BUDGET SETTING AUTONOMY AND POLITICAL ACCOUNTABILITY*

Susana Peralta

FEUNL and CORE-UCL **

Abstract

The autonomy of local governments in deciding their revenue level varies a lot worldwide, and is very low in Portugal. We analyze the consequences of this autonomy from the viewpoint of political accountability. We study a two-period game in which elections take place at the end of the first period, in a model where local officials may be public or self interested. We show that a greater autonomy improves selection (i.e., voting out bad incumbents), while it decreases discipline (i.e., giving incentives to the bad incumbent). Electoral turnover is expected to be higher with greater autonomy. We analyze the effect of tax setting autonomy on expected voter welfare.

* This paper was written for presentation at the conference "Desenvolvimento Económico Português no Espaço Europeu", to be organized by the Portuguese Central Bank in February 2006. I am grateful to the *Comité Científico* for useful comments and to Banco de Portugal for financial support. I thank Isabel Dias at the Comissão Nacional de Eleições for providing me with data on Portuguese local elections, Fátima Teixeira at the Direcção Geral das Autarquias Locais for help with municipal finance data and Sofia Fernandes for research assistance.

** Campus de Campolide P-1099-032 Lisboa. Phone: +351 21 3801642. Email: peralta@fe.unl.pt

1. Introduction

Fiscal decentralization is a policy objective advocated by international organizations such as the World Bank (World Bank, 2000) and the OECD (OECD, 2001, 2002). Moreover, it has become a dominant trend in several countries (Epple and Nechyba, 2004). However, the degree to which it is implemented, both on its expenditure and tax collection aspects, varies a lot. Different institutional arrangements on the sharing of competencies between central (or federal) and local (or state) governments exist (see, for instance, Ter-Minassian, 1997, and OECD, 1999).

A recent study by the OECD (OECD, 1999) has looked in detail at the tax setting autonomy of local governments in 19 countries. It focuses both on taxes collected at the local level and tax-sharing arrangements. These latter refer to taxes collected by the central government, whereof part of what is collected by (or arising from activities located in) a local government's territory accrues automatically and unconditionally to it. Taxes and tax-sharing revenues are classified into eight categories of decreasing autonomy. The largest autonomy occurs when local governments are free to chose both tax rates and bases, while the lowest level refers to centrally set tax rate and base. Table 1 summarizes the results of the study. For each level of local government in each country, the percentage of revenues falling into each category is computed. Table 1 displays, for each country, the unweighted average across all local government levels (i.e., for Portugal, *autarquias*, on the one hand and autonomous governments from Madeira and Azores, on the other).

Table 1 allows one to conclude that local governments are far from having full control of their fiscal revenue. It is noteworthy that transfers from the central government and supra-national institutions like the European Union, virtually totally out of local governments's control, are outside the scope of the OECD study. Also, in some countries the central government decides on an allowable range for the tax rates on revenue sources falling into categories (a) and (b). Hence, if anything, the figures in Table 1 are too optimistic about local governments' autonomy. Table 1 also makes clear that there is considerable variation among countries. In this study, Portugal shows up as one of the countries where local governments enjoy less revenue setting autonomy.

Table 1: Tax autonomy: % revenue by category

	(a)	(b)	(c)	(d.1)	(d.2)	(d.3)	(d.4)	(e)[a]
Austria	5.5	5.5	-	-	89.5	-	-	-
Belgium	7	59.7	-	-	32.3	0.67	0.3	-
Czech Republic	2	5	3	-	-	90	-	-
Denmark	-	94.5	-	-	-	2	-	3.5
Finland	50	44.5	-	-	-	5.5	-	-
Germany	0.5	26	-	-	73.5	-	-	-
Hungary	-	30	-	-	-	-	70	-
Iceland	8	92	-	-	-	-	-	-
Japan	-	88.5	-	-	-	-	-	11.5
Mexico	7	-	-	-	43	37	-	13
Netherlands	-	100	-	-	-	-	-	-
New Zealand	98	-	-	-	-	-	-	2
Norway	-	2.5	-	-	-	0.5	97	-
Poland	-	45	1	-	-	54	-	-
Portugal	24.5	7	-	-	-	-	-	68.5
Spain	24	29	-	-	47	-	-	-
Sweden	2	98	-	-	-	-	-	-
Switzerland	44.5	48.5	-	-	3	4	-	-
United Kingdom	-	100	-	-	-	-	-	-
Average	14.4	46.1	.2	-	15.2	10.2	8.8	5.2

[a] *(a) sub-central government (SCG) sets tax rate and tax base; (b) SCG sets tax rate only; (c) SCG sets tax base only; (d.1)-(d-4) tax-sharing; (d.1) SCG determines revenue-split; (d.2) revenue-split can only be changed with consent of SCG; (d.3) revenue-split fixed in legislation, may unilaterally be changed by central government; (e) central government sets tax rate and base of SCG tax.*

Source: OECD(1999, Table 1). Computations from the author. Each country's entry is the unweighted average of each level of SCG.

The question of revenue setting autonomy falls into the more general debate on whether government should be decentralized or not. The literature on decentralization is abundant, but it usually treats public good provision and financing together, i.e., either both are left to the central government or both are decentralized. One notable exception are papers studying transfers from the central to local governments. They build a case for local governments' lack of revenue-collection autonomy both on efficiency (avoiding inter-jurisdictional externalities) and equity (avoiding fiscal imbalances) grounds (see, e.g., Bucovetsky and Smart (2004) for a recent contribution where both objectives are shown not to be incompatible).

This paper seeks to look at revenue autonomy from an alternative viewpoint, namely, political accountability. One may think that giving more autonomy to local

governments increases the opportunities for corrupt local officials to extract rents for private purposes. As an illustration, one may read in the web-based edition of "Inside Indonesia" that "*corruption in the provinces stems in part from local politicians' access to the budget.*"[1] The fact that local governments may be more prone to corruption is the basis of the analysis of decentralization by Bardhan and Mookherjee (2000), who also recognize it to be a prominent issue in the political debate about decentralization, dating back to the foundation of the US (see Bardhan and Mookherjee (2000) and the reference to the Founding Fathers therein). The potential danger of decentralization due to the poor quality of local politicians is also recognized in the political science literature (see, for instance, Bird, 2000).

On the one hand, if one accepts the idea that local governments are more prone to corruption than the central one, revenue-collection centralization can be seen as a way to fight corruption, in that it hampers the capacity of local officials to extract rents. On the other hand, if the central government sets the local budget, we may reasonably suppose that voters observe it only imperfectly. In fact, fiscal laws are often complex and confusing (Bird, 2000), and it may be in the interest of politicians to hyde information from voters and render the budget unclear (this is suggested by Besley (2005, page 193), in the context of the use of debt). When the voters actually pay for the public good with local taxes, their awareness of its actual cost increases. For instance, in a World Bank report about intergovernmental fiscal relations in the Czech Republic (World Bank, 2003), one may read "*(...) local authorities have little autonomy over revenue. (...) predictable and transparent preparation of local government budgets has been limited by lack of synchronization with the central government budget, uncertainty about basic budget parameters, and insufficient information on central government guarantees and contingent liabilities. (...) Budgets would be more predictable if basic parameters (...) were defined in organic laws rather than the annual budget law.*" This lack of transparency is also a recurrent issue in the Portuguese political debate. This is clear in the following quotation, taken from the Portuguese newspaper O Publico (November 11, 2005, page 10), citing the intervention of the Minister of Finance in a parliamentary debate "*everyone who has assumed governmental positions or has had any contact with local governments knows that, besides*

[1] http://www.insideindonesia.org/edit80/p9-10steele.html

the transfers predicted by the Law of Local Finances, there are numerous additional mechanisms to transfer funds for local governments, (...) transfers that are outside of the control of the Minister of Finance and are performed without any transparency. (...) The proposal in this year's budget aims at imposing a maximum value and increasing the transparency of such transfers". This lack of transparency at the local level is likely to have an impact on voters' capability to discipline local politicians. The idea that financing expenditures by raising revenues locally leads to greater accountability is explicitly put forward by the World Bank (World Bank, 2003).[2]

What is the impact on corruption and accountability when budgets are under the full control of local governments? Such is the object of this paper. We build on the model in Besley and Smart (2003). A public good is provided at the local level. The provision cost may be high or low. There are two types of politicians, public-interested and self-interested, unobservable to voters. If revenue is collected at the local level, voters observe both the public good and the revenue level. If it is collected centrally, the central government knows the true provision cost, sets the budget accordingly, and voters cannot observe it, i.e., they only know the public good level. The corrupt politician can misbehave in two ways, as in Besley and Smart (2003) and Hindriks and Lockwood (2004). Firstly, he may provide no public good and extract maximal rents, thereby revealing is type (separating equilibrium). Secondly, when the true provision cost is low, he may pretend it is high and extract the equivalent (smaller) rent (pooling equilibrium). In the former case, voters vote him out of office for sure, which is not true of the latter. As usual in this type of models, there is a trade-off between selection (the bad incumbent is revealed) and discipline (the bad type mimics the good one). While voters want to discipline a bad politician (incentive), his good behavior hampers the voters' capability to identify him as bad, thus they are less likely to vote him out of office (selection).

We begin by comparing the two regimes in terms of rent extraction and obtain that none is better under all circumstances. Rents are higher in the decentralized regime under the separating equilibrium, but lower when the bad incumbent pools. Indeed, when the local official has full control of the budget and decides to reveal his type, he extracts

[2] One may also find explicit references to this idea in the Local and Municipal Governance and Finance program (sub-program of the Governance and Anti-Corruption Learning Program), details on http://web.worldbank.org.

maximal rents. This is in line with the common wisdom that increased autonomy leads to more rent diversion. On the other hand, if the politician decides to pretend that the provision cost is high, he takes advantage of the lack of voters' information in the centralized regime and extracts more rents in that case. It is not *a priori* clear whether it is better to have the budget set by the central or local government.

Given the above, it is clear that the politician looses less from pooling in the centralized regime (conversely, has more to gain from separating in the decentralized one). This explains our main result, namely, that separation occurs under a greater parameter range in the decentralized regime than in the centralized one. Conversely, the centralized regime disciplines bad incumbents under a greater parameter range. This means that, in terms of expected voter welfare, no regime is clearly preferred. In fact, for the parameter range under which discipline and selection are the same in both regimes, centralization dominates decentralization. More interestingly, when the parameters are such that decentralization improves selection (at the cost of discipline) when compared to centralization, we obtain that this latter is preferable if the average quality of politicians is low and the future is heavily discounted. Intuitively, the value of selection comes from the possibility of finding a good politician to replace a bad one in the future.

Literature review

This paper is related to the literature on (fiscal) decentralization, whose roots date back to the seminal contributions by Tiebout (1956) and Oates (1972). Traditional approaches focus essentially on inter-regional spillovers and preference heterogeneity and suppose, in general, aggregate utility maximizer governments.

As we have already pointed out, the literature on fiscal competition has provided a rationale for decreasing the autonomy of local governments (see, for instance, the survey by Wilson, 1999). Fiscal base mobility may be detrimental, as it increases the marginal cost of taxation, thereby creating a downward pressure on the public sector. This constitutes a welfare loss if governments are benevolent and is a reason to centralize tax collection.

This paper is more in line with the recent contributions that take a political economy viewpoint: benevolent governments are abandoned. The relative merits of centralized and decentralized systems have been analyzed, *inter alia*, by Bardhan and Mocherjee (2000), Besharov (2002), Besley and Coate (2003), and Hindriks and Lockwood

(2004). The first two focus on whether one of the government levels is more prone to capture by special interests, the first using a model of political competition and the second a menu-auction one. In Besley and Coate (2003), centralized decision is undertaken by an assembly of locally elected representatives. Hindriks and Lockwood (2004) use a political agency model. Voters have incomplete information about the quality of politicians and must choose whether or not to reelect an incumbent, using past performance to infer his quality. A decentralized system (each region run by a politician) is compared with a centralized one (one politician for both regions). A key feature of decentralized systems is the possibility for yardstick competition: with correlated economic contexts, voters can condition their reelection strategy on policy outcomes in the other region. This is studied by Belleflamme and Hindriks (2002), Besley and Smart (2003) and Hindriks and Lockwood (2004), among others.

The remainder of the paper is organized as follows. The next section presents a brief description about the Portuguese system of local public finance. Section 3 introduces the model and equilibrium under each regime. Section 4 looks in detail at the relative merits of both regimes in terms of discipline and selection. Section 5 compares voters' expected welfare under the two regimes. In Section 6 we present some preliminary data on Portuguese local elections. Section 7 concludes.

2. A closer look at Portuguese local finance

Portuguese local government is divided into two levels: municipalities (*municípios*) and a smaller unit called *freguesia*.[3] These two government levels are called *autarquias*. Additionally, the archipelagos of Madeira and Azores have their own autonomous governments. As of 2004, there were 304 *municípios* and 4281 *freguesias*. The average *município* has an area of 299 square km and 34 thousand inhabitants. *Freguesia* is a smaller unit, with an average area of 21.6 square km and 2438 inhabitants. A closer look at the data also allows one to conclude for the existence of considerable heterogeneity in the sizes of *municípios* and *freguesias* (Direcção Geral das Autarquias Locais - DGAL, 2004b). Both government levels have their own elected officials, with elections taking

[3] The Portuguese Constitution mentions an additional level of local government, the Regions, encompassing several municipalities, which have not, to date, been implemented.

place every 5 years.

In the OECD publication mentioned in the introduction (OECD, 1997), Portugal shows up as one of the countries conferring a smaller autonomy to local governments in the determination of their fiscal revenue.

Table 2: Local revenue sources in Portugal

Local tax	% of total tax revenue (1995)	Classification	
		OECD	Corrected[a]
Imposto municipal sobre imóveis (Real estate tax)	34.1	(a)	(b)[b]
SISA[c] (Tax on transfer of real estate)	30.7	(e)	(e)
Derrama sobre o IRC (Corporate Income Tax)	14.1	(b)	(b)[d]
Fees and general service payments	11.3	(a)	(a)
Vehicle use tax	5.9	(e)	(e)
VAT (tourism)[e]	3.2	(a)	(e)?

[a]Using the information in Baleiras (1997) and DGAL (2004a, 2004 b)

[b]Tax rates allowed by central government range from 1.1 to 1.3% in urban properties. Rural properties are taxed at 0.8%.

[c]This tax is no longer denominated SISA, but we keep the old denomination for simplicity.

[d]Each municipality's rate cannot exceed 10% the corporate income tax surcharge collected in its jurisdiction.

[e]This tax has since been abolished.

Taking a closer look at the Portuguese official publications (DGAL, 2004a, 2004b) one may actually conclude that autonomy is even more restricted than what is suggested by OECD (1997). We have attempted a reclassification, taking into account the detailed description of local governments' tax setting autonomy in DGAL (2004a, 2004b) and Baleiras (1997). The result is Table 2. This table refers only to *autarquias*, i.e., Madeira and Azores autonomous regions are excluded.

It is noteworthy that taxes only represent 28% of total revenue (figure for 2002), as shown in Table 3, which displays the composition of revenues of Portuguese *autarquias*. This raises the question of the capacity of local governments to influence the amount of funds they receive as transfers. As is apparent from a close inspection of the transfers' rules, local governments have little or no power to influence the amounts. Local governments are entitled to 30 % of the average revenues of personal income tax, corporate income tax and

value added tax collected in the country two years before. This total amount is then distributed to local governments as follows.

- 62.1 % for the Municipalities General Fund (*Fundo Geral Municipal*), split according to a formula that accounts, in decreasing order of importance, for the number of inhabitants, hotel and camping occupation rates, younger than 15 inhabitants, geographic area, number of *freguesias* and amount of personal income tax collected in the municipality.
- 16.7 % for the Municipalities Cohesion Fund (*Fundo de Coesão Municipal*), which targets the poorest municipalities, i.e., the ones with a per capita fiscal revenue below the national average and the ones performing worse in terms of quality of life indicators (health, life expectancy, and education).
- 13.6 % for the Municipalities Base Fund (*Fundo de Base Municipal*), equally split amongst the municipalities;
- 7.6 % is distributed to *freguesias*.

Local governments are also entitled to conditional transfers (i.e.,targeted for specific projects) from the central government, varying from 60% to 90% of the total cost in situations like unexpected public calamity, projects related to urban reconstruction, environment and natural resources, transportation infra-structures, subsidized housing, among others. Finally, municipalities may apply to European Structural Funds and Regional Development Funds. In both types of conditional transfers, the scope of local governments to influence the total amounts received relies almost exclusively on their capacity to submit projects which are in line with the funding priorities defined by the central government or the European Union.

The brief description above allows one to conclude for a "*weak autonomy of local governments vis-à-vis the design of their own revenue sources*" as "*tax proceedings are virtually insensitive to local policy-makers decisions concerning tax parameters*" and, as regards transfers, "*the discretionary autonomy of policy makers is very limited*" (Baleiras, 1997, pages 4 and 5). Local governments in Portugal do seem to enjoy considerable freedom in choosing the provision of local public goods of which they are in charge (a non-exhaustive list includes parks, transportation and road system, sports and leisure, consumer protection, housing; see Baleiras (2002) and DGAL (2004b) for a detailed description).

Table 3: Composition of local government revenues in 2002

Own Revenues			
Direct taxes	Indirect taxes	Fees, fines, property revenue, sales of goods and serv.	Other
25%	2.8%	11.4 %	1.9%
Other Revenues			
Transfers from Central Government (FGM, FCM, FBM)[a]	Transfers from EU	Credit	Other
29.5%	7.1%	16%	6.5%

[a]FGM=Fundo Geral Municipal, FCM=Fundo de Coesão Municipal, FBM=Fundo de Base Municipal
Source: DGAL (1994a)

3. *The model*

The base model is adapted from Besley and Smart (2003). A local government decides on the quantity of public good G. The cost θ of the public good is uncertain and it can be high ($\theta = H$) or low $\theta = L$), with $H > L$. The probability of a high cost is q. Voters derive utility from the consumption of the public good and dislike high local budgets. The local budget is denoted $x \in [0, X]$, i.e., there is a no-debt constraint and a maximum budget size. The utility function is $W(G, x) = G - C(x)$, where C is a strictly increasing and strictly convex function. The C function is meant to capture inefficiency costs of tax collection. We define G_H^g and G_L^g as follows

$$G_\theta^g = \arg\max \; G - C(\theta G)$$

and let $x_\theta^g = \theta G_\theta^g$. Convexity of the C function ensures that $x_L^g > x_H^g$, i.e., the public sector is optimally larger when the provision cost is low. This, together with $L < H$, implies that $G_L^g > G_H^g$, i.e., the quantity of the public good provided decreases with the provision cost. We also suppose that $X > x_L^g$.

There are two types of politicians, good (g) and bad (b). Good politicians always pursue the interests of the electorate, while bad ones care about the rents r they manage to extract. The proportion of good politicians is π. This may be interpreted as a measure of the quality of the polity.

The timing of the model is as follows. There are two periods. In the first period, there is an incumbent in place, who implements a given policy. At the end of the first period, an election takes place. The incumbent is either approved by the electorate and stays in office one further period or he is voted out, in which case nature randomly selects a politician to be in office in the second period. The game ends at the end of the second period, with no further elections. The future is discounted by β.

The local budget x may be set by the local government or by the central one. We shall denote the former regime as D (mnemonic for *decentralization*) and the latter as C (standing for *centralization*). When the budget x is set locally, local officials decide x and G, and both are observed by the electorate. If the budget x is set by the central government, local officials only decide G. In this situation, voters have less information about the size of the budget. This may be because the law is unclear or too complicated to be understood by the electorate, with lots of exceptions, or even because there is no clear written rule as to the size of the budget. We capture this idea in its more straightforward form, by supposing that voters do not observe x. The central government knows the true provision cost and sets the budget accordingly, that is $x = x_L^g$ if $\theta = L$ and is $x = x_H^g$ if $\theta = H$. Hence, voters know that the budget is x_H^g (x_L^g) with probability q ($1-q$).

3.2. Preliminary results

Voters observe the policy implemented by the incumbent and use Baye's rule to compute the posterior probability Π that he is good, given the observed record. If Π is greater than the probability that the randomly selected official is good, π, the incumbent is reelected. Otherwise, he is voted out of office.

What about the politicians? As usual, we solve the game by backwards induction. We begin by looking at regime D. A good politician implements (G_θ^g, x_θ^g) in both periods. Hence, any other policy vector perfectly signals a bad politician. A bad politician extracts maximal rents in the second period (since he is no longer concerned by re-election), i.e. $x = X$ and $G = 0$. We now look at the bad politician's behavior in the first period. He may implement one of three policy vectors: (G_H^g, x_H^g), (G_L^g, x_L^g) or $(0, X)$ [4] To simplify notation

[4] Any other policy vector is a perfect signal of his type and is dominated by $(0, X)$.

we shall refer to the policy vectors only by the G component. Also, let Π_G denote the posterior probability of the good type given an observed quantity of the public good of G. If the provision cost is H, the bad incumbent gets a negative rent (equal to $(L-H)G_L^g$) by implementing G_L^g, no rent by choosing G_H^g and the maximal rent when he implements 0. The two former strategies are dominated by the last one.[5] If the provision cost is low, a similar dominance argument allows one to eliminate G_L^g. The politician either implements 0, extracting a rent of X, or G_H^g, extracting a rent of $(H-L)G_H^g$. We let λ denote the probability that he takes the latter action.

We may summarize the behavior of the bad politician as follows. He never provides the correct amount of the public good. If the cost is high, he extracts maximal rents and is voted out of office. When the cost is low, he may use one of two possible strategies. He either *separates* himself from the good type by providing no public good and being voted out. Or he *pools* with the good type under a high cost and keeps his chance of re-election. In so doing, he foregoes some current rents in return for a probability of reelection (hence, future rents).

From the above, we immediately see that G_L^g can only be implemented by the good politician, hence $\Pi_{G_L^g}=1>\pi$ and the voters reelect the incumbent. Also, $\Pi_0=0<\pi$, hence the incumbent is voted out of office. Finally, we have that

$$\Pi_{G_H^g}=\frac{\pi q}{\pi q+(1-\pi)(1-q)\lambda}$$

As regards regime C, a good politician will, again, implement G_θ^g in both periods. The bad politician will again extract maximal rents in the second period (i.e., implement $G=0$ and get a rent equal to the budget set by the central government). As for the first period, when the provision cost is high, the central government sets a budget of x_H^g. A dominance argument of the kind used above allows one to conclude that the politician implements $G=0$ and extracts $r=x_H^g$. If the provision cost is low, again we may eliminate the dominated action G_L^g and we are left with $G=0$ (with a rent of x_L^g) or G_H^g (with a rent of $L(G_L^g-G_H^g)$).

[5] Indeed, 0 yields a payoff of X, whereas the other two actions give at most $(L-H)G_L^g+\beta X$ and βX, respectively.

Voters can only observe the level of G. They do not reelect when $G = 0$ and reelect with probability one if $G = G_L^g$. Conditional on observing G_H^g, the probability that the incumbent is good is again given by $\Pi_{G_H^g}$.

Comparing regimes C and D, one concludes that maximal rents are higher in the latter, which is not surprising, since the local official has full control of the budget. However, $L(G_L^g - G_H^g) = x_L^g - LG_L^g > (H-L)G_H^g = x_H^g - LG_H^g$ (since $x_L^g > x_H^g$) and the rent he extracts when pooling his higher in regime C. This is due to the lack of transparency, since voters can only observe the level of G, and not the budget. We will use the following notation

$$r^D = (H-L)G_H^g$$
$$r^C = L(G_L^g - G_H^g)$$

We have the following preliminary result regarding the bad politician's behavior.

Proposition 1 *When the bad politician signals his type to the electorate, he extracts higher rents under the decentralized regime. When the bad politician mimics the good one, he extracts higher rents under the centralized regime.*

3.2. Equilibrium

Having outlined the strategies of the players, the equilibrium of the game is straightforward to obtain. Let $\hat{\sigma}$ denote the probability that voters approve the incumbent after observing G_H^g and $\hat{\lambda}$ the probability that the bad politician implements G_H^g when the cost is low, for regime D. For regime C, $\tilde{\sigma}$ and $\tilde{\lambda}$ have analogous meanings.

Equilibrium in regime D is described in the following lemma.

Lemma 1 (Besley and Smart, 2003) *When the budget is set at the local level, an equilibrium exists for all values of parameters and is generically unique.*

1. *A pooling equilibrium, with $\hat{\lambda} = \hat{\sigma} = 1$, exists if and only if*

$$q \geq \frac{1}{2} \text{ and } r^D \geq (1-\beta)X$$

2. *A hybrid equilibrium, with $\hat{\lambda} = q/(1-q)$ and $\hat{\sigma} = (X - r^D)/\beta X$, exists if and*

only if

$$q < \frac{1}{2} \text{ and } r^D \geq (1-\beta)X$$

3. *A separating equilibrium, with* $\hat{\lambda}0$ *and* $\hat{\sigma} = 1$, *exists if and only if*

$$r^D \leq (1-\beta)X$$

Proof See Besley and Smart (2003).

The equilibrium strategy of the bad incumbent is ruled by the trade-off between current (obtain r^D and forego X) and future rents (βX). When behaving according to voters' interest, the incumbent bears a cost of $X - r^D$, with a gain of $\beta\sigma X$. If the cost is very high, he prefers to reveal his type by extracting maximal rents and be voted out of office. If the cost is low enough, he mimics the good type to gain reelection.

While future rents are given by X in regime L, irrespective of the state of nature, this is no longer true when the budget is set by the central government. In this case, the bad incumbent will extract a rent of x_H^g when the cost is high and x_L^g when the cost is low. To compute equilibrium strategies, we have to make an hypothesis about the realization of the shock in the second period. To keep things simple, we suppose that the provision cost is the same in both periods. Hence, the rent extracted by the bad incumbent in the second period, if he keeps in office, is equal to x_L^g.

Lemma 2 *When budget is set at the central level, an equilibrium exists for all values of parameters and is generically unique.*

1. *A pooling equilibrium, with* $\tilde{\lambda} = \tilde{\sigma} = 1$, *exists if and only if*

$$q \geq \frac{1}{2} \text{ and } r^C \geq (1-\beta)x_L^g$$

2. *A hybrid equilibrium, with* $\tilde{\lambda} = q/(1-q)$ *and* $\tilde{\sigma} = (x_L^g - r^C)/\beta x_L^g$, *exists if and only if*

$$q < \frac{1}{2} \text{ and } r^C \geq (1-\beta)x_L^g$$

3. *A separating equilibrium, with* $\tilde{\lambda} = 0$ *and* $\tilde{\sigma} = 1$, *exists if and only if*

$$r^C \leq (1-\beta)x_L^g$$

Proof See Appendix.

The intuition underlying the equilibrium is the same as in the D regime. It amounts to a trade-off between current and expected future rents. Equilibrium of both regimes is summarized in Figure 1, where $i = C, D$ and $\max \text{rent}^i$ stands for X when $i = D$ and x_L^g when $i = C$. When rents from pooling are too low, separation occurs. If rents are high, some pooling occurs at equilibrium. If the probability of a high cost is high enough, voters are willing to believe that G_H^g was implemented by a good politician and they reelect the incumbent with probability one. Otherwise, both voters and the politician play mixed strategies.

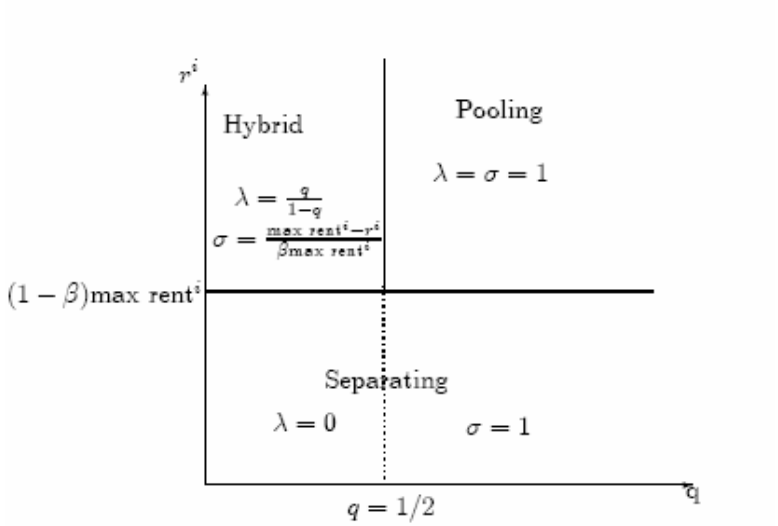

Figure 1: Equilibrium

4. Discipline and selection

While both regimes are equivalent in the equilibrium structure, they do no yield the same payoffs. A closer inspection of Figure 1 reveals that r^i, $\max \text{rent}^i$ and σ differ between regimes. We know from Proposition 1 that $\max \text{rent}^D = X > \max \text{rent}^C = x_L^g$ and $r^C > r^D$. It is therefore natural to expect that the separating equilibrium arises more under regime C, which is exactly what one sees in Figure 2, where the (q, β) space is divided

into five regions, according to the prevailing equilibria. As the value of the future, β, decreases, the bad politician prefers to extract maximal rents in the first period and be voted out. This will happen for lower values of β under regime C.

It is now clear that, when the budget is set centrally, less separation occurs at equilibrium. Hence, lack of autonomy in budget setting improves discipline, at the cost of decreasing selection.[6]

Proposition 2 *The discipline of the bad incumbent is improved when the budget is set at the central level.*

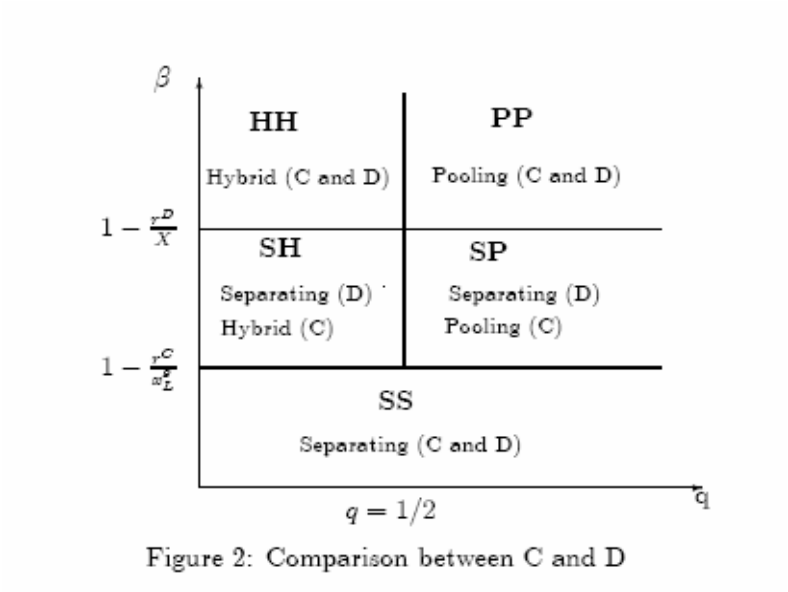

Figure 2: Comparison between C and D

We now turn to the selection issue, i.e., bad incumbents being voted out of office. In a separating equilibrium, selection is perfect: the bad incumbent signals his type and is voted out. In a pooling equilibrium, there is no selection, since the incumbent is always reelected, irrespective of his type. Hence, when β is intermediate and $q > 1/2$ we may safely conclude that selection is improved in the D regime. When $q < 1/2$, that is still the case. A bad incumbent is always voted out of office in case D and only sometimes in regime C.

[6] Note that, under the hybrid equilibrium, $\hat{\lambda} = \tilde{\lambda}$, hence both regimes yield the same discipline.

When the equilibrium of both regimes is hybrid, we have

$$\tilde{\sigma} - \hat{\sigma} = \frac{x_L^g - r^c}{\beta x_L^g} - \frac{X - r^D}{\beta X} = \frac{x_L^g r^D - X r^C}{\beta x_L^g X} < 0$$

And again the probability that the bad incumbent is voted out ($1-\sigma$), is greater in the decentralized regime.[7]

The fact that $\tilde{\sigma} < \hat{\sigma}$ is a result of the mixed strategy equilibrium. Given that in regime D the gain from separating is higher, voters must reelect with a higher probability to keep the incumbent indifferent between current and future rents.

Proposition 3 *Elections are more effective in selecting out bad incumbents under regime D.*

We may interpret devolution of budget setting power to local governments as making more information available to voters. Our results would then imply that improving voters' information is bad for discipline but good for selection. This is reminiscent of the result in Besley and Smart (2003). In their model of local budget setting, they introduce a probability that voters become informed about the provision cost and show that increasing this probability improves selection but decreases discipline.

Propositions 2 and 3 highlight the basic trade-off between the two budget-setting systems. It is not clear, a priori, which system is better. In the next section we compare expected welfare under both regimes.

One implication of this proposition is that we should observe more turnover when budgets are set locally. We present some preliminary evidence regarding turnover in Portuguese local elections in Section 6.

---

[7] For the sake of precision, one must reckon that in a hybrid equilibrium there is a probability to vote out the good incumbent, when the cost is high. This is equal to $q(1-\sigma)$. The probability to vote out the bad incumbent is $q + (1-q)(\lambda(1-\sigma)+1-\lambda)$. Hence, the net selection effect of elections is equal to $1 - \lambda\sigma + q\sigma = 1 - \frac{q^2}{1-q}\sigma$, i.e., the greater is σ, the lower is selection.

5. *Welfare comparison*

We begin by computing expected welfare (at the beginning of the first period) for both regimes, EW_C and EW_D. Recall that the utility function is given by $G-C(x)$. For the decentralized regime, this poses no problem, as voters observe both G and x. This is no longer true of regime C, as voters only observe G. However, the central government's budget is funded by taxes, a part of which is born by the local voters. Our objective is to concentrate on the trade-off between selection and discipline. Hence, we prefer not to make any explicit assumption about the regional distribution of the central government tax collection. In order to keep the two regimes fully comparable, we shall use the same utility function for both regimes. Voters may care about the budget size even if they do not pay for it entirely, or they do not foresee the link with their tax bill. Alternatively, one may interpret the utility function as reflecting the trade off between public good provision and budget size which a benevolent planner would take into account for the purpose of comparing the two regimes.

Before proceeding, it is useful to introduce some notation. Let $W_\theta^g = G_\theta^g - C\left(x_\theta^g\right)$, $W_\theta^b = -C(x_\theta^g)$ and $W_X^b = -C(X)$. Also, denote $EW^i = qW_H^i + (1-q)W_L^i$. Now let W_C^o and W_D^o denote the expected per-period utility in the absence of elections under each regime, i.e.

$$W_C^o = \pi EW^g + (1-\pi)EW^b \text{ and } W_D^o = \pi EW^g + (1-\pi)W_X^b$$

Expected utility in regime C is given by

$$\begin{aligned} EW_C = {} & (1+\beta)W_C^o + (1-\pi)(1-q)\tilde{\lambda}G_H^g + \\ & \beta(1-\pi)\pi\left(q\tilde{\sigma}(W_H^g - W_H^b) + (1-q)(1-\tilde{\sigma}\tilde{\lambda})(W_L^g - W_L^b)\right) \end{aligned} \tag{1}$$

While expected utility in regime D equals

$$\begin{aligned} EW_D = {} & (1+\beta)W_D^o + (1-\pi)(1-q)\hat{\lambda}(W_H^g - W_X^b) + \\ & \beta(1-\pi)\pi\left(q\hat{\sigma}(W_H^g - W_X^b) + (1-q)(1-\hat{\sigma}\hat{\lambda})(W_L^g - W_X^b)\right) \end{aligned} \tag{2}$$

The two last terms in (1) and (2) give the impact of elections on voters' welfare. The first one is the *discipline effect*, the increased utility obtained when the bad incumbent refrains from extracting maximal rents, which happens with probability λ when the

incumbent is bad (probability $1-\pi$) and the provision cost is low (probability $1-q$). The second term is the *selection effect*, representing the increased utility from identifying and voting out bad incumbents. This may happen when the cost is high or low. In the former case, a good politician is voted out with probability $1-\sigma$ and a bad one with probability 1. Hence, selection improves voters' welfare with probability σ. In the latter case, a bad politician is replaced by a good one either if he pools and is voted out ($\lambda(1-\sigma)$) or if does not pool $(1-\lambda)$. The total probability equals $1-\lambda\sigma$.

One should note at this stage that incentive and selection only matter to the extent that some bad politicians exist. If $\pi=1$, the existence of elections has no impact on welfare. This is a natural result in a model where there is consensus, i.e., all voters agree on their preferred policy.

The welfare difference between the two regimes may be sub-divided into three parts. The first one is the baseline difference, i.e., what would obtain in the absence of elections,

$$(1-\pi)(1+\beta)\Delta\mathcal{C} = (1-\pi)(1+\beta)\left(C(X)-qC(x_H^g)-(1-q)C(x_L^g)\right) \tag{3}$$

The second one pertains to the discipline effect of elections

$$(1-\pi)\Delta\mathcal{D} = (1-\pi)(1-q)\left(\tilde{\lambda}G_H^g - \hat{\lambda}(W_H^g + C(X))\right) \tag{4}$$

The third one is related to selection

$$\begin{aligned}(1-\pi)\beta\pi\Delta\mathcal{S} = (1-\pi)\beta\pi\Big[& q\left(\tilde{\sigma}(W_H^g + C(x_H^g)) - \hat{\sigma}(W_H^g + C(X))\right) + \\ & (1-q)\left((1-\tilde{\sigma}\tilde{\lambda})(W_L^g + C(x_L^g)) - (1-\hat{\sigma}\hat{\lambda})(W_L^g + C(X))\right)\Big]\end{aligned} \tag{5}$$

Summing up the three effects we obtain

$$EW_c - EW_d = (1-\pi)\left((1+\beta)\Delta\mathcal{C} + \Delta\mathcal{D} + \beta\pi\Delta\mathcal{S}\right)$$

A few observations are in order. First of all, in the absence of bad politicians ($\pi=1$), both regimes would be equivalent in terms of welfare, since good politicians have the same behavior in both. Secondly, in the absence of elections, regime C dominates

regime D, since there is no discipline at all and only maximal rents matter. Finally, $\Delta\mathcal{C}$, $\Delta\mathcal{D}$ and $\Delta\mathcal{S}$ are independent of π. The average quality of the polity, π, then determines the relative weight of selection on the welfare difference. Indeed, the gain from voting out a bad incumbent is only good to the extent that there is a high probability that he be replaced by a good one.

Table 4 summarizes the relative performance of each regime in giving proper incentives and selecting bad incumbents.

Table 4: Impact on expected utility of incentives and selection differences

	$\Delta\mathcal{D}$	$\Delta\mathcal{S}$
SS	0	$q(C(x_H^g)-C(X))+(1-q)(C(x_L^g)-C(X))<0$
SH	$qG_H^g>0$	$q\left(\bar{\sigma}G_H^g-(W_H^g+C(X))\right)$ $+(1-q)\left(\left(1-\bar{\sigma}\frac{q}{1-q}\right)G_L^g-(W_L^g+C(X))\right)<0$
SP	$(1-q)G_H^g>0$	$q\left(C(x_H^g)-C(X)\right)-(1-q)(W_L^g+C(X))<0$
HH	$q\left(C(x_H^g)-C(X)\right)<0$	$q\left(\bar{\sigma}G_H^g-\hat{\sigma}(W_H^g+C(X))\right)$ $+(1-q)\left(\left(1-\bar{\sigma}\frac{q}{1-q}\right)G_L^g-\left(1-\hat{\sigma}\frac{q}{1-q}\right)(W_L^g+C(X))\right)$
PP	$(1-q)(C(x_H^g)-C(X))<0$	$q\left(C(x_H^g)-C(X)\right)<0$

Even if regime C is better in the absence of elections, regime D is, in general, more effective in getting the most out of elections. Excluding the positive effect of discipline in SH and SP (and selection in HH, which we cannot sign), regime C is always outperformed by regime D. Note that this is not incompatible with Proposition 2. It is still true that regime C provides more discipline, in the sense that it does so for a greater range of parameter values: in regions SH and SP, D provides no discipline at all while C provides some. However, when both regimes provide discipline, i.e., in SS, HH and PP, the expected impact on voters' welfare is higher under regime D. This is because the stakes of disciplining the incumbent, i.e., the difference between maximal rents and rents extracted when pooling are higher in regime D. Given the difference in maximal (i.e., second period) rents, the stakes of voting out a bad politician (the selection effect) are also higher under regime D. This, together with the result in Proposition 3, immediately implies that the impact of selection on welfare is higher under regime D.

We summarize our conclusions in the following two propositions.

Proposition 4 *When equilibrium is separating or pooling in both regimes, expected welfare is higher in the centralized regime.*

Proof See Appendix.

When equilibrium is separating under both regimes, bad incumbents are always voted out, and second period utility is the same as first period one. As bad incumbents always extract maximal rents, regime C is better. As regards case PP, it is easy to see that maximal rents also play an important role. On the one hand, bad incumbents are never voted out and always extract maximal rents in the second period. On the other hand, the probability of a high cost q, is high, and bad incumbents also extract maximal rents in the first period when the provision cost is high. It is interesting to notice that the advantage of the centralized regime stems in both cases from the welfare difference in the absence of elections. Indeed, inspection of Table 4 reveals that the impact of elections on welfare, i.e., $\Delta\mathcal{I} + \Delta\mathcal{S}$ is negative in both cases SS and PP.

We know, however, that a change in the tax setting regime may induce a change in the equilibrium outcome of the game. In particular, it is possible that selection is improved in the decentralized regime (cases SH, SP and HH). We now investigate what is the likely impact of this equilibrium change in the expected welfare of the voters.

Proposition 5 *When selection is improved in the decentralized regime, expected welfare is higher under this latter if the value of the future is high and the average quality of the polity is low.*

Proof See Appendix.

The intuition behind proposition 5 is easy to grasp. In the two cases in which $\Delta\mathcal{D} > 0$ and $\Delta\mathcal{S} < 0$, i.e., SH and SP, we just have to recall that the weight of the selection effect is increasing with the average quality of politicians and that selection matters when the weight given to the future is high enough. Hence, when politicians are on average very good (and future is not too heavily discounted), the regime that performs better in terms of selection (D) is better than C. As regards the hybrid equilibrium, we have that, excluding the selection effect, the centralized regime outweighs the decentralized one. Imposing one further condition (amounting to an upper bound on the rent difference of the decentralized regime, $X - r^D$), we ensure that the impact of selection on the expected utility is negative, and again the intuition goes through.

6. Turnover in Portuguese local elections

Our analysis has highlighted several implications of the lack of tax setting autonomy. One of those is related to electoral turnover, which is expected to be lower than with a higher degree of local autonomy. In this section, we present some preliminary data on turnover in Portuguese local elections. A richest empirical analysis would entail either an international comparison (countries conferring different degrees of autonomy to local governments) or a comparative analysis of Portuguese municipalities, exploring the variation in revenue sources. Even if the general level of discretion is very low, there are some revenue sources for which municipalities enjoy a greater autonomy. A full-fledged empirical analysis being outside the scope of this paper, we simply show some descriptive statistics to suggest that turnover at the local level seems indeed to be restricted in Portugal.

We present our descriptive statistics in Table 5. Local elections in Portugal took place in 1976, 1979, 1982, 1985, 1989, 1993, 1997, 2001 and 2005. Table 5 gives the number of different presidents that have been in office in each municipality during the last three decades. It refers to the identity of the president, as opposed to his party.[8]

Table 5: Turnover in Portuguese local elections 1979-2005

Number of different presidents	Percentage of *municípios*
1	3.86
2	12.22
3	27.01
4	30.55
5	16.72
6	7.07
7	1.93
8	0.64

Source: www.cne.pt

Although the *Presidente da Câmara* is not the only elected official in each municipality, he is the chief of the executive branch of the local government, the *Câmara Municipal*, and seems to enjoy a considerable latitude in decision making. Indeed, the

[8] This distinction is relevant, although not very important empirically, as it has happened that an incumbent runs for reelection representing a different political party.

following quote, adapted from DGAL (2004b, pages 45-47), suggests that the *Presidente da Câmara* enjoys considerable power. "*The Câmara Municipal is a permanent executive office, in charge of the organization and functioning of the municipal services, urbanism and public works, as well as relations with other local government bodies. It executes the decisions of the Assembleia Municipal [legislative and consultative body], administers the employees and the patrimony, decides the local budget, concedes licences [for construction and economic activities], and gives support to Freguesias. (...) It is the Presidente da Câmara who decides the division of policy areas amongst the elected members of the Câmara Municipal (vereadores). Within certain limits, he may also decide the number of vereadores who are actually responsible for a policy area, as opposed to merely attending the meetings, and whether they work part or full-time. He is also competent to supervise the administration of the employees at the service of the municipality*".

Table 5 allows one to conclude that most Portuguese municipalities have indeed had a very low number of different presidents. Indeed, with a history of 9 elections, the average number of different presidents is 3,76. Around 73% of the municipalities have had 4 or less presidents. This means more than two mandates per president. No municipality at all has changed president in every election.

This piece of evidence is to be taken with care, given that it does not take into account several important aspects. First of all, it may well be the case that turnout is low because the incumbent is, on average, good. If this is the case, however, our welfare analysis suggests that increasing local autonomy will have a positive impact on voters' welfare. More importantly, our model is one of political consensus, that is, all the voters agree on the best policy to be implemented. In reality, the *Presidentes da Câmara* belong to different parties and propose different platforms to the electorate and this is, admittedly, an important determinant of turnover.

7. Concluding remarks

This paper looks at the relationship between budget setting autonomy and political accountability at the local level. The usual focus of the literature is on decentralization of both expenditure and revenue collection. However, both functions are not necessarily decentralized to the same extent. In particular, there is evidence of revenue collection being

only partially left to the autonomous initiative of local governments. The usual rationale for such a lack of autonomy is the internationalization of inter-jurisdictional spillovers as, e.g., externalities stemming from tax competition. This paper studies the issue from the viewpoint of political accountability.

We use a political agency model to compare two budget setting regimes: the centralized (budget set by central government) and decentralized one (budget set by local government). In both regimes, expenditure is set at the local level, i.e., local governments decide the quantity of the local public good.

No regime dominates the other in terms of rent seeking. While maximal rents, that reveal a bad incumbent, are higher with decentralization, a corrupt local official can extract higher rents in the centralized regime without revealing his type. Hence, the relative gains from separating *vis-à-vis* pooling are higher with decentralization. Therefore, the decentralized regime outperforms the centralized one in terms of selection, while it is outperformed in terms of discipline.

With the background of the relative merits of the two regimes in terms of discipline and selection, we proceed to a comparison of expected welfare. When both regimes yield exactly the same discipline and selection (i.e., equilibrium is either separating or pooling in both), we show that centralization is preferred to decentralization. In both types of equilibrium, maximal rents play an important role, be it because the bad incumbent always plays them in the first period (separating equilibrium) or because he is never voted out of office, hence they are very often played in the second period. Therefore, the regime with the lowest maximal rents is preferred. The most interesting cases arise when a change in regime switches the type of equilibrium, namely, discipline is improved in the centralized regime. That is, the decentralized one has a separating equilibrium, with no discipline at all, and at least some discipline arises under centralization, with a hybrid or pooling equilibrium. In these cases, the decentralized regime dominates the centralized one if the average quality of politicians is high and if the future is not heavily discounted. *Indeed, it makes more sense to invest in selection if there are a lot of good politicians in the world and if second period utility matters a lot; conversely, if most politicians are bad, or future is very discounted, then it pays more to give them a stronger discipline.*

The analysis undertaken in this paper constitutes a first look at the issue of

different degrees of autonomy in the revenue and expenditure functions of local governments. It gives interesting insights about the main tradeoffs driving the choice of the degree of autonomy in budget setting. The analysis could be extended in a number of ways. Firstly, we could analyze a game with more than two periods. Indeed, in Portugal, local politicians are not term limited and it is not realistic to suppose that they cannot run for re-election at the end of the second period. With a finite number of periods, the last period effect (i.e., the bad politician extracting maximal rents) always arises. The gain from pooling is however higher as the politician reckons that he may serve for more than one additional period. Hence, we could expect restraint to be more often observed. This is likely to shift the balance in favor of the decentralized regime, where rents extracted when pooling are lower than in the centralized regime. If we consider, instead, an infinite number of periods, then matters become more complicated, since we are likely to run into multiple equilibria issues, and it is not clear how to compare the regimes. Another interesting extension would be to consider endogenous entry of politicians, that is, suppose that each individual in the society is either public or self-interested and may decide to become a politician. The pool of politicians is likely to be better in the decentralized regime, as public-spirited individuals know that they have a higher chance of being elected, due to the increased turnover, and this increases their utility from becoming politicians. One may also envisage extensions that will have an impact in the information of voters, like the introduction of debt or the possibility of yardstick competition. These can change the relative merits of the two regimes if there are reasons to believe that they have an asymmetric impact in information available to voters under the two regimes.

The most interesting predictions implied by our analysis may be summarized as follows. Firstly, there should be more turnover at the local level when budget setting power is held by local officials. Secondly, we should observe more rent seeking at the local level in countries where local governments enjoy less budget setting autonomy. Finally, one should observe less budget setting autonomy of local governments in countries where the average quality of the politicians is lower.

The relative merits of increased local autonomy seem to have made their way into Portuguese politics. Indeed, the Portuguese Government has recently created a Commission for the revision of the law that regulates local public finances (*Lei das Finanças Locais*),

where the idea of "*giving increased autonomy to, and increasing the responsibility of, local governments*" plays an important role (Secretary of State for the Local Administration, cited by the online newspaper Portugal Diário, October 25, 2005).

Appendix

Proof of Lemma 2

We look at each type of equilibrium in turn.

Pooling With $\lambda = 1$, we have that $\Pi_{G_H^g} \geq \pi$ if and only if $q \geq 1/2$. With $q < 1/2$, voters vote against the incumbent when they observe G_H^g, and the best reply from the bad incumbent is $\lambda = 0$. With $q \geq 1/2$, we have to make sure that G_H^g dominates 0 for the bad incumbent, i.e.

$$r^C + \beta x_L^g \geq x_L^g$$

Hybrid Voters must be indifferent between reelecting or not, i.e., $\Pi_{G_H^g} = \pi$, which, solving for λ, yields $\lambda = q/(1-q)$. The bad incumbent must be indifferent between pooling or separating, i.e.

$$r^C + \sigma\beta x_L^g \geq x_L^g \Leftrightarrow \sigma = \frac{r^D - x_L^g}{\beta x_L^g}$$

Separating Playing G_H^g must be dominated 0 with $\sigma = 1$, i.e.

$$r^C + \beta x_L^g \leq x_L^g$$

With $\lambda = 0$, we have $\Pi_{G_H^g} = 1 > \pi$, hence reelecting is a best reply from voters.□

Proof of Proposition 4 For region SS, it is straightforward to obtain

$$EW_c - EW_d = (1-\pi)(1+\beta(1-\pi))\Delta\mathcal{C} > 0$$

Under PP, straightforward manipulation yields

$$\begin{aligned} EW_c - EW_d = (1-\pi)\big(&q(C(X) - C(x_H^g)) - (1-q)(C(x_L^g) - C(x_H^g)) \\ &+(1-q)\beta(C(X) - C(x_L^g)) + (1-\pi)q\beta(C(X) - C(x_H^g))\big) \end{aligned}$$

where $q(C(X)-C(x_H^g))-(1-q)(C(x_L^g)-C(x_H^g))>0$ because $(C(X)-C(x_H^g))>(C(x_L^g)-C(x_H^g))$ and $q>1/2$.□

Proof of Proposition 5

We utilize the following assumption.

Assumption 1 *The rents of the decentralized game are such that*

$$\left(\max\left\{\left.\frac{\Delta\mathcal{C}}{qG_H^g}\right|_{q<1/2},\left.\frac{\Delta\mathcal{C}}{(1-q)G_L^g}\right|_{q>1/2}\right\}+\frac{G_H^g}{G_L^g}\right)X<X-r^D<\frac{G_H^g}{G_L^g}\frac{G_L^g-G_H^g}{W_L^g-W_H^g}$$

As regards SP and SH, we have

$$EW_c-EW_d=(1-\pi)\left((1+\beta)\Delta\mathcal{C}+\Delta\mathcal{D}+\beta\pi\Delta\mathcal{S}\right)>0$$

if

$$\pi<\bar{\pi}=\frac{(1+\beta)\Delta\mathcal{C}+\Delta\mathcal{D}}{-\beta\Delta\mathcal{S}}$$

To complete the proof, we investigate whether, in each case, $\bar{\pi}<1$. Let $\Delta W(\pi)=\frac{EW_c-EW_d}{1-\pi}$. Also, denote $\underline{\beta}=G_H^g/G_L^g$ and $\overline{\beta}=1-r^D/X$.

For SP, we have, after simplification,

$$\Delta W(\pi)=(1+\beta)\Delta\mathcal{C}+(1-q)G_H^g-\beta\pi\left(\Delta\mathcal{C}+(1-q)G_L^g\right)$$

ΔW is decreasing in π and we have that

$$\Delta W(0)=(1+\beta)\Delta\mathcal{C}+(1-q)G_H^g>0$$
$$\Delta W(1)=\Delta\mathcal{C}+(1-q)(G_H^g-\beta G_L^g)$$

$\Delta W(1)$ is decreasing in β, and it is positive when $\beta=\underline{\beta}$ and negative when $\beta=\overline{\beta}$, under Assumption 1. This implies that there exists a $\tilde{\beta}$ such that $\bar{\pi}<1$ when $\beta>\tilde{\beta}$.

For SH, we have

$$\Delta W(\pi)=(1+\beta-\beta\pi)\Delta\mathcal{C}+qG_H^g(1-\beta\pi)-\beta\pi q\tilde{\sigma}\left(G_L^g-G_H^g\right)$$

ΔW is decreasing in π and, using $\tilde{\sigma}=\frac{G_H^g}{\beta G_L^g}$, we have

$$\Delta W(0) = (1+\beta)\Delta \mathcal{C} + qG_H^g > 0$$
$$\Delta W(1) = \Delta \mathcal{C} + qG_H^g \left(\frac{G_H^g}{G_L^g} - \beta \right)$$

Following a similar argument as for SP above, we obtain that there exists a $\tilde{\beta}$ such that $\bar{\pi} < 1$ when $\beta > \tilde{\beta}$.

As regards the hybrid equilibrium, we have that, under Assumption 1, $\Delta \mathcal{S} < 0$ and, after simplification,

$$\Delta W(0) = (1+\beta)\Delta \mathcal{C} + q(C(x_H^g) - C(X)) > 0$$
$$\Delta W(1) = \beta q(C(X) - C(x_H^g)) + (1-q)(C(X) - C(x_L^g)) +$$
$$q\left(\overline{\beta} X (W_L^g - W_H^g) - \frac{G_H^g}{G_L^g}(G_L^g - G_H^g) \right)$$

Under Assumption 1, the last term in $EW(1)$ is negative. Since it is increasing in β, as soon as it is negative for $\beta = \underline{\beta}$ and positive for $\beta = 1$, there exists a $\tilde{\beta}$ such that $\bar{\pi} < 1$ when $\beta > \tilde{\beta}$.□

References

Baleiras, R., 1997. Local finance in Portugal: rules and performance, mimeo, Faculdade de Economia da Universidade Nova de Lisboa.

Baleiras, R., 2002. Finanças e fiscalidade regional e local. *In* J. S. Costa, ed. *Compêndio de Economia Regional*. Coimbra, Portugal: Associação Portuguesa para o Desenvolvimento Regional, 647-684.

Bardhan, P. and D. Mokherjee, 2000. Capture and governance at local national levels. *American Economic Review*, 90(2), 135-139.

Belleflamme, P. and J. Hindriks, 2002. Yardstick competition and political agency problems. CORE DP 2002/29, forthcoming in *Social Choice and Welfare*.

Besley, T., 2005. Principled Agents? The Political Economy of Good Government. Available online at http://econ.lse.ac.uk/staff/tbesley/book/completebook.pdf.

Besley, T. and S. Coate, 2003. Centralized versus decentralized provision of local public goods: a political economy approach. *Journal of Public Economics*, 87, 2611-2367.

Besley, T. and M. Smart, 2003. Fiscal restraints and voter welfare, mimeo, LSE.

Besharov, G., 2002. Influence costs in the provision of local public goods, mimeo, Department of Economics, Duke University.

Bird, R., 2000, Intergovernmental fiscal relations: universal principles, local applications. Working paper 00-2, International Studies Program, Andrew Young School of Public Studies, Georgia State University.

Bucovetsky, S. and M. Smart, 2004. The efficiency consequences of local revenue equalization: tax competition and tax distortions, *Journal of Public Economic Theory*, forthcoming.

Direcção Geral das Autarquias Locais (DGAL), 2004(a),Finanças Municipais 2002, Ministério das Cidades, Administração Local, Habitação e Desenvolvimento Regional.

Direcção Geral das Autarquias Locais (DGAL), 2004(b), Estrutura e Funcionamento da Democracia Local e Regional, Ministério das Cidades, Administração Local, Habitação e Desenvolvimento Regional.

Epple, D. and T. Nechyba, 2004. Fiscal decentralization. *In* V. Henderson and J. Thisse,

eds., *Handbook of urban and regional economics*, forthcoming.

Hindriks, J. and Lockwood, B., 2004. Centralization and political accountability, mimeo.

Oates, W. E., 1972. *Fiscal federalism*. New York: Harcourt Brace.

OECD, 1999. *Taxing powers of state and local government.* OECD Tax Policy Studies 1. Paris: OECD.

OECD, 2001. *Tax and the economy: a comparative assessment of OECD countries*. OECD Tax Policy Studies 6. Paris: OECD.

OECD, 2002. *Fiscal decentralization in EU applicant states and selected EU member states*. Paris: OECD.

Portugal Diário, 2005/10/25. Governo quer reforçar autonomia financeira das autarquias. Available online http://www.portugaldiario.iol.pt/noticia.php?id=601307&dic_id=291

Público, 2005/11/11. PCP insiste na existência de "saco azul" para autarquias. (Page 10)

Ter-Minassian, T., (ed.), 1997. *Fiscal federalism in theory and practice*. IMF.

Tiebout, C., 1956. A pure theory of local public expenditures. *Journal of Political Economy*, 64(5), 416-424.

Wilson, J., 1999. Theories of tax competion. *National Tax Journal*, 52(2), 269-304.

World Bank, 2000. *Entering the 21st century*. World Development Report. World Bank

World Bank, 2003. *Reforming intergovernmental fiscal relations in the Czech Republic*, PREM (Poverty Reduction and Economic Management) Notes 80.