The Tiebout model

There are as many communities as there are types of preferences (maybe because there are no setup costs to beginning a new community). Suppose that for any level of public good, the per-capita cost curve (total cost per person) for the public good has a unique minimum. So higher per-capita cost is associated with higher amounts of public good (in this sense it is not a pure public good - the only way it is public is that you can’t exclude anyone within a community from consuming it, you can exclude people from joining the community). This assumption prevents there from being communities with many different types of preferences due to economies of scale.

With a minimum per-capita cost, each community has a population corresponding to that minimum per-capita cost. If a community had a larger population, some people could break off and form a new community with population at the minimum per-capita cost and get the same amount of public good at a lower cost. If a community had a smaller population, they could attract members of other similar communities by promising lower taxes because the larger community would have lower cost per capita.

$G_i$ is the amount of public goods spending in community $i$. $N_i$ is the number of people living in community $i$. $G_i/N_i$ is the tax paid by each person in community $i$. The result is that people end up in communities with those who have the same preferences. For any given preferences, the communities are ranked. So people with the same preferences choose the same one.

How is the equilibrium reached? Suppose you have a group of people in a community with identical preferences. Then they should be able to agree on provision of the public good. The cost could be divided evenly among the people in the community. The amount of public good chosen by everyone in the community in Nash equilibrium is then the efficient amount - given that the cost is divided equally among everyone, and that everyone has the same demand curve for the public good, the quantity chosen at that ”price” is the quantity where the sum of the demand curves intersects the marginal cost curve. Once this is done, no one has an incentive to move away. This is because there will never be a community which has more public good but lower per-capita cost, because higher amounts of public good are associated with higher per-capita cost.

Problems with the Tiebout model

Problems with Tiebout competition

For the predictions of the Tiebout model to hold - that local public goods provision is efficient - some unrealistic assumptions must be made.

1. People must be willing to ”vote with their feet” if public goods provision is
not efficient in their town. But in reality people might get settled in one place; they might not be willing to move every time they find out about an inefficiency. More realistic models impose some cost of moving.

2. People find out immediately about the manner of public goods provision in their town. In reality, it may not be common knowledge that the town is providing some public good inefficiently. Even if the newspaper reports it, a person may not be paying attention.

3. There must be a large range of towns from which to choose. But in some areas towns are spread out and to move away would mean having to find a new job.

4. There must be enough towns from which individuals can choose, but also enough individuals so that there are a lot of individuals in each town. This is because many public goods require a sufficient scale to be provided efficiently. There are large fixed costs for the construction of a park, but only small marginal costs for the use of the park by an additional consumer. Therefore a park used by 1000 people can be financed by a smaller property tax per household than a park used only by 10 people.

Problems with Tiebout financing

The Tiebout model requires the tax on each resident of a town to be equal. Such a tax can be viewed as inequitable, as it does not depend on wealth, income or consumption. Rich and poor would pay the same amount of tax.

In reality, towns usually finance public goods through property tax, in proportion to the value of homes.

Financing through a property tax would tend to make people want to live in a town with richer people than themselves.

Zoning counteracts this tendency. Zoning regulations are restrictions on how real estate property can be used. A common zoning regulation is a restriction on how many people can live in a building. By prohibiting multi-family housing, the amount of housing in an area is lowered, so the value of existing houses in an area is inflated. Thus poorer people can’t afford to live in that area.

No externalities/spillovers

The Tiebout model assumes that the effects of public goods provision in one town do not spill over into neighboring towns. If there are such spillovers, then it may be better to provide the public goods at a higher level of government than local.

When deciding on whether to build a park, a town generally considers only the preferences of its residents. But people outside the town may want to use the park as well. Then there may be an inefficiently low level of provision of park services. The park should be built if the social benefits to all of society of building it exceed the cost, but it will only be built if the benefit to residents
in the town exceeds the cost.

Similarly, if one town provides inadequate police protection, criminal activity in that town could spill over to other towns, if one town doesn’t fix its streets, drivers from other towns suffer from potholes when they drive through, education has external effects on the whole society.

When there are significant externalities or spillover effects on other towns from the provision of a public good, it may be optimal to provide it at the state or federal level.

Evidence on the Tiebout model

Despite the unrealistic assumptions imposed by the Tiebout model, there is some evidence that provision of local public goods is consistent with the Tiebout description.

The model predicts that people living in the same town should have similar preferences for local public goods. The more local communities there are to choose from, the more residents can sort themselves into group of similar individuals. One could therefore test whether when people have more choice of local community, the tastes for public goods will be more similar among residents of one community than when there is not much choice.

Gramlich and Rubinfeld (1982) surveyed Michigan households about their demand for public goods. They found that in large metropolitan areas preferences were more similar within each town than in smaller areas with fewer towns to choose from.

Also, in urban or suburban areas people were more satisfied with the level of public goods provision than in non-urban areas.

Capitalization of fiscal differences into house prices

Tiebout model predicts that differences in the fiscal attractiveness of a town will be reflected in housing prices. The price of a house depends on the costs and benefits of living in that house. Costs include property taxes; benefits include the level of public goods provision in the town. Towns with high property taxes relative to the level of public goods provision should have low house prices; town with low property taxes relative to the level of public goods provision should have high house prices. This is ”voting with the pocketbook” - people are willing to pay more for a house with inexpensive public goods provision.

There is evidence for voting with the pocketbook. Rosen’s 1982 study of the effects of Proposition 13.

Proposition 13 mandated that the maximum amount of a tax on property could not be more than 1% of the ”full cash value” of the property, defined as the value as of 1976, with annual increases of at most 2%. If the property was sold the full cash value would be the sale value.

Rosen (1982) examined tax rates and housing prices in 60 municipalities in the
San Francisco area 6 months before and 6 months after the vote on proposition 13. The treatment group was towns with high property tax rates before 1978. The control group was towns with lower property tax rates before 1978. Treatment group saw a large reduction in property tax rates after 1978, control group saw less of a change. This setup provides a quasi-experiment for the impact of property taxes on house values.

Rosen found that a $1 decrease in property tax increased house values by $7. For lower property taxes to be fully capitalized into house prices, house prices should rise by the present discounted value of all reduced future tax payments. Thus house prices would rise by \((1/r)\) for each dollar reduction in property taxes, where \(r\) is the real interest rate. Interest rates at the time were 12%. With full capitalization house prices would have risen \(1/0.12 = 8.33\) for each dollar in reduced property taxes. A $7 rise per dollar of reduced property taxes implies close to full capitalization.

This means that Californians either did not value the public goods financed with the tax money very much or that they did not expect to lose much of them due to lower property taxes. Rosen conjectured that they assumed the state would continue using its funds to offset losses. But this did not happen.

Optimal fiscal federalism

What are the implications of the Tiebout model for the optimal design of fiscal federalism? According to the Tiebout model, three factors determine which public goods should be provided locally:

1. Tax-benefit linkages. How much of a link is there between taxes paid and benefits received (tax-benefit linkage). For local roads, there is a strong tax-benefit linkage. Higher property taxes fund better-quality roads, which benefits most town residents. Thus roads should be provided locally. But public goods such as welfare payments to low-income residents have little tax-benefit linkage, as the majority of residents don’t benefit from this. Thus welfare should be provided at the state or federal level.

Residents may not be willing to pay local taxes unless they can see the benefits these taxes provide to them. If not, they may just move to another town with a more preferred level of taxes and benefits.

2. The amount of externality or spillover due to the public good provision. If a local public good has large spillover effects into other towns, then it will be underprovided by the town. It should then be provided by the state or federal government.

3. Economies of scale - public goods with large economies of scale (declining average costs over a large range) (e.g. national defense) cannot be efficiently provided by many localities. Instead they should be provided by the federal government.

These discussions conclude that local governments should focus on providing
public goods that have few spillover effects or externalities and low economies of scale. Local governments should have limited involvement in redistributive public goods (cash welfare), goods with large spillover effects (education) or large economies of scale (national defense).

In general, the distribution of public goods provision follows this pattern, but not completely. Local governments finance public works, state government and local governments split the financing of education, redistributive programs are financed by state and federal governments, defense is national. Should education be financed by the federal government instead? Currently it provides only 10% of education spending.

Section 10.3 - Redistribution across communities

There is much inequality across communities, for example in terms of how much revenue is raised per student in public school. In the state of Illinois, a study found that the property values per public school student vary by a factor of more than 10. Poorest 5% of communities had property values per student of less than $45,000, richest 5% have property values per student of more than $467,000. Should policy makers rectify this?

Two arguments for it.

1. Failure of the Tiebout mechanism. There are reasons why people can’t always vote with their feet. For example, zoning rules cause houses to be very expensive in towns with large amounts of public goods provision. There may be people who like high amounts of public goods but can’t afford to move to such areas. They are stuck in places with low public goods provision. It could then be efficient to redistribute to the low public goods towns.

2. Externalities. Suppose that high-quality elementary education leads to lower crime rates in that town and in neighboring towns. Then it may be optimal to tax high-revenue towns to pay for high-quality education in low-revenue towns.

Grants

Intergovernmental grants are transfers from one level of government to another. There are transfers from state to federal and from federal to state, and between them and local governments.

Use the example of a state redistributing money to local communities. Suppose the only public good provided to the residents of a town is education. Education is financed through property taxes. The money people have left over after paying for taxes is spent on private goods. Before any state grants are given, residents of the town spend some amount on private goods and some on taxes to finance education.

Matching grants - the amount of grant provided is related to the amount spent on education by the town. A one-for-one matching grant provides $1 of state funding for each $1 of education spending by the town. The one-for-one matching grant has both income and substitution effects. The income effect is that the
town now has more income, so it spends more on education. The substitution effect is that education is now less costly relative to private goods (because $1 of education spending by the town buys $2 of education spending), so more is spent on education. In this case, substitution and income effects go in the same direction, of more spending on education. For spending on private goods, the substitution and income effects go in opposite directions (income effect causes more spending on private goods, substitution effect causes less), so the spending on private goods could be increased or reduced.

Block grants - the state gives the town some amount of money $G$, with no restriction on how it should be spent. The block grant has only an income effect. It can cause both education spending and private spending by the town to increase.

With the same amount of grant in each case (matching and block), and forgetting about the externalities due to education, the town will be made at least as well off by the block grant. This is because there is room for more choice about whether to spend it on public education or on private goods. If the tastes of the town were such that it would spend all the block grant money on education, then the block grant and the matching grant would have equal effects; the town would be equally well off under either.

So the optimal choice of grant mechanism depends on what the state government wants. If the state government wants to maximize the welfare of the local government, then block grants will be best. If the goal is to encourage spending on education (due to the external benefits of education, then matching grants will be more effective.

Conditional block grant - a fixed amount of money given to the town under the condition that it be spent only on education. Suppose the government gives the town the same amount as before, but mandated that it be spent only on education. If the town is already spending more than the grant amount on education, then the conditional block grant will be no different than the unconditional block grant. The town will just put the grant money towards education and reallocate its remaining money in its optimal way, between education and private goods.

The only way a conditional block grant can have an effect different from an unconditional block grant is if the town was initially spending less than the amount of the grant. Then it is possible that the post-grant amount the town spends on education is higher than the amount they would have spent if the grant was unconditional.

School finance equalization laws require the redistribution of funds across communities within a state to make sure schools are more equally financed. Local school districts in US get 45% of funding from local sources, mostly from local property taxes. Because of wide variations in property values, there is a lot of disparity in school funding. In Texas, the Leonard school district spends
$7067 per student, and the Bruceville-Eddy school district spends $19,276 per student. States can try to alleviate the disparities by redistributing tax revenues in the form of matching grants or block grants to communities with low property values. Since 1970, every state has made at least one effort to equalize school finances.

The flypaper effect

If block grants are unconditional, or are conditional but less than what the town is already spending on the public good, then they act just like income increases to the town.

Do states reduce their own contributions to public goods when such a grant is received? Researchers studied the spending of states that received larger and smaller federal grants to see whether there is crowding out. Hines and Thaler (1995) found that the crowding out of state spending by federal spending is in fact close to zero (so $1 in federal grants result in close to $1 of state spending). This was described as the "flypaper effect" by economist Arthur Okun because "the money sticks where it hits".

But this and other such studies may be biased. Knight (2002) noted that the states which value public goods the most may be more successful at lobbying for federal grants. Then there would be a positive correlation between spending and government grants because states that get grants are the ones that like spending the most.

Knight proposed a quasi-experiment. He noted that highway grants from federal government to states are determined by the power of the states’ senators and representatives. Thus, treatment states were those where a congressperson gained more power over the period of study (for example due to being appointed to the Senate transportation committee). Control states were those which saw a decrease in power of congressional delegations (maybe because a congressperson with long tenure is not reelected). Knight found that federal grants rise for states with increased power of their delegations. This grant money crowds out the state’s own spending; an additional $1 of grant money increase led to a $0.90 decrease in the state’s own spending. This casts doubt on the flypaper effect.

Structure of equalization schemes. Some states try to completely equalize spending across school districts. California provides a base level of school financing for school districts, prohibits differences between school districts of more than $300 of per pupil spending. When a district spends $300 more than the lowest-spending district, all additional property taxes raised by that district are given to the state.

Some states have a statewide property tax, redistributed to guarantee a base level of per pupil spending for each town. In New Jersey, towns with property values above the 85th percentile in the state get a small foundational grant from the state and have to raise the remainder of their revenues from local
taxes. Towns with property values below the 85th percentile get a matching grant that is a multiple of their own spending.

New York uses a foundation aid formula. A district’s aid equals the difference between the foundation amount and the expected local contribution. The foundation amount is an estimate of what is needed to reach the state’s performance standards (From internet EFAP Column by John Yinger).

The effects of equalization

Studies on the attempts to equalize school finances agree that they have had desired effects, and that there has been an equalization of school outcomes. Murray, Evans and Schwab (1998) found that court-ordered equalizations reduced in-state spending inequality to 19 to 34%. Card and Payne (2002) found that equalizations narrowed the gap in average SAT scores between students with highly educated parents and students with poorly educated parents by 8 points (5% of the gap).

Has this equalization been brought about by raising spending in low-income districts or lowering spending in high-income districts or both? Hoxby (2001) computed the tax price of school equalization schemes, how much money a school district would have to raise to gain $1 more of spending. California school districts have an infinite tax price at spending above a certain level: No matter how much revenue they raise through local taxation they can’t raise local education spending to more than $300 above the lowest-spending district. For New Jersey, the tax price for most school districts is less than 1; a district could raise $0.60 of its own revenue to get $0.40 in state aid - tax price would be 0.6.

Hoxby found that schemes with very high tax prices (like California’s) led to an overall reduction in per-pupil spending. Since any additional taxes beyond $300 above the lowest-spending district are taken by the state, there is not much incentive to raise taxes. California’s equalization caused a decrease in per-pupil spending of 15%. Equalization schemes with lower tax prices like those in New Jersey, New York and Pennsylvania increased per-student spending by 7-8%.