

Lobbying and Rent-Seeking for Public Goods in a Fiscally Centralized System

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Abstract

This paper deals with public good provision and rent-seeking in an economy consisting of two regions with different preferences over public good consumption. The government either provides a national public good or two regional public goods with spillover effects. Since public expenditures are financed by general taxation, individuals in both regions try to influence policy-making in their preferred direction. Interesting results emerge from the analysis and in particular: rent seeking or influence activities for a national public good are increasing in the degree of heterogeneity across regions and there are also increasing in the degree of spillovers of local public goods.

Keywords: (Local) Public Goods; Rent-Seeking; General Taxation; Spillovers

JEL Classification: D72; H41; H73

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1 Introduction

While Western European countries are engaged in a process of economic and political integration that is unprecedented in their history, Eastern Europe provides dramatic illustration of swift collapse of political and economic union. These recent developments have led economists to study the size distribution of nations from a political economy point of view. These studies attempt to isolate the economic and political forces affecting the integration and separation of sovereign states. In this literature, integration reduces interstate transaction costs but increases intrastate transaction costs. The former costs have an economic nature and correspond, for example, to exchange transaction costs or to the accommodation costs to the standard or to the legislative system of the other countries. It can also be the opportunity from unexploited economics of scale in the provision of public goods. The latter costs have a political nature, as larger states are likely to have a more heterogeneous population in several dimensions (endowments, preferences, culture...)¹.

Because political separatism entails some economic and efficiency costs, we should observe that there is still some heterogeneity within the population of a particular nation. In other words, even if there is more place for taking into account heterogeneity, nation which are mainly characterized by the provision of public goods must still deal with the preference's heterogeneity of citizens. Notice that this is argument is closely related to the large public finance literature inspired by Tiebout's model. Tiebout (1956) argued that the heterogeneity problem could be mitigated by the mobility of people across jurisdictions. People 'vote with their feet' and sort themselves into the communities that provide the public

¹For a survey of this literature, see Alesina et al. (1995) or Bolton et al. (1996).

good they want. However subsequent literature has pointed out several problems with Tiebout solution, such as the restricted number of jurisdictions, the multidimensional nature of public goods, limitations to mobility or economics of scale in public good provision. In addition, there often exist legal constraints to extreme segregation by a particular group of people. Thus, despite the possibility of sorting, heterogeneous preferences will not disappear in practice.

In this paper a political economy model is set up to analyze the influence of preference's heterogeneity on public good provision and on rent-seeking of interest groups. More precisely, we consider a nation consisting of two regions that benefit to a different degree from public good consumption. We analyze two different regimes: one in which the government provides a unique national public good and the other in which the government provides two local public goods, one for each region, with positive spillovers. Public goods in the two regimes are financed by general taxation at the centralized level. In other words, policy-making is centralized and public spending is financed by a uniform head tax on all citizens.

Because regions value differently public good consumption, individuals have an incentive for rent-seeking to influence the policy and public good provision in their preferred direction. In this paper, rent-seeking is analyzed in a simple model of political equilibrium. The government is assumed to maximize the weighted aggregate welfare of the two groups. The respective weight of each group is determined by its rent-seeking expenditures. A first result is the following: when the two groups have access to the same power-seeking technology then, in equilibrium, the influence of one group exactly cancels out the influence of the other group. This result is valid whatever the distribution of preferences and whenever the government provides a national public good or two local public goods. It means that the political effec-

tiveness of a particular group is determined not by its absolute efficiency but by its efficiency relative to the efficiency of others which has been first recognized by Becker (1983). As a result, aggregate is always equal to 0 and the government supplies the same level of public goods as without rent-seeking.

Still, rent-seeking expenditures depend on the degree of heterogeneity across regions and on the type of public good (pure or local) that is provided by the government. When the government provides a unique national public good, both groups spend rent-seeking expenditures to influence policy only if they do not have the same preferences for public good consumption. More importantly, we show that rent-seeking expenditures by each interest group are increasing in the degree of heterogeneity across the two regions. If the government provides local public goods, both groups are always active even if they have the same preferences for public good consumption. In addition, rent-seeking pressures are more important than in the case of a pure national public good as long as the marginal utility of local public goods is high enough. We also show, quite unexpectedly, that the higher the degree of spillovers of local public goods the higher the levels of rent-seeking expenditures. General taxation and the distribution of tastes for public good consumption across regions appear to be important features of these results.

The remainder of the paper is organized as follows. Section 2 briefly reviews some related literature. Section 3 presents our political economy analysis for the benchmark of the provision of a pure public good. Section 4 considers the case where interest groups lobby for local public goods. Section 5 discusses some extensions of the analysis and concluding remarks appear in Section 6.

2 Related Literature

Our paper crosses the boundaries of several branches of the literature. First, this paper is related to recent literature on the political economy of the organization and size of government. For example, Alesina and Spolore (1997) consider the optimal and equilibrium number of districts in a model that trades off scale economies in public good provision against preference diversity. Bolton and Roland (1997) consider when a federation would likely to break up. In their analysis, there are two unequally wealthy regions that favour different redistribution policies and the trade-off is between the political benefits of having a policy closer to individual regions' tastes and an exogenous cost of separation. Ellingsen (1998) analyses the positive and normative economics of centralization of a pure public good. Decentralized systems of governments lead to inter-regional externalities. An integrated jurisdiction will solve the externality problem but it entails other costs in particular a neglect of minority interest. All these papers consider the provision of a national (federal) public good and use the median voter framework. In our paper, heterogeneity of preferences is also a central phenomenon but we do not restrict the analysis to the case of a national public good. We also consider the case of local public good provision². More importantly, our modelling of the policy-making process is quite different. The median voter framework is admittedly convenient from a theoretical point of view but not realistic. In most countries, individuals do not set economic policy directly but rather give the responsibility to their representatives. Also, in representative democracies, governments shape policies in response not only to the concerns of general electorate, but also to the pressures applied by special interest which is central in our analysis.

²Ellingsen (1998) briefly considers the extension to a local public good.

This paper is also related to the literature on fiscal federalism and distributive politics initiated by Oates (1972) and by Weingast, Shepsle and Johnson (1981). Following Oates' seminal work, recent papers, among others, by Lockwood (2001) and Besley and Coate (2000), have focused on the political economy of centralized versus decentralized provision of local public goods. These papers (see also Cheikbossian, (2000)) consider a system as one in which public spending is financed by general taxation, but regions can receive different levels of local public goods. Centralization of public good provision undermines cross-region externalities but entails a political cost which is a certain degree of uniformity in public spending across regions. In addition, policy is formed by elected regional representatives who eventually bargain in a national legislature. Our paper is related to that literature to the extent that national and local public goods are financed by general taxation. However, unlike this literature, we do not focus on the political economy of the organization of governments (between centralized and decentralized decision-making). We rather emphasize on the incentives for heterogeneous interest groups to influence centralized decision-making by the way of rent-seeking expenditures.

There is also a body of recent works which focuses explicitly on special interest politics. Becker (1983, 1985) first pointed out that because of their higher stakes, beneficiaries of various programs are more likely to be politically organized. More recent contributions have focused on structural models of the political process, trying to identify which features of the political system confer influence on some groups rather than others. Persson (1998) provided a comprehensive survey of this literature and Helpman and Grossman (2001) wrote a monograph on this topic. Our modelling of the political process is rather a reduced form with respect to this literature but this allows us to study how inter-regional heterogeneity over private

versus public consumption affect rent-seeking for different types of public goods which so far has been neglected by the literature.

Finally, there is a huge literature on the theory of rent-seeking initiated by seminal work of Tullock (1967). Typically, this literature assumes a given structure of rent-seeking contest and studies its equilibrium outcome. In particular, one of the major concerns have been the chance of winning the contest depending on individual or group's characteristics and also the dissipation rate that is the ratio between the outlay made by the contestants and the prize at stake³. Despite the abundance of contributions, there appears to be very few papers on rent-seeking for public goods. Exceptions are Katz, Nitzan and Rosenberg (1990) or Baik (1993). There is however a crucial difference between this type of literature and our analysis. Indeed, we view rent seeking as a mean to increase political influence relative to other interest groups which in turn can affect the policy of the government and public good provision and not as a mean of winning a particular (public or private) prize.

3 Rent-seeking and the Provision of a National Public Good

We consider an economy consisting of two geographical regions. There are N individuals and each individual lives either in region A and region B . Let n_A and n_B be the number of individuals in regions A or in region B respectively with $N = n_A + n_B$. There is no mobility across regions. We assume that individuals within each region are identical. More precisely they share the same preferences for public good consumption. However, there is heterogeneity of preferences across regions. There are thus two types people A and B , characterized by their locations

³See Nitzan (1994) for a survey.

and their tastes for a public good. The public good is financed by general taxation at the centralized or national level. The tax is nondistortionary.

Let us now turn to the details of the model. There is only one purely private good and an individual of region j for $j = A, B$ has the following quasi-linear utility function

$$v_j = x_j + \theta_j H(G) \tag{1}$$

where x_j is the individual's consumption of the private good and G is the aggregate level of the public good. G can be interpreted such as infrastructure or public spending and may also be viewed in terms of risk sharing and redistribution. $\theta_j > 0$ (for $j = A, B$) is a taste parameter and represents how individuals of group j value public consumption relative to private consumption. The function $H(\cdot)$ is a twice differentiable function and also satisfies the following conditions:

Assumption 1. (i) For all G ; $H_G(G) > 0$, and $H_{GG}(G) < 0$. (ii) $\lim_{G \rightarrow 0} H_G(G) = \infty$. (iii) $\lim_{G \rightarrow \infty} H_G(G) = 0$. (iv) $H(0) = 0$.

For example, one can consider the following class of functions: $H(G) = \frac{G^{1-\alpha}}{1-\alpha}$, with $\alpha \in [0, 1]$.

The public good is financed by an equal lump-sum tax and we assume that unit cost of providing the public good is equal to 1. We also assume that exogenous income (y) is equal for everyone in society and sufficiently high to always allow positive consumption of the private good. This implies together with quasi-linearity of preferences that there are no wealth effects. Using the government budget constraint, we then have

$$v_j = y - (G/N) + \theta_j H(G) \quad (2)$$

However, the conflict concerning the desired level of public good may give both groups an incentive to influence policy through rent-seeking activities. To model political influence of rent-seeking, we use a simple two-stage policy game: in the first stage interest groups exert rent-seeking pressure on the government. In the second stage, the government chooses the level of the public good.

The government is assumed to maximize a weighted sum of the welfare of both groups. The respective weights ϕ_A and ϕ_B are determined by the level of rent-seeking expenditures of the interest groups in the first stage of the game. Let W be the objective function of the government. We have

$$W = n_A \phi_A n_A v_A + \phi_B n_B v_B. \quad (3)$$

This set-up, as it has been shown by Coughlin, Mueller and Murrell (1990a,b) or Dixit and Londregan (1996) is consistent with a model of electoral competition with interest groups. For example, in Coughlin et al. (1990a,b) two political candidates compete for votes in a forthcoming election. The candidates are uncertain about the political preferences of the individuals. This uncertainty is characterized by a stochastic bias term in favour of one of the candidates. Voters are distributed into different interest groups composed of individuals with the same policy preferences and the same distribution of the bias term. In such a setting both candidates choose their policy platform to maximize a weighted social welfare function. The political weight of each group of voters is inversely related to the degree uncertainty concerning the bias term of the members of this group. Following Lorz (2001)

rent-seeking can be introduced into this setting in a way that interest groups spend resources to reduce the uncertainty of the candidates.

To solve for the subgame perfect equilibrium of the policy game, the solution of the second stage is derived first⁴. Inserting Eq. (2) into Eq. (3) for $j = A, B$ and maximizing Eq. (3) gives the following interior solution for the public good level that is chosen by the policy maker

$$G^o = V \left(\frac{n_A \phi_A + n_B \phi_B}{N (n_A \phi_A \theta_A + n_B \phi_B \theta_B)} \right) \quad (4)$$

where the function V is the inverse function of the derivative of H i.e. $V(\cdot) = H_G^{-1}(\cdot)$. Since, by assumption H is concave, V is a decreasing function.

The level of public good provided in equilibrium is increasing in both taste parameters. Eq. (4) also shows how the political weights of both interest groups influence the equilibrium level of public good in the second stage of the policy game. An increase in the political weight of group j , for $j = A, B$, affects the level of public good according to

$$\frac{dG^o}{d\phi_j} = -V_{\phi_j} \left(\frac{n_A \phi_A + n_B \phi_B}{N (n_A \phi_A \theta_A + n_B \phi_B \theta_B)} \right) \left[\frac{n_A n_B \phi_k (\theta_j - \theta_k)}{N (n_A \phi_A \theta_A + n_B \phi_B \theta_B)^2} \right], \quad j \neq k. \quad (5)$$

where V_{ϕ_j} (which is negative) is the derivative of V with respect to ϕ_j . As a result

$$\frac{dG^o}{d\phi_j} \begin{cases} \geq 0 \\ < 0 \end{cases} \text{ as } \theta_j \begin{cases} \geq \\ < \end{cases} \theta_k, \quad j = A, B; \quad j \neq k. \quad (6)$$

⁴Because there are no resources constraints, the order of this game has no special importance. The equilibrium conditions are the same if the decisions of the government and of the interest groups are made simultaneously. Our presentation of the rent-seeking game as sequential is for expositional felicity only.

In other words, the equilibrium level of public good increases (decreases) in the political weight of the interest group which values public good consumption more (less) than the other group. If both groups have the same political preferences, then political strength by any groups does not have any influence on the level of public good provided in equilibrium. Thus, political influence depends crucially on taste heterogeneity. Since individuals in both groups have to bear the same tax burden, the political influence of each group over the level of public good depends on whether or not each group values public consumption more importantly than the other group. For example, if group A values public consumption less than group B , it will have an incentive to influence the policymaker towards a lower level of public good and of taxation.

Now let consider the first stage of the policy game. Each interest group j can raise the political weight ϕ_j by rent-seeking expenditures. Let the weight ϕ_j for $j = A, B$ be a twice differentiable function of the sum of rent-seeking expenditures r_j spent by members of group j which also satisfies the following conditions:

Assumption 2. (i) For all r_j ; $\phi_j'(r_j) > 0$ and $\phi_j''(r_j) < 0$. (ii) $\lim_{r_j \rightarrow 0} \phi_j'(r_j) = \infty$. (iii) $\lim_{r_j \rightarrow \infty} \phi_j'(r_j) = 0$. (iv) $\phi_j(0) = 0$.

Political influence is therefore assumed to be an increasing and concave function of rent-seeking expenditures.

The interest groups are assumed to maximize the aggregate income of their members minus rent-seeking expenditures. Assumptions 1 and 2 guarantees that this choice is interior, and that it is completely described by the following first-order condition which has to be satisfied for $j = A, B$ with G^o and $dG^o/d\phi_j$ given by Eq. (4) and Eq. (5) respectively

$$\frac{dv_j}{dr_j} = \frac{dv_j}{dG^\circ} \frac{dG^\circ}{d\phi_j} \frac{d\phi_j}{dr_j} - \frac{1}{n_j} = 0 \quad (7)$$

Calculating dv_j/dG° with v_j given by Eq. (2), the first order condition can be rewritten as it follows

$$\left(\theta_j H_G(G^\circ) - \frac{1}{N} \right) \frac{dG^\circ}{d\phi_j} \frac{d\phi_j}{dr_j} = \frac{1}{n_j}. \quad (8)$$

Note that $H_G(G^\circ)(\cdot) = (H_G \circ V)(\cdot) = I(\cdot)$ where $I(\cdot)$ is the identity function. Inserting Eq. (4) and Eq. (5) into Eq. (8) for $j = A, B$ gives the following first order conditions for the equilibrium level of rent-seeking expenditures

$$\frac{dG^\circ}{d\phi_j} \frac{d\phi_j}{dr_j} \left(\frac{n_k \phi_k (\theta_j - \theta_k)}{N (n_A \phi_A \theta_A + n_B \phi_B \theta_B)} \right) = \frac{1}{n_j}, \quad j \neq k. \quad (9)$$

As a result, the level of rent-seeking expenditures r_j that is optimally chosen by group j , for $j = A, B$, when it acts as if the pressure exerted by the other group is unaffected by its behavior, is implicitly defined by

$$\frac{d\phi_j}{dr_j} = \frac{N (n_A \phi_A \theta_A + n_B \phi_B \theta_B)}{n_A n_B \phi_k (\theta_j - \theta_k)} \left(\frac{dG^\circ}{d\phi_j} \right)^{-1}, \quad j \neq k. \quad (10)$$

Inserting Eq. (5) into Eq. (10) we find that

$$\frac{d\phi_j}{dr_j} = - \left(V_{\phi_j} \left(\frac{n_A \phi_A + n_B \phi_B}{N (n_A \phi_A \theta_A + n_B \phi_B \theta_B)} \right) \right)^{-1} \left[\frac{N^2 (n_A \phi_A \theta_A + n_B \phi_B \theta_B)^3}{[n_A n_B \phi_k (\theta_j - \theta_k)]^2} \right], \quad j \neq k. \quad (11)$$

Eq. (11) characterizes the optimal level of rent-seeking expenditures of one group (in this case group j) given that of the other group (group k). Therefore Eq. (11) for $j = A, B$ implicitly describes a system of two reaction functions. Solving

this system, we obtain the Nash equilibrium in rent-seeking expenditures r_A^* and r_B^* .

Without specifying functions H and ϕ , it seems presumptuous to look for closed-form solutions. Note however that the two reaction functions are quite similar. Indeed, only the denominator of the second right-hand-side term differs from one reaction function to the other. More precisely, it is apparent from Eq. (11) that the level of rent-seeking activity by group j is essentially a matter of the political activity of the other group. Indeed, the term which makes the difference between reaction functions is ϕ_k i.e. the political influence of the other group and it appears that, *ceteris paribus*, r_j is increasing in ϕ_k (Recall also that because ϕ is concave, $d\phi/dr$ is a decreasing function).

More specifically, let express the ratio of the two implicit reaction functions

$$\frac{d\phi_A/dr_A}{d\phi_B/dr_B} = \left(\frac{\phi_A(r_A^*)}{\phi_B(r_B^*)} \right)^2. \quad (12)$$

From this equation, we have

Proposition 1 *When both groups have access to same power-seeking technology, in equilibrium the influence of one group exactly cancels out the influence of the other group.*

This result is important because it means that the political effectiveness of a group is mainly determined not by its absolute efficiency but by its efficiency relative to the efficiency of other groups which has been first recognized by Becker (1983). To make it clear, consider that both groups have access to the same power-seeking technology (i.e. $\phi_j(\cdot) = \phi_k(\cdot)$). In that case, it is apparent from Eq. (12) that both groups spend the same level of rent-seeking expenditures in equilibrium.

Let r^* be the rent-seeking level in this symmetric equilibrium. It follows that both groups have the same influence on policy making i.e. $\phi_A(r^*) = \phi_B(r^*) = \phi$ and therefore aggregate influence is 0. We will see that this result also holds when the government provides two local public goods with spillover effects from one region to the other.

With asymmetric rent-seeking technologies, the game will not be zero-sum in influence. Asymmetric political influence can result from different group's characteristics. For example, collective action may be less difficult to achieve in a small group than in a large group. Indeed, because individuals bear only partially the adverse consequences of their contributed effort, collective effort typically falls below the group-optimal level (see Olson (1965)). This well-known free-rider problem can be partially controlled by putting in place a system of sanctions for deviant members but this is costly and the cost is likely to be increasing with the size of the group. A large group would therefore be less efficient at producing political pressure than a small group and this could be reflected by different political influence function. We will go back to the case of asymmetric rent-seeking in the last section.

When both groups have access to the same rent-seeking technology ϕ , the equilibrium level of rent-seeking expenditures for both groups is implicitly defined by

$$\hat{\phi} \equiv \frac{d\phi/dr}{\phi} = - \left(V_\phi \left(\frac{1}{n_A\theta_A + n_B\theta_B} \right) \right)^{-1} \left[\frac{N^2 (n_A\theta_A + n_B\theta_B)^3}{[n_A n_B (\theta_A - \theta_B)]^2} \right] \quad (13)$$

The equilibrium rent-seeking level of both interest groups is strictly positive only if $\theta_A \neq \theta_B$. When everyone has identical tastes, i.e. $\theta_A = \theta_B = \theta > 0$, given assumption 2, there is no incentives to exert rent-seeking pressure i.e. $r_A^* = r_B^* = 0$.

For convenience, let consider the case of isoelastic utility $H(G) = \frac{G^{1-\alpha}}{1-\alpha}$. This

implies that V , the inverse function of the derivative of function, H satisfies $V(G) = G^{-\frac{1}{\alpha}}$ and therefore the derivative of V satisfies $V_G(G) = -\frac{1}{\alpha}G^{-(\frac{1}{\alpha}+1)}$. With this specification, we obtain

$$\widehat{\phi} \equiv \frac{d\phi/dr}{\phi} = \frac{\alpha N^2 (n_A \theta_A + n_B \theta_B)^{2-\frac{1}{\alpha}}}{[n_A n_B (\theta_A - \theta_B)]^2} \quad (14)$$

How does rent-seeking depend on the degree of heterogeneity? As it turns out, the answer hinges on the relative values of taste parameters. More specifically, we have

Proposition 2 *The level of rent-seeking expenditures by each interest group is an increasing function of $|\theta_A - \theta_B|$.*

Proof. Let note $\Delta = (\theta_A - \theta_B)^2$ and suppose, without loss of generality, that $\theta_A > \theta_B$. Eq. (14) becomes $\widehat{\phi} = \frac{\alpha N^2 (n_A \sqrt{\Delta} + N \theta_B)^{2-\frac{1}{\alpha}}}{[n_A n_B]^2 \Delta}$. Calculating the derivative of $\widehat{\phi}$ with respect to Δ gives: $\frac{\partial \widehat{\phi}}{\partial \Delta} = -\frac{\alpha N^2 (n_A \sqrt{\Delta} + N \theta_B)^{1-\frac{1}{\alpha}} ((n_A \sqrt{\Delta}/2\alpha) + N \theta_B)}{[n_A n_B]^4 \Delta^2} < 0$. Now let calculate $\frac{d\widehat{\phi}}{dr}$, with $\widehat{\phi} = \frac{d\phi/dr}{\phi}$. We have $\frac{d\widehat{\phi}}{dr} = \frac{((d^2\phi/dr^2)\phi - (d\phi/dr)^2)}{\phi^2}$ which is negative since ϕ is assumed to be concave. Therefore $\widehat{\phi}$ is a decreasing function of r . Because the right-hand term of (14) is decreasing in Δ , r is increasing in $|\theta_A - \theta_B|$ ■

The above proposition states that political conflicts and rent-seeking activities are exacerbated by an increase in the polarization of preferences. An increase in resources brought about via political activities is a source of social deadweight loss to the extent that these resources are devoted to political activities (and then not used for productive activities). A proportional reduction in efforts by both politically active groups would reduce the overhead cost of the political process, without

affecting the overall disposition of government policies. Indeed, with heterogeneity of preferences, the group with a relatively high preference for public good consumption seeks to increase the public sector level; the group with a relatively low preference for public good consumption seeks to reduce it. In equilibrium the rent-seeking-influence of one group exactly cancels out the influence of the other group, and the government supplies the same level of public good as without rent-seeking.

The political game is zero-sum in influence and negative-sum in rent-seeking expenditures. Our point is that an increase in polarization of preferences will not affect the political equilibrium but will increase unproductive rent-seeking expenditures. This suggests that in a multi-regional state, the political effort of every particular group to obtain preferential treatment for itself tends to threaten the interest of other groups. Consequently, each group is inclined to overinvest in the production of political influence. The political conflict thereby engendered may be peaceful, as in well functioning democracies where groups lobby legislatures for particular favors, or may be violent in countries in which government functions poorly or have been captured by one group and used to exploit others.

4 Rent-seeking and the Provision of Local Public Goods

So far, we have confined attention to the case of a pure national public good which is available in the same quantity in each region. What if the government can provide public goods with local or regional specific benefits? To answer this question, we consider a situation in which the policy maker provides two regional public goods that spillover from one region to the other. There are still two types of people A and B with relative preferences for public good consumption θ_A and θ_B respectively and an individual lives either in region A or in region B .

A natural way of capturing this phenomenon within the model is to consider that individuals in region j for $j = A, B$ have the following utility function

$$v_j = x_j + \theta_j H(g_j + \beta g_k), \quad j \neq k \quad (15)$$

where g_j and g_k are public goods with local benefits in region j and region k respectively. One can still interpret g_j and g_k as public investments or local infrastructures. The parameter $\beta \in [0, 1]$ captures the spillover effects from other region's public spending on the "home" region. When $\beta = 1$ we are in the Samuelson case of a pure public good at the national (regional) level⁵.

We still consider that public spending in each region is financed by general taxation i.e. by an equal lump-sum tax at the national level and we assume that unit cost of providing the public good is equal to 1. Each individual, irrespective of the region he belongs to, as an exogenous income (y) that is sufficiently high to always allow positive consumption of the private good. Using the government budget constraint, we have

$$v_j = y - (g_A + g_B)/N + \theta_j H(g_j + \beta g_k) \quad j \neq k. \quad (16)$$

As in the previous section, we analyze the following two-stage policy game: in the first stage the interest groups exert rent-seeking pressure on the government. In the second stage the government chooses the level of public goods by maximizing a weighted sum of the welfare of both groups. The solution of the second stage of the game is derived first by maximizing the objective function of the government

⁵However when $\beta = 1$, we are not back to our original formulation. The reason is that now, the policy maker has two policy instruments (two local public goods) instead of one, which in turn affects the incentives for rent-seeking. This will become clear later on.

given by Eq. (3) and v_j for $j = A, B$ given by Eq. (16) with respect to g_A and g_B . By solving $dW/dg_j = 0$ for $j = A, B$, we obtain the following first-order conditions

$$n_j \phi_j \theta_j H_{g_j} (g_j + \beta g_k) + \beta n_k \phi_k \theta_k H_{g_j} (g_k + \beta g_j) = \frac{n_A \phi_A + n_B \phi_B}{N}, \quad j \neq k. \quad (17)$$

where H_{g_j} denotes the derivative of H with respect to g_j .

Let note G_A and G_B the levels of 'disposable' public goods for region A and B . More specifically $G_A = g_A + \beta g_B$ and $G_B = g_B + \beta g_A$. The first-order conditions then reduce to

$$G_j^o = V \left(\frac{n_A \phi_A + n_B \phi_B}{N(1+\beta) n_j \phi_j \theta_j} \right), \quad j = A, B \quad (18)$$

where $V(\cdot) = H_{g_j}^{-1}(\cdot)$.

Since H is concave, disposable public good in region j is increasing in θ_j . Furthermore, an increase in the political weight of group j for $j = A, B$ will affect the equilibrium level of disposable public good according to

$$\frac{dG_j^o}{d\phi_j} = -V_{\phi_j} \left(\frac{n_A \phi_A + n_B \phi_B}{N(1+\beta) n_j \phi_j \theta_j} \right) \left[\frac{(1+\beta) N n_A n_B \phi_k \theta_j}{[(1+\beta) N n_j \phi_j \theta_j]^2} \right] > 0, \quad j \neq k \quad (19)$$

for group j and

$$\frac{dG_k^o}{d\phi_j} = V_{\phi_j} \left(\frac{n_A \phi_A + n_B \phi_B}{N(1+\beta) n_k \phi_k \theta_k} \right) \left[\frac{(1+\beta) N n_A n_B \phi_k \theta_k}{[(1+\beta) N n_k \phi_k \theta_k]^2} \right] < 0 \quad j \neq k \quad (20)$$

for group k .

In the first stage of the policy game, both groups can raise their political influence by making rent-seeking expenditures. Fellow group members decide collectively the level of their rent-seeking expenditures r_j so as to maximize utility net

of rent-seeking effort. The following first order condition has to be satisfied, for $j = A, B$, with G_j^o and $dG_j^o/d\phi_j$ given by (18) and (19) respectively

$$\frac{dv_j}{dr_j} = \frac{dv_j}{dG_j^o} \frac{dG_j^o}{d\phi_j} \frac{d\phi_j}{dr_j} - \frac{1}{n_j} = 0. \quad (21)$$

Observing that $g_A + g_B = \frac{G_A + G_B}{1 + \beta}$ and calculating dv_j/dG_j^o with v_j given by Eq. (16), the first order conditions, for $j = A, B$, can be rewritten as it follows

$$\theta_j H_{g_j} \left(V \left(\frac{n_A \phi_A + n_B \phi_B}{N(1 + \beta) n_j \phi_j \theta_j} \right) \right) \frac{dG_j^o}{d\phi_j} \frac{d\phi_j}{dr_j} - \frac{\left(\frac{dG_j^o}{d\phi_j} + \frac{dG_k^o}{d\phi_j} \right) d\phi_j}{N(1 + \beta) dr_j} = \frac{1}{n_j}, \quad j \neq k. \quad (22)$$

For convenience in the exposition, let note $V(\Delta_j) \equiv V \left(\frac{n_A \phi_A + n_B \phi_B}{N(1 + \beta) n_j \phi_j \theta_j} \right)$ for $j = A, B$. Inserting Eq. (19) and Eq. (20) into Eq. (22) for $j = A, B$ and $j \neq k$ and observing that $H_{g_j}(V(\cdot)) = I(\cdot)$, one can find after some routine calculations the following marginal influence of rent-seeking for group j ($j = A, B$) given that of the other group

$$\frac{d\phi_j}{dr_j} = - \frac{\phi_j [(1 + \beta) N]^2 (n_A \phi_A \theta_A)^2 (n_B \phi_B \theta_B)^2}{n_A n_B \phi_k \left[V_{\phi_A}(\Delta_A) (n_B \phi_B)^3 \theta_B^2 \theta_A + V_{\phi_B}(\Delta_B) (n_A \phi_A)^3 \theta_A^2 \theta_B \right]}, \quad j \neq k. \quad (23)$$

Eq. (23) implicitly define best reaction functions for groups A and B . Solving this system, we obtain the Nash equilibrium in rent-seeking expenditures r_A^* and r_B^* . Observe that the only terms which differ from one equation to the other are those in front of the brackets both in the nominator and the denominator. More specifically, we can express the marginal political effectiveness of one group relative to the other in the following way

$$\frac{d\phi_A/dr_A}{d\phi_B/dr_B} = \left(\frac{\phi_A(r_A^*)}{\phi_B(r_B^*)} \right)^2. \quad (24)$$

Again, when the two groups have access to the same rent-seeking technology (i.e. $\phi_j(\cdot) = \phi_k(\cdot)$), they spend the same level of rent-seeking expenditures. Let r^* be the rent-seeking level in this symmetric equilibrium. It follows that both groups have the same influence on policy making i.e. $\phi_A(r^*) = \phi_B(r^*) = \phi$. Eq. (23) then reduces to

$$\widehat{\phi} \equiv \frac{d\phi/dr}{\phi} = -\frac{n_A\theta_A n_B\theta_B [(1+\beta)N]^2}{V_{\phi_A}(\Delta_A)n_B^3\theta_B + V_{\phi_B}(\Delta_B)n_A^3\theta_A} \quad (25)$$

where now $V_{\phi_j}(\Delta_j) = V_{\phi_j} \left(\frac{1}{(1+\beta)n_j\theta_j} \right)$.

Since V_{ϕ_A} and V_{ϕ_B} are negative, rent-seeking expenditures are strictly positive in equilibrium. As long as the interest groups have access to same power-seeking technology, they neutralize each other in the political process. The government provides the same levels of local public goods as without rent-seeking. Proposition 1 still holds which strongly supports the view that the political effectiveness of a group is determined not by its absolute efficiency but by its efficiency relative to the efficiency of the other groups.

To simplify the analysis and to clarify the exposition, let us consider the case of the isoelastic utility function $H(G) = \frac{G^{1-\alpha}}{1-\alpha}$. Then it is a matter of few computations to show that Eq. (25) reduces to

$$\widehat{\phi} \equiv \frac{d\phi/dr}{\phi} = \frac{\alpha N^2 (1+\beta)^{1-\frac{1}{\alpha}}}{(n_A\theta_A)^{\frac{1}{\alpha}} n_B^2 + (n_B\theta_B)^{\frac{1}{\alpha}} n_A^2} \quad (26)$$

The first thing to notice is that, unlike in the case of a national public good, rent-seeking expenditures are strictly positive even if both groups share the same

preferences for public good consumption. The intuition is simple. Public goods are financed by general taxation at the centralized level. However public goods have region specific benefits. This gives an incentive for each group to push for an expansion of g_j since the tax burden is shared between the two groups. As a result, both interest groups will have an incentive to exert rent-seeking pressure for local public good consumption even if they have identical tastes.

The motive for rent-seeking is therefore quite different from that which drives political influence when the government provides a pure public good. In fact, inspection of Eq. (26) reveals that rent-seeking is increasing both in θ_A and θ_B ⁶. Since regions contribute equally to the national tax burden, both groups compete for public spending in their own region. Therefore their incentives for rent-seeking are increasing both in the home and other region's taste parameter.

Does it mean that rent-seeking by each interest group is higher when the government provides local public goods than in the case where it provides a unique national public good? The following proposition makes this point more precise

Proposition 3 *When both groups are of equal size and if the marginal utility of the public good is sufficiently high then, in equilibrium, rent-seeking expenditures for local public goods are more important than for a national public good.*

When both groups are of equal size i.e. $n_A = n_B = n$. Eq (14) and (26) which characterize the equilibrium levels of rent-seeking pressure for national and local public good reduce to $\hat{\phi} = \left[4\alpha (\theta_A + \theta_B)^{2-\frac{1}{\alpha}} / n^{\frac{1}{\alpha}} (\theta_A - \theta_B)^2 \right]$ and $\hat{\phi} = \left[4\alpha (1 + \beta)^{1-\frac{1}{\alpha}} / n^{\frac{1}{\alpha}} \left(\theta_A^{\frac{1}{\alpha}} + \theta_B^{\frac{1}{\alpha}} \right) \right]$ respectively. Because ϕ is concave, $\hat{\phi}$ is a decreasing function of r . Therefore, rent-seeking expenditures will be lower with a

⁶In Eq. (25), θ_A and θ_B appear in the denominator and $\hat{\phi}$ is a decreasing function because of the concavity of ϕ . As a result, in equilibrium, rent-seeking is increasing both in θ_A and θ_B .

national public good than with local public goods if $\left[(1 + \beta)^{1 - \frac{1}{\alpha}} / \left(\theta_A^{\frac{1}{\alpha}} + \theta_B^{\frac{1}{\alpha}} \right) \right] < \left[(\theta_A + \theta_B)^{2 - \frac{1}{\alpha}} / (\theta_A - \theta_B)^2 \right]$. Rearranging the terms, we get that rent-seeking pressure for local public goods is higher than rent-seeking for a national public good only if

$$(1 + \beta)^{1 - \frac{1}{\alpha}} < [(\theta_A + \theta_B) / (\theta_A - \theta_B)]^2 \left[\left(\theta_A^{\frac{1}{\alpha}} + \theta_B^{\frac{1}{\alpha}} \right) / (\theta_A + \theta_B)^{\frac{1}{\alpha}} \right] \quad (27)$$

Inspection reveals that this condition is always satisfied if $\alpha \geq 1/2$ ⁷. If the marginal utility of the public good is not decreasing too rapidly both interest groups exert more rent-seeking pressure for a local public good than for a national public good. Intuitively, because public expenditures have local specific benefits and because of the common financing, there is now two incentives for rent-seeking: first, to obtain a public good that fits the preferences of the region and second, to exploit the budgetary externality.

Again, rent-seeking causes a prisoner's dilemma situation for the interest groups and in equilibrium the rent-seeking influence of one group exactly cancels out the influence of the other group. The difference with the case of a national public good is that now unproductive rent-seeking activities are more important which further decreases the welfare of both interest groups.

How does rent-seeking change with the degree of spillovers? We may think that the higher the level of inter-regional externalities of public spending the lower the incentives to engage in a costly rent-seeking process. Indeed, the size of the

⁷Observe that the left-hand term is, for any $\beta > 1$, strictly lower than 1 (because $\alpha < 1$). The right-hand term is the product of two terms, one strictly lower than 1 and the other strictly higher than 1. For any values of θ_A and θ_B the right-hand term is strictly higher than 1 for $\alpha = 1/2$. Since the right-hand term is increasing in α , we can conclude that the inequality is always satisfied for any $\alpha \geq 1/2$.

externality β is a measure of the relative importance of local specific benefits of public good provision. A high value of β means that local specific benefits are of marginal importance. In this case the distributional conflict between the two regions to attract public spending should be mitigated which would reduce the level of rent-seeking activities with respect to the case of a high value of β . However, this intuition is misleading as indicated in the following proposition.

Proposition 4 *The level of rent-seeking expenditures by each interest group is increasing in the degree of spillovers.*

Proof. Since by assumption ϕ is concave the left-hand term of Eq. (26) is decreasing in r . The right-hand term is a decreasing function of β (recall that $\alpha < 1$). Therefore, r is an increasing function of β ■

Why this result? A possible explanation is the following. The two groups try to raise their political influence by increasing their rent-seeking expenditures. The government provides two group specific public goods while total spending are financed by a uniform head tax on all citizens. β indexes the degree of spillovers of these two public goods. When β is low, individuals care principally about the public good in their own locality. The incentive to influence the government is then principally driven by the opportunity to exploit the budgetary externality as discussed above. Contrarily, when β is approaching 1, both groups care equally about the public goods in both localities. Indeed, for each group, public good consumption is determined equally by the preferences of the fellow group members and those of the other group. Each group has thus strong incentive to lobby not only for a local public good which fits the preferences of fellow group members but also for low provision to the other group to pay lower taxes. This can explain why

rent-seeking is increasing in the degree of spillovers.

5 Extensions

5.1 Collective action and group size

So far, we have assumed that the cost of political pressure is equally shared between group's members. However, because political pressure is a public good, it can be subject to the problem of free-riding: each person wants to shirk his obligation and impose the cost of producing pressures on other members. When individuals decide non-collectively their rent-seeking activities the private marginal cost of rent-seeking is 1. Therefore, the right-hand term in Eq (8) and (22) characterizing the first order conditions in the two regimes would be 1 instead of $1/n_j$. It follows that in the rent-seeking equilibrium, the marginal political effectiveness of one group to the other would now be given by

$$\frac{d\phi_A/dr_A}{d\phi_B/dr_B} = \frac{n_A}{n_B} \left(\frac{\phi_A(r_A^*)}{\phi_B(r_B^*)} \right)^2. \quad (28)$$

If both groups have access to the same power-seeking technology, then

Proposition 5 *The group with fewer individuals gets the larger influence on centralized decision-making.*

Proof. Assume, without loss of generality, that $n_A > n_B$ then Eq. (28) can be rewritten as it follows $\frac{\phi'_A(r_A^*)}{\phi'_B(r_B^*)} \cdot \left(\frac{\phi_B(r_B^*)}{\phi_A(r_A^*)} \right)^2 > 1$. Now assume that $r_A^* > r_B^*$, then if both groups have access to the same power-seeking technology i.e. $\phi_A(\cdot) = \phi_B(\cdot)$ we would have $\phi(r_A^*) > \phi(r_B^*)$ and $\phi'(r_B^*) > \phi'(r_A^*)$ which is in contradiction with the previous inequality. Therefore if $n_A > n_B$, necessarily $r_B^* > r_A^*$ which implies that in equilibrium $\phi(r_B^*) > \phi(r_A^*)$ ■

We can find some empirical evidences. For example, the voting rules and allocation of votes to member nations in the EU Council of Ministers gives weights out of proportion to their size to relatively smaller nations. However, we probably need a micro-founded model of rent-seeking and of political influence to get further insights on the problem of free-rider within interest groups.

5.2 Many Interest groups

Another extension should be to consider that the economy is divided in several groups and the question is whether it increases or decreases the aggregate level of rent-seeking activities⁸. There are several effects at work: on the one hand since each group counts less in the welfare objective function of the government, the incentive to engage in political influence instead of productive activities should be reduced because the relative effectiveness of rent-seeking is reduced. On the other hand, a large number groups may exacerbate competition between them.

I have refrained from a full analysis of this extension of the model partly because it becomes quite complicated to handle with much more parameters and partly because the added insight is quite limited. However, few points are worth making. Let first consider the case of a national public good. To focus on the impact of the number of groups on rent-seeking, let assume that there are I regions of equal size n and that each region except region j , has the same preferences over public good consumption i.e. $\forall i \neq j, \theta_i = \theta$. Using the isoelastic utility function and after some computations, Eq. (14) characterizing the level of rent-seeking expenditures in the symmetric equilibrium is now given by

⁸Results in this subsection are stated without proof. However, the details are available upon request.

$$\widehat{\phi} \equiv \frac{d\phi/dr}{\phi} = \frac{\alpha n^{-\frac{1}{\alpha}} I^2 [(I-1)\theta + \theta_j]^{2-\frac{1}{\alpha}}}{[(I-1)(\theta - \theta_j)]^2} \quad (29)$$

The result that we can get by calculating the derivative of $\widehat{\phi}$ with respect to I is the following: if $\alpha < 1/2$ then rent-seeking expenditures are always (i.e. for any values of θ and θ_j) increasing in the number of groups when the government provides a national public good. In other words, when the marginal utility of public good is decreasing rapidly, an increase in the number of interest groups raises political competition for influence. When $\alpha > 1/2$ the result is ambiguous and depends on the relative values of the parameters (θ , θ_j , α and I). How to interpret the result? First notice that because there are $(I-1)$ groups that share the same preferences, we can view the set up as one in which there is a competition between a small group and a large group. But there is a problem of free-riding among the large group since decisions are taken independently by the $(I-1)$ groups with preferences θ . Therefore, the marginal benefit of rent-seeking for group j is increasing in I which in turn increases rent-seeking by group j and by the other groups as well. This is because rent-seeking is driven by the opportunity to counteract the political influence of others.

Let now consider the case of the provision of local public goods. In that set up, regions are always active even if they share the same preferences for local public good consumption. Therefore, let assume that we have I groups of equal size n and with the same valuation θ for public good consumption. Eq. (26) characterizing the level of rent-seeking expenditures in the symmetric equilibrium is now given by

$$\widehat{\phi} \equiv \frac{d\phi/dr}{\phi} = \frac{\alpha n^{-\frac{1}{\alpha}} I (1+\beta)^{1-\frac{1}{\alpha}}}{\theta^{\frac{1}{\alpha}}} \quad (30)$$

It is immediate that the derivative of $\widehat{\phi}$ with respect to I is positive. Because $\widehat{\phi}$ is a decreasing function of the r , this implies that in the symmetric equilibrium, the common level of rent-seeking expenditures is decreasing in the number of interest groups. This result is perhaps surprising. We could have thought that the larger the number of groups the higher the competition to exploit the budgetary externality as in a standard common pool set up. But in the light of Proposition 4, we can understand this result. Indeed, an increase in the number of groups for a given level of the degree of spillover β has the same effect that an increase in β given I that is: from the point of view of each region, regional preferences are perceived to count less for the provision of local public goods. To overcome this effect of dilution, each region has thereby strong incentives for rent-seeking.

6 Concluding Remarks

This paper has shown that the political effectiveness of a group is principally determined by its efficiency relative to the others as in Becker (1983). When the government provides a pure public good, heterogeneity of preferences may aggravate distribution conflicts and thereby cause an increase in rent-seeking expenditures of interest groups. Such influence activities are even more important when the governments provides regional public goods. In addition, rent-seeking expenditures are shown to be increasing in the degree of spillovers. General taxation and the distribution of tastes are shown to be important features of the problem.

The model has several limitations. Let mention a few. While our framework can be relevant for different types of public goods, there are many policies which do not fit comfortably with it, for example, the study of laws, regulations or standards that may require a different model. Also, our analysis of the political making

process would probably need more microeconomic foundations. Finally, we have limited the analysis of rent-seeking to the case of a fiscally centralized system. We plan to explore in future research the impact of rent-seeking in other systems of government. Particularly, we would like to use the framework employed here to analyze rent-seeking in a federal organization that is a system which decentralizes to some extent policy choice at the regional level with a system of transfers and subsidies between localities. A recent paper by Alesina et al (2001) study how different institutional rules affect public good provision in a federal system. Their analysis of the political making process is however given by the adoption of the majority rule. An important direction for future research would be to incorporate political pressure by different interest groups.

References

- [1] Alesina, A., I. Angeloni, and F. Etro, (2001), "Institutional Rules for Federations," NBER *Working Paper* N°8646.
- [2] Alesina, A., R. Perotti., and E. Spolaore, (1995), Together Separately? Issues on the Costs and Benefits of Political and Fiscal Unions, *European Economic Review*, Papers and proceedings 39, 751-758.
- [3] Alesina, A., and E. Spolaore, (1997), "On the Number and Size of Nations," *Quarterly Journal of Economics* 112, 1027-1056.
- [4] Baik, K.H., (1993), "Effort Levels in Contests: The Public-Good Prize Case," *Economic Letters* 41, 363-367.
- [5] Becker, G., (1983), "A Theory of Competition Among Pressure Groups for Political Influence," *Quarterly Journal of Economics* 98, 371-400.

- [6] Becker, G., (1985), "Public Policies, Pressure Groups and Dead Weight Costs," *Journal of Public Economics* 28, 329-347.
- [7] Besley, T., and S. Coate, (2000), "Centralized versus Decentralized Provision of Local Public Goods: A Political Economy Analysis," CEPR *Discussion Paper* N°2495.
- [8] Bolton and Roland, (1997), "The Break-up of Nations: A Political Economy Analysis," *Quarterly Journal of Economics* 112, 1057-1090.
- [9] Bolton, P., Roland, G., and E. Spolaore, (1996), Economic Theories of the Breakup and Integration of Nations, *European Economic Review*, Papers and Proceedings 40, 697-605.
- [10] Cheikbossian, G., (2000), "Federalism, Distributive Politics and Representative Democracy," *Economics of Governance* 1, 105-122.
- [11] Coughlin, P., Mueller, D.C., and P. Murrell, (1990a), "A Model of Electoral Competition with Interest Groups," *Economic Letters* 32, 307-311.
- [12] Coughlin, P., Mueller, D.C., and P. Murrell, (1990b), "Electoral Politics, Interest Groups and the Size of Government," *Economic Inquiry* 28, 682-705.
- [13] Dixit, A., and J. Londregan, (1996), "The Determinants of Success of Special Interests in Redistributive Politics," *Journal of Politics* 58, 1132-1155.
- [14] Ellingsen, T., (1998), "Externalities vs Internalities: a Model of Political Integration," *Journal of Public Economics* 68, 251-268.
- [15] Grossman, G.M., and E. Helpman, (2001), *Special Interest Politics*, MIT Press.

- [16] Katz, E., Nitzan S. and J. Rosenberg, (1990), "Rent-seeking for pure public goods", *Public Choice* 65, 49-60.
- [17] Lockwood, B., (2001), "Distributive Politics and the Cost of Centralization," forthcoming *Review of Economic Studies*.
- [18] Nitzan, S., (1994), "Modelling Rent-Seeking Contests," *European Journal of Political Economy* 10, 41-60.
- [19] Oates, W.E., (1972), *Fiscal Federalism*, Harcourt, Brace: New York.
- [20] Olson, M., (1965), *The Logic of Collective Action*, Cambridge: Harvard University Press.
- [21] Persson, T., (1998), "Economic Policy and Special Interest Politics," *Economic Journal* 108, 310-327.
- [22] Tiebout, C., (1958), "A Pure Theory of Local Expenditure," *Journal of Political Economy* 64, 416-424.
- [23] Tullock, G., (1980), "Efficient Rent-Seeking," in Buchanan J.M., Tollison, R.D. and G. Tullock, (Eds), *Towards a Theory of Rent-Seeking Society*, College Station: Texas A&M Press.
- [24] Weingast, B.R., Shepsle, K., and C. Johnsen, "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics," *Journal of Political Economy* 89, 642-64.