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 inposing 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 hourse 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: $h \in H = \left\{1, ..., \bar{h}\right\}$; $(\bar{h} = 3)$
  - there are $\bar{m}$ communities: $m \in M = \{1, ..., \bar{m}\}$; $(\bar{m} = 3)$;
  - there are $\bar{\imath}$ income levels: $i \in I = \{1, ..., \bar{\imath}\}$;$(\bar{\imath} = 5)$.
  - $C_{mh} \subseteq N$ 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

  $u_n(m, h, x, z) = h^{\delta(n)} x_0^{\alpha(n)} x_m^{\beta(n)} z^{\gamma(n)}$, 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 $(\bar{t}_1, ..., \bar{t}_m)$, a *constrained equilibrium* is a list (p, t, x, J) where
  - $p : M \times H \to R_+$ is the housing prices;
  - $t = (t_1, ..., t_m) \in [0, 1]^m$ is the proportional property tax rates;
  - $x = (x_1, ..., x_m)$ is the public good levels;
  - $J = \{J_{mh} \subseteq N : \sum_{h \in H} \mu(J_{mh}) = \mu(E_m)\}$ is the assignmens 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 $(\bar{t}_1, ..., \bar{t}_m)$ 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. maxmize 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 fromNew 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.