

Fiscal Federalism : (b) Redistributive Taxes and Zoning

One of the key assumptions underlying the Tiebout model was the assumption that the local public sector was financed by a head tax, or by a user charge which was the same for each household.

Recall that, by definition, a **local public good** is **rivalrous**. The cost to a jurisdiction of providing a level of public service z to each of P people was assumed to equal czP for some unit cost c . That is : if a jurisdiction has chosen to provide a level of public service of z , then if one more household chooses to live in the jurisdiction, the total cost of the jurisdiction's public sector rises by cz , the cost of providing the local public good to one more household.

Given that a local public good is rivalrous, the efficiency condition for provision of the good is the same as for any private good. If x is some ordinary private good, then the allocation will be efficient only if

$$MRS_{zx}^h = MRS_{zx}^i = MRT_{zx}$$

for any two households h and i in the metropolitan area, where MRS_{zx}^h is household h 's marginal rate of substitution between the local public good and the private good x , and where MRT_{zx} is the marginal rate of transformation.

Why doesn't the Samuelson condition for efficiency apply here? The Samuelson condition applies only for **non-rivalrous** goods. The marginal benefit of a little more of a good should be added up over all people only if all people can consume (simultaneously) the increment in provision of the good. With a rivalrous good, that is not the case. One more desk in a primary school cannot be occupied by more than one student.

In Tiebout's model, the menu of local public good levels provided by different jurisdictions led to an efficient allocation. Each household chooses to locate in a jurisdiction providing a level of public output such that the household's indifference curve is tangent to a line with slope c , as in figure 2. Here c is the marginal rate of transformation : it is the cost of a little more of the local public good (in terms of foregone consumption of the numéraire private good). The slope of the indifference curve is the household's MRS .

But why was the slope of the line in figure 2 equal to $-c$? The line had that slope because each household was assumed to pay the cost of providing its own local public good consumption, cz . That meant moving to a jurisdiction with a level of local good provision which was higher by Δz would cost the household $c\Delta z$ in additional taxes.

Suppose instead that the household paid only half the cost of the local public goods it consumed in a jurisdiction. Then the income available for private consumption for the household would be $y - (0.5)cz$, if it located in a jurisdiction providing the level z of the local public good, where y is the household's before-tax income. Changing z by Δz would decrease the household's private consumption by only $(0.5)c\Delta z$. So the opportunity set faced by the household, corresponding to the (z, x) combinations available in different jurisdictions, would have a slope of $(-0.5)c$, not c . The household would choose, as its most preferred location, a jurisdiction providing it a (z, x) combination such that the slope of its indifference curve equalled this slope $(0.5)c$ of the line. So

the household's choice would lead to an outcome at which $MRS_{zx}^h = (0.5)MRT$, which is not consistent with efficiency.

Moreover, if one household is paying **less** than the cost of the local public good which it consumes, some other household in the jurisdiction must be paying **more**. For that other household, paying more than cz in taxes in a jurisdiction providing z , its opportunity set would have a slope greater than c (when z is on the horizontal axis, x on the vertical). This household i would choose a location such that $MRS_{zx}^i > c > MRS_{zx}^h = (0.5)c$. So different households would have different MRS 's, violating another condition for efficiency.

So if there is some redistribution in the local public sector — if some households have to pay less than the cost of the local public goods they consume, and others have to pay more — then the outcome of people voting with their feet will not be efficient. Tiebout's model required that people paid the actual marginal cost of differences in local public good levels when they made their location choices.

The local public sector in Canada (and in the United States, and in every other country) does not use head taxation. User charges are becoming increasingly popular in the local public sector. However, the main revenue source for local government (other than grants from the provincial government) is the property tax. Some large American cities levy personal income taxes of their own as well.

Under either property taxation, or income taxation, people are **not** always paying exactly the cost of the local public goods they consume. Under property taxation, how much of the cost of the local public sector that a household pays depends on the value of the house (or the value at which the tax authorities assess the house). Suppose that the **average** assessed value of houses in a jurisdiction is \bar{h} . Then if the local government funds its expenses completely through property taxation, the property tax rate t in the jurisdiction must obey the equation

$$t\bar{h} = cz \tag{1}$$

That is, on average, the tax collection per household must equal the cost of the local public sector per household. Now suppose some household would choose a house of value h , if it were to choose to reside in this particular jurisdiction? What would it pay in local property taxes? Its taxes would be th . Solving for t from equation (1), that means that the taxes paid by the household would be

$$\frac{h}{\bar{h}}cz \tag{2}$$

Expression (2) says that a household will be paying less than the cost of the local public goods it consumes, if (and only if) the house it occupies is less valuable than the average for the jurisdiction.

Expression (2) implies that the total taxes paid to live in a jurisdiction depend on the household's housing consumption, **relative to the average in the jurisdiction**. If the household were to occupy a house assessed at \$300,000, wherever they chose to live, then their taxes would be more than the cost of the local public goods they consumed when they lived in a jurisdiction

with an average assessed property value of \$200,000, but less than the cost of the local public goods they consumed if they lived in a jurisdiction with an average assessed property value of \$400,000.

[Implicit in this entire discussion is the assumption that the cost providing a level z of local public goods to a household is **the same for every household**. Not only might it be true that this cost varied with different households, but this cost might vary with the size of house occupied. Families with more children occupy bigger houses, other things equal. And it will cost more to provide primary education to families with many children. It may cost more to provide police protection, and garbage collection, to larger houses. To take account of these factors, the analysis would have to be modified slightly. The local public sector will redistribute from those in large houses to those in small houses provided that the added costs of providing services to the families in large houses was less than the added taxes paid by the families in large houses.]

Expression (2) is relevant both to households choosing where to live, and to existing residents of a jurisdiction. Expression (2) decreases with the average assessed value of the houses in a jurisdiction. Holding everything else (including the quality z of the local public sector), it costs less to consume the local public sector in a jurisdiction with a high average property value. Prospective migrants will want to move into high-income jurisdictions, since those jurisdictions have higher average property values.

But equation (1) says that the tax rate in a jurisdiction decreases with the average property value. If new migrants choose to live in houses which are assessed at values less than \bar{h} , then their moving in will lower the average property value in the jurisdiction, raising the tax rate t . Conversely, immigration by people who buy houses of above-average value will lower tax rates to everyone living in the jurisdictions. So existing residents want to attract high-income migrants, since this will raise the tax base per capita, and lower the tax rates.

Summarizing, redistribution at the local level influences both the location decisions of prospective migrants, and the impact of immigration on existing residents of a jurisdiction :

i other things equal, prospective migrants want to locate in a jurisdiction with the highest tax base per capita of all the locations from which they are choosing

ii other things equal, existing residents of a jurisdiction will be harmed (by facing higher tax rates for a given quality of local public sector) whenever someone moves in whose income is lower than the jurisdiction's average

The second result just listed holds whenever a household's tax liabilities rise with its income. This will certainly be true if the local government finances its public sector through an income tax. But it will also hold if a property tax is used, if housing is a **normal good** : holding other things (such as age, family composition, and tastes) constant, demand for housing tends to be an increasing function of the household's income.

These two results together suggest that the combination of free mobility among jurisdictions, and a redistributive local tax can lead to the "poor chasing the rich".

Notice that, at least in this model, the antagonism of existing residents towards immigration by lower-income families does not stem from any form of prejudice. Even if existing residents did not really care intrinsically about their neighbours' socio-economic status, they still want to see their own tax rates as low as possible. As long as low-income immigrants pay less in taxes than the cost of providing them with local public goods, their presence will raise taxes of existing residents. It is this "fiscal externality" which makes people care about their neighbours' incomes in the model used here.

So existing residents will want to keep out low-income immigrants (and attract high-income immigrants). One method of doing so would be to alter the public expenditure decision. Other things equal, prospective immigrants will want to locate in a jurisdiction with a high tax base per capita. But among the other things are the level of local public good provision. If the local public good is a normal good, then low-income households would prefer jurisdictions with a lower level of provision, if the "price" they pay is held constant. In Tiebout's model, the price is the same for each jurisdiction : it's just c per unit of local public good. So, if the local public good is normal, different jurisdictions would attract different income classes in the Tiebout model. In that model, everyone pays the same price per unit of the local public good. So, if the good is normal, higher income people will choose to locate in jurisdictions providing a high level of z (and charging high taxes to pay for it).

With the local public sector funded by property tax, the price to prospective immigrants of the local public good will not be the same everywhere. From equation (2),it's

$$\frac{h}{\bar{h}}c$$

per unit of the public good.

Nonetheless, if the local public good is normal, low income people would tend to prefer jurisdictions which provided less of the public good. If some high-income jurisdiction raised its level z of public good provision sufficiently, it might deter entry by low-income residents. Even though the prospective immigrants face low taxes per unit of the local public good, they have to consume more of the local public good than they want.

Figure 3 illustrates. In that figure,the prospective immigrant (whose indifference curves are illustrated in the figure) would prefer to locate in jurisdiction B , even though jurisdiction A offers a lower "price" $[h/\bar{h}]c$ for the local public good. Because the quantity z of local public good provision in jurisdiction A is so high, the combination offered by b puts the household on a higher indifference curve.

This over-provision, as a means to exclude low-income residents, may be a fairly costly mechanism for existing residents to keep their tax base per capita high. In order to make their jurisdiction unattractive to the people they want to exclude, they may have to increase the level z of local public good provision well above the level that they themselves would prefer. (That is, the level z preferred by existing residents of jurisdiction A might be to the left of the point a in the diagram, so far to the left [along the "budget set" for jurisdiction A] that prospective migrants would prefer

it to *b*. Only by moving farther down and to the right than their own preferred point can existing residents make their jurisdiction less attractive to the low-income immigrants than *b*.)

A more direct mechanism to control the tax base is through zoning legislation. Almost every incorporated municipality in Canada or the United States has a comprehensive plan, which restricts the type of use to which land may be put. Many of these restrictions are motivated by the fiscal incentives considered here.

The more expensive the property, the more taxes will be collected from it. So existing residents of a jurisdiction would like to restrict new housing to units which are much more expensive than existing houses. That way, each new resident will pay much more in property taxes than the cost of provision of local public goods to her household. The problem is : each resident wants to get into the richest jurisdiction she can get into.

So where will I locate, if all my prospective destinations have comprehensive zoning plans? Suppose that they all restrict new housing to be at least as big as existing housing. That is, if the average property value in some suburb is \$300,000, then that suburb will restrict new development to houses of \$300,000 or more. These are the only new residents whose presence will raise the tax base per capita (and lower tax rates).

If I am planning on living in a house worth \$300,000, what are my location options? There may be rich suburbs with houses worth \$500,000 or \$600,000. I would like to move into one of those suburbs [if their local public good provision level is not too high : and with zoning, they will have no incentive to “over-expand” the local public sector]. The trouble is, they don’t want me. They have passed zoning laws which restrict new housing to be worth at least as much as their average property values, which is more than I want to spend.

On the other hand, there are poorer jurisdictions which want me to move in. Any jurisdiction in which the average property value is less than \$300,000 would welcome me, since my taxes will more than cover the cost of the local public goods provided to my household. The trouble is, I don’t want to subsidize other people. If I move into a town with an average property value of \$200,000, then my taxes will exceed the cost of my household’s local public good consumption. Expression 2 says that my taxes are higher in jurisdictions with low average property value.

In other words (as Groucho Marx allegedly claimed) : I don’t want to join any club which wants me to join it. Rich jurisdictions don’t want me ; I don’t want poor jurisdictions. The best feasible solution for me is to find a jurisdiction in which the average property value is \$300,000, the same as mine. Any lower a value, and I would face higher taxes. Any higher a value, and I would not be allowed in.

So the result of fiscal zoning is that households move into jurisdictions in which the average property value is the same as the value of their own house. The possibility of this “perfect” fiscal zoning, and the availability of a large number of different jurisdictions, mean that different income classes locate in different jurisdictions, just as in the original Tiebout model. Each jurisdiction will contain a different “slice” of the income distribution.

If zoning laws can be sufficiently restrictive, the outcome of people’s location decisions will be

exactly the same as the outcome of the Tiebout model. That outcome is efficient. Since property values are the same within a jurisdiction, each household's tax bill will be the same, and will equal the cost of the local public goods provided to the household. When I choose where to locate, the effective price per unit of the local public good is c , as in the Tiebout model — even though the property tax is used to finance the local public sector. There are richer jurisdictions, in which the price to me would actually be less than c per unit — but zoning laws exclude me from living there. There are poorer jurisdictions, in which the price to me would exceed c — but I don't want to live there.

This extreme result — that zoning makes the property tax into a head tax — depends on very detailed and strict zoning laws. In practice, these laws control only some attributes of people's houses : the size of the lot, the percentage of the lot which must be left as open space, the number of residents per hectare. These attributes are very strongly correlated with the value of the house, so that many of the zoning rules in practice may be fairly close approximations of the “perfect” zoning by property value considered here.

Although zoning makes the outcome efficient, it also eliminates any redistribution. Although a local property tax (or a local income tax) will redistribute from rich to poor within a jurisdiction, this will not happen in practice if there is little variation in income within a jurisdiction. In many American metropolitan areas, there seems to be very little income heterogeneity within suburbs. This homogeneity may be a result of the fiscal incentives created by a redistributive (in theory) local tax.