Rent-seeking, spillovers and the benefits of decentralization

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Abstract

In the presence of spillovers, decentralized provision of local public goods may lead to a higher surplus than centralized provision even though localities have identical preferences. Indeed, free-riding costs associated to decentralization can be lower than the costs of rent-seeking and influence activities under centralization. Actually, centralization yields a higher level of regional surplus only if both the spillover effect from local public spending is sufficiently large *and* the elasticity of the influence function is sufficiently small.

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1 Introduction

The existing literature on fiscal decentralization can be divided into three branches. The first branch, pioneered by Tiebout [22], emphasizes the benefits of competition among local jurisdictions. The basic idea is that, under a head tax-regime, competition for mobile citizens should match bundles of public goods to citizens' preferences more accurately. Tiebout further argued that in a system with many jurisdictions, competition among them would ensure an efficient outcome both in the production of local public goods and in the distribution of total population over communities.[1] The Tiebout sorting equilibrium, however, crucially depends on a number of unrealistic assumptions one of them being the absence of spillovers among localities. The second branch of the literature on fiscal decentralization focuses precisely on the spillovers among jurisdictions resulting from the mobility of the tax base. The standard analysis assumes immobile citizens but mobile capital that is taxed by local governments to finance public good provision. Mobility of capital across borders raises the marginal cost of public funds perceived by each jurisdiction since it reduces the available tax base. As a result, suboptimal levels of tax rates and of local public goods emerge in a decentralized equilibrium.[2] In general, however, this literature abstracts from any heterogeneity between consumers. Brueckner [6,7] was the first to attempt to reconcile these two branches of the literature by analyzing a tax-competition model where consumers are heterogeneous and can move from one jurisdiction to the other. One of his main conclusions is that the dispersion of preferences is a critical factor to evaluate the performance of fiscal or political decentralization.

The third branch of the literature concentrates on the optimal allocation of powers between the central and local governments. It emphasizes that fiscal decentralization may be inefficient even though the tax base is immobile and there is no heterogeneity in preferences within local jurisdictions. This is the

[1] See Scotchmer [21] for a recent discussion of the Tiebout literature.

[2] See Wilson [27] for a recent survey of the tax-competition literature.

case if citizens can benefit from public goods provided in other jurisdictions or if there exists economies of scale in the production of public goods. The drawback with a centralized system, however, is that it produces a uniform policy that does not reflect local preferences. Hence, when different localities have different preferences over public policies, the choice of a centralized system over a decentralized system depends on the size of the benefits of internalizing externalities relative to the costs of policy uniformity. This result is usually known as the Oates' [17] Decentralization Theorem. The present paper belongs to this strand of literature since we focus on the relative performance of centralized and decentralized structures when both consumers and the tax base are immobile and in presence of cross-boundary externalities stemming from locally provided public goods. However, in contrast with most previous analysis, we argue that even though localities have identical tastes and value public spending to the same extent, centralized decision-making may not be the most efficient system. This is because, under centralization, sharing the costs of local public spending gives rise to a distributive conflict, as each region wishes to push the central government for an expansion of its own public sector level and for a decrease of that level in the other region so as reduce tax burden. Thus, from a political economy perspective, the relative performance of centralized and decentralized systems depends upon the costs of this distributive conflict, which is reflected in a competition for political influence, relative to the cost of non-cooperative behavior between localities.

While much of the recent literature in political economy analyzes lobbying as a common agency game (see Grossman and Helpman [12]), we adopt, in this study, the public choice school paradigm of modeling the competition for political influence which was proposed by Tullock [24,25]. This approach is not micro-founded, and therefore is not suitable to study important theoretical topics such as the role of asymmetric information in politics. However, the central focus of our work is the importance of the distributive conflict between regions and the resulting waste of resources on lobbying that fiscal centralization may imply. The analysis of the harmful competition for political influence can

then be conveniently based on the complementing, reduced-form and simple rent-seeking approach.[3] More specifically, we consider a two-stage centralized policy game that we borrow from Lorz [14,15]. In the first stage, two regions exert rent-seeking pressure on the central government. In the second stage, the government selects policy by maximizing a weighted sum of the welfare of both regions. The respective weight of each region is determined by its lobbying efforts or rent-seeking expenditures in the first stage of the game. If both regions have access to the same rent-seeking technology or influence function, the two regions neutralize each other in the political process and policy (i.e. local public spending in each region) is therefore optimal as it would be the case in a model *à la* Grossman and Helpman[4]. Centralized decision-making, however, entails influence costs for the two regions. Under a decentralized system, each region provides and finances its own level of public spending given the other region's choice of public policy. Externalities under this system are, in consequence, not internalized. Both regimes yield an inefficient outcome and the question is: which regime results in lower regional surplus, centralized provision with its influence activities or decentralized provision with its free-riding behavior. We show that centralization yields a higher level of surplus only if both the spillover effect from local public spending is sufficiently large and the elasticity of the influence function is sufficiently small.

In related work, Besley and Coate [5] provide a political economy analysis of the relative benefits of centralized and decentralized provision of local public goods. They dispense with the hypothesis that centralized policy is uniform across localities with different preferences and also assume that it is determined by a legislature of locally elected representatives.[5] The drawback of centraliza-

[3] For other analysis that use and justify the contest approach for studying competitive lobbying between several interest groups, see for example Epstein and Nitzan [8,9].

[4] For example, in Grossman and Helpman [11], the politician as a common agent implements the optimal trade policy (i.e. free trade for a small open economy), when all interest groups, as principals, offer campaign contributions to influence policy.

[5] In the same spirit, see also Lockwood [13].

tion is that it produces strategic incentives to elect representatives with different preferences from the median voters' preferences. The cost of strategic delegation is then balanced with the cost of decentralized and non-cooperative behavior to determine which regime performs better. Lorz and Willmann [16], also consider that voters strategically elect regional representatives who then decide both the degree of centralization and the regional cost shares of centrally provided public goods. In their model, strategic delegation partially undermines the benefits of internalizing spillovers under centralization, and it also leads to less centralization than is optimal. In our analysis, the source of inefficiency of centralized provision also stems from political economy considerations but the political process is totally different since it is assumed to take the form of a lobbying game. Other recent works, including among others Redoano and Scharf [20], Alesina, Angeloni and Etro [2,3], analyze alternative voting rules such as direct referendum or qualified majority voting. However, in these studies, the relative benefits of centralization always depend on the internalization of the externalities while that on decentralization on the adaptability to regional differences. In this paper, we present an alternative political economy analysis of the drawbacks of centralization which abstracts from any heterogeneity between localities and that emphasizes the costs of the competition for political influence.

The remainder of the paper is organized as follows. Section 2 presents the model. In Sections 3 and 4, we analyze policy outcomes under decentralized and centralized decision-making, respectively. Section 5 provides a welfare comparison of the two regimes. The last Section concludes.

2 The Model

Consider an economy of two equally sized regions, indexed by $j = A, B$, with the region size normalized to 1. There are three goods in the economy, a private good x and two local public goods g_A and g_B, each one associated with a particular region. All individuals have identical endowments y in private goods and to produce one unit of either of the local public goods, requires 1 unit of

the private good.[6] In addition, all individuals share the same preferences for public good consumption and individuals in region j have the following utility function

$$v_j = x_j + H\left[(1-\beta)\, g_j + \beta g_k\right], \quad j \neq k. \tag{1}$$

The parameter $0 < \beta < 1/2$ captures the spillover effects from other region's public spending on the "home" region.[7] The lower β is, the more citizens care about the public good in their own region. The function $H(.)$ is a twice differentiable function and also satisfies the following standard conditions:

A1: For all g: (i) $H_g(.) > 0$ and $H_{gg}(.) < 0$. (ii) $\lim_{g\to 0} H_g(.) = \infty$. (iii) $\lim_{g\to\infty} H_g(.) = 0$. (iv) $H(0) = 0$.

Given that the income is sufficiently high to always allow positive consumption of the private good, there are no wealth effects and so we can focus on the public good surplus. Pareto efficiency requires maximization of the aggregate surplus: $H\left[(1-\beta)\, g_A + \beta g_B\right] + H\left[(1-\beta)\, g_B + \beta g_A\right] - (g_A + g_B)$ with respect to g_A and g_B. Because the two regions are the same, the Pareto-optimal level of local public spending is identical across regions and is given by the following first-order condition: $H_g\left[g^*\right] = 1$. Let $V(.)$ being the inverse function of the derivative of the H function i.e. $V(.) \equiv H_g^{-1}(.)$. We then have $g^* = V(1)$. Since H is concave, V is a decreasing function.

This symmetric Pareto optimal allocation yields an individual (regional) public good surplus of

$$S^* = H\left[V(1)\right] - V(1). \tag{2}$$

[6] We will assume throughout that individual endowments are large enough to meet their tax obligations.

[7] We eliminate the polar extremes of 0 and 1/2 for reasons that will become clear later on (see footnote 10).

Observe that the optimal level of regional surplus is independent of the level of spillovers.[8]

3 Decentralization

Under a decentralized regime, public goods are provided and financed at the regional level. The representatives of each region j simultaneously and independently select g_j to maximize their own public good surplus $H\left[(1-\beta)\, g_j + \beta g_k\right] - g_j$. The following first-order condition has to be satisfied (for $j = A, B$)

$$(1-\beta)\, H_g\left[G_j^0\right] = 1 \tag{3}$$

where $G_j^0 = (1-\beta)\, g_j^0 + \beta g_k^0$, $j \neq k$, is the level of *effective* public consumption in region j. Therefore, in the Nash equilibrium between the two regions, we have the following common equilibrium level of local public good i.e.

$$g_A^0 = g_B^0 = V\left(\frac{1}{1-\beta}\right) \tag{4}$$

where $V(.) \equiv H_g^{-1}(.)$. This amount decreases in β because of the free-riding incentives and is smaller than the optimal amount $V(1)$. In equilibrium, the public good surplus in both regions reads as

[8] Indeed, with our specification of the utility function, an increase in the spillover parameter β does not lead to a mechanical increase of surplus. This would not be the case with the following quasi-linear specification: $v_j = x_j + H\left[g_j + \beta g_k\right]$, that is generally used in the literature. With this specification, given g_j for $j = A, B$, an increase in β always raises surplus. Hence, in that case, the optimal level of local public good is increasing in the size of the public good externality. By contrast, the equilibrium level of local public good, under decentralization, is independent of β while with our specification it is decreasing in β. However, with both specifications, the welfare difference between the optimal outcome and the outcome under decentralization is increasing in β. Hence, as it will become clear later in the paper, the two specifications lead to the same qualitative results.

$$S^0 = H\left[V\left(\frac{1}{1-\beta}\right)\right] - V\left(\frac{1}{1-\beta}\right). \tag{5}$$

The derivative of S^0 with respect to β is given by

$$\frac{\partial S^0}{\partial \beta} = \frac{1}{(1-\beta)^2}.H_g\left[V\left(\frac{1}{1-\beta}\right)\right].V_g\left(\frac{1}{1-\beta}\right) - \frac{1}{(1-\beta)^2}.V_g\left(\frac{1}{1-\beta}\right) < 0. \tag{6}$$

By definition of the $V(.)$ function, we have $H_g[V(.)] \equiv I(.)$ where $I(.)$ is the identity function. Simplifying the above expression, we then have

$$\frac{\partial S^0}{\partial \beta} = \frac{\beta}{(1-\beta)^3}.V_g\left(\frac{1}{1-\beta}\right) < 0 \tag{7}$$

since from the conditions on the function $H(.)$, we have $V_g(.) < 0$. The equilibrium level of surplus is, therefore, decreasing in the spillover parameter. Hence, the difference between the optimal level of surplus and the level of surplus under decentralization grows larger as the spillover parameter increases.

4 Centralization

Under a centralized regime, the level of public spending g_j in the jth region is decided by a central authority and is funded by a general and uniform lump-sum tax. Thus, public goods levels (g_A, g_B) result in a tax of $\frac{(g_A+g_B)}{2}$ on all citizens. This common financing rule may give both regions incentives to organize themselves in interest groups in order to influence centralized policy-making through rent-seeking activities. To model political influence of rent-seeking, we use a simple (two-stage) policy game that we borrow from Lorz [15]. In the first stage, each region exerts rent-seeking pressure on the central government, taking the pressure of the other region as given. In the second stage, the government selects the levels of local public goods by maximizing a weighted sum of the welfare of both regions. The respective weights ϕ_A and ϕ_B are determined by

the level of rent-seeking expenditures of regions A and B in the first stage of the game.[9] Let W be the objective function of the government i.e.

$$W = \begin{cases} \phi_A v_A + \phi_B v_B; & \text{if} \quad \phi_A \neq 0 \quad \text{and} \quad \phi_B \neq 0, \\ v_A + v_B, & \text{otherwise.} \end{cases} \tag{8}$$

Each region j can raise its political weight ϕ_j by rent-seeking expenditures $T_j \geq 0$. Let the weight $\phi_j \equiv \phi(T_j)$, for $j = A, B$, be a twice differentiable function of the rent-seeking expenditures T_j spent by the representative individual of group j, which has the same properties than the $H(.)$ function i.e.

A2: For all T_j; (i) $\phi'(T_j) > 0$ and $\phi''(T_j) < 0$. (ii) $\lim_{T_j \to 0} \phi'(T_j) = \infty$. (iii) $\lim_{T_j \to \infty} \phi'(T_j) = 0$. (iv) $\phi(0) = 0$.

For example, one permissible class of functions is $\phi(T_j) = (1/\gamma) T_j^{\gamma}$ where $0 < \gamma < 1$ is the elasticity of the rent-seeking function. Condition (i) states that political influence is assumed to be an increasing and concave function of rent-seeking expenditures. In other words, there are decreasing returns to the scale of rent-seeking expenditures. From conditions (ii) and (iii) marginal influence can vary between 0 and infinity. The last condition needs a remark. When $T_j = 0$ the influence function is set equal to 0. If the two regions do not engage in influence activities, the government is assumed to maximize the arithmetic sum of the welfare functions of both regions.

[9] This type of objective function can be micro-founded with a probabilistic voting model in which two candidates compete for votes in a forthcoming elections. It is well-known that in such models, candidates maximize a weighted social welfare function with the weight of each group of voters being inversely related to the degree of uncertainty concerning the ideological bias term of the members of this group (see, for example, Chapter 3 on Electoral Competition in Persson and Tabellini [18]). Following Lorz [15], rent-seeking can be introduced into this political setting in a way that groups spend resources to reduce the uncertainty of the candidates, which in turn increases their weights in the objective function of the government.

As usual, the outcome of the second stage of the policy game is derived first. The central government selects g_A and g_B so as to maximize weighted aggregate public good surplus i.e.

$$\phi_A \left[H\left[(1-\beta)\, g_A + \beta g_B\right] - \frac{g_A + g_B}{2} \right] + \phi_B \left[H\left[(1-\beta)\, g_B + \beta g_A\right] - \frac{g_A + g_B}{2} \right]. \tag{9}$$

The levels $\widetilde{g}_j$ and $\widetilde{g}_k$ chosen by the central government must solve the following first-order condition (for $j = A, B$)

$$(1-\beta)\,\phi_j H_g\left(\widetilde{G}_j\right) + \beta\phi_k H_g\left(\widetilde{G}_k\right) = \frac{1}{2}\left(\phi_A + \phi_B\right), \qquad j \neq k, \tag{10}$$

where $\widetilde{G}_j = (1-\beta)\,\widetilde{g}_j + \beta\widetilde{g}_k$, $j \neq k$ is the *effective* level of public good consumption in each region.[10] Solving this system, we find (for $j = A, B$)

$$\phi_j^r H_g\left(\widetilde{G}_j\right) = \frac{1}{2} \tag{11}$$

where $\phi_j^r = \phi_j / \left(\phi_A + \phi_B\right)$ and $\phi_k^r = \left(1 - \phi_j^r\right)$. From this equation and using the implicit function theorem, we have

[10] Observe that when $\beta = 1/2$, this system of first-order conditions reduce to $H_g\left(\frac{1}{2}\widetilde{g}_A + \frac{1}{2}\widetilde{g}_B\right) = 1$. In this case, the levels of local public spending chosen by the central authority do not depend on the political weight of any group. Indeed, when $\beta = 1/2$ the two local public goods are perfect substitutes and citizens care equally about public spending in both regions. Hence, they do not have any incentives to engage in influence activities and so there is no trade-off between centralization and decentralization (i.e. centralization is efficient and always dominates decentralization). On the other extreme, when $\beta = 0$, citizens care only about the public good in their own region. Hence, there are no public good externalities and again no trade-off between the two systems (i.e. decentralization is efficient and always dominates centralization). This is why we excluded these uninteresting cases from the analysis.

$$\begin{aligned}\frac{\partial \widetilde{G}_j}{\partial \phi_j^r} &= -\frac{H_g\left(\widetilde{G}_j\right)}{\phi_j^r H_{gg}\left(\widetilde{G}_j\right)} = \frac{\widetilde{G}_j}{\phi_j^r \theta\left(\widetilde{G}_j\right)} > 0, \\ \frac{\partial \widetilde{G}_k}{\partial \phi_j^r} &= \frac{H_g\left(\widetilde{G}_k\right)}{\left(1-\phi_j^r\right) H_{gg}\left(\widetilde{G}_k\right)} = -\frac{\widetilde{G}_k}{\left(1-\phi_j^r\right)\theta\left(\widetilde{G}_k\right)} < 0\end{aligned} \tag{12}$$

where $\theta(.) = -H_{gg}(g).g/H_g(g) > 0$ is an index of concavity of the utility function. It can also be interpreted as the elasticity of the marginal valuation for public good consumption (which, from now, is assumed to be constant i.e. $\theta\left(\widetilde{G}_j\right) = \theta\left(\widetilde{G}_k\right) = \theta$). From the above expressions, we then have $(1-\beta)\left[\partial \widetilde{g}_j/\partial \phi_j^r\right] + \beta\left[\partial \widetilde{g}_k/\partial \phi_j^r\right] > 0$ and $(1-\beta)\left[\partial \widetilde{g}_k/\partial \phi_j^r\right] + \beta\left[\partial \widetilde{g}_j/\partial \phi_j^r\right] < 0$. Hence, one of the two derivatives of local public spending with respect to ϕ_j^r must be positive while the other must be negative. Since $\beta < 1/2$, this necessarily implies that

$$\frac{\partial \widetilde{g}_j}{\partial \phi_j^r} > 0 \text{ and } \frac{\partial \widetilde{g}_k}{\partial \phi_j^r} < 0. \tag{13}$$

The equilibrium level of local public spending that is provided by the government, in each region, is increasing in the political influence of that region and decreasing in the political influence of the other region. This is because public goods have local benefits while the costs of these goods are shared equally between the two regions. Therefore, the higher the political influence of one region is, the higher its ability to shift the cost of local public spending onto the other region and the higher its ability to resist the financing requirement of local public spending in the other region. As a result, an increase in the political influence of region j causes, in the second stage of the game, a higher public sector level in region j and a lower public sector level in region k.

In the first stage of the policy game, each region j can raise its political weight ϕ_j by rent-seeking expenditures. Each region then maximizes its surplus minus the cost of its lobbying pressure i.e. maximizes $H\left(\widetilde{G}_j\right) - \frac{(\widetilde{g}_A + \widetilde{g}_B)}{2} -$

T_j with respect to T_j. Observe first that there is no equilibrium of the rent-seeking game where the two regions do not try to influence centralized decision-making. Indeed, if one region does not invest in rent-seeking activities, the other region could be the unique agent in the objective function of the government by investing an arbitrarily small amount. Hence, the following first-order condition has to be satisfied (for $j = A, B$) with $\widetilde{G}_j$, $\partial\widetilde{G}_j/\partial\phi_j^r$ and $\partial\widetilde{G}_k/\partial\phi_j^r$ given by (11) and (12) respectively

$$\left[H_g\left(\widetilde{G}_j\right)\frac{\partial\widetilde{G}_j}{\partial\phi_j^r} - \frac{1}{2}\left(\frac{\partial\widetilde{G}_A}{\partial\phi_j^r} + \frac{\partial\widetilde{G}_B}{\partial\phi_j^r}\right)\right]\frac{\partial\phi_j^r}{\partial T_j} - 1 = 0 \tag{14}$$

since $\widetilde{g}_A + \widetilde{g}_B = \widetilde{G}_A + \widetilde{G}_B$. Note that $H_g\left(\widetilde{G}_j\left(.\right)\right) = I\left(.\right)$ where $I\left(.\right)$ is the identity function. Indeed, from equation (11) and recalling that $V\left(.\right) \equiv H_g^{-1}\left(.\right)$, we have $\widetilde{G}_j = V\left[1/\left(2\phi_j^r\right)\right]$. Using also (12), we then have

$$\left[\frac{1}{2\phi_j^r}\frac{\widetilde{G}_j}{\phi_j^r\theta} - \frac{1}{2}\left(\frac{\widetilde{G}_j}{\phi_j^r\theta} - \frac{\widetilde{G}_k}{\left(1-\phi_j^r\right)\theta}\right)\right]\frac{\partial\phi_j^r}{\partial T_j} = 1 \tag{15}$$

where again θ is the (constant) elasticity of the marginal valuation for public good consumption. We finally have

$$\frac{\partial\phi_j^r}{\partial T_j} = \frac{2\theta.\left(\phi_j^r\right)^2.\left(1-\phi_j^r\right)}{\left[\left(1-\phi_j^r\right)^2.\widetilde{G}_j + \left(\phi_j^r\right)^2.\widetilde{G}_k\right]}, \qquad j \neq k. \tag{16}$$

It represents equilibrium rent-seeking expenditures T_j, for $j = A, B$, that are best responses to each other. Since $\phi_A^r + \phi_B^r = 1$, we can express the marginal relative political effectiveness of one region relative to the other in the following way

$$\frac{\partial\phi_A^r/\partial T_A}{\partial\phi_B^r/\partial T_B} = \frac{\phi_A^r}{\phi_B^r}. \tag{17}$$

Recalling that $\phi_j^r = \phi_j/[\phi_A+\phi_B] = \phi\left(T_j\right)/[\phi\left(T_A\right)+\phi\left(T_B\right)]$, we have $\partial\phi_j^r/\partial T_j = \frac{\phi(T_k).\phi'(T_j)}{[\phi(T_A)+\phi(T_B)]^2}$ for $j \neq k$. Hence, (17) reduces to

$$\frac{\phi'(T_A)}{\phi'(T_B)} = \left[\frac{\phi(T_A)}{\phi(T_B)}\right]^2. \tag{18}$$

Therefore, since the two regions have access to the same influence function, (18) is satisfied by the same level $\widetilde{T}$ of lobbying effort of both regions. It follows that both groups have the same influence on policy making i.e. $\phi_A = \phi_B = \phi\left(\widetilde{T}\right)$ and $\phi_A^r = \phi_B^r = 1/2$. The two regions neutralize each other in the political process and the government provides the same levels of local public goods as without influence activities. Indeed, using (11), we have $\widetilde{G} = \widetilde{g} = V(1)$.

The political game is thus zero-sum in influence and negative-sum in rent-seeking expenditures. Because public goods have local specific benefits but are financed by general taxation, there is an incentive for each region to lobby for an expansion of its own public sector level. Put another way, both regions have incentives to engage in rent-seeking activities to extract more of the common resources in the second stage of the game. The two regions, however, end up in a prisoner's dilemma situation and they would rather not lobby if they could.[11]

We now characterize the equilibrium level of rent-seeking expenditures and the regional surplus under centralized decision-making. Let note γ the elasticity of the influence function i.e. $\gamma = \frac{\phi'(T)T}{\phi(T)}$. Recalling that $\partial\phi_j^r/\partial T_j = \frac{\phi(T_k).\phi'(T_j)}{[\phi(T_A)+\phi(T_B)]^2}$, we have $\frac{\partial\phi_j^r}{\partial T_j}\Big|_{T_j=\widetilde{T}} = \frac{\phi'(\widetilde{T})}{4\phi(\widetilde{T})} = \frac{\gamma}{4\widetilde{T}}$. Hence, because $\phi_j^r = 1/2$ and $\widetilde{G}_j = \widetilde{g}$ (for $j = A, B$) (16) gives the following common level of influence activities

$$\widetilde{T} = \frac{\gamma\widetilde{g}}{2\theta}. \tag{19}$$

The equilibrium level of rent-seeking activities is increasing in the elasticity of the influence function and decreasing in the elasticity of the marginal valuation for public good consumption. The surplus in both regions is

[11] Some authors have analyzed how lobbies, in particular in the trade context, can agree to stop competing for political rents. For example, Aidt [1] studies cooperative lobbying as a costly Nash bargaining over the set of Pareto-improving reductions in lobbying activities.

$$\widetilde{S} = H\left[V(1)\right] - \frac{\gamma + 2\theta}{2\theta} V\left(1\right). \tag{20}$$

We now turn to the welfare comparison between centralized and decentralized provision of local public goods.

5 Centralized versus Decentralized Provision

The welfare difference between centralized and decentralized provision of local public spending, given by (20) and (5), respectively is $\widetilde{S} - S^0$ or

$$\Delta\left(\beta, \gamma\right) = H\left[V\left(1\right)\right] - \left[\left(\gamma + 2\theta\right)/2\theta\right] V\left(1\right) - H\left[V\left(1/\left(1-\beta\right)\right)\right] + V\left(1/\left(1-\beta\right)\right). \tag{21}$$

This expression is increasing in β and decreasing in γ.[12] When β is approaching 0, the above expression is clearly negative. The decentralized system yields an efficient outcome and dominates the centralized system since it avoids costly influence activities, whose level is given by (19). When β is approaching $\frac{1}{2}$, the above expression can be positive only if γ, the elasticity of the rent-seeking function, is sufficiently small. We can then establish the following result.

Proposition 1 *Let $\overline{\gamma}$ such that $\lim_{\beta \to 1/2} \Delta\left(\beta, \overline{\gamma}\right) = 0$. Then, (i) if $\gamma \geq \overline{\gamma}$, decentralization dominates centralization independently of the level of spillovers; (ii) if $\gamma < \overline{\gamma}$, there exists a threshold value of the spillover parameter, that is increasing in γ, i.e. $\overline{\beta}\left(\gamma\right) < \frac{1}{2}$ such that for any value above (below) this threshold, centralization (decentralization) produces a higher level of surplus.*

Proof. Given the elasticity of the influence function γ, the welfare difference between centralized and decentralized decision-making is increasing in the spillover parameter β. As a result, given γ, $\Delta\left(\beta, \gamma\right)$ is negative for β close to 0 and reaches a maximum when β is approaching 1/2. (Again, if $\beta = 1/2$, we

[12] The sign of the derivative of this expression with θ is, however, indeterminate since a change in θ will also affect the $H\left(.\right)$ function.

have $\widetilde{T} = 0$ and centralization produces an efficient outcome.) If we define $\overline{\gamma}$ the value such that at this maximum, $\Delta(\beta, \gamma)$ is equal to 0, then for any $\gamma \geq \overline{\gamma}$, $\Delta(\beta, \gamma)$ is negative or null since $\Delta(\beta, \gamma)$ is decreasing in γ. In this case, as stated in part (i) of the above Proposition, decentralization dominates centralization independently of the spillover parameter. If, however $\gamma < \overline{\gamma}$, $\Delta(\beta, \gamma)$ is positive when β is approaching 1/2. Therefore, because $\Delta(\beta, \gamma)$ is increasing in β, there exists a limiting value of the spillover parameter (as a function of γ) i.e. $\overline{\beta}(\gamma) < 1/2$, such that for any $\beta > (<)\ \overline{\beta}(\gamma)$, $\Delta(\beta, \gamma)$ is positive (negative), which then implies that centralization (decentralization) performs better. In addition, because $\Delta(\beta, \gamma)$ is decreasing in γ, the threshold value of the spillover parameter is increasing in γ. This corresponds to part (ii) of the above Proposition ■

It follows that centralization can perform better only if the political effectiveness of rent-seeking activities of both groups is sufficiently small. In this situation, there is a critical value of the spillover parameter, that is increasing in γ, such that centralization produces a higher level of surplus if and only if β exceeds this critical level. If, however, the marginal benefit of rent-seeking activities of both groups is sufficiently large, decentralization yields a higher level of surplus than does centralization irrespective of the spillover parameter. Indeed, an increase in the elasticity of the influence function exacerbates distributive conflicts to the extent that it increases the level of rent-seeking expenditures and decreases regional welfare without affecting the overall disposition of the policy of the central government.

I conclude this Section with an example. Let $H(g) = \frac{g^{1-\theta}}{1-\theta}$ with $0 < \theta < 1$ being the elasticity of the marginal valuation for public good. With this specific function, we have $H_g(g) = \left(\frac{1}{g}\right)^{\theta}$ and $V(g) = \left(\frac{1}{g}\right)^{\frac{1}{\theta}}$ (recall that $H_g[V(g)] = g$ by definition of the V function). We also consider the following influence function $\phi(T_j) = (1/\gamma) T_j^{\gamma}$. Then $g^0 = (1-\beta)^{\frac{1}{\theta}}$, $\widetilde{g} = 1$ and $\widetilde{T} = \frac{\gamma}{2\theta}$. Then, the regional surplus under decentralization is $S^0 = (1-\beta)^{\frac{1-\theta}{\theta}} \left[\frac{\theta+\beta(1-\theta)}{1-\theta}\right]$ and the regional surplus under centralization is $\widetilde{S} = \frac{2\theta^2-\gamma(1-\theta)}{2\theta(1-\theta)}$. Note that in this case,

$\widetilde{S} \geq 0$ only if $\gamma \leq \frac{2\theta^2}{(1-\theta)}$. We can now calculate for selected values of θ the threshold value $\overline{\gamma}$ such that if $\gamma < \overline{\gamma}$, there exists a trade-off between centralization and decentralization depending on the size of the spillover parameter. The results are presented in the following Table.[13]

INSERT TABLE 1

This Table suggests that the threshold value $\overline{\gamma}$ of the elasticity of the influence function must be quite small to obtain a trade-off between the two regimes. It also suggests that this trade-off is more likely to be obtained for higher values of the elasticity of the marginal valuation for public good consumption.

6 Concluding Remarks

In this paper, we revisit the classic trade-off between centralized and decentralized provision of local public goods. We show that, in the presence of cross-boundary externalities stemming from locally provided public goods, centralization may not be desirable due to the conflict for political influence it may generate. Indeed, centralized provision of local public goods implies cost sharing and then creates a conflict of interest between citizens in different regions. This distributive conflict exists even though all regions have the same preferences for public spending and is reflected in rent-seeking and influence activities. The cost of the rent-seeking conflict must then be balanced with the benefits of internalizing spillovers to determine which regime performs better. When the influence function is sufficiently elastic, it is shown that decentralization always dominates centralization. This is because the prisoner's dilemma of rent-seeking, under a centralized system, is too costly relative to the costs of the free-riding incentives under a decentralized system. If, however, the marginal influence of rent-seeking activities is sufficiently small, the performance of centralization relative to decentralization depends upon the size of the spillover effect. In this situation, we

[13] To calculate the value $\overline{\gamma}$, we have taken $\beta = 0.49$.

obtain a standard conclusion but from different reasons than emphasized in the literature.

Throughout, we have assumed that, under centralization the costs of providing public goods are shared equally among regions. This is justified on empirical grounds since most centralized systems of government operate (roughly) according to such rules.[14] This is the case, as in France for example, even though the central government does not redistribute equally tax revenues among jurisdictions or groups through the provision of differentiated levels of public spending to account for the heterogeneity in the economy. But, in this paper, the two localities have identical preferences and value public good consumption to the same extent. Hence, our assumption of equal cost sharing can also reflect the outcome of a constitutional stage in which the two regions must agree on the budgeting process. In turn, sharing the costs of local public spending creates a budgetary externality and a distributive conflict that does not exist under decentralization, when each region must pay for its own public good. The decentralized structure, however, has also a drawback since interregional spillovers are not internalized. This involves lower levels of public good provision than the optimal levels obtained under centralization. In other words, decentralization is represented as a market failure whereas centralization is represented as a political failure. Consequently, a potential trade-off emerges between the two systems even though regions are perfectly identical.

It would be both interesting and natural to consider some source of asymmetry across regions. For example, one could consider that the two regions have different valuations of public good consumption relative to private consumption. If centralization implies policy uniformity, as it is usually assumed in the literature, demand heterogeneity would reinforce the case for decentralization of public good provision. If, however, the central authority can differ-

[14] Very often, equal cost sharing is a constitutionally imposed arrangement. For example in the US, the tax code describing the rules of federal tax collection cannot discriminate across States. In most European countries, uniform tax rules is also at the core of budgeting institutions (see, e.g., Von Hagen [26])

entiate the levels of public spending according to the heterogeneous tastes in each region, this would eliminate the bias towards decentralization implied by the heterogeneity in preferences. We then conjecture that, in this case, the main result of this article would still prevail even though the equilibrium levels of public spending would depend on relative public-goods valuations. It would also be interesting to consider that there is heterogeneity not only between, but also within local jurisdictions. In that situation, we could have rent-seeking and influence activities both at the local and central levels and the question would be: which regime produces more lobbying.[15] Actually, very few theoretical papers deal with this question. Notable exceptions are the papers by Bardhan and Mookherjee [4] or Redoano [19]. Using a common agency framework with heterogeneous individuals, they emphasize that the relationship between the level of centralization of policy decision and lobbying is ambiguous and depends on the characteristics of the groups that engage in influence activities. Hence, relaxing the assumption of identical individuals, in our reduced-form framework but with interregional spillover effects, may yield interesting results as to the impact of heterogeneity in preferences on lobbying and on the welfare comparison between centralization and decentralization.

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Table 1

$\bar{\gamma}$ / θ	0.5	0.6	0.7	0.8	0.9
	0,24	0,28	0,30	0,33	0,35