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# Local Government behavior and principal - agent theory

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## LOCAL GOVERNMENT BEHAVIOR AND PRINCIPAL-AGENT THEORY

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### Abstract

This paper aims at presenting a simple model of local decision-making based on the hypothesis of “constrained” monopoly power on the part of local governments. It adds the contribution of the principal-agent theory by assuming that: (a) monopolistic behavior is constrained by voters’ efforts to monitor the outcomes of policies; (b) local governments’ policies affect local property values. An empirical test of the model for the Portuguese local authorities indicates that the hypothesis of “monitoring” may be accepted and that of capitalization can only be accepted in relation to local public services not to local taxes on property.

#### 1. Monopoly power and principal-agent theory

The political economy models that have focused on the analysis of local politicians’ monopoly power are inspired by Brenner and Buchanan (1980), according to which monopoly power is reflected on the maximization of public revenues. This behaviour is the result of absence of competition, both in the political arena and in the supply of public provision. More recently, at the local authority level, other studies worth mentioning, such as Ashworth and Gemmell (1996) on the UK case: They show that there are information asymmetries both between central and local governments and also between the latter and their constituents. Those asymmetries allow local governments to

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<sup>1</sup> I would like to thank Professor Thomas Gasche (A.M.) for useful comments .

set higher local tax levels than it would be possible in a *full information* setting. According to microeconomic theory, monopoly power is associated to a market where there is just one big supplier, in a context of absence of competition owing to the nature of the good or service provided, to large economies of scale and/or barriers to entry. The monopolistic organization obtains a profit by setting a high price and providing a level of service smaller than the socially desirable output. The extent of monopolistic power depends upon the nature of public regulation (agency) thus, upon the control that is exerted over its activity.

Likewise, in the case of local authorities, the exploitation of monopolistic power may be reflected by the fixation of high levels of local taxation. The degree of exploitation has been shown to be directly related to: (a) the size of local authorities, (b) the political support for the incumbent parties or the size of seat majority (which determines the degree of political competition); and (c) the possibility that local authorities have of shifting the political costs of tax increases to higher levels of government.

Principal-agent theory offers interesting insights into the analysis of local government behavior by focusing on the efforts of local constituents (voters) to impose constraints on government or bureaucracy monopoly power. The agency approach to this setting stems from the analogy of local authorities' activities with those of a firm where, managers are agents who are expected to fulfill the *principals* interests (stockholders), i.e., by maximizing profits<sup>2</sup>. However, the agents hold most of the information and may pursue their own self-oriented goals instead; henceforth, principals should control or monitor managers' actions. In a context of perfect competition, the agents are constrained to increase profits, given capital market discipline. However, owing to market inefficiencies, the threats of bankruptcy or *take over* may not be effective in inducing profit maximization on the part of managers.

Applying this approach to the context of local authorities, the incumbent political party, which is responsible for local government, acts as an *agent* while local voters are the *principals*. The incumbent politician faces a threat of entry by the opposition party in the next elections, just like the manager in a firm faces the threat of a *take over*. Control of the agents by the *principals* is limited by the existence of asymmetric information and other imperfections of the political system that invests local governments with the

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<sup>2</sup> For a general economic description of principal-agent theory see, for instance, Ross (1973), Grossman and Hart (1983) and Stiglitz (1987). More recently, Sappington (1991) develops the issue of the choice of incentives in principal agent relationships and William (1992) focus on the role of information on the control of agents.

monopoly for the provision of public goods. Nevertheless, the greater is local government's discretionary power in setting tax rates and the higher the relative importance of local own revenues, the higher will be the accountability of local policies, hence, the higher the possibility of control on the part of local constituents. Furthermore, the extent of capitalization of local taxes, or its visibility by property owners, is likely to determine local constituents' incentives to control, affecting local politicians' ability to exploit their monopoly power.

## 2 . Local constituents as *principals* in the context of fiscal capitalization

The analysis of *principal-agent* relationships have been extended to analyze several areas of the political *market*, leading the political economist to study the instruments available to the *principals* to control their *agents*, such as:

- a) Developing democratic decision-making processes that increase political participation and competition.
- b) Increasing voters' control over political outcomes and creating schemes- which may include regulations and the institutional organization - that facilitate monitoring of the results from public policies,

As to a), given the existence of several tiers of government and sometimes of complex institutional settings (such as, the Congress or parliament committees, bureaus and interests groups) which affect political decisions, there is not a simple and single agent-principal relationship. The institutional approach has been used to analyze the American political system; Einswer and Meir (1990) stressed the importance of the rules and the particular organization and activities of committees for political outcomes and more recently, Poole (1996) uses a similar approach to study the legislative system, analyzing the role of legislators as both agents of their constituents and ideologues, while Kroszner (1998) analyses the relationship between the organization of Congress and interest-group competition. In some of this literature the oversight committees (acting in the name of constituents) devise efficient incentive structures to induce bureaus (the agents) to produce services/policies that satisfy their constituents. The use of principal-agent theory to study public administration can be seen in Horn (1995) and Laffin (1997), who follow a public management approach.

In this paper, we take a local public economy view, assuming that the incentives for voters to control local politicians depend upon several factors but mainly, on voters'

perception of their tax-price. Fiscal capitalization affects tax-price or tax burden so, it should also enter the analysis<sup>3</sup>.

Therefore, this paper shares some of the previously stated hypothesis but introduces additional assumptions related to:

- (i) the control of voters over local authorities' outcomes;
- (ii) and the existence of capitalization of tax and expenditures on local property.

As a matter-of-fact, interjurisdictional variation in the degree of capitalization of local taxes is liable to affect the real cost of taxation to the residents. As Hoyt (1999) argues, in larger urban jurisdictions, that cost may be lower in big cities than in smaller localities due to the fact that, in the former, local property tax is only partially capitalized, as a result of the weight of other sources of revenue. As a result, if local taxpayers perceive a lower burden they have less incentive to control local authorities' policies. Therefore, the existence of higher per capita spending in large jurisdictions - implying also higher per capita taxes resulting from greater monopoly power imposed by the incumbent politicians - is likely to be related with less voters' *monitoring* due to lower tax burdens. This hypothesis stresses the influence of the demand side, differing from the traditional hypothesis of the Leviathan.

As a matter-of-fact, our model of local government behavior has the advantage of incorporating and articulating the elements of both the demand and the supply sides.

### 3. A model of Local government behavior

We assume that local politicians are self-interested politicians, forming the basis of Leviathan governments as opposed to the benevolent type – i.e., the social welfare oriented ones. Public choice theory has formulated the leviathan hypothesis in a variety of ways: maximization of public revenue, of public expenditures or maximization of some sort of *surplus*, as assumed in the literature, such as in Hamilton (1976, 1978), given the assumptions of heterogeneous communities, fiscal capitalization and some zoning ordinances. This paper takes a more general approach and incorporates the hypothesis that the incumbent politicians are agents of their constituents; they are supposed to represent the preferences of the median voter, trying to extract some kind of *surplus* (represented by  $S$ ), which can be represented by the difference between the

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<sup>3</sup> We shall not develop particular issues related to capitalization, such as, *zoning* (Hamilton (1975) is one of the pioneers on this subject).

benefits from public services and tax revenue, being positively related to per capita public provision ( $g$ ) and negatively related to taxes ( $t$ ) as tax increases represent a political cost for public decision-makers.

However, owing to asymmetric information and other inefficiencies in administrative and political systems, government will try to impose a higher tax rate than the level preferred by voters. Assuming that there is a correct tax perception on the part of voters, government is constrained to set the average tax rate ( $t$ ) at a level that is influenced by the amount of monitoring ( $m$ ) on the part of voters, apart from other constraints ( $Z$ ) related to the political and institutional systems and a budget restriction.

Following on this line, we may formulate politicians' objective function as the maximization of his constituents' utility, perceived from *his* own political interest ( $U^P$ ), i.e., the desire to increase popularity. Utility ( $U^P$ ) depends on a surplus ( $S$ ), which is represented by a net benefit from local expenditure and tax policies:

$$U^P = U(S)$$

$$S = S(g, t)$$

Subject to:

$$t = t(m, Z)$$

$$t p_h H \geq N g \quad (\text{budget constraint})$$

Where  $\partial U / \partial S > 0$ ,  $\partial S / \partial g > 0$ ,  $\partial S / \partial t < 0$ ,  $0 < t < 1$

$N$  is the population size,  $H$  is the local property value;  $t$  is the average tax rate,  $g$  is per capita local provision of public goods (or per capita expenditures on goods and services) and  $m$  stands for the monitoring level.

#### 4 . Local voters' utility

Local voters are assumed to be home-owners who derive utility from maximization of per capita public goods ( $g$ ), from private goods consumption ( $X$ ) and from property ( $H$ ). They evaluate local government policies through the level of public expenditures and the effect of taxes on their properties' values ( $p_h H$ ), which are positively related to some types of public spending and negatively related to property taxes ( $t$ ). This is reasonable if we assume capitalization of the property tax and of expenditures on property values (or in rental prices, in the case of landlords), i.e., property values decrease as local tax rate increase and increase with the amount and quality of public

provision. However, capitalization of public expenditures is often very difficult to test, as there are externalities and distributive effects.

One of the developments of the principal-agent relationship is the *transaction cost theory* which derives from the fact that the principal has to collect information, design contracts that incorporate incentives to agents and engage in transactions that are costly<sup>4</sup>. Assuming that local constituents are politically organized, they engage in activities aiming at controlling public policies namely, through interest group activities, or through political parties, with the objective of monitoring (m) the tax system and/or pressing for public provision. We assume that local residents perceive that their effort of monitoring is costly, therefore, they will engage in monitoring when the gain they expect to obtain is greater than the cost of monitoring ( $c_m$ ). Let's assume a representative  $i^{\text{th}}$  individual (who may be the median, as a special but convenient case) that derives his utility from the benefits he perceives from public provision (g) and from owning property, or housing, ( $H^i$ ); subject to his budget constraint – income  $Y^i$  must equal private goods consumption (numeraire,  $X^i$ ), the rental cost of housing ( $p_h H$ ), per capita public spending (g) (as the counterpart of his property tax burden ( $t p_h H_i$ )) and to the amount spent on monitoring government ( $c_m m^i$ ); however, for simplification we assume that both Y and X are constant and expressed in numeraire so, in the budget constraint, we present  $Y^i$  net of  $X^i$  and also net of local tax paid by the  $i^{\text{th}}$  voter (assumed to finance per capita local expenditures g).

$$(1) \quad U^i = U^i(H^i, g, m^i)$$

s. to:

$$(a) \quad Y^i = p_h H^i + c_m m^i \quad ^5$$

$$(b) \quad H^i = H^i(h)$$

$$(c) \quad P_h = 1/(1+t)$$

$$(d) \quad t = t(m^i, Z)$$

$$(e) \quad m^i = m^i(c_m, L, OP)$$

$U^i$  is a monotone concave function and:

$$c_m > 0, \quad \partial U^i / \partial X^i > 0, \quad \partial U^i / \partial g > 0, \quad \partial U^i / \partial H^i > 0$$

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<sup>4</sup> See annotated list of bibliography on transaction costs, including agency issues compiled by Harvey, James (2002).

<sup>5</sup>  $Y^i$  is net of local tax and private expenditures (X).

$$\begin{aligned} \partial H^i / \partial h > 0, \quad \partial H^i / \partial t < 0, \\ \partial m^i / \partial L > 0, \quad \partial m^i / \partial OP > 0, \quad \partial m^i / \partial c_m < 0 \end{aligned}$$

The individual monitoring effort ( $m^i$ ) is a function of :

- a) individual participation in political activities (POL) and lobbying (L), which are directed at opposing the potential increase in taxation;
- b) and of the costs ( $c_m$ ) involved in those activities. At the aggregate level, POL may be the strength of the opposition to government as represented by the number of seats (or its percentage) occupied by the opposition parties in the municipal council, and L may be measured by the number of interest groups or the number of events promoted by them. House price ( $p_h$ ) depends on the average tax rate  $t$  (on account of capitalization) and the amount of housing opted for ( $H$ ) on housing characteristics ( $h$ ) such as area.

To simplify, let us assume that the representative  $i^{\text{th}}$  individual takes per capita public goods/expenditures ( $g$ ) as given and chooses the effort of monitoring ( $m$ ) to control only the tax rate ( $t$ ). Then, utility ( $U$ ) is essentially a function of  $H$  and  $m$ :

$$(2) \quad U(H, m)$$

The demand for housing or property ( $H$ ) is a function of the local property price per square meter ( $p_h$ ), which is affected by the property tax rate ( $t$ ), and the level of this rate depends upon the effort of controlling local government ( $m$ ). Therefore, we can represent utility as a function of  $m$ . For any given value of  $m$ , the amount of  $H$  that the representative voter needs to satisfy the budget constraint can be represented as the following linear function<sup>6</sup>; given 1. (a) and solving in order to  $H$ :

$$(3) \quad H = (Y / p_h) - (c_m / p_h) m$$

This is the value of  $H$  that will always satisfy the budget constraint whatever the value of  $m$  is. Substituting this expression for  $H$  into the utility function, we obtain the unconstrained maximization problem in  $m$  alone:

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<sup>6</sup> See Varian (1992), p. 91.



$$(4) \quad \text{Max}_m U(m, (y/p_h - c_m/p_h))$$

We then differentiate  $U$  with respect to  $m$  and set the result equal to zero, which is the same as the optimization condition:

$$(5) \quad (\partial U(m, H(m)) / \partial m) + (\partial U(m, H(m)) / \partial H) (\partial H / \partial m) = 0$$

Now,  $(\partial H / \partial m)$  can be obtained by differentiating (3):

$$(6) \quad (\partial H / \partial m) = (-c_m / p_h) (\partial p_h / \partial t) (\partial t / \partial m) \quad \text{as } p_h = p_h(t(m)). \text{ Substituting into (5), we obtain:}$$

$$(7) \quad (\partial U(..) / \partial m) + (\partial U(..) / \partial H) (-c_m / p_h) (\partial p_h / \partial t) (\partial t / \partial m) = 0, \text{ and rearranging:}$$

$$(8) \quad (\partial U(..) / \partial m) / (\partial U(..) / \partial H) = (-c_m / p_h) (\partial p_h / \partial t) (\partial t / \partial m)$$

where  $(c_m)$ , is assumed to be fixed.

This states that the MRS between  $m$  and  $H$  equals the relative price ratio weighted by  $-(\partial p_h / \partial t) (\partial t / \partial m)$ , which is the product between the *capitalization* effect and the effect of monitoring, i.e., the marginal increase in their property value from reducing  $t$  and the inverse of the marginal effect of monitoring on the tax rate  $(\partial t / \partial m)$ .

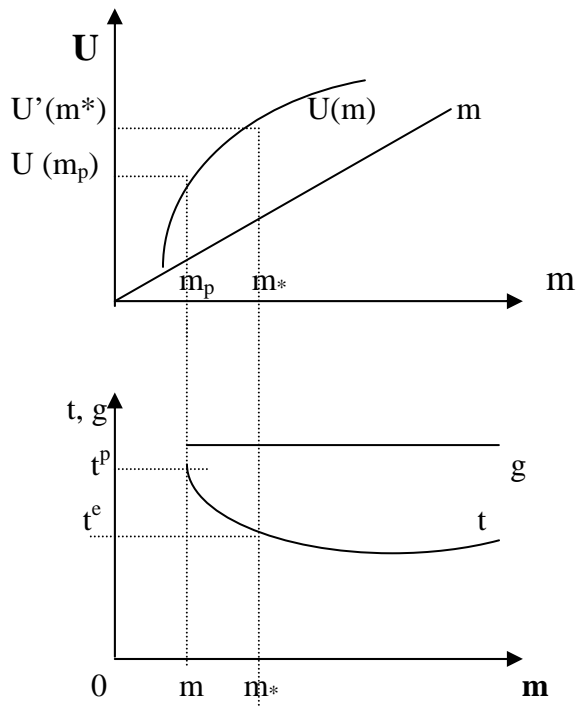
If there is full capitalization of tax, then  $\partial p_h / \partial t = -1$  and given that  $(\partial t / \partial m) < 1$ , we can substitute this hypothesis in (8) to obtain:

$$(9) \quad (\partial U(..) / \partial m) / (\partial U(..) / \partial H) = (-c_m / p_h) (\partial t / \partial m)$$

This means that, under the hypothesis of full capitalization, an utility-maximizing voter will increase his effort in one unit at the cost of losing one unit of the other good depending on the price ratio and the effectiveness of monitoring upon the reduction of the tax rate. This condition ensures that property owners do not face a reduction in the values of their properties ( $p_h H$ ).

The optimal value for monitoring  $m$  and for  $H$  could be obtained by solving the system of equations given by (5) and the budget constraint (1) (a).

Graph 1 illustrates the solution to this problem, showing that the optimal value for monitoring ( $m$ ) chosen by the local representative voter should be  $(m^*)$  in order to maximize the utility value ( $U(m^*)$ ), hence, his property value ( $H^i$ ). We assume that the effort of control ( $m$ ) does not affect  $g$ , so, the surplus ( $S$ ) for the voters are larger as  $t$  drops with the increase in  $m$ . Assuming *monitoring effort* on the part of voters, the level of the voter's utility  $U(m^*)$  is higher than would otherwise be if local politicians behavior was not controlled ( $U(m_p)$ ). This is a common result in the literature on bureaucratic or monopolistic political behavior<sup>7</sup>.



### 5. An empirical test of the theoretical model

Our next step will focus on performing an empirical test of the model represented in the previous sections.

Naturally, given the difficulty in obtaining some data, we had to opt for including some proxies. For instance, the monitoring effort ( $m$ ) should include, first of all, regular participation in the local political system and secondly, activities of groups of citizens in interest groups or associations of various natures. However, we have included only the former, assuming that monitoring is related mainly with the proportion of the

<sup>7</sup> See, for instance, Hayes (1998).

“opposition” parties represented in the municipal assemblies which we have named POL. For property value we chose the value per square meter which is obtained by bank evaluations used for housing credit (Vprop).

To test both the hypothesis of capitalization of local taxes into property value and the existence of an agency relationship, we have performed two regressions: equation [1] is assumed to reflect the behavior of local governments which we simplify by assuming that their main target is to setting local taxation levels – thus, given the non-availability of real tax rates on property, we regress local per capita property tax revenue (RPpc) on: POL (the proportion of members of the “opposition” parties in local authorities assemblies), on property value (Vprop), on loans as percentage of total local revenue (Emp) and also on an index of municipal wealth, intended at standing for local purchasing power (LPP), as shown above:

$$[1] \quad RPpc = a_0 + a_1 POL + a_2 Emp + a_3 VProp$$

$$[2] \quad Vprop = b_1 + b_1 RPpc + b_2 Med + b_3 Dpop + a_4 LPP$$

Equation [2] is assumed to reflect the interest of local citizens in explaining the value of their properties by controlling the policy variables, which are assumed to be capitalised into property price Vprop: Property tax revenue (RPpc) and public services (proxied by the number of physicians per 1000 inhabitants (MED)). Population density was included to represent demand for housing.

However the first relationship was not significant and Med did not have the expected sign.

We tested an alternative model with only one equation, which is assumed to be able to reflect both hypothesis we want to test – the monitoring of LA expenditure policies by adding a political variable (POL) and the capitalization of local taxes and local provision of public services.

We have estimated by the Ordinary Least Squares (OLS) method the following equation:

$$[3] \quad Vprop = \beta_0 + \beta_1 Pol + \beta_2 RPpc + \beta_3 Cons + \varepsilon$$

In this equation, the meaning of the endogenous and the explanatory variables is the one indicated in the previous paragraphs and  $\varepsilon$  is the error term of the equation. We added a proxy for local public goods - the number of consultations in the health center per 1000

inhabitants (Cons), instead of the number of physicians. The results showed that there is a positive relation of property prices per m<sup>2</sup> (Vprop) to per capita taxes on property (RPpc), to visits to the health center (Cons) and to the representation of opposition parties (POL) in the municipal council (“assembleia municipal”).

The results of the estimation are reported in Table 1. According to the P-values shown in the last column of Table 1, we may conclude that the explanatory variables, individually, are all significant at the 10% level of significance. The F-value in the last line of the table is also significant at the 1% level of significance. So, the set of independent variables is relevant for the explanation of the endogenous variable (Vprop). However, the R<sup>2</sup> value in the last line of Table 1 is low implying a poor fit of the model (the model explains only 33.2% of the variation of the dependent variable).

Dependent variable: Vprop				
Independent variable	Estimated Coefficient	Standard Error	t-statistic	P-value
Constant	377.311	179.429	2.10284	[.041]
Pol	10.7839	3.98150	2.70850	[.009]
RPpc	580.086	319.867	1.81353	[.076]
Cons	38.0005	19.7445	1.92462	[.060]
N=51	R <sup>2</sup> =0.332	F=7.797	[0.000]	

Table 1: Results of the estimation of equation []

Therefore, we are led to the conclusion that our hypothesis that citizens control local authority’s behaviour has to be accepted, given that property value (Vprop) depends positively upon the representation of opposition parties in Municipal Councils (POL); this variable is assumed to stand for the “monitoring “ effort to control local governments’ policies through the political system. However, the capitalization hypothesis could not be properly tested as there is a positive correlation between property value and local taxes (IPpc). This result cannot be conclusive as we have used per capita tax revenue on local property instead of real tax rates on property;

capitalization implies that tax rates are negatively related to property values. Nevertheless, in Portugal the housing market has many inefficient aspects due to rent control and property values are not updated – the latter implies that property tax revenues do not reflect the “real” property values.

## 6. Final remarks

The formalization adopted in our model is similar to the ones which represent local governments’ monopolistic power or bureaucratic behavior. In all of them, the optimal output from governments’ policies, either in terms of public provision levels, production costs or, in this case, the tax rate, is higher than that which would correspond to the preferences of the representative voter. We think that the introduction of the agency theory’s assumption - that voters engage in activities to monitor politicians - offers an interesting insight into local public choice models that deserves further research. Our model was tested empirically for a sample of Portuguese local authorities (51 municipalities included in the metropolitan areas of Lisboa e Porto and surrounding areas). The results indicate that the hypothesis that local voters monitor LA’s policy outcomes may be accepted, although the hypothesis of capitalization of local property tax could not be properly tested. However, local public provision do influence local property prices in a positive way, as expected.

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