

1 Nechyba JPE 1997

1.1 Questions and Results

- Two Questions:
 - Why is the property tax the almost exclusive tax instrument used by local governments?
 - Why do we consistently observe higher levels of governments (e.g. states) undermining local property tax system through income tax-funded grants and through imposing caps on local property tax rates?

- This paper models heterogeneous consumers endowed with income that are mobile and communities competing by choosing combinations of income tax and property tax. The main conclusion is that:
 - under a range of objective functions for the local community leaders, it is a dominant strategy for them to set the local income tax close to zero;
 - if there were some exogenous local dissatisfaction with the property tax, only higher level governments can alleviate the prisoner's dilemma among the local communities.

1.2 A Computable GE Model

- N : the set of individuals and houses. $n \in N$ is the individual initially endowed with house n ; $N = [0, 1]$;
- A community structure is an assignment of individuals to communities and moreover to different houses:
 - there are \bar{h} house types: $h \in H = \{1, \dots, \bar{h}\}$; ($\bar{h} = 3$)
 - there are \bar{m} communities: $m \in M = \{1, \dots, \bar{m}\}$; ($\bar{m} = 3$);
 - there are \bar{i} income levels: $i \in I = \{1, \dots, \bar{i}\}$; ($\bar{i} = 5$).
 - $C_{mh} \subseteq N$ is the set of agents living in house type h in community m ;

- $E_{mhi} \subseteq N$ is the set of agents living in house type h in community m with income level i ; [$\mu(E_{mhi}) = 1/45$ for all $(m, h, i) \in M \times H \times I$].

- Agent n 's utility function is

$$u_n(m, h, x, z) = h^{\delta(n)} x_0^{\alpha(n)} x_m^{\beta(n)} z^{\gamma(n)}, \text{ for all } n \in N,$$

where x_0 is the state public good (SPG); x_m is the local public good (LPG) in community m , z is private good; and $\delta(n) + \alpha(n) + \beta(n) + \gamma(n) = 1$.

- The production functions for SPG and LPG in the simulation are

$$f_0(z) = \frac{z}{\mu(N)}, f_m(z) = \frac{z}{\mu(C_m)} \text{ for } m \in M.$$

- Financing of SPG and LPG:

- SPG is financed through a proportional income tax t_0 ;

- LPG is financed through local tax system described by (t_m, \bar{t}_m) where t_m and \bar{t}_m are community m 's proportional property and income tax rates respectively.
- Determination of tax rates:
 - State income tax rate t_0 and local property tax rates t_m are set through absolute majority rule voting by members of the relevant constituencies;
 - local income tax rate \bar{t}_m is set exogenously by a community planner.
- Assumptions on the behavior of agents: Residents behave myopically (or competitively): they take community compositions, property values and \bar{t}_m as given when voting.

- Given local income tax rates $(\bar{t}_1, \dots, \bar{t}_m)$, a *constrained equilibrium* is a list (p, t, x, J) where
 - $p : M \times H \rightarrow R_+$ is the housing prices;
 - $t = (t_1, \dots, t_m) \in [0, 1]^m$ is the proportional property tax rates;
 - $x = (x_1, \dots, x_m)$ is the public good levels;
 - $J = \{J_{mh} \subseteq N : \sum_{h \in H} \mu(J_{mh}) = \mu(E_m)\}$ is the assignments of agents to communities; s.t.
1. housing prices clear the market for each type of houses;
 2. all government budget balance;
 3. consumers cannot gain utility by moving;
 4. local property and state income tax rates are determined through majority rule voting.

- An *unconstrained equilibrium* is a constrained equilibrium with the local income tax rates $(\bar{t}_1, \dots, \bar{t}_m)$ endogenized to maximize each community leader's objectives.
 - Community leaders are assumed to be forward looking and strategic.
 - Various objectives of community leaders are assumed:
 1. maximize community income;
 2. maximize community property values;
 3. maximize local wealth;
 4. maximize local utility levels;
 5. maximize the size of the local public sector;
 6. satisfy the current median voter.

1.3 Calibration and Simulation

- The model's parameters are calibrated using data from New Jersey, and then the constrained and unconstrained equilibrium are simulated.
- The results are: regardless of the objectives of the community leaders, unilateral deviation from zero local income tax is detrimental.