Distributional Conflicts, Factor Mobility, and Political Integration

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By Patrick Bolton and Gérard Roland*

Will there be political integration in Europe? This question has been at the forefront of post-war European history. The breakup of Yugo-slavia, Czechoslovakia, and the Soviet Union and separatist movements in Belgium, and Italy show, on the contrary, tendencies toward separation. A new literature has started to analyze the political incentives of countries to unite or to separate (Alessandra Casella and Jonathan Feinstein, 1990; Shang-Jin Wei, 1991; Bolton and Roland, 1993; Alberto Alesina and Enrico Spolaore, 1995); for a survey, see Bolton et al. (1996). The main trade-off identified is that between the economic advantages of unification and the political costs of policies that are less close to the preferences of local majorities in a unified country. The degree of mobility of citizens across borders obviously plays an important role in determining the size of nations. Mobility in the United States is relatively higher than mobility across countries in Europe. The theme of mobility and political integration, already explored in Bolton and Roland (1993), is developed further in this paper.

The local public-goods literature since Charles Tiebout (1956) has emphasized how mobility leads to diversity in public-good provision as citizens move to the jurisdiction offering their most-preferred bundle of public goods. Similarly, the more recent political-economy literature on local jurisdictions (see e.g., Dennis Epple and Thomas Romer, 1991; Raquel Fernandez and Richard Rogerson, 1994; Roland Bénabou, 1996) puts forward models where mobility leads to stratification into rich and poor communities. In this paper, we show that *absence of mobility* may be a condition for diversity in public policies. When individuals differ only in their taxable income and intensity of preferences for public goods, then perfect mobility will lead to equalization of tax rates and public-good provision across countries and to the removal of political obstacles to unification. In contrast, in the absence of mobility, not only will fiscal policies be different across countries, but political obstacles to unification will be more important.

We find that Tiebout-type results may obtain when individuals differ in their preferences over the composition of public goods. In that case, mobility may increase diversity of public-good supply, as it allows for individual sorting and leads to a higher level of more specialized public-good provision across countries. Interestingly, opposition to political integration is higher in this case, whether or not citizens are mobile, since the political equilibrium under unification leads to a homogeneous supply of public goods across jurisdictions. The degree of opposition to political integration depends thus not only on mobility of labor and capital, but also on whether individual preferences differ mostly over the *quantity* of public goods provided or over their *composition*.

I. The Model

Consider two countries, A and B. Country $k = A, B$ provides a bundle of public goods, $\mathbf{g}_k = (g_{k1}, g_{k2})$. The preferences of individual i in country k over private consumption c_i and public goods, $\mathbf{g}_k$, are represented by the utility function

$$(1) \qquad U(c_i, \mathbf{g}_k) = c_i + \boldsymbol{\gamma}_i \cdot \mathbf{g}_k$$

where $\gamma_i = (\gamma_i^1, \gamma_i^2)$ represents the intensity of individual i's preferences for the different public goods.

We shall consider in turn two polar cases: one where individuals differ in the intensity of their preferences for public goods and the other where they differ in their preferences over the composition of public goods. In the first polar case individuals agree on the composition of public goods, and only want public good of type 1, so that $\gamma_i^2 = \gamma_j^2 = 0 \; \forall i, j$. However, some agents have a high preference for public goods with $\gamma_i^1 = \bar{\gamma}$, while others have a low preference with $\gamma_j^1 = \underline{\gamma}$ and $\underline{\gamma} < \bar{\gamma}$. In the other polar case, individuals have the same intensity of preferences, but some only like public good 1 so that $\gamma_i^1 = \gamma$, $\gamma_i^2 = 0$; while others only like public good 2 so that $\gamma_j^1 = 0$, $\gamma_j^2 = \gamma$.

Agents differ not only in their tastes for the public good, but also in their income. Agent i has an income of w_i and the distribution of income in each country is given by $h_A(w_i)$ and $h_B(w_i)$, with full support on $[0, \bar{w}]$, where $0 < \bar{w} < \infty$. We assume, for simplicity, that for each income group there is the same proportion of individuals of any given type.

Countries may differ in their income distributions and in the proportions of types in the population. The public good is financed in each country by a linear income tax, $1 > t_k > 0$. Let y_k denote the mean income in country k. Then, country k can supply a level of public services of

$$(2) \qquad y_k\left(t_k - \frac{t_k^2}{2}\right) = g_{k1} + g_{k2}.$$

The term $y_k(t_k^2/2)$ denotes the cost of public funds. In each country, the level of public goods and taxes is determined through majority voting. We consider in turn the equilibrium supply of public goods in each country without mobility and with full mobility. In each case, we consider the incentives of the two countries to integrate. Unification can take place if there is a majority of voters in favor of unification in each country.

There are two reasons why the countries may want to integrate: first, because unification may bring about productive effi-

ciency gains; second, because unification eliminates fiscal competition (see Bolton and Roland [1993] for a more complete discussion).

II. Differences in the Intensity of Preferences for Public Good Consumption

Given our assumptions, an agent with income w_i and type $\bar{\gamma}$ has indirect utility given by

$$(3) \quad U(w_i; t_k | \bar{\gamma})$$

$$= (1 - t_k)w_i + \bar{\gamma}\left(t_k - \frac{t_k^2}{2}\right)y_k$$

and an individual of type $\underline{\gamma}$ has indirect utility given by

$$(4) \quad U(w_i; t_k | \underline{\gamma})$$

$$= (1 - t_k)w_i + \underline{\gamma}\left(t_k - \frac{t_k^2}{2}\right)y_k.$$

A. Political Equilibrium with No Mobility

It is clear from equations (3) and (4) that all agents have single-peaked preferences with respect to t_k, whatever their income or type. Thus, the equilibrium tax rate is the most preferred tax rate of the median voter. It is clear from equations (3) and (4) that even though we allow for two dimensions of heterogeneity, our voting game remains one-dimensional since we can reduce all relevant forms of heterogeneity to a one-dimensional "hedonic income" variable, $\hat{w}_i \equiv w_i/\gamma_i$, where $\gamma_i \in \{\bar{\gamma}; \underline{\gamma}\}$. Let $\hat{w}_{mk}$ be the median voter's "hedonic" income in country k. Then, the equilibrium tax rate is given by

$$(5) \qquad t_k^* = 1 - \frac{\hat{w}_{mk}}{y_k} = 1 - \frac{w_{mk}/\gamma_m}{y_k}.$$

When both countries integrate, the income per capita in the union is given by y_u, and the equilibrium tax rate is given by

$$(6) \qquad t_u^* = 1 - \frac{w_{mu}/\gamma_{mu}}{y_u}.$$

Assume first that individual and aggregate incomes remain unaffected by unification (i.e., there are no economic gains or losses from unification). In that case, y_u is simply the average of y_A and y_B weighted by population. Assume without loss of generality that $w_{mA}/\gamma_{mA} > w_{mB}/\gamma_{mB}$. Then, under unification it must be true that

$$\frac{w_{mu}}{\gamma_{mu}} \in \left[\frac{w_{mB}}{\gamma_{mB}}, \frac{w_{mA}}{\gamma_{mA}} \right].$$

Because the median voter in the unified country will be different from the median voter in each country, the equilibrium redistribution policy in the union will tend to be different from the most desired policy of the median voters in each country. The change in utility for the median voter in each country obtained by integration is then given by

$$(7) \quad \Delta U_{mk} = U(w_{mk}; t_u^*/\gamma_{mk})$$

$$- U(w_{mk}; t_k^*/\gamma_{mk})$$

$$= \frac{1}{2} \left[\left(1 - \frac{\hat{w}_{mk}^2}{y_k y_u} \right)(y_u - y_k) \right.$$

$$\left. - \frac{(\hat{w}_{mu} - \hat{w}_{mk})^2}{y_u} \right].$$

To determine whether unification will take place or not amounts to checking whether or not $\Delta U_{mk} \geq 0$ for $k = A$, B.

It is instructive to interpret the two terms on the right-hand side of equation (7). The first term is nonzero when $y_k \neq y_u$. Assuming that the ("hedonic") income distribution is such that the median income is smaller than the mean income, this term is negative (positive) when $y_k > y_u$ ($y_k < y_u$). In other words, the median voter in country k is against unification, other things equal, when $y_k > y_u$, and is in favor of unification when $y_k < y_u$. This term represents the well-known and often emphasized "regional transfer" effect: a country dislikes (likes) unification if as a result it ends up making positive (negative) tax-revenue transfers to the other country. Moreover, even if $y_k = y_u$, the second term

in the right-hand side of equation (7) represents the "political cost" of integration due to the change in political majority after unification. Note that, unless $\hat{w}_{mu} = \hat{w}_{mk}$, this cost is always strictly positive, whether $\hat{w}_{mk} \gtreqless \hat{w}_{mu}$. If for example $y_A = y_B = y_u$ and $\hat{w}_{mA} > \hat{w}_{mB}$, unification will be resisted in country A because it will lead to more redistribution, but it will also be resisted in country B because it will lead to less redistribution. This political cost echoes conflicting fears about European political integration in various countries. Thus, in the United Kingdom, European integration is seen as "socialism through the back door," and in Scandinavian countries or the Netherlands it is seen as a threat to the welfare state.

The analysis so far has emphasized the political costs of unification. These must be weighed against the efficiency advantages (see Bolton and Roland [1993] for a complete analysis). To summarize, with no mobility at all between the two countries, the efficiency gains from unification must be large enough to overcome the political cost, if the two countries are to merge at all.

B. *Equilibrium and Unification under Perfect Mobility*

For any given national tax policy, t_k, and per capita income y_k ($k = A$, B), an individual with income w_i and preference intensity γ_i may choose to move to the other country either to lower the tax burden or to benefit from a higher supply of public goods. We assume throughout this paper that mobility is perfect. This means that an individual i with income w_i in country A, say, obtains exactly the same income when she moves to country B. Given that agents can locate in the country that offers the most attractive policy, the national governments are now setting taxes taking into account the fact that voters are mobile. We shall characterize equilibrium tax policies (t_A, t_B), such that:

(i) no individual has an incentive to move from one country to the other;
(ii) given the tax policy in region k, the median voter's choice of tax in country $\ell \neq k$ is a best response to t_k.

Thus, for any equilibrium tax vector (t_A, t_B), each individual with income w_i and preference intensity γ_i in A must weakly prefer to stay in that country

$$(8) \quad (1 - t_A)w_i + \gamma_i \left(t_A - \frac{t_A^2}{2} \right) y_A$$

$$\geq (1 - t_B)w_i + \gamma_i \left(t_B - \frac{t_B^2}{2} \right) y_B$$

for all (w_i, γ_i) in A. Similarly, all agents j in country B must prefer to stay in B:

$$(9) \quad (1 - t_B)w_j + \gamma_j \left(t_B - \frac{t_B^2}{2} \right) y_B$$

$$\geq (1 - t_A)w_j + \gamma_j \left(t_A - \frac{t_A^2}{2} \right) y_A$$

for all (w_j, γ_j) in B. Under quite general conditions, we obtain the following rather striking and surprising result.

PROPOSITION 1: *Any tax equilibrium under perfect mobility is such that* $t_A = t_B \geq 0$, *and* $y_A = y_B$ *if* $t_A = t_B > 0$.

In other words, under perfect mobility, the two countries offer an identical tax and public-good package in equilibrium, even though agents differ in their preferences for the public good. Thus, mobility does not allow for sorting of types across countries. If anything, perfect mobility prevents the emergence of any diversity in the supply of local public goods. This result puts Tiebout on its head, so to speak.

PROOF:

In equilibrium, either all individuals end up in one country (in which case $t_A = t_B$ and $y_A = y_B$ hold vacuously) or there is a positive mass of agents in each country. In that case, the "hedonic" income distributions may or may not overlap. If they overlap then all individuals with the same "hedonic" incomes in both countries must satisfy equations (8)

and (9) simultaneously. For those individuals these two constraints reduce to

$$(10) \quad (t_B - t_A)w_i$$

$$+ \gamma_i \left[y_A \left(t_A - \frac{t_A^2}{2} \right) - y_B \left(t_B - \frac{t_B^2}{2} \right) \right]$$

$$= 0.$$

Equation (10) is satisfied when $t_B = t_A$ and $y_B = y_A$ if $t_B = t_A > 0$. So, suppose by contradiction that $t_B \neq t_A$. Then we must have

$$(11) \quad w_i = \gamma_i \frac{\left[y_B \left(t_B - \frac{t_B^2}{2} \right) - y_A \left(t_A - \frac{t_A^2}{2} \right) \right]}{t_B - t_A}.$$

This equation cannot hold for both $\gamma_i = \bar{\gamma}$ and $\gamma_i = \underline{\gamma}$.

When the two distributions do not overlap, and $t_A > t_B$ (without loss of generality) then the support of "hedonic" incomes is partitioned in a way that all incomes $\hat{w} \in [0, \hat{w}_A]$ are in country A, and all incomes $\hat{w} \in [\hat{w}_B, \hat{w}_{max}]$ are in region B, with $\hat{w}_A \leq \hat{w}_B$. These are the only partitions that are compatible with equations (8) and (9). It is easy to see that such a partition cannot be an equilibrium since an agent with income $\hat{w}_A$ has a strict incentive to move to region B.

We have established that there cannot be an equilibrium with different tax rates and different incomes per capita across countries.[1] The question now is whether there exists an equilibrium with equal tax rates and per capita incomes.

To determine the existence of such an equilibrium we must specify the effects of a deviation from equal taxes by one national government on the migration of voters, since

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[1] Proposition 1 fails if the income distribution is degenerate and all agents have the same incomes. In that case, one possible equilibrium outcome is to have one high-tax country with all type $\bar{\gamma}$ in that country and a low-tax country with all type $\underline{\gamma}$'s.

any difference in tax rates induces migration. Accordingly we consider an extensive-form game with the following sequence of moves: first, voters choose in which country to locate; second, the median voters choose taxes; third, voters choose whether to relocate; and finally, taxes are collected and the public good is supplied.

Observe that if the "hedonic" income distributions are the same in both countries, and if the median voters choose the same tax rates, then voters have no reason to relocate, and both countries end up offering the same policy package. It is always possible in stage 1 to have voters locate in each country in such a way that the national "hedonic" income distributions are the same. An obvious candidate for an equilibrium tax rate is then the most preferred tax rate of the median voter given the identical income distribution determined in stage 1. It is easy to verify that this tax rate is indeed an equilibrium. A median voter cannot benefit by setting a higher or a lower tax: If she sets a higher tax, she triggers migration of the whole population to the other country, and if she sets a lower tax she triggers migration of the other country's entire population, so that the income distribution in stage 4 is the same as in stage 2, but a suboptimal tax rate is implemented.

The above argument establishes that there exists an equal tax equilibrium and also that there cannot be an equal tax equilibrium with a tax rate strictly above the median voter's most preferred tax rate. Because perfect mobility leads to equalization of tax rates and income per capita across countries, the political costs of unification are eliminated. Therefore, even small efficiency gains from unification (that increase the income of a majority in both countries) or some fiscal competition under separation will be sufficient to generate political support for unification. In the absence of mobility, much larger efficiency gains are needed. The analysis of this section is summarized in Proposition 2.

PROPOSITION 2: *When individuals differ in income and intensity of preference for redistribution, then perfect mobility removes the diversity of fiscal policies across countries and eliminates the political costs of unification.*

III. Different Preferences over the Composition of Public Goods

Assume, without loss of generality, that there is a majority of type-1 individuals in A, who only like public-good 1 and for which $\gamma_i = (\gamma, 0)$, a majority of type-2 individuals in B for which $\gamma_i = (0, \gamma)$, and a majority of type-1 individuals in countries A and B jointly.

A. Political Equilibrium with No Mobility

The first result we establish is the existence of a political equilibrium. It involves $g_2 = 0$ in country A and $g_1 = 0$ in country B, and equilibrium tax rates are determined by selecting the preferred tax rate of the median voter. Note first that any policy involving the supply of positive quantities of both public goods would be defeated by a majority. Indeed, for the same tax rate, those with the majority preferences (that is, type 1 in country A) are strictly better off if g_2 is set at zero and g_1 is increased commensurately. In that case, type-2 individuals' preferred tax rate (in country A) is zero. Now redefine the median voter in country A as a type-1 individual with income w'_{mA} with all type-1 individuals with lower income to his left, and all others to his right. All type-2 individuals are ranked next to type-1 individuals whose preferred tax rate is zero.

Note next that a policy with $t_A = 1 - w'_{mA}/y_A$ and $g_2 = 0$ cannot be defeated by a majority. Indeed, no individual in the majority to the left of w'_{mA} can be made better off either by lowering t_A or by having $g_2 > 0$. They can only be made better off with a higher tax rate and $g_2 = 0$. But all individuals to the right of w'_{mA} can only be made worse off by such a policy. Therefore, in political equilibrium, $g_2 = 0$ and $t_A = 1 - w'_{mA}/y_A$. Note, however, that $w'_{mA} > w_{mA}$ (the median income in country A) because all type-2 individuals prefer a zero tax rate. The higher the proportion of type-2 individuals, the higher w'_{mA}, and the lower the equilibrium tax rate. A similar reasoning holds for country B. The stronger the minority in each country, the more the equilibrium tax rate will tend to converge to zero.

B. *Equilibrium and Unification under Perfect Mobility*

Given our assumptions on the distribution of income and preferences, there exists a mobility equilibrium with perfect sorting, and $t_A = t_B$ (where all type-1 individuals move to country A and all type-2 individuals to country B). Recall that under perfect sorting each country has the *same* income distribution and therefore the *same* median voters. This is why they will set the same tax rates in a subgame-perfect equilibrium of the extensive-form game specified in Section II-B. Note that, in contrast to the case without mobility, under a perfect sorting equilibrium the tax rate will be *higher* in both countries. Mobility leads here to more diversity, as the classical Tiebout analysis would suggest. Further analysis is needed, however, to fully characterize the mobility equilibria in this setup.

Note finally that, whether or not factors are mobile, political integration will always be rejected here unless there are substantial economic benefits. Indeed, the logic establishing the existence of a political equilibrium without mobility tells us that only type-1 goods which are preferred by a joint majority in both countries would be provided under unification. Country B would thus reject unification in a referendum. The literature on fiscal federalism since Wallace Oates (1972) has built on the assumption that centralized governments are constrained to supply a homogeneous public good, and that only decentralization of government can accommodate for heterogeneity in local preferences. In the context of our model, a single public good is supplied in the unified nation in political equilibrium, even if in principle the centralized government could replicate the supply of local public goods under separation. Thus, we do not need to *assume* that a single public good is supplied under unification. This is an *outcome* of the political process.

The discussion of this section can be summarized by the following proposition.

PROPOSITION 3: *When individuals differ in income and preferences over the composition of public goods, then perfect sorting equilibria under mobility lead to higher levels of specialized public-good provision in each country. Moreover, unification eliminates diversity in the supply of public goods.*

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