

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: $f'(k_i) - t_i = R(t_i) \quad \forall i \in \{1, \dots, n\}$

$$\text{i.d.} \Rightarrow \frac{\partial k_i}{\partial t_i} = \frac{1 + (\partial R / \partial t_i)}{f''(k_i)}, \quad \frac{\partial k_j}{\partial t_i} = \frac{(\partial R / \partial t_i)}{f''(k_j)}, \quad i \neq j \quad \textcircled{2}$$

< 0
 > 0

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

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

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

• 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):

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

• $n=1 \Rightarrow m_i=1 \Rightarrow \text{MRS} = \text{MRT}$

• $n > 1 \Rightarrow m_i > 1 \Rightarrow$ underprovision of g

• $\frac{\partial m_i}{\partial n} > 0$