Tiebout sorting

Definition – if shopping and competition among cities are introduced to the public goods market, then the government provision of local public goods will be fully efficient.

Source: Gruber, J (2016) *Public Finance & Public Policy*

Intuition – some individuals value public education, some value recycling, and others value more public parks. Meanwhile, cities each provide a different amount of these public amenities. If one individual is not happy with their cities' provision of public goods then they can shop around neighboring cities, where they may receive the level of amenities that they so desire. Individuals can move, "voting with their feet," to a city that has the right public goods for them.

Mathematical / Technical

- Tiebout sorting occurs when citizens move to attain preferable local amenities.
- The allocation of households across towns is in a Tiebout Equilibrium if and only if the provision of public goods is decided by the median voter, financed equally by town residents, and no two households want to swap positions across towns.
- Suppose there are two types of households across two towns: families and elderly. Their budget and respective utilities for private consumption (C) and public schools (G) are

$$Y = \frac{G}{N} + C$$

$$U^F(C,G) \text{ and } U^E(C)$$

- Tiebout Theorem Part 1: in equilibrium, residents will sort themselves into towns according to their preferences. This creates town A for families and town B for elderly. If there is a household of elderly in town A or of a family in town B and they are willing to switch, then they are not in a Tiebout equilibrium.
- Tiebout Theorem Part 2: In each town, the provision of local public goods is efficient. Town B will have $G = 0$, which is efficient because nobody values G. Town A will have $G = G^*$ such that:

$$G^* \text{ maximizes } U^F(C,G) = U^F\left(Y - \frac{G}{N}, G\right)$$

so that the partial derivative with respect to G is set equal to zero:

$$\frac{dU^F}{dG} = \frac{-U^F}{N} + U_G^F = 0.$$

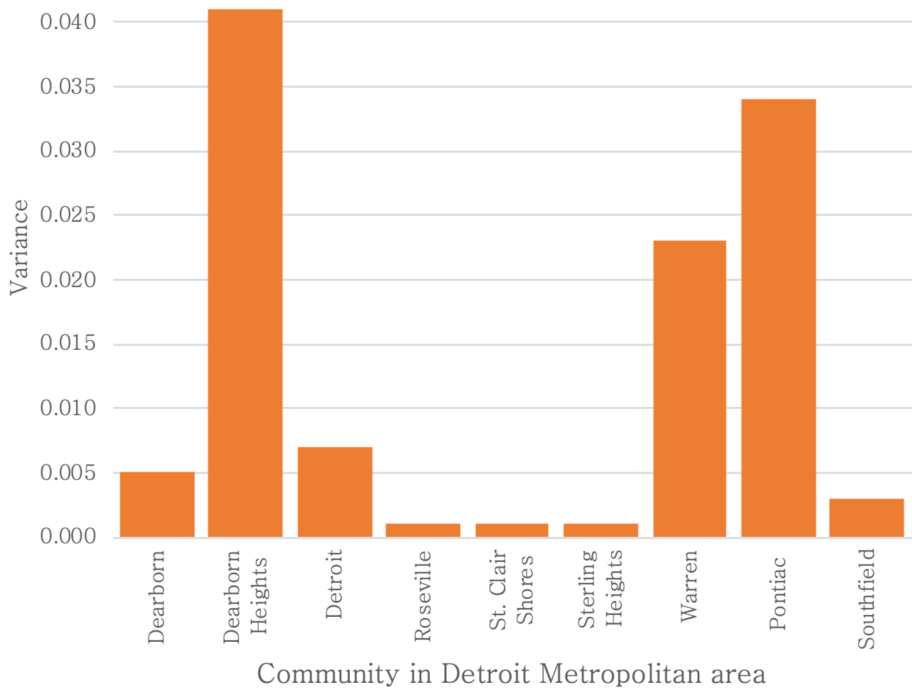
- To satisfy a Tiebout equilibrium, there also needs to be equal financing of public goods across all the residents. To do this in town A:

$$\frac{-U^F}{N} + U_G^F = 0 \rightarrow \frac{U_G^F}{U_C^F} = \frac{1}{N} \rightarrow \text{to tax residents:}$$

$$\sum \frac{U_G^F}{U_C^F} = \frac{N}{N} = 1 = MC \text{ to provide the public good.}$$

- Equal financing can be done through a lump-sum tax, but public goods are more commonly financed through property taxes.

Graphical- Variance of Demand for Public Spending



Tiebout sorting is demonstrated if the intra-community variance is significantly less than the overall statewide variance. Seven of nine Detroit communities have smaller intra-community variances, significant at the 1% level, indicating that these residents sorted themselves. The results for two non-significant communities, Dearborn Heights & Pontiac, imply that the statewide variance is slightly larger than those variances: 0.034 and 0.041.

Source: Gramlich, E., Rubinfield, D., (1982) *Journal of Pol. Econ.*

Real-world aspects – The Tiebout equilibrium is an idealized model that requires numerous assumptions. First, people must have perfect mobility between towns; in reality, moving has high transaction costs.[a] Second, people must have perfect information about each towns' respective public benefits and taxes.[a] Third, there must be a wide enough array of towns to offer a range of local public amenities, and this may not be the case in rural settings. Fourth, there must be no spillovers of public goods across towns; however, this is not always the case with public goods like air quality, which can transcend town lines.[b]

Sources: [a] Gruber, J (2016) *Public Finance & Public Policy,*
[b] Banzhaf H., Walsh R. (2008) *American Economic Review*

Practice questions

1. Reiterate the technical requirements for a Tiebout equilibrium. What are the assumptions in the model?

2. Two types of households in Montclair and Upland: runners and basketball players. Runners have an income of $Y_R = 200$ and basketball players have an income of $Y_B = 50$. Total benefit for public parks is modeled by $TB = [(Y_i Pk)/5] + (Pk^2/4)$. Total cost of public parks is $TC = 4Pk$. Pk is park acreage.
   A. How many parks do runners and basketball players each want?
   B. Montclair is composed of 200 runners and 150 basketball players. Upland is composed of 150 runners and 200 basketball players. How many public parks does Montclair provide under majority voting? Upland?
   C. Are these towns in a Tiebout equilibrium?

3. With two types of residents in Claremont, students & professors, the total benefit for recycling is $TB = 8R - R^2$ for students and $TB = 2R - 0.5R^2$ for professors. Show professors want more recycling. If professors have majority vote, why do the students stay? What Tiebout model aspect(s) is(are) lacking?

Numerical solutions: **2A.** 72 & 12 acres; **2B.** 72 v 12 acres; **3.** 4 < 8