Efficiency explanations of the wealth and size of nations provide useful insights into the history and current makeup of nations. We focus here on two related issues that matter, for instance, in large areas such as Western or Eastern Europe, or Canada. We develop an analytical framework for understanding the limits of constitutional unity. This microeconomic model of unitary states deals with two kinds of heterogeneity. First, preference distance or physical distance account for decreasing net benefits from expansion. Second, heterogeneity may involve a discontinuity in the spatial pattern of preferences: “peripheral behaviors” threaten unity. We integrate such behaviors into the model and draw some lessons as to the nature of an optimal constitutional area, discussing in particular the status of peripheral regions. © 2000 by Elsevier Science Inc.

I. Introduction

In a world in which secessions give birth to an increasing number of nations, Europe seems to be an exception. Indeed, political concentration dominates a process of integration that results from successive treaties or less formal additions of central institutions [Schmidtchen and Cooter (1997)]. Obviously, the relevance of this process must be investigated. How far does harmonization of the law make sense? At what cost does a unitary state maintain uniform constitutional prerogatives? To deal with these questions, we develop an analytical framework for understanding the limits of consti-
tutional unity. More precisely, our purpose is to show the importance of spatial constraints in the definition of a unitary state. Two streams of theoretical references can be used. A first explanation builds on the social contract approach [Schmidt-Trenz and Schmidtchen (1997)]. Variables such as the number of contract parties or the degree of specification of the property rights system are incorporated in a club-theoretical model that shows how a protective agency may adopt the territoriality principle to establish its prerogatives. A second perspective uses spatial explanations for the size of unitary states [Friedman (1977); Wittman (1991)]. In the wake of this explanation, Blum and Dudley (1991) and Wittman (1998) provide spatial models to show how technologies of information or of conflict influence and shape the choice set of rules.

Our article extends this literature by providing an efficiency model in which states are formalized as heterogeneous spatial clubs. We show that unity can be threatened by two forms of heterogeneity. The first one is implied by distance and its influence on preferences. The second one involves possible discontinuities in the willingness to accept the state. Peripheral regions are then identified as a consequence of this second source of heterogeneity, and we study the way in which unitary states can deal with them. In the context of Europe and its new frontiers, such an approach could shed light on the spatial dimension of that fascinating constitutional enterprise.

The article is organized as follows. We first describe a model of unitary states (Section II), and then we consider the first form of heterogeneity, which is related to distance (Section III). Discontinuities in the spatial pattern of preferences then define peripheral regions (Section IV). Some concluding comments end the article (Section V).

II. Unitary States as Spatial Clubs

Most models describe the making of nations through a social-planner solution or by endogenous majority-voting formation [see, for instance, Alesina and Spolaore (1997); Bolton and Roland (1997)]. Authors like Friedman (1977) consider, on the other hand, rent-maximizing governments for which the increase in marginal costs of territorial control is outweighed by greater tax resources. We build here on an intermediate stage between those two extremes. As is evidenced by Dudley (1990, p. 186), most industrialized countries have a monopolistic constitution-making process without being dictatorships. Our model is developed within the analytical framework of Hotelling’s line (Hotelling, 1929). Hotelling’s model has been influential mainly in industrial economics or in regional science. Spatial-voting theory also builds on its legacy. However, constitutional economics has not yet taken the full measure of the explanatory power of spatial variables, particularly as they concern both the space of preference and the geographical space.

Our model is, thus, that of a state the center of which is exogenously located in “capital” $j$ in the physical space or is represented by “government” $j$, in the space of preference. To exemplify the spatial making of unitary states, let us first consider the usual Hotelling process of formation of a “community” of customers around a seller or equivalently of individuals, $i$, around a local public good. The latter are continuously distributed along a line of given length, the segment $[0,1]$, for instance. The exogenous government provides a club good located in $j$. A lump-sum user charge $t_j \geq 0$ gives access to it. The frontiers of the club are endogenous. They are determined by the marginal individuals, the “frontiersmen,” $i = i_t$ on both sides of $j$. Preference for the club good decreases with distance, in the geographical acceptance of the latter, or in the space of preference. That dual nature of space implies that individuals are not
mobile, as is the case on Hotelling’s line. The geographical distance or, identically, the preference distance to government \(j\) is denoted \(d_i\). The individual willingness to accept the constitutional power of the government can be expressed as

\[
w_i = f(d_i),
\]

and we assume that it decreases with distance from \(j\). As to the interpretation of the user charge, the rationale for a lump sum, \(t_j\), may not be general enough in a fiscal model. However, it fits well in a law and economics framework in which \(t_j\) expresses the extent of the constitutional power of the government. Because the law is to apply uniformly to all citizens, it can be interpreted as the degree of constitutional control over individuals and it must be constant throughout a given territory, hence \(0 \leq t_j \leq 1\).

The size of nations and the extent of the power of the lawmaker are related by the conjunction of two factors. The first one involves individual preferences with regard to the proposed government. Equation (1) describes it. The second factor is the spatial nature of the costs of control of the population. Such territorial costs cannot be ruled out without ignoring that the law implies the protection of rights but also the corresponding coercion. We hypothesize that as the geographical or preference distance from the center increases, the costs of spatial control are higher. These costs are incurred by the government, and they cannot help but influence the extent of its territorial and legal power. The average cost of control borne by government \(j\) is given by

\[
c_j = g(d_i),
\]

with \(g'(.) > 0\). Government must simultaneously define its optimal size and the corresponding extent of its constitutional power. Denote \(r_j\) the radius of the state. It defines the left and right frontiers by

\[
r_j = |j - i_j| = d_{i_j},
\]

where \(i_j\) is the marginal individual to the right or equivalently to the left of capital \(j\). The extent of constitutional power amounts to

\[
t_j = f(r_j)
\]

Hence, it is determined by the location of the marginal individual. Thus, we formalize the state as a heterogeneous spatial club in which distance matters and shapes both the frontiers and the extent of constitutional power. Many ways of enforcing the law exist. The two usual mechanisms are the territoriality principle and the personality principle [see Schmidt-Trenz and Schmidtchen (1997) for definitions and further references]. We adopt here the perspective of an enforcement mechanism based on the territoriality of law. This assumption can be justified by the fact that our model considers one protective authority within a given geographic area.

We finally assume that there is enough room for state \(j\) to reach its intended size whether it behaves as a monopolist or it maximizes total surplus. This assumption is made here without loss of generality because peripheral regions are defined within optimally sized states. In some cases, however, competition for available space may of course prevent existing states from spreading to their optimal size. Space may be a scarce resource that must be shared by potential or existing states. Spatial competition in the market for goods amounts here to possible conflicts between sovereign states. Some of them may not be able to reach their optimal size. Further assumptions as to
military technology could help to describe the ensuing conflicts and attempts to annex all or part of neighboring territories. We will not consider here such conflicts but will keep focus on efficiency explanations of the size of a given unitary club-state facing first heterogeneity due to distance.

III. Heterogeneity Due to Distance and the Size of a Unitary State

We first characterize the monopolistic solution (Section III, first part) and then we provide a comparison with the program of surplus maximization (Section III, second part).

The Unitary State as a Monopolist

In this framework, the objective of the government is to maximize its discretionary legal control over citizens, with respect to the radius of the state. Such a government is neither a dictator nor a benevolent social planner. It is a monopolist that must take into account both the increasing costs of territorial control and the decreasing individual willingness to abide by its law as the size of the state increases:

Program 1: A monopoly unitary state solves

$$\max_{r_j} 2r_j [f(r_j) - g(r_j)].$$

The government thus maximizes its total discretionary power (over each citizen, multiplied by their number), taking into account non-discretionary costs associated with the control of the territory. Endogenous frontiers associated with the optimal radius $r_j^*$ are such that

$$f'(r_j^*) + r_j^* f''(r_j^*) = g'(r_j^*) + r_j^* g''(r_j^*)$$

The second-order condition is

$$r_j^* f''(r_j^*) + 2f'(r_j^*) - r_j^* g''(r_j^*) - 2g'(r_j^*) \leq 0,$$

which is verified for instance if $f'' \leq 0$ and $g'' \geq 0$. The left side of the first-order condition describes the marginal consent to the constitutional power of the state. The right side represents the marginal cost of control of the territory. Frontiers are determined by Equation (3) where the radius is such that Equation (6) is satisfied. The extent of constitutional power amounts to

$$t_j^* = f(r_j^*).$$

It delineates the range of constitutional control over the private domain, and Figure 1 illustrates it. It represents the right side of state $j$, but should be mirrored at the left side.

To compare the monopolist constitution with the planning solution, it is convenient to conduct the analysis in terms of surplus extraction or maximization.

Comparison with Surplus Maximization

We still consider that capital $j$ is exogenously located. The objective is such that the radius $r_j^*$ is obtained by maximizing total surplus:

Program 2: A benevolent unitary state solves

$$\max_{r_j} 2r_j [f(r_j) - g(r_j)].$$
FIG. 1. Monopolistic (*) and social-planning (s) solutions.
It amounts to maximizing
\[ \max_{r_j} \int_0^{r_j} \left( f(u) - t_j \right) du + \int_0^{r_j} t_j du - r_j g(r_j). \]  
(9)

It amounts to maximizing
\[ \int_0^{r_j} (f(u) du) - r_j g(r_j). \]  
(10)

The frontier \( i^*_j \) on either side of \( j \) is such that
\[ f(r_j^*) = g(r_j^*) + r_j^*g'(r_j^*), \]  
(11)

for which individual willingness at the frontier equals the marginal cost of territorial control. Surplus maximization thus implies a degree of constitutional power
\[ t_j^* = f(r_j^*) \]  
(12)

Compare Equation (11) to Equation (6) to verify that \( r_j^* \) and \( t_j^* \). The surplus-maximizing solution provides a larger optimal territory than the monopolist government does; at the same time, there are more restrictions on the power of the government in the benevolent setting (see Figure 1 for a graphic illustration).

We now move on to the comparison of surpluses. First, citizens gain
\[ \Delta^I = 2|j - i^*_j|\int_{i^*_j}^{r_j^*} (f(u) - t_j^*) du, \]  
(13)

when a benevolent government replaces the monopolist one, whereas government loses
\[ \Delta^I = -2|j - i^*_j|\int_{i^*_j}^{r_j^*} [t_j^* - (g(u) - ug'(u))] du \]  
(14)

when it chooses to maximize total surplus, providing that \( \Delta^I \) is negative.

An important assumption that has been made until now is the invariability of the functional forms of cost and willingness throughout the whole territory constituting the state. The following developments consider what happens when that assumption is lifted, thus dealing with a second kind of club heterogeneity.

**IV. Discontinuities in the Spatial Pattern of Preferences**

The setting here is still that of a unitary state. It has reached its optimal monopoly size building on individual consent, \( f \), and cost of control, \( g \). We first formally define peripheral regions (Section IV, first part) and then discuss their possible constitutional status (Section IV, second part).

**Definition of Peripheral Regions**

**Definition 1:** Consider for the sake of convenience the right side of state \( j \). Assume that \( \forall i \in [j, i^*] \subseteq [j, i^*] \)
Individuals in the peripheral region do not refer to the same consent function as other members of the state. There is a discontinuity in the willingness to accept the power of the government, expressed by the reference to a different function, $f_p$, once the periphery is reached. The problem is not simply a matter of distance ($f_p(.)$ and $f_p'(.)$ are both negative): Consent does decrease with distance, but in a different pattern since $f_p(.) < f(.)$ all over the periphery. The same thing happens with the costs of control.

Figure 2 depicts a unitary monopoly state that includes a peripheral region. The latter is situated at the border, but it does not need to be the case in general, particularly as distance in the space of preference becomes much more pregnant than physical distances. One may wonder why state $j$ does not take such a break into account. This very lack of consideration explains the isolation of the periphery. Consciously or not, capital $j$ acts as if the whole population could be controlled by using a constant functional form, $g$, throughout the territory. Similarly, function $f$ would accurately describe the willingness to belong to the state whatever the location on the territory. Reference to the surplus-maximizing solution would not solve the problem at all. In the case of Figure 2, the peripheral region would simply no longer be a border region. The problem may be even more pronounced: The capital may not grasp the fact that regions not very distant from the center may be so specific as to require different functions of cost and willingness. The impossibility for state $j$ to take this heterogeneity into account may rest on a normative principle according to which a unitary state cannot acknowledge peripheral behaviors without endangering its very unity. The economic translation of this principle is that the government keeps itself from using price discrimination. In other words, it does not allow itself to propose $t_{j,i} < t_j$ to $i \in [i_p,i^*]$. This policy would, of course, contradict the unity of constitutional law over the whole state.

In practice, the existence of peripheries must be acknowledged, even if it may not be accepted as such by central governments. In this case, the capital faces extra costs, $\Delta^+ C_j$, that amount to

$$
\Delta^+ C_j = \int_{i_p}^{i^*} (g_p(u) - g(r^*_j)) \, du,
$$

while the discretionary power of the government diminishes by $\Delta^- T_j$

$$
\Delta^- T_j = \int_{i_p}^{i^*} (f(r^*_j) - f_p(u)) \, du.
$$

Figure 3 provides an illustration of these losses in the monopolistic case.

Unitary states may face the existence of peripheral regions that can threaten the unity of the territory and its constitutional cement. Europe, for instance, may have to tackle this problem in the near future.
FIG. 2. Peripheral region \((i_p,j^*_f)\) in a monopolist unitary state.
FIG. 3. Maximum loss entailed by the existence of a peripheral region.
The Constitutional Status of Peripheral Regions

Drèze (1993) proposes to define a “status of regions of Europe,” which is quite close to our perspective. Following the core idea of the article, regions could move from a national state to the European one. Even if it is not expressed explicitly, they would be linked to the “new center” by a contract. “A geographical area, currently part of a member state of the European Community [. . .] could henceforth belong to the community directly, without being any longer part of a member state,” [Drèze (1993), p. 265]. This geographical area is, in our model, a peripheral region that is characterized by preferences and costs of control (functions $f_p$ and $g_p$ with regard to capital $j$) that do not correspond to those of “central” regions. The latter do not come under Definition 1 of peripheries, because their characteristics of willingness and control are described by the central functions $f$ and $g$ with regard to capital $j$.

To claim the specific status of peripheral regions may require two conditions. The first one is that there should exist a regional capital, say, $k$, that would provide a local public good commonly accepted in the region. The second one is that individual consent and cost of control, as perceived with regard to $k$, should match the particular functions $f_k$ and $g_k$ on the whole subsegment. If we remain in the framework of Definition 1, these conditions are summarized by

$$
\exists k \in [i_p, i^*_p] \subseteq [j, i^*_j], \exists f_k, \exists g_k \text{ such that } \forall i \in [i_p, i^*_p]
$$

$$
w_i = f_k(.) \text{ and } c_j = g_k(.) \text{ with either Program 1 or Program 2 satisfied.} \quad (19)
$$

If Condition (19) is satisfied, it means that citizens of a particular area have given themselves a regional capital. In other words, the periphery has managed to determine a constitutional body comprising all aspects of law as a local public good, that could suit the whole region. What remains to be formalized is the link between the periphery and the center. Salmon (1994) addresses a related question when he discusses the possible transfer of “attachments” from a region to a nation, a nation to a federation (though his model does not take the cost of control into account and is set in a nonspatial framework). Attachment corresponds in a way to our willingness to accept the power of the lawmaker. As in Salmon (1994), the willingness to participate can be defined for more than one community. The European capital must provide all citizens with a public good, the benefits of which could spread over the whole segment of space. This public good could be contractually associated with the existence of an ordered society that guarantees minimal rights of property and contract. For this good, the functions of consent and control must have invariant functional forms throughout the state.

Both our article and the one by Drèze (1993) may help view a link based on a two-level contract: the first one with the regional capital for a periphery, with the national capital for a “central” region; and the second stage representing the contract with the European capital subscribed by peripheries and possibly by some nations. While we focus on the spatial microeconomic rationale for the existence of such regions, Drèze formalizes their possible contract with Europe.

V. Conclusion

The constitutional enterprise is spatially constrained. We have shown how that characteristic is particularly relevant and binding. We have adopted here an efficiency explanation by which economic reasoning helps to delineate the respective spheres of influence of private and collective action. Unitary states are formalized as clubs facing
two kinds of heterogeneity. The first one is expressed by the influence of distance on the costs of control and on individual willingness to participate in the state. It delineates the size of the state and the extent of its constitutional power. The second one is conveyed by discontinuities in willingness and cost functions. It defines peripheral regions that may threaten the requirements of unity.

References


