Economics 230a, Fall 2013
Lecture Note 9: Property Taxes, the Tiebout Model and Education Finance

In the United States, about one-third of public spending is provided by state and local governments. The logic of having lower levels of government provide public goods is that such governments are closer to individual voters and hence may be more responsive to their preferences; also, local or state provision may allow greater flexibility with respect to heterogeneity of tastes across locations. On the other hand, lower level governments may not be able to take full advantage of economies of scale in the provision of public goods, and may not fully internalize the effects of their policies on residents of nearby jurisdictions. Thus, a key question in the area of fiscal federalism, which considers the role in a fiscal system of governments at different levels, is the optimal assignment of responsibilities among jurisdictions.

As one of the most important areas of local public spending is public education, much research is devoted it. In public economics, there has been considerable attention to school finance and how different methods of finance affect school spending levels and student outcomes. In the United States, much of the cost of public education is covered by property taxes, and property taxes are an important source of revenue for local governments. The incidence of the property tax is therefore a question that comes up frequently in analyses of local government behavior.

The Tiebout Hypothesis

How might sorting of individuals across jurisdictions lead to an efficient provision of public goods? The Tiebout hypothesis provides an answer, at least in a very stylized model. Imagine that local governments provide goods that may have nonrival aspects of consumption, but are not pure public goods in that not any number of individuals may consume a given unit. For example, nonrival consumption may be limited by distance (e.g., a public park or police protection). We summarize this by saying that

(1) The average cost of provision across individuals is u-shaped – there is a minimum cost at a finite number of individuals greater than 1;

(2) Exclusion is possible; in particular, individuals not in the jurisdiction do not have access to the publicly provided goods;

(3) A particular government's spending decisions have no direct impact on individuals in other jurisdictions – there are no externalities;

(4) Individuals have costless mobility across jurisdictions;

(5) Governments cover the costs of their spending through uniform (within jurisdictions) lump-sum tax assessments on residents; and

(6) There is a large number of jurisdictions relative to the number of individuals with distinct preferences regarding public spending.

Incorporating these assumptions, the Tiebout hypothesis is that local government provision will result in an efficient outcome, with individuals sorting among jurisdictions according to their tastes for the level and mix of public goods. The intuition is that local governments will provide a bundle of goods, for which the lump-sum tax paid by residents serves as a price. Individuals simulate market choices among goods by choosing among locations, and competition among jurisdictions ensures that production will be efficient (at the point of minimum average cost) and that individuals will have access to their respective optimal bundles of goods.

The Tiebout hypothesis provides a striking way around the preference-revelation problem we typically associate with public goods provision. Excludability means that the free-rider problem can be avoided, and individuals "vote with their feet," so that in equilibrium the valuation of public goods is the same among all those in any particular jurisdiction. Although its underlying assumptions are not realistic, the Tiebout hypothesis certainly captures some elements of community formation and sorting, particularly if one focuses on residential communities within a metropolitan area; some communities may have higher taxes and better public goods than others, and different communities may offer different bundles of public goods.

Note that, in a Tiebout equilibrium, there will be income heterogeneity within any jurisdiction, to the extent that tastes for public goods vary. For example, if public goods are "normal," then individuals with a strong taste for public goods will live in the same community as others with a weaker taste for public goods (in terms of budget share) but higher income. Since each resident consumes the same bundle of public goods and pays the same price for them, there is no incentive to exclude lower income residents. But this conclusion changes if we alter one of the model's assumptions, that public spending is financed through lump-sum taxation. Suppose, instead, that local governments must use residential property taxes. (A similar outcome would result for any tax related to income or ability to pay.) Then there will be three sources of distortion introduced:

(1) Once in a community, individuals will be discouraged from purchasing housing, as the increased property taxes will not be associated with more public goods.

(2) Individuals will face different taxes for the same bundle of public goods in different jurisdictions, depending on who else lives there. For example, a wealthy community with more expensive houses will be able to charge less per unit of housing to provide the same level of public goods. This will lead to a situation in which the poor seek to move into wealthy communities, and the wealthy seek to exclude the poor.

(3) As there will no longer be homogeneity in preferences for public goods within a community, a decision by majority vote regarding the level of public goods provision will be subject to the usual problem that the outcome is unlikely to be efficient, given the distribution of tastes within the community.

The relative sizes of these distortions are examined in the paper by Calabrese, Epple, and Romano (with community shifting being found the costliest).

The Tiebout model can be "rescued" by adding residential zoning to property-tax finance, a point first made by Hamilton (1975). Suppose that there are a sufficient number of communities so

that individuals can sort not only by the level of public goods, but also by the level of housing. Now, set the minimum level of housing for a community equal to the amount that would be purchased by residents under lump-sum taxation. Then, facing property taxation instead, individuals would prefer to purchase less housing, but will be unable to do so. Thus, they will be at a corner solution for housing demand, at the minimum level allowed in the community. But this will result in exactly the same equilibrium within the community as under lump-sum taxes. If each community follows this procedure, then the same overall distribution of individuals among communities will result; while an individual might wish to move to a wealthier community to partake of their cheaper public goods, zoning will prevent this; and there will be no incentive to move to a poorer community, for the outcome there will be worse than before from the individual's perspective (same public goods plus a distorted housing choice). While the addition of zoning makes property-tax finance look more like lump-sum-tax finance, it does so at a considerable cost of generality. Now, communities must be homogeneous with respect not only to public goods demand, but also housing demand.

Within the context of the Tiebout model (the version based on property taxes and zoning), we can initially address the question of property tax incidence. If one looked across jurisdictions at variations in the rate of property taxation, what would the effect on property values be? First, we should specify that property taxes apply to the full value of house plus land. To the extent that housing stock can be adjusted, we would expect that property taxes on houses would not be capitalized into property values in the long run, just as in the long-run analysis of the Harberger model. But land is immobile, so differences in taxes on land might affect land values. However, under the Tiebout hypothesis, property taxes differ because optimal bundles of public goods differ. We therefore shouldn't expect higher property taxes to be associated with lower property values, because the higher property taxes are also associated with higher levels of public spending. This conclusion could be altered if, for example, some local governments were more efficient than others, with less efficient local governments using higher taxes to provide the same level of public services.

In the short run, of course, we wouldn't expect immediate adjustment of the housing stock to property taxes, so a change in policy could have an impact on housing values. Indeed, this offers an alternative perspective on equilibrium with property taxes in the absence of zoning restrictions. In this case, as we have discussed, individuals would seek to move into communities with higher-income people who have large houses and pay substantial property taxes. But with a fixed housing stock in each community, this movement is not possible in the aggregate. As a result, houses of different sizes in a given community, which have different property taxes and yet come with the same bundle of local public goods, will have prices reflecting this pattern. In particular, expensive houses, which have higher than normal property taxes, will have the excess taxes capitalized into lower property values, while inexpensive houses, which have lower than normal property taxes, will sell at a premium that reflects the "bargain" price at which the public goods are being obtained. In this way, one can once again have heterogeneity of housing within a Tiebout equilibrium with property taxes and no zoning, but only to the extent that the housing stock is fixed. Otherwise, we would expect to see responses to the capitalization, for example property owners seeking to subdivide land to increase the ratio of capital to land and sell more "bargain" houses. See Mieszkowski and Zodrow for further discussion of housing heterogeneity and capitalization.

Fiscal Spillovers and Federal Grants

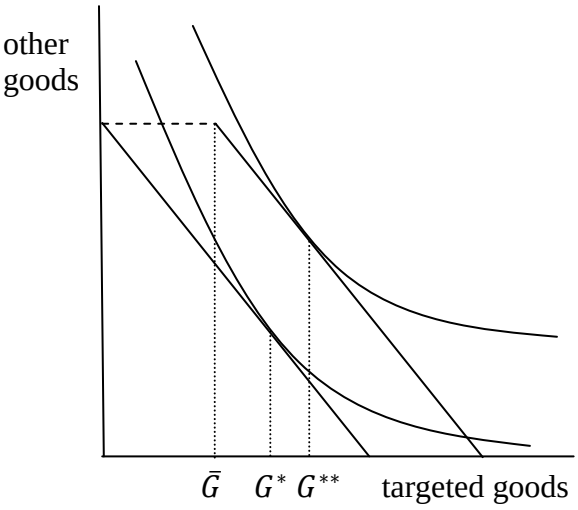
Another key assumption of the Tiebout model is that government decisions in one community have no spillovers in other communities. One type of spillover is the classic externality, where a government's policy directly has either a positive or a negative impact on individuals outside the community. For example, one government's increased spending on police enforcement might increase crime in a neighboring community. A fiscal externality is one where the tax base of one community is affected by the tax policy of another. For example, if one community raises its sales tax (which US local as well as state governments to raise revenue), this may increase the sales tax base in the neighboring community, as shoppers flee the higher tax. As in the case where private individuals or firms are a source of externalities, local government decisions having externalities will not be efficient from a *national* perspective. A potential policy response to local spillovers is for a higher level of government to implement some sort of a Pigouvian solution. In the case of a positive externality, this might take the form of a matching grant, by which the higher level of government pays for a fraction of the cost of a local public expenditure, at the margin.

Types of Grants

It is common for higher levels of government to provide grants to lower levels of government. In the United States, the federal government provides funding to state governments and local governments, and state governments also provide grants to local governments. One simple argument for such a pattern is efficiency in revenue collection, if there are fixed costs to administering a tax system. Another is the motive for redistribution; a national progressive income tax partially redistributed to states on, say, a per capita basis serves to transfer resources from higher income states to lower income states. (Note, though, that if redistribution were the primary motivation, this objective could be more directly targeted using transfers to individuals rather than to areas.) Corresponding to these motivations might be the simplest form of grant, simply an unrestricted, fixed amount, sometimes called a block grant.

Matching grants are typically targeted to a specific purpose, and involve the higher level of government paying for a fraction of costs at the margin. In the United States, the Medicaid program for indigent individuals works this way – the program costs are shared by the federal and state government, but the state government can determine the generosity of the program. As discussed above, matching grants might be justified in the case of positive externalities. With Medicaid, one might argue, the positive externality is caring for the poor. If caring for the poor is something that is in the national interest, then any jurisdiction that cares for the poor is generating positive externalities for other jurisdictions. The question also arises whether direct federal provision, rather than state provision with matching grants, might be preferred. There is a trade-off here, in that state provision makes it easier to adapt to cross-state differences in conditions and tastes, while federal provision more directly internalizes externalities.

Categorical grants are provided for specific expenditures, but typically not as matching grants; for example, $100,000 for school spending. What impact would be expect such grants to have, on spending in the targeted category as well as other local private and public spending? Consider the impact on the local budget constraint:



A categorical grant should shift the budget line to the right, as shown. If the local community remains at an interior solution (with spending on targeted goods to the right of $\bar{G}$), the grant should have only an income effect, increasing spending on targeted goods from G^* to G^{**}, with the remaining amount of the grant spent on other public and private goods. However, there have been empirical studies finding a much larger response on spending in the targeted category, suggesting less fungibility than our standard analysis suggests. This finding is commonly referred to as the flypaper effect. See Hines and Thaler (*JEP*,1995) for further discussion.

Education Finance

In the United States, an important share of local government spending goes toward primary and secondary public education. To a considerable extent, this education is financed through local property taxes. This can lead to large differences in school spending per pupil between rich and poor districts, and state governments typically intervene to lessen these differences. An interesting question is why differences in schooling, rather than in resources overall, are the policy objective. Potential answers include (1) some sort of specific egalitarianism in the social welfare function, meaning that we seek to narrow differences in certain categories of consumption, such as housing, health care, and education, rather than differences in overall well-being; (2) paternalism, i.e., the view that poorer districts may undervalue education spending; and (3) some sort of positive social spillovers from an educated population.

Hanushek discusses how various funding formulas work. Here are some examples:

(1) Foundation level funding: Let B be the locality's tax base per pupil and N be the number of pupils. The state government wishes to allow the local government to provide a basic, or "foundation" level of funding, F, per pupil, when imposing a "normal" property tax rate, r_0, on the tax base, so the state provides the difference via a grant: $G = N\cdot(F\text{-}r_0B)$.

(2) Power equalization funding: the state government provides grants to compensate for differences in the locality's tax base from some "normal" level, B_0; that is, with the grants the locality's revenue at tax rate r equals rB_0. Thus, the grant is $G = N\cdot r(B_0\text{-}B)$.

Both formulas provide higher grants to districts with lower values of B, but with different marginal incentives. To see this, note that under the foundation grant, $dG/dr = 0$, whereas under the power equalization grant $dG/dr = N\cdot(B_0\text{-}B)$. Thus, the former has only an income effect while the latter also has a substitution effect, via a matching grant with the match rate higher the lower is the tax base per pupil. Thus, for a given size grant, we would expect a stronger impact on spending by poorer districts and greater equalization under the power equalization formula.

California's approach is essentially power equalization, but with the added constraint that *r* is fixed, so that spending per pupil is (approximately) equated across jurisdictions. But, in a voting equilibrium, at what level will the spending be set? Once state spending is equalized, we can think of the level as being the one corresponding to the preference of the median state voter, whose identity will depend, among other things, on how progressive the state source of funding is. One way of thinking about the difference between state provision and local provision is that the uniform level of state provision corresponds to the preference of the median state voter, whereas the average value of locally provided education corresponds to the *mean* of preferred education levels, since each district can choose its own spending. Nechyba (Table 9), in simulating a general equilibrium model of education provision and voter choice, finds that under uniform state provision the level of education spending per pupil is lower than the average under pure local property financing as well as variants of the two systems discussed above (which in his simulations correspond to a "targeted block grant" and a "targeted matching grant.") Nechyba also discusses the modeling of school choice, in particular what happens when there are private schools and how vouchers might be designed. Among the interesting conclusions are that facilitation of school choice may reduce housing segregation by income, since the link between schools and housing location is weakened.