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An Economic Theory of Fiscal Decentralization

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FISCAL federalism involves the relations of multilevel governments. A normative approach may take the political structure as given and then see what economic consequences result. Conversely, one may neutralize political variables and arrange governments solely on the basis of economic efficiency.

This paper is concerned with fiscal federalism—fiscal decentralization—purely from the point of view of economic efficiency. Alternatively stated, the problem is defined such that—as nearly as possible—political federalism is neutral. This framework can be varied as alternative forms of political federalism come under consideration as discussed by Richard Musgrave in this volume.

1. Introduction

To begin with, assume there are no states, counties, metropolitan authorities and so on. Private goods are produced by activities organized along the lines of a Lösch spatial patterning.[1] The task—to organize for the provision of public goods.

A. Assumptions

The following is assumed:

1. The set of goods which are to be publicly provided has been decided.

2. The average cost of producing each of the public goods is "U" shaped; i.e., there are economies of scale.

3. The central government may establish agencies for the provision of each public good. In turn, each agency can establish "branch governments" where efficiency requires more than one site of production.

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[1] August Lösch, *The Economics of Location*, trans. by William Wolgom with the assistance of Wolfgang Stolper, Yale University Press, 1954.

4. All taxes are on a pure benefits basis, therefore redistribution in the form of taxes and transfers between individuals or regions is not allowed.

These assumptions will be spelled out in the discussion which follows. Later some will be relaxed to see what implications can be drawn.

B. Public Goods

The public goods which are to be provided satisfy social wants and cannot be provided on a fee basis.[2] Assume, in other words, the polar case of public goods.[3] (In some cases we use examples of public goods where fees might be charged. Indeed, most public goods are a blend of pure private and pure public goods; i.e., benefits show externalities between 0 and 100 per cent. *Interest here is only in the externalities!*)

C. Spatial Setting

Space is of considerable importance to our problem. The reason is not transport costs, as in the private market. The reason is that public goods have a spatial extent on the benefits side. Moreover, benefits from public services may not accrue equally to all residents of a region. More specifically:

1. *Benefits from some services accrue in the same amount to all persons within a region.* By way of examples: The soldier who protects the resident of California provides the same protection for the resident of Maine. Police patrol cars provide, more or less, uniform protection for all residents throughout the precinct covered. Trucks which spray against mosquitoes are likely to spray uniformly throughout the municipality.

2. *Benefits from some services taper off from the site of production.* By way of examples: An air raid siren at the corner of Hollywood and Vine in Los Angeles provides more protection to a person who lives one block away than a person living forty blocks away. The siren provides no protection to a resident of Bangor, Maine. Emergency hospitals provide more protection to people living nearby, as do fire houses.

[2] The nature of public goods has been discussed by Musgrave and Samuelson. See especially, Richard Musgrave, *The Theory of Public Finance*, McGraw-Hill, 1959; Paul A. Samuelson, "The Pure Theory of Public Expenditures," *Review of Economics and Statistics*, November 1954, pp. 87–9.

[3] A polar or pure public good implies A's consumption leaves B no worse off.

3. *Benefits from some services have a spillover effect.* Suppose community X provides a set of public services; e.g., mosquito spraying, air raid sirens, fire protection, and so forth. Its neighbor, community Y, provides none of these services. Residents of Y will still benefit from X's provision of some of these services: fewer mosquito bites; some residents near X can hear the air raid siren; and some fire protection can be given—assuming the X fire department is willing to cross community boundaries. This "spillover" occurs whether or not the service is provided uniformly throughout X, mosquito spraying; or with diminishing benefits within X, air sirens.

4. *Benefits from some services reinforce each other while others do not.* As a result of mosquito spraying, residents of X receive benefits. Now suppose community Y sprays. Residents of X are provided with even more benefits. In other words, the spillover effect is associated with benefits which reinforce each other.[4]

Benefits would not reinforce each other in the following spillover case. Suppose Mr. Jones lives on the edge of community X, ten miles from the hospital. His benefits from the good "emergency hospital service" are less than those of residents with more central locations. Now community Y builds a hospital, also ten miles from Mr. Jones. Mr. Jones, however, is no better off, nor is anybody else in X.[5]

These four characteristics of public goods together with the benefit principle and economies of scale pose one of the problems of spatial arrangement to be discussed below.

D. Uniformities in Tastes and Incomes

The spatial patterning of public goods will differ depending on differences in tastes and incomes of various spatial groupings of people; i.e., taste and income heterogeneity within the nation. A community of Quakers, for example, might wish no provision of Nike sites. Two communities with the same tastes might want different amounts of fire protection if one community has a higher

[4] Public goods may well reinforce each other with varying degrees of intensity. For mosquitoes it may be slight. On the other hand, protection against a two alarm fire might be more than twice as effective when two communities are considered as opposed to one. We are not interested in the degree of reinforcement.

[5] Clearly, one can think of many reasons why Mr. Jones will be better off because of the new hospital in community Y; e.g., extra bed space, more specialized treatment, etc. Again, we are concerned only from the point of view of the pure public good, "emergency hospital treatment."

income level. In turn, with more output this may call for a somewhat larger geographic fire district for the wealthier community. These issues will be taken up below.

2. *Basic Patterning with Uniform Tastes and Incomes*

Let us assume first that tastes and incomes are uniform throughout the nation. Each agency of the central government needs to determine how many "branch governments"—separate sites of production—are required for its particular public good given the spatial extent of benefits and the technological aspects of supply. Consider the case of uniform benefit services and then diminishing benefit services.

A. Uniform Benefits Throughout the District Served

The following is illustrative of the case of uniform benefits throughout the districts served.

Assume a city of 100 square miles in which the population is evenly distributed, there are no differences in income within the population, and further, a uniform demand for police protection. Assume the demand is known. Further, suppose that police protection is a pure public good within a patrolled precinct. That is to say, the patrol car which protects your house also protects mine. Thus, total output $X_p = x_1 = x_2 \ldots = x_n$, where n is the number of consumers who all consume in common. A unit of output is some number indicating a certain amount of protection spread evenly throughout a police precinct. Thus, to say a five-square-mile precinct has 600 units of output implies that each resident receives 600 units of protection.[6] (We grant that it is difficult to define units of output—units of production—in operational terms. If a patrol car passes everybody's house three times a day instead of twice, *cet. par.* output has gone up by some amount.)

The problem is to set up an optimum number of precincts within the city and provide uniform police protection. (Whether these units are independent police forces or precincts is not an issue. The

[6] Even with a uniform population spread, some problems of district size appear. Clearly, square miles and miles along a radial line are not the same thing. It is easier, however, to treat the police problem as if population were spread along a line. Thus, although we incorrectly say "square" miles where "line" miles should be used, it does not affect the analysis and is useful for exposition.

same type of analysis applies to both cases. It is analogous to firm and plant economies.)

It is necessary to be clear on the meaning of costs. Total cost is the usual cost of supplying the output. In the case of police protection, total cost will increase for one of two reasons: (1) Given a district to be protected, say five square miles, the total cost will rise with the level of protection offered; i.e., with increasing output. (2) Total cost will also increase, given the level of output per person, as the area served increases. The key in understanding this is in the meaning of "output."

Suppose a precinct covered three square miles and received 300 units of protection. Total output, therefore, is 300 units and, for a pure public good, each resident receives 300 units of output. The total cost of providing this protection is, say $75,000 a year. Now the precinct is enlarged to seven square miles. Unless the precinct budget is increased, the protection is spread thinner and thinner and, in turn, the units of protection received per resident go down. On the other hand, with economies of scale, increasing the budget to $150,000 a year may allow the same 300 units of protection to be provided for all residents within seven square miles. In an obvious sense, total output has risen even though output per resident has remained constant. Supposedly, with pure public goods, output per resident equals total output. Evidently, total output needs to be defined for a specified region. Thus, while the relationship—total output equals each individual's share—holds for public goods such as national defense, for nonnational goods it needs to be defined with respect to the region served.

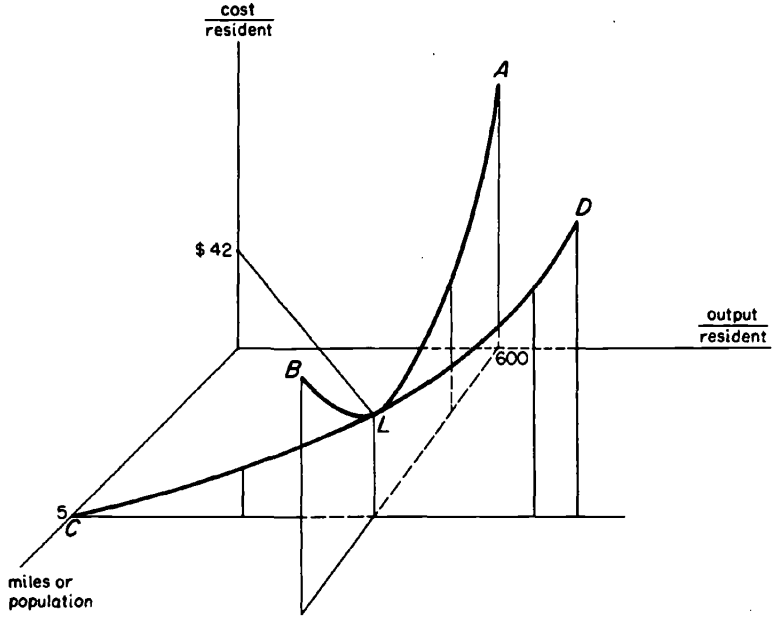
For present purposes, the relevant cost is the cost per resident. This, given our assumptions, indicates the tax bill each resident must pay for police protection. The tax bill will depend on the amount of service offered and the number of people who benefit. Each resident, with uniform demand, will pay in taxes the total cost divided by the population. Note that greater population lowers the cost per resident, but not the amount of the pure public service received. Thus, a new family building on a vacant lot next door requires no more effort from the patrol car which passes anyway, but its presence does lower the cost per resident.[7]

[7] This is, clearly, an extreme assumption. Police protection costs are a function of the number of people protected, given the geographic bounds of the district. We are, however, sticking with the polar case of a public good.

Figure 1 shows the variables which are assumed to affect the cost per resident. Consider cost per resident, holding the number of square miles—and, by assumption, population—constant (*CLD*). As output per resident increases the cost per resident increases. Why? Simply because to produce more output per resident in a given

FIGURE 1

Police Protection: Assumed Relationship of Cost/Resident to Output/Resident and Miles or Population



area costs more in total cost for extra policemen, patrol cars, and so forth. With population constant, cost per resident must rise.

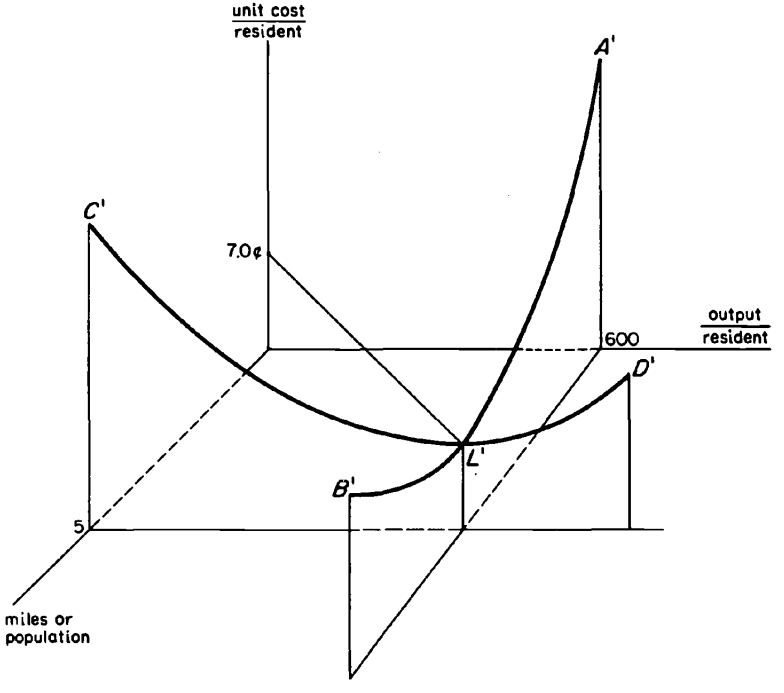
Turning to Figure 2 for a moment, here the *Z* axis measures unit-cost/resident. Again holding the number of square miles serviced (and population) constant, consider the cost to each resident per unit of protection (*C'L'D'*). The "U" shape with a low point at 600 units reflects the economies of scale in the ordinary sense of the term; e.g., better utilization of equipment.

Turning back to Figure 1, holding output per resident constant, consider an increase in the geographic size of the precinct; i.e., in square miles (and population)—(*ALB*). Here a second set of economies are assumed to enter. If 600 units of protection are

provided for a very small precinct, the cost per resident will be quite high. As the level of output increases because of a larger precinct, certain economies of scale enter. Some are the same forces which provide economies of scale in Figure 2 with respect to increased output per resident, given the precinct size. Thus, costs per resident

FIGURE 2

Police Protection: Assumed Relationship of Unit Cost per Resident to Output per Resident and Miles or Population



fall for awhile. Eventually, costs per resident rise as diseconomies, especially transport costs, enter. In Figure 2, the curve at 600 units of output per resident ($A'L'B'$) is of the same shape as Figure 1, except that it is 1/600 as high in terms of costs.

Table 1 presents a set of per person costs as a function of square miles and total output. Holding square miles constant, reading up the columns, cost increases per resident as the level of output increases. Holding output per resident constant, reading across the rows, cost per resident declines and then rises as more square miles

TABLE 1

Cost Per Resident: Output Per Resident
And Square Miles Covered
(cost in dollars)

Output Per Resident										
	900	104	96	84	81	79	73	**72**	120	260
	800	92	87	67	61	59	**55**	68	119	151
	700	78	68	53	49	48	**46**	63	103	130
	600	60	57	51	47	**42**	45	57	101	127
	500	48	44	41	38	**36**	43	53	85	99
	400	36	35	32	**29**	34	39	46	71	82
	300	28	27	24	**22**	25	37	41	58	69
	200	18	16	**15**	17	23	28	34	39	61
	100	12	10	**8**	9	13	17	22	31	34
	0	0	0	0	0	0	0	0	0	0
		1	2	3	4	5	6	7	8	9
					Square Miles					

and larger populations are covered. For each level of output per resident there is one precinct size where cost per person is lowest. These values are in bold face. Note that at an output of 600 units per resident a five-mile precinct is optimal and the cost per resident is 42 dollars. This corresponds to Figure 1.

Another implication of Table 1 is given by the following: Suppose a precinct were three square miles and provided 700 units of protection per resident. Operating as efficiently as possible it will cost each taxpayer 53 dollars. If taxpayers are willing to join with their neighbors and increase the precinct to six square miles, cost to each taxpayer will be reduced to forty-six dollars. If for some reason, say political, they object to enlarging their precinct, they will not be at an efficiency point in terms of the economics of federalism. This does not deny that such an operation might not be efficient under some form of political federalism. Under the present rules, however, the precinct would be six square miles.

The northeast drift of the lowest cost per resident point in Table 1 reflects the economies of scale discussed above. Dividing each **circled** value in Table 1 by the corresponding units of output gives the unit cost of supplying each, and every, resident. The intersection of the demand and supply curve is the same for one and all. Moreover, it determines the level of output and given the size of the city, the number of precincts is determined.[8] Assuming average cost pricing, each person will pay the same tax. The net residuum, benefits

[8] The issue of possible inequalities in precinct size and city size is disregarded. For example, what if five square miles is optimal but the city contains twenty-seven square miles? This problem is encountered and discussed in monopolistic competition theory.

minus taxes, will be zero for each resident.[9] The benefits principle is satisfied.

B. Diminishing Benefits

The technological problems in providing public goods take on additional complexities when the benefits accruing diminish as a function of distance from the site of production. Fire protection, air raid sirens, emergency hospital treatment, parks, and so forth, provide examples of benefits diminishing with distance. Some of the problems involved may be illustrated by the following exercise—which is merely suggestive and not presented as a tight technical solution.

Suppose a city of 10,000 population has to set up fire precincts. Again, we are not concerned with the optimal number of precincts to a fire district. As noted, protection falls as distance from the fire house increases. For a given fire house, people in the first-mile ring all receive some amount of protection. Those in the second ring, because of the time involved in getting to the fire, receive less protection. And so it goes. Beyond some point, benefits (protection) will be zero.

We assume various kinds of fire houses can be built. For example, a fire house with two pumpers and one hook and ladder, or four pumpers and two hook and ladders. Suppose some level of output at the fire house can be defined, say 110 units of protection. Whatever combination of equipment that provides this level for the least cost is most efficient. For other levels of output some other combination may be optimal. There is one level which provides the lowest cost per unit of fire protection. Thus, the cost curve is "U" shaped. (For purposes of a solution a less general ordering is satisfactory. All we imagine is that there is a list of possible types and sizes of fire houses.)

In order to focus on externalities, we again assume that fire protection is a *pure public good.* This implies that there is no loss of service to people in the first-mile zone when the second-mile zone is brought under protection. To be sure, the people in the first-mile zone will be better off to the extent that their tax bill is lowered. Further, by assumption, no extra dollar costs are incurred by including the second mile zone. Of course, both will be better off if the third mile zone is included.

[9] See James Buchanan, "Federalism and Fiscal Equity," *American Economic Review*, September 1950, pp. 583–99.

TABLE 2

Values and Cost: i^{th} Type of Fire House
(population = 10,000)

Miles from Fire House (1)	*Value to Resident* (2)	*Total Value to the City* (3)	*Average Value Per Resident* (4)	*Total Cost to City* (5)	*Cost Per Resident* (6)	*Surplus Per Resident* (7)[a]	*Tax on Each Resident* (8)	*Surplus to Each Resident After Tax* (9)[b]
1	$100	$1,000,000	$100	$2,000,000	$200.0	$−100.0	$44.4	$55.6
2	90	950,000	95	1,000,000	100.0	−5.0	40.0	50.0
3	80	900,000	90	666,000	66.7	+23.3	35.6	44.4
4	70	850,000	85	500,000	50.0	+35.0	31.1	38.9
5	60	800,000	80	400,000	40.0	+40.0	26.7	33.3
6	50	750,000	75	300,000	33.3	+41.7	22.2	27.8
7	40	700,000	70	285,000	28.5	+41.5	22.2	27.8
8	30	650,000	65	248,000	24.8	+40.2	26.7	33.3

[a] (7) is (4) less (6).
[b] (9) is (2) less (8).

The demand for protection, as before, is the same for all individuals. The problem is to find the optimum sized fire precinct. This problem contains elements of two problems discussed in the literature: (1) the average cost-marginal cost pricing problem for decreasing cost industries; and (2) the boundary problem under spatial duopoly—in essence, what determines the boundary where one producer's market area stops and another's begins. The latter problem has been discussed by Hotelling and Smithies—among others.[10]

One possible approach is given by the following procedure.[11] A city planner interviews various residents, asking them how much they are willing to pay for a fire house—type one—within one mile of their home or none at all. "How much are you willing to pay to have it within two miles of your home or none at all?"—and so on. "How about for fire house—type two—(perhaps larger)? How about for type three?"—and so on. The residents are assumed to reveal their true preferences.

Table 2 presents a hypothetical set of data for the city for the i^{th} type of fire house. Columns 1 and 2 present the values placed on fire protection as a function of distance from the fire house. Column

[10] Harold Hotelling, "Stability in Competition," *The Economic Journal*, February 1929, pp. 41–57; Arthur Smithies, "Optimum Location in Spatial Competition," *Journal of Political Economy*, October 1941, pp. 423–39. Both articles are reprinted in *Readings in Price Theory*, George Stigler and Kenneth Boulding (eds.), Irwin, 1952.

[11] H. L. Miller was extremely helpful in pointing out this type of approach.

3 shows the value to all residents of the city. For example, with a fire house every four miles, half of the population will live within one mile and the other half within two miles.[12] Thus, the total value to the city of 10,000 population is 950,000 dollars; i.e.,

$$\$100 \times 5{,}000 + \$90 \times 5{,}000.$$

Column 4 presents the average value per resident. Column 5 shows the total cost to the city if a fire house is located every two miles, four miles, six miles, and so forth. The cost per resident is given in Column 6. This is not necessarily the tax each resident pays. Column 7 shows the "surplus" per resident, where surplus is defined as total value less total cost. Columns 8 and 9 will be discussed below.

The planner notes that for the i^{th} type of fire station, this surplus is a maximum and equal to 41.7 per person with a six-mile precinct; i.e., with fire stations every twelve miles. For the $i + 1$ type of fire station some other maximum surplus exists and corresponds, perhaps, to some other precinct size. The same holds for all other types of fire stations.

In choosing the optimum fire station and its corresponding precinct size, the planner could simply pick that one with the largest surplus. Let us assume, however, that the rule is to pick the combination which yields the largest surplus in proportion to the cost per resident. That is, if the k^{th} fire house offers a surplus of 100 dollars per resident and a cost of 100 dollars per resident, it is preferable to the j^{th} station type where the surplus is 150 dollars, but the cost per resident is 200 dollars. Other rules governing choice can be devised.

We assume that the i^{th} type of station, given in Table 2, yields the largest surplus in proportion to costs.

The planner indicates that the city should build fire stations of type i every twelve miles. In order to just cover costs, 33.3 dollars per resident will need to be raised in taxes. The problem is now turned over to the tax bureau.

The tax bureau proceeds to raise the needed funds. The benefits principle requires that each taxpayer have a zero net residuum. The average tax per resident will be 33.3 dollars. At least two schemes appear as possibilities.

[12] Again there are problems of square miles versus line miles. (Footnote 6.) Once more assume the city is spread along a line, even though the term "square" miles is used in the discussion and calculations.

One scheme would tax each taxpayer *in proportion to his share of the total benefits.* Assuming one resident per mile for a radial of six miles, the benefits to the six people are 450 dollars; i.e., from Column 2, 100 + 90 + etc. These peoples' share of the total tax is 200 dollars; i.e., 33.3 dollars times the six people. Mr. Jones who lives in the first-mile zone receives 100/450 of the benefits. His tax is 100/450 × 200 dollars, or 44.4 dollars as shown in Column 8 of Table 2. Mr. Smith who lives in the sixth-mile zone pays 50/450 × 200 dollars, or 22.2 dollars. Other residents' taxes are calculated in the same manner. The people living seven and eight miles away will be the sixth- and fifth-mile residents of an adjoining precinct.

Under this proportion to benefits scheme, the "surplus" received by each individual will not be equal, but proportional, to the tax paid. Mr. Jones pays 44.4 dollars in taxes and receives 100 in the value of benefits to him. His surplus is 55.6 dollars given in Column 9 of Table 2 which is 125 per cent of his tax bill. Mr. Smith of the sixth-mile zone receives a surplus of only 27.8 dollars, which is also 125 per cent of his taxes.

An alternative scheme would be to tax so that *each person's surplus is equal.* Since the average surplus per resident is 41.7 dollars, each person's tax is the value to him of the benefits less 41.7 dollars. Here Mr. Jones of the first mile would pay 58.3 dollars in taxes and Mr. Smith of the sixth mile would pay only 8.3 dollars in taxes. Both, and all others as well, would have a "surplus" of 41.7 dollars.

The first tax scheme corresponds to the method by which the optimum station was chosen, namely to seek to make the proportion of surplus over cost as large as possible. This tax scheme will give a "surplus" of about 1.25 dollars for every dollar of cost for all taxpayers.

C. Cost Problems

The discussion of fire and police protection assumed benefits were independent of the population size. This may be the case for national defense and air raid sirens, but it does not hold for police and fire protection. As more people are added to a given size fire or police precinct, the total cost of providing the same per capita amount of protection will go up. An important question is, will it cost more per resident or less? A priori information offers no conclusive hints on this question. It is true that most studies indicate

that increasing population is associated with increased per capita expenditures.[13] It may be that the level of, say police protection, has increased. Yet, in larger urban areas the same amount of protection may not result in less net crime. Insofar as larger cities are a well-spring of crime—somehow defined—greater units of protection may not be enough to offset the relatively greater crime potential in urban areas as opposed to small communities.

Economies of scale are extremely difficult to measure. Studies in the private sector, for the most part, have been limited to those industries where the product is readily identifiable—such as the petroleum industry. Even here, economies of scale are extremely difficult to measure. In the case of public goods one immediately runs into the problem of holding product constant. Nevertheless, many governmental reorganization studies seem to imply that empirical studies of economies of scale will provide a major basis for reorganization.[14] A possible pitfall in this approach is that it leads to undue attention to the supply aspects in providing public goods to the detriment of the demand aspects.

D. Final Patterning

The discussion of the technological aspects of supply given, the problem of providing public goods is conceptually simple. With uniform demand each public good agency will establish as many branch agencies as economies of scale indicate. The national defense agency will be a one branch agency. The national agency in charge of fire protection will have *n* branches.

When all agencies and branch governments are operating, the spatial patterning will be similar to that for the private sector. All public goods will be produced at the capital. Some will be national for single branch agencies. Others will serve the immediate needs of the capital region; e.g., the fire department. Other communities will produce within their borders only a subset of the total number of different public goods; e.g., they will provide fire protection, but not a Supreme Court. The public sector, in other words, will develop along a Lösch pattern.[15]

It should be noted that the problem of spillover discussed above

[13] See Harvey Brazer, "The Role of Major Metropolitan Centers in State and Local Finance," *American Economic Review, Proceedings*, May 1958, pp. 305–16.

[14] For example, Metropolitan St. Louis Survey, *Path of Progress for Metropolitan St. Louis*, August 1957, p. 51.

[15] Lösch, *op.cit.*

is of no concern in this simplified model. With uniform demand, population, income, and, in turn, uniform services, each community will receive back as much in spillover as it contributes to its neighbors. Each sprays uniformly against mosquitoes and the per capita benefits exchanged are equal.

3. *Complications with Demands and Income Variable*

Certain complications which arise because of differences in taste and incomes and the resulting unequal spillover of benefits are now introduced.

A. Differences in Taste

Keeping incomes equal for the moment, how is it possible to allow for differing demands? Suppose that within a geographic area tastes differ. People being where they are, what principles should the central government (still assuming that it has full powers over the branch governments) adopt in laying out public service boundaries for each branch?

A general rule, similar to that used in the fire protection example, might be to make the "surplus" in proportion to taxes as large as possible. Operationally, this is not of much use. Conceptually, the costs of providing various amounts of public goods in various locations should be compared with the benefits received by residents. That combination which yields the largest surplus should be chosen. Clearly, this is a trial and error method and, even if demands were known, one could not be certain that the combination is a maximum maximorium without trying all possible combinations. A similar problem arises in determining the location of firms in the private sector.[16]

Fortunately, an alternative approach exists. Instead of taking the people as given and trying to fit the nonnational public goods pattern to them, offer a varied pattern of public goods and make it possible for the people to move to suit their tastes. People who want good schools will then be able to move to communities where good schools are provided. To the extent that communities offer a varied pattern of public goods, each resident can, conceptually, choose the pattern

[16] See Charles M. Tiebout, "Location Theory, Empirical Evidence, and Economic Evolution," *Regional Science Association, Papers and Proceedings*, III, 1957, pp. 74–86.

which best satisfies his preferences. (The details of this type of approximate solution have been given elsewhere.[17]) That people with similar tastes move together is a first principle of fiscal federalism.

B. Differences in Income

If the assumption that incomes are equal is relaxed, a new variable enters. People in choosing communities with differing expenditure patterns will consider their share of the cost. One of the major variables determining their share will be the incomes of the other residents. Given the tax structures and incomes of various communities offering about the same pattern of public services, a person will choose the community where his tax bill is least. In fact, he may well choose a community where the pattern of services offered is not as nearly to his liking as another community, but his tax bill is sufficiently lower to make this a more favorable location.

As a result of unequal incomes, the resulting pattern of public goods will be less optimal, in a sense, than in the case where incomes are equal. However, two modifications appear which somewhat offset any distortions introduced by unequal incomes.

At a conceptual level, with many communities from which to choose, a person will consider both the cost and pattern of services. How will differential costs modify his choice of patterns? Suppose a set of k equally wealthy suburbs surround a city. From the cost (tax) point of view alone, a person will pick one of these k suburbs as opposed to some other community. Of these k communities, one will have a pattern of services which best suits his preferences.

In effect, the presence of wealthy communities has lowered the cost to the prospective resident. It is true that at a lower cost he will pick a different pattern of public goods than at a higher cost. Thus, he may move to a community which spends 12 per cent of its budget on parks when his cost is low. At a higher cost, he may prefer a community which spends only 8 per cent on parks. Other residents, with higher incomes, are also content with 12 per cent spent on parks. If the cost to these people was lowered so that they paid the same as the low income family, they might desire 18 per cent spent on parks. Thus, the fiscal rule that people with similar tastes should

[17] See Charles M. Tiebout, "A Pure Theory of Local Expenditures," *Journal of Political Economy*, October 1956, pp. 416–24.

move together needs qualification. People with the same fiscal tastes, given the costs to each of them, should move together.

At the real world level, the existence of unequal incomes has lead to the "tax colony." That is, people with high incomes band together in communities which keep low income residents out of the community. Zoning laws, building restrictions, and so forth, are some of the means of control. Moreover, it does appear that communities with high levels of public service tend to have high rental and housing prices. When you seek good schools for your children, you often find the rents and housing prices are high. This is not to suggest any single direct causality, for other factors do influence the level of rents and housing prices. It is simply a suggestion as to how it is the rich avoid paying taxes for the poor.

So far the analysis has assumed that the pattern of public goods is given and that people adapt to the pattern which suits their preferences. Public service patterns, however, can be changed: (1) as a condition for entering a community; and (2) once a person is a resident of a community. Firms are much more likely to obtain a change in fiscal arrangements as a condition of moving than are individuals. Community efforts to entice industry into their bounds frequently involve fiscal bargains. The granting of a tax free status for a period of years seems to be a favorite ploy. The fiscal logic of such a move, evidently, is that in the long run the firm will more than pay its share of costs. Even if the pattern of public goods is initially changed, the residents will eventually be better off in terms of a lower tax benefit ratio.

Other people may pick a community with an eye towards changing the pattern of goods provided once residence is established. Other things equal, the smaller the community, the more likely one is to have influence. Further, small group theory suggests that the smaller the community, the more likely the people are to agree on the issues at hand and clearly identify the problem. Thus, tastes are apt to be more uniform.

C. Spillover

One major problem still confronts us under fiscal federalism with varied tastes and incomes. Most public goods have a spillover effect. A simple example will illustrate the problem.

Suppose a whole ring of communities surrounding a town decide to spray against mosquitoes. Community A does not spray. Clearly,

A residents are better off, and without paying any extra taxes. As noted earlier, the same sort of spillover analysis holds for other public goods.[18] The question is, should A residents be forced to pay something?

In terms of benefits taxation, residents of community A should be taxed and a transfer doled out to the spraying communities. Yet, if it is decided that community A should pay something, how should its share be assessed? Under a nonunitary system, this involves a decision by a higher level of government, and one of the major functions of a higher level government, under fiscal federalism, is to arbitrate such spillovers.

In practice it appears that this arbitration is carried out by a provision of minimum standards.[19] Usually minimum standards of service are set up for certain public goods; such as, all children shall have so much education, and a community must provide so many dollars per student. The normative justification for minimum standards may be simply in the notion of the welfare state—knowing what is best for people. It seems feasible to suggest that a second reason for minimum standards is the question of spillover. If community A is forced to spray against mosquitoes, neighboring communities will receive greater benefits from their own spraying. If they wish to spray even more than the minimum, that is their privilege, but they cannot expect community A to share the cost. Thus, minimum standards are seen not so much in the welfare sense, but as a substitute for intercommunity transfers.

Summary

This paper has set forth an efficiency framework for an evaluation of fiscal federalism. On the supply side, benefits may be uniform throughout the district served or may diminish as a function of distance from the site of production. The existence of benefit spillovers indicates that one community's well being, in part, depends on the public goods provided by its neighbors. As a result, higher level governments may be called upon to arbitrate differential spillovers.

On the demand side, the problem of determining taxpayer preferences still exists. The demand for national public goods such as defense

[18] Other aspects of spillover are discussed by James Buchanan, "Federal Expenditure and State Functions," in *Federal Expenditure Policy for Economic Growth and Stability*, Joint Economic Committee, Washington, D.C., November 1957, pp. 174–9.

[19] Insofar as communities offering similar patterns of public goods cluster together—such as wealthy areas—spillovers tend to be equal.

and, as a matter of degree, nonnational goods such as schools is determined through the political process. To the extent that demands differ, a partial solution at the nonnational level is offered through the mobility of people to communities where the pattern of services provided suits their tastes.