THE STANDARD MODEL OF CAPITAL TAX COMPETITION

(Zodrow & Mieszkowski, 1986; Wilson, 1986; Hoyt, 1991)

- n identical countries
- all individuals supply one unit of labour and own $\bar{k}_i$ units of capital
- capital / labour is perfectly mobile / immobile
- capital-market clearing: $\sum_{i=1}^{n} \bar{k}_i = K$ (1) $= \sum_i k_i$
- single homogeneous good with price normalised to unity
- production function: $f'(k_i) > 0$, $f''(k_i) < 0$
- perfect competition in all markets
- tax on capital: t_i per unit
- equilibrium world net interest rate: R
- arbitrage condition: $f'(k_i) - t_i = R(t_i) \quad \forall i \in \{1, .., n\}$

$$\overset{\text{i.d.}}{\Rightarrow} \frac{\partial k_i}{\partial t_i} = \underbrace{\frac{1 + (\partial R / \partial t_i)}{f''(k_i)}}_{<0}, \quad \frac{\partial k_j}{\partial t_i} = \underbrace{\frac{(\partial R / \partial t_i)}{f''(k_j)}}_{>0}, \; i \neq j \quad (2)$$

$$(1) \Rightarrow \frac{\partial k_i}{\partial t_i} + (n-1)\frac{\partial k_j}{\partial t_i} = 0 \quad (3)$$

$$(2)(3) \Rightarrow \frac{\partial R}{\partial t_i} = -\frac{1}{n} \quad (4)$$

$$(2)(4) \Rightarrow \frac{\partial k_i}{\partial t_i} = \frac{1 - (1/n)}{f''(k_i)} < 0 \quad (5)$$

- utility function: $u(c_i, g_i)$
- $\frac{\partial g_i}{\partial c_i} = -1$ (MRT)
- government budget constraint: $g_i = t_i k_i$ (6)
- income of representative agent:

$$c_i = f(k_i) - f'(k_i) k_i + R\bar{k} \quad (7)$$

- FOC of government taking others' tax rates as given:

$$\frac{\partial u}{\partial t_i} = \frac{\partial c_i}{\partial t_i} + m_i(c_i, g_i) \frac{\partial g_i}{\partial t_i} = 0 \quad (8)$$

where

$$m_i(c_i, g_i) = \frac{\partial u / \partial g_i}{\partial u / \partial c_i} = \text{MRS}$$

- Differentiate (6) and (7) w.r.t t_i, and substitute with (5) into (8)

$\Rightarrow$ government best-response function (Nash):

$$\bar{k}(m_i - 1) + m_i t_i \frac{1 - (1/n)}{f''(\bar{k})} = 0 \quad \forall i$$

- $n = 1 \Rightarrow m_i = 1 \Rightarrow$ MRS = MRT
- $n > 1 \Rightarrow m_i > 1 \Rightarrow$ underprovision of g
- $\frac{\partial m_i}{\partial n} > 0$