

## Robbing Peter to Pay Peter: The Economics of Local Public Residency Requirements<sup>1</sup>

PAUL N. COURANT

*Department of Economics and Institute of Public Policy Studies, University of Michigan,  
Ann Arbor, Michigan 48109*

AND

DANIEL L. RUBINFELD

*Department of Economics and School of Law, University of California, Berkeley,  
California 94720*

Received October 2, 1985; revised May 2, 1986

### I. INTRODUCTION

In 1980 the mayor of Boston issued an executive order requiring that all construction projects funded in whole or in part by city funds should be performed by a work force consisting of at least half bona fide residents of Boston.<sup>2</sup> The Boston residency requirement order raises a number of interesting constitutional questions which have yet to be resolved.<sup>3</sup> Apart from constitutional questions, however, it is important from a policy perspective because it represents a recent step in what has been substantial growth in the use of preferential treatment regulations by state and local governments.<sup>4</sup> In this paper we treat the question of whether residency

<sup>1</sup>We thank Anthony Rufolo, John Yinger, Edwin Mills, and an anonymous referee for helpful comments.

<sup>2</sup>The requirement is described in some detail in *White v. Mass. Council of Construction Employees, Inc.*, 103 S.Ct. 1042 (1983). The order covered not only city raised funds, but all funds which the city had the authority to administer. It forced private contractors who received city contracts to hire Boston residents for 50% of their work crews.

<sup>3</sup>The Supreme Judicial Court of Massachusetts had found the executive order to violate the Commerce Clause (384 Mass. 446, 425 N.E. 2d 346 (1981)). The U.S. Supreme Court then held that the Boston executive order did not violate the Commerce Clause. The Court based its decision on the distinction between the state acting as a market participant and as a regulator. Where the line between participant and regulator ought to be drawn, and whether such a distinction is the relevant one, remain interesting legal issues.

<sup>4</sup>In addition to Boston a number of other cities have residency requirements. See Hirsch and Rufolo [6] for econometric evidence that wages are significantly affected by residency requirements, implying the requirements are, on average, binding. Moreover, this use is growing. Approximately 27 states also have statutes which require preferential treatment of in-state labor and materials in state-funded projects.

requirements of the Boston type can be supported on economic grounds—are they in the interest of the cities that impose them and are they economically efficient from a broader social perspective?

In order to get at this question, we construct a number of models of a city in an urban area. We find, not surprisingly, that unless there is some other market imperfection, a residency requirement reduces overall economic efficiency. More surprisingly, however, we also find that we cannot rule out the possibility that individual jurisdictions may gain from such a policy. We also suggest that residency requirements can provide an effective way for cities to circumvent union seniority rules—with the possibility that both overall efficiency and city welfare are increased.

In order to keep the analysis relatively simple, we do not explicitly consider long-term consequences of residency requirements. Rather, we look at the immediate impact on the welfare of city residents, taking as a meta-lemma that in suitably framed urban models when utility within a city goes up, the long run consequence (if the city is open) is that population will increase and land rents and housing prices within the city will increase. In evaluating the desirability of residency requirements by looking at the immediate impact, we implicitly assume that current residents of the city will be net winners in the long term to the extent that they are landlords as well as residents. The same result would be obtained were we to assume that the decision maker in our problem is a landlord.

Since we focus our attention initially on whether a residency requirement is desirable from the perspective of a city that is considering its imposition, an explicit discussion of the global efficiency implications will be postponed to the end of the paper. In Section II we describe the basic model, one in which all resources are initially fully employed. Section III presents a version of the model in which some city residents are unemployed, and the residency requirement employs some of these people while displacing employment of suburban residents. Section IV of the model contains some extensions and suggests that the major economic motivation for residency requirements may lie in the manner in which they can be used to circumvent union seniority rules, especially when senior union members are suburban residents. Section V contains an evaluation of the efficiency of residency requirements and Section VI some brief conclusions.

## II. A MODEL WITH FULL EMPLOYMENT

We begin by analyzing the use of residency requirements by a city located within a metropolitan area which is sufficiently large so that in the long run the utility of residents within the city is fixed (for comparable individuals) and equal to the utility of others living in the metropolitan area. We also assume that there are two types of individuals, private sector

Table 1

Notation in the Full-Employment Model	
$w_p$	wage rate of employees in the private sector
$w_g$	wage rate of employees in the public sector
$N_p$	number of employees in the private sector who reside in the city
$s$	unit cost of capital
$c$	cost of producing a unit of the public good
$G$	level of the pure public good
$C_p$	level of the private employees' consumption of the private good
$N_g$	number of employees in the public sector who reside in the city
$N_g^*$	number of resident public employees in competitive equilibrium
$P$	tax price of the public good faced by a private employee
$B$	tax base of the city
$\eta$	elasticity of public sector wages with respect to local resident public sector employment
$t$	local tax rate

employees residing in the city and in the suburbs and public sector employees in the city, all having identical utility functions but generally receiving different wages. The analysis is simplified by assuming that there is a unique pure public good that is financed by a proportional income tax.<sup>5</sup> Table 1 provides definitions of the notation we use in the analysis.

In this first short-run full-employment model, we assume that all private employees in a city work in a purely competitive metropolitan labor market at wage rate  $w_p$ . The city is small relative to the metropolitan area, so that the wage is fixed with respect to changes in the city's policy variables. The number of private employees,  $N_p$ , is fixed in the short run, the period in which neither interjurisdictional migration of private employees nor the movement of private sector employees into public sector jobs is possible.<sup>6</sup>

<sup>5</sup>We deal with the case in which impure public goods are publicly provided later in this section. The income tax assumption allows us to avoid an in-depth evaluation of the effect of residency requirements on the housing market, which would complicate the analysis substantially without altering the nature of our results.

<sup>6</sup>Of course, short-run movements in utility will lead to longer run movements in population, both interjurisdictional and intersectoral; this will arbitrage the utility differences away. In the long run, and perhaps even in the short run, we expect job switches between the city public and private sectors. Entry into the public sector would obviously mute to some extent the gains to be obtained by using a city residency requirement.

Initially, the public sector is assumed to provide a pure public good produced in the city at unit cost  $c$  given by the cost function  $c(w_g, s)$ , where  $w_g$  is the public employee wage and  $s$  is the exogenous cost of capital. The function  $c(\cdot)$  is homogeneous of degree one and strictly concave in its arguments. The level of the public good,  $G$ , which is produced from capital and labor, but not land, is determined by majority rule voting in the city.

Because a majority of residents in the city work in the private sector, the decisive voter is a private sector employee.

Each private sector employee maximizes the utility function  $U(C_p, G)$ , where  $U(\cdot)$  is a concave function and  $C_p$  is the level of consumption of a private consumption good.

The focal point of our analysis is the local public labor market. In a competitive world with costless and unrestricted interjurisdictional migration, the city would employ laborers from the city and from the remainder of the metropolitan area, i.e., suburbs, as well. All would be paid the identical wage (we have assumed no travel costs). The residency requirement can then be viewed as an attempt to lower the tax price of the city's public good by requiring suburban employees to reside in the city if they wish to work in the public sector. If the residency requirement is imposed initially in a competitive world, and suburban public employees can obtain the same level of utility by working elsewhere (they are not earning rents), then the local public wage must be raised to compensate them for the lost utility associated with city residence. The value of a residency requirement to the city can then be modeled by asking whether the increase in the public wage and tax base associated with an increase in resident public employment makes the decisive city voter better or worse off.<sup>7</sup>

To pursue this approach, we assume that there is a perfectly elastic demand for public employees in the suburban public sector and that the city must pay all public sector workers identical wages. The relationship between the number of resident public employees and the public sector wage is given by a function  $w_g = f(N_g)$ , where  $f(\cdot) = w_p$  when  $N_g < N_g^*$  (the competitive number of resident public employees)<sup>8</sup> and  $f'(\cdot) > 0$  for  $N_g \geq N_g^*$ . Thus, in order to raise  $N_g$  above  $N_g^*$ ,  $w_g$  must be raised above  $w_p$ . The following analysis deals only with this case, the case in which the residency requirement is binding.

<sup>7</sup>We assume that all tax-base changes arise because of adjustments in the labor market. Were the housing market to adjust as well, residency requirements would lead to higher city rents, which is in the interests of owners, but not necessarily renters, of the housing stock.

<sup>8</sup>We assume that there exists a competitive equilibrium within the local public economy. The existence question has been raised by Stiglitz [11], among others. A set of sufficient conditions for existence has been given in a somewhat more elaborate model by Courant and Rubinfeld [3].

From the perspective of the city, the residency requirement can be a potentially useful policy variable, since it can raise the public sector wage without changing the private wage. This is of value to public employees who would work in the city without the requirement. Whether it is of value to the decisive private employee, however, depends upon the effect of the residency requirement on the city's tax base and on the cost of producing the public good.

The analysis is simplified by examining the utility-maximizing behavior of the decisive voter. Note that with  $w_p$  and the price of the private good fixed during the period of the analysis, the indirect utility function is simply  $V(P)$ , where  $P$  is the tax price of the public good.

The tax price  $P$  is given by

$$P = w_p c / B, \quad (1)$$

where

$$B = w_p N_p + w_g N_g. \quad (2)$$

Because  $V'(P) < 0$  for all  $P$ , it follows that maximization of  $U(\cdot)$  subject to the voter's budget constraint, the technology of public goods production, and  $w_g = f(N_g)$  is equivalent to the minimization of  $P$ .

Thus we can evaluate the residency requirement from the perspective of the decisive voter simply by asking whether its imposition lowers the tax price she faces. (Recall that resident public employees are always made better off because their wages rise. Thus, if a residency requirement is desirable from the private perspective, it improves the welfare of all city residents.) To the extent that a residency requirement is effective, we expect that the level of public goods demanded would change, as would the factor proportions used in public production.<sup>9</sup>

To evaluate the conditions under which an increase in resident public employees will increase local private utility, we substitute (2) into (1) and totally differentiate.<sup>10</sup> This yields the result that

$$\text{sgn} \left[ \frac{dP}{dN_g} \right] = \text{sgn} \left[ \frac{B}{w_g} \frac{\partial c}{\partial w_g} \frac{\partial w_g}{\partial N_g} - c(1 + \eta) \right], \quad (3)$$

<sup>9</sup>Total public employment could either rise or fall. Total *resident* public employment must rise, or the constraint is nonbinding and has no effect.

<sup>10</sup>Note that  $\partial w_g / \partial N_g$  is defined in such a manner that the number of public employees is sufficient to produce the level of public goods demanded. In other words, public production is efficient given factor prices, and  $G$  is chosen optimally by the decisive voter, given income and  $P$ .

where

$\eta$  = the elasticity of public sector wages with respect to local resident public sector employment ( $1/\eta$  is the elasticity of resident public sector labor supply).

The central results of the short-term full-employment model follow directly.

RESULT 1. A necessary condition for a residency requirement to be desirable for the locality's residents is given by

$$\frac{N_g + N_s}{N_g} < t \left( 1 + \frac{1}{\eta} \right) \quad (4)$$

where  $N_s$  is the number of suburban residents who work in the local public sector and  $t$  is the local tax rate.

*Proof.* This follows from (3), the fact that (from Shepard's Lemma)  $\partial c/\partial w_g = (N_g + N_s)/G$  and the fact that  $t = cG/B$ .<sup>11,12</sup>

COROLLARY 1. *A residency requirement is likely to be adopted, other things equal, when the tax rate  $t$  is large.*

COROLLARY 2. *A residency requirement is likely to be adopted, other things equal, when the wage elasticity,  $\eta$ , is small (i.e., the elasticity of labor supply is large).*

COROLLARY 3. *A residency requirement is likely to be adopted, other things equal, when the ratio of total public employees to resident public employees is small.*

<sup>11</sup>The reason that the tax price can fall in spite of the fact that  $w_g$  rises is due to the publicness of the public good. In the case analyzed here—that of a pure public good—utility is not concave with respect to total income in the community (see [11]). Later in the paper we show how an impure public good leads to the condition analogous to (4) being more stringent; in the case of a purely private publicly provided good, the condition cannot hold.

<sup>12</sup>The analysis in the text implicitly assumes that any increase in  $N_g$  occurs because suburban residents relocate in the city. If there is an initial population of public employees who work in the suburbs but live in the city, (2) becomes  $B = W_p N_p + W_g N_g + W_p N_z$ , where  $N_z$  is the number of out-commuting public employees. Carrying out the analysis in the text in this case, inequality (4) becomes  $(N_g + N_s)/N_g < t(1 + 1/\eta + N_z/N_g \mu)$ , where  $\mu$  is the elasticity of out-commuting public labor supply with respect to the public sector wage in the city. Plainly,  $\mu$  is negative, and thus the easier it is for out-commuting public employees to switch jobs (to the city's public sector) the less likely is the augmented form of (4) to obtain. However, because of job-specific training and experience, seniority rules, and the like, we would not expect  $\mu$  to approach  $-\infty$ , and, indeed, its absolute value could be quite small. To simplify the analysis, we explicitly assume that  $N_z$  is zero (or that  $-\mu$  is small) for the remainder of this discussion.

Each of the corollaries makes intuitive sense. The larger the tax rate, the greater the gain (on the margin) to be achieved if the tax price of the public good can be lowered, since the tax rate provides a measure of the level of the public good consumed. A small wage elasticity (or a high labor supply elasticity) makes the policy more attractive because it assures that as the residency requirement becomes binding the public wage rate will not rise rapidly. In other words, the gains from a residency requirement occur because the increased number of public sector employees who take up residency in the city add to the tax base. Increases in the public sector wage rate, however, raise the tax price because they increase the marginal cost of producing the public good.

Finally, the residency requirement is likely to be effective if there are initially relatively few suburbanites who commute to work in the city's public sector. The greater the number of public employees who work in the city, the more that wage increases associated with a residency requirement will be captured in the city's local income tax base. Were most city employees to be commuters, however, the high public sector wage would be paid primarily to those outside the city, and thus would not add to the tax base.<sup>13</sup>

The statements in Result 1 and its corollaries illustrate that in the short run a local residency requirement can be desirable from the perspective of local residents.<sup>14</sup> However, we see the converse statement of the corollaries as just as important. With competitive labor markets, there are reasonable conditions in which the short-run effect of a residency requirement will be to make residents of the city unambiguously worse off. In the longer run, in a more elaborate model, the city would then lose population and aggregate land values.

Indeed, a guess at parameter values suggests that in general the current residents of a city will not be able to increase their tax base by imposing residency requirements. Even when  $(N_s + N_g)/N_g$  is very low, say 1.1 (at 1.0 the residency requirement is not binding), and  $t$ , the local income tax

<sup>13</sup>Recall that we are dealing here with a small change in  $N_g$ . Were the residency requirement complete, i.e., all local public employees required to be residents, Corollary 3 would be irrelevant.

<sup>14</sup>Recall that our analysis is marginal in the sense that we ask whether a requirement of residency for an additional suburban employee will raise city welfare. We could also consider the question of the "optimal" residency requirement using this model. Two types of more general results are possible: (1) there will exist an optimal partial residency requirement, given by setting (4) equal to 0; or (2) there will be a corner solution, arising because tax price falls monotonically as the residency requirement is applied to more public employees. In this case the city would hire public employees requiring residency, until it reached the constraint that the level of public employment demanded by the efficient operation of the public sector ( $N_g(w_g(N_g))$ ) was just equal to  $N_g$  with  $N_s = 0$ .

rate, is very high, say 0.1, the policy makes sense only if  $\eta$  is less than 0.10, or the elasticity of supply of suburban public sector workers to city residency is greater than 10. If the ratio of public employment to resident public employment is 2.0 and  $t$  is 0.05, assumptions which are quite favorable for imposition of the requirement, then the critical value of  $\eta$  falls to  $1/39$ . Moreover, the argument in footnote 12 regarding out-commuters makes the critical value of  $\eta$  even lower. We know of no evidence that bears directly on the actual value of  $\eta$ , although we could imagine estimating  $\eta$  by looking at time-series data on responses to wage changes in the presence of residency requirements.

In any event, the suggestive estimates of critical values of  $\eta$  given in the preceding paragraph depend on the unrealistic assumption that the government is producing a pure public good. If we assume instead that the public good is congestible, the public employee residency requirement becomes even less likely to be worth adopting. Suppose that the level of government services given to each citizen is given by  $g = G/N^b$ , where  $0 < b < 1$ . In this case, the condition for the residency requirement to be adopted by private sector voters is

$$\frac{N_g + N_s}{N_g} + \frac{bBt}{N_g + N_p} w^g \eta < t \left( 1 + \frac{1}{\eta} \right). \quad (5)$$

When  $w_g = w_p$ , (5) reduces to

$$\frac{N_g + N_s}{N_g} < t \left( 1 + \frac{1-b}{\eta} \right). \quad (6)$$

Inequality (6) cannot hold when  $b$  is unity (the government provides a private good) and if the public good is partially congested, the critical values of  $\eta$  calculated above are reduced by the factor  $1 - b$ . Assume for example that  $b = 0.8$ , a result which is consistent with the empirical work of Borchering and Deacon [1] and Gramlich and Rubinfeld [4]. If  $(N_g + N_s)/N_g = 1.1$ , and  $t = 0.1$  as before, then the economic conditions support the introduction of a residency requirement only when the value of  $\eta$  is less than 0.02. Clearly, the more nearly private the local public good, the lower the benefit of attracting an additional employee to reside in the city, since the cost of providing that public good will rise substantially. The explanation of why cities put residency requirements into effect is likely, therefore, to involve issues that are not well captured in the full-employment competitive model.



### III. A MODEL WITH UNEMPLOYMENT

We have seen that in the full-employment model it appears likely that a residency requirement will be self-defeating from the point of view of city residents. One might argue, however, that when there is unemployment in the city there may be another source of potential local benefits associated with a residency requirement. If the residency requirement can be used to discourage suburban residents from working in the city (assuming there is a cost in terms of lost utility to moving), then unemployed workers in the city can be hired. This will obviously benefit the unemployed, but our concern lies with whether such a policy would also benefit the employed decisive voter. The model which follows suggests that gains can be made, but not in all cases. The benefit associated with increased tax base must be traded off against the cost of using employees who are less productive than their suburban counterparts.<sup>15</sup>

We proceed by altering some of the assumptions made in Section III. We now assume that there are four types of laborers in the local economy—private employees who receive wage  $w_p$ , productive resident public employees (denoted  $N_{gp}$ ) who receive wage  $w_g = w_p$ , productive nonresident public employees, who also receive  $w_g = w_p$ , and unproductive public employees (denoted  $N_{gu}$  when employed) who are initially unemployed. If employed, unproductive public employees would have a marginal product of labor equal to  $aw_g = aw_p$ , with  $0 < a < 1$ . We also assume that suburban public employees will resign rather than live in the city at  $w_g = w_p$ , i.e.,  $\eta > 0$ . Over the relevant range, unemployed residents are supplied perfectly elastically to the local public sector at  $w_g = w_p$ .<sup>16</sup> This assumption assures that a residency requirement will lead to the displacement of suburban public employees by resident unemployed, unproductive workers, rather than to the relocation of productive suburban workers.

The analysis of the possible adoption of a residency requirement proceeds as in Section II. As in II, the tax price faced by the decisive voter is given by

$$P = \frac{w_p c}{B}, \quad (7)$$

<sup>15</sup>In a competitive world, if the unemployed were not less productive they would not be unemployed in the first place. However, with a minimum wage law, some low-skill workers might be unemployed, while others of equal ability were working. With public sector unions, even this need not be so; we consider residency requirements as a possible tool for union busting in a later section.

<sup>16</sup>We could make the parameter  $a$  decreasing function of the number of unemployed hired by the local public sector without affecting our qualitative results.

where

$$B = w_p N_p + w_g N_{gp} = w_p N,$$

where  $N$  is total resident employment.

The analysis differs from the previous case in that the marginal cost of producing an additional unit of the public good is now equal to  $c(w_g^*, s)$ , where  $w_g^*$  is the "effective wage of an average public employee," defined as

$$w_g^* = w_p \left[ \frac{N_{gp} + N_{gu} + N_s}{N_{gp} + aN_{gu} + N_s} \right]. \quad (8)$$

Given our revised labor market assumptions, it follows that as a residency requirement is imposed, city public employees residing in the suburbs relocate their employment to the suburbs. The city responds by hiring previously unemployed unproductive workers. Once again, the decisive voter is better off if the tax price of the public good falls. The central result in this section is then:

**RESULT 2.** A necessary condition for the residency requirement to be locally desirable in the model with unemployment is given by

$$aw_p > w_p - \frac{cG}{N}. \quad (9)$$

*Proof.* The condition follows directly by substituting (8) into (7), differentiating with respect to  $N_{gu}$  and evaluating the resulting expression at  $N_{gu} = 0$ .

The necessary condition given in (9) states simply that the first unemployed worker should be hired, via the residency requirement, if the marginal product of the worker ( $aw_p$ ) is greater than the marginal cost of the hire (the foregone productivity of the suburban worker less the increment that the newly hired work makes to the public fisc). Clearly, such a condition may or may not hold, depending upon the parameters of the model. This is made clear in the corollaries that follow.

**COROLLARY 4.** A residency requirement is desirable from the point of view of the city, other things equal, the smaller the gap between the productivity of employed and unemployed workers (i.e., the larger is  $a$ ).

**COROLLARY 5.** A residency requirement is desirable from the point of view of the city, other things equal, the larger is the individual tax share ( $cG/N$ ).

Once again the corollaries make intuitive sense. The imposition of a residency requirement in a world with unemployed, lower skilled workers

increases the tax base, but increases the marginal cost of producing a unit of the public good as well. Even if such a policy is effective it will be only effective up to the point at which the marginal cost and benefit of an additional city worker being hired are equated, as given by

$$w_p(1 - a) \left[ \frac{N_{gp} + N_s}{N_{gp} + N_{gu} + N_s} \right] = \frac{cG}{N}. \quad (10)$$

This condition is likely to hold as an interior solution as long as the marginal cost is increasing.

Finally, it is important to recall that the residency policy is more likely to be effective in the model with unemployment than in the model with full employment. This can be seen by rewriting both conditions in a similar form and evaluating them at competitive equilibrium.

$$\left[ \frac{N_g + N_s}{N_g} \right] \left[ \frac{\eta}{1 + \eta} \right] < t \quad (4')$$

$$(1 - a) < t. \quad (9')$$

If  $a$  is close to unity, as one might expect when  $N_{gu}$  is near zero, (9') will hold at very low tax rates. For sufficiently high values of  $\eta$ , however, (4') cannot hold even at high tax rates. It is interesting to note that  $a$  itself could be written as an elasticity, that of the effective wage with respect to  $N_{gu}$ . Here, if the effective wage rose rapidly enough (i.e., if  $a$  were far from unity), the choice between implementing the residency requirement by adding residents and paying higher wages or by hiring nonproductive current residents would depend (appropriately) on the relative magnitudes of the elasticities of effective resident labor supply.

The result that the residency requirement is more likely to be adopted in the unemployment model also holds when the public good is congestible, although congestion makes the condition less likely to obtain than when the public good is pure. Following our earlier notation when the public good is congestible, the condition for a residency requirement to benefit private sector employees when there is unemployment is

$$aw_p > w_p + \frac{cG}{N}(b - 1). \quad (11)$$

For  $b = 1$  (the perfectly private case), the condition cannot hold. For values of  $b < 1$ , however, (11) can be rewritten as

$$\frac{1 - a}{1 - b} < t. \quad (11')$$

For comparison, (6) can be rewritten as

$$\frac{N_g + N_s}{N_g} \left[ \frac{\eta}{\eta + 1 - b} \right] < t. \quad (6')$$

Again, (11') can hold at high values of  $a$ , provided that  $b$  is low enough. Even at very low values of  $b$ , however, (6') cannot hold at sufficiently high values of  $\eta$ . Furthermore, the possibility that (11') may actually be consistent with real world parameter values, while remote, does not strain credulity. If unemployed workers are nearly as productive as employed ones (e.g.,  $a = 0.95$ ) and congestion is moderate (e.g.,  $b = 0.5$ ), then a residency requirement is locally desirable if  $t > 0.1$ , a condition that may obtain in precisely those high-tax large urban areas that tend to have residency requirements. Even here, however, the parameter values needed are somewhat extreme, leading us to conclude that the motivation for residency requirements may lie elsewhere.

#### IV. EXTENSIONS AND SPECULATIONS

##### 1. *Union Busting and Seniority Rules*

One possibility suggested by the discussion immediately preceding is that unemployed city residents are just as productive as suburban public employees, but cannot be hired because of union seniority rules. In this case, as long as the public good has any publicness ( $b < 1$ ) it will be in the interest of city residents to adopt the residency requirement if the outcome of such adoption is to cause the resignation of suburban workers and their replacement by unemployed urban residents (see (11) with  $a = 1$ ).

A variation on the above theme occurs when unions have been able to obtain wages such that  $w_g > w_p$ .<sup>17</sup> In this case, if a large number of union members are suburban residents, and if union seniority rules are such that new workers get paid less than old ones, the policy can reduce the cost of labor and increase the local tax base. In this case, the city as employer is able to weaken union power without acting directly to do so—it merely adds a new rule that has the effect of reducing wages. In a recent paper, Hirsch and Rufolo [6] present some empirical results that suggest that residency requirements lead to lower public sector wages than the absence of such requirements. One of Hirsch and Rufolo's interpretations is that the resident civil servants have some loyalty to their city and would be embarrassed to strike against their own friends and neighbors. While there may be something to this, we find the explanation implicit in this discus-

<sup>17</sup>Unions are not necessary for public wages to be higher than competitive levels. See Lewin and Katz [8] for details.

sion, and discussed by Hirsch and Rufolo as well, to be at least as plausible—in the presence of unemployment and the well-known tendency for higher income, established households to reside in the suburbs, the residency requirement tends to cause the replacement of high-wage public employees with lower wage ones, thus reducing the average wage. One good market imperfection deserves another.

Finally, there is the possibility that unemployed urban workers may be more productive than their suburban counterparts, given the demographic changes that have occurred in many cities and the consequent likelihood that many suburban public employees are of a different ethnic and cultural background from the populations that they serve, while their urban replacements are not.

### *2. Voting on Local Public Referenda*

Local residency rules might also be viewed as an example of the political process working in the interests of a subgroup of the local population (the public sector), but not in the broader interest of all voters. Imagine a referendum process in which turnout is stochastic, so that prior to any referendum the probability that a millage for increased spending will pass is increasing in the proportion of resident public employees. Then a residency requirement can have a secondary effect on public spending, and perhaps public wage rates, beyond the effect described in the previous sections. By increasing the number of public employees who vote more often than do private employees,<sup>18</sup> the likelihood of greater (than optimal) local spending is increased. This argument is developed in a somewhat larger context in Mills [9], who discusses a number of cases in which public employees and public sector managers act together in opposition to private sector interests. In the long run, the possibility of such behavior is limited, but not eliminated, by private sector mobility.<sup>19</sup>

### *3. The Possibility of Retaliation*

Assume for purposes of argument that a residency requirement is in the short-run interest of the city. Will the benefits be maintained over time as the suburban governments and their workers consider retaliatory moves? Consider the full-employment model first. Under our assumption of a perfectly elastic supply of suburban public sector labor, there will be no effect on the suburban tax base caused by the city's residency requirement, since a new public employee will move into the suburb from another metropolitan area at the original wage. Clearly, in this case no retaliation is

<sup>18</sup>See Rubinfeld [10], and Gramlich and Rubinfeld [4] for empirical evidence supporting this view.

<sup>19</sup>See Courant et al. [2].

necessary. In the more general case of a closed suburban labor market, the analysis is somewhat more complex. In this case, the residency requirement would raise the marginal cost of suburban public services (a higher wage would have to be offered to restrain workers from moving to the city), and would make suburban private sector residents worse off. Note, however, that even in this case a policy of retaliation via a suburban residency requirement would only be effective to the extent that there are suburban public employees who reside in the city.

The model with unemployment leads to similar results. Whether or not suburban residents are made worse off by the residency policy, there are no effective retaliatory moves.

## V. EFFICIENCY

To this point, our analysis has been from the perspective of city residents. Here we briefly discuss the efficiency aspects of our models.

### 1. *The Full-Employment Model*

In the full-employment model of Section II, the city finds a residency requirement desirable only because the requirement may permit it to exploit a nonconvexity inherent in the nature of public goods. Put simply, the policy can be desirable only if the city is of suboptimal population in the sense that adding to population expands the budget set for city residents. Even if all jurisdictions are of suboptimal size, the efficiency gain in the city in question will engender efficiency losses everywhere else. Whether there is an overall efficiency gain or loss will depend on the circumstances in all jurisdictions. If all cities are of optimal size to begin with, the city in question will not want to adopt the policy. The one unambiguous case would be where the city adopting the policy is of suboptimal size, and all others are superoptimal. Unfortunately, the literature on optimal city size is too abstract to tell us when such circumstances might obtain.<sup>20</sup> In any event, locally provided public goods tend to be sufficiently private in nature that the issue probably does not arise in an important way empirically—in the full-employment model the parameter values necessary for the policy to be desired appear to be very unlikely to obtain.

### 2. *The Unemployment Model*

As before, a nonconvexity is required in order for the policy to be locally desirable, and the presence of such a nonconvexity raises the same issues as in the full employment case. Moreover, as in the full-employment case,

<sup>20</sup>See Henderson [5].

there is a production inefficiency engendered by the fact that relative factor prices are distorted by the residency requirement (production of  $G$  will become too capital intensive). But there is also inefficiency associated with the fact that resources are unemployed to begin with, and this latter inefficiency is alleviated by the adoption of the residency requirement.

### 3. *The Union-Busting Model*

In the union seniority model there may be efficiency gains independent of the public nature of the public good. If wages in the public sector are above market levels, and can be reduced by imposition of the residency requirement, our results suggest what appears to be a classic second best argument for imposing a constraint on the behavior of the labor market.

## VI. CONCLUSION

The question of whether and to what extent the federal government ought to be involved in monitoring the regulation of the state and local sector is becoming an important policy issue. If the state and local regulations are in the public interest, or if individual voters are mobile and have sufficient choice, then one might be hard-pressed to make a case for a federal role. However, if the regulations are not in the long-run interest of the public, and sufficient competition is not available, then a federal role becomes a serious option.

This paper treats one particular state-local regulation—the local public residency requirement. We find that the set of conditions under which such regulations are likely to be in the general interest of residents of the cities that enact them is somewhat limited and that such regulations are less likely to be efficient when seen from a broader perspective. On the other hand, the regulations may be efficiency-enhancing, and the little empirical evidence that exists [6] is broadly consistent with this possibility, in that wages tend to be lower when there are residency requirements. In the absence of additional evidence then, we do not see a federal role regarding local public sector residency requirements.

## REFERENCES

1. T. E. Borcharding and R. T. Deacon, The demand for the services of non-federal governments, *Amer. Econom. Rev.*, **62**, 891–901 (1972).
2. P. Courant, E. Gramlich, and D. Rubinfeld, Public-employee market power and the level of government spending, *Amer. Econom. Rev.*, **69**, 806–817 (1979).
3. P. N. Courant and D. L. Rubinfeld, The welfare effects of tax limitation, *J. Public Econom.*, **16**, 289–316 (1981).
4. E. Gramlich and D. Rubinfeld, Micro-estimates of public spending demand functions and tests of the tiebout and median-voter hypotheses, *J. Polit. Economy*, **90**, 536–560 (1982).
5. J. V. Henderson, "Economic Theory and the Cities," Academic Press, New York (1977).

6. W. Z. Hirsch and A. M. Rufolo, Economic effects of residency laws on municipal police, *J. Urban Econom.*, **17**, 335–348 (1985).
7. W. Z. Hirsch and A. M. Rufolo, Residency laws and unionization in municipal labor markets: The case of firefighters, *J. Urban Econom.*, forthcoming.
8. D. Lewin and H. C. Katz, Payment determination in municipal building departments under unionism and civil services, in “The Economics of Municipal Labor Markets” (W. Z. Hirsch and A. M. Rufolo, Eds.), Institute of Industrial Relations, UCLA, Los Angeles (1983).
9. E. Mills, “Burden of Government,” Hoover Institution, 1986.
10. D. Rubinfeld, Voting in a local school election: A microanalysis, *Rev. Econom. Statist.*, **59**, 30–42 (1977).
11. J. Stiglitz, The theory of local public goods, in *The Economics of Public Services* (M. Feldstein and R. Inman, Eds.), Macmillan Press, London (1977).