmanuelle Reulier and Yvon Rocaboy (2006), "Tax Competition among Municipalities in Finland", Urban Public Economics Review, no. 5, pp. 12-23.

Kelejian, H., and D. Robinson (1993), "A suggested method of estimation for spatial interdependent models with autocorrelated

errors, and an application to a county expenditure model", Papers in Regional Science, 72, pp. 297-312.

Revelli, Frederico (2002), "Local Taxes, National Politics and Spatial Interactions in English District Election Results. European Journal of Political Economy", vol. 18, pp. 281-299.

Rietveld, P. and P. Wintershoven (1998), "Border Effects and Spatial Autocorrelation in the Supply of Network Infrastructure", Papers in Regional Science, 77, pp. 265-276.

Salmon P. (1987), "Decentralization as an Incentive Scheme", Oxford Review of Economic Policy, 3, pp. 24-43.

Sedmihradská, L. (2013), "Yardstick Competition in case of the Czech Property Tax", Review of Economic Perspectives, 13(2), pp. 77-91.

Shleifer, Andrei (1985), "A theory of yardstick competition", Rand Journal of Economics, vol. 16, no. 3, pp. 319-327.

Solé-Ollé, A. (2003), "Electoral accountability and tax Mimicking: The Effects of Electoral Margins, Coalition Government, and Ideology", European Journal of Political Economy, vol. 19, pp. 685-713.

Veiga, Francisco (coordenador) (2015), "Monitorização da evolução das receitas e das despesas dos municípios", relatório preliminar (Escola de Economia e Gestão, Universidade do Minho),.

Vermeir, J. and B. Heyndels (2006), "Tax Policy and Yardstick Voting in Flemish Municipal Elections", Applied Economics, vol. 38, pp. 2285-2297.