# Lecture Notes: Systems Competition
# II.1: "Race to the bottom" view

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November 8, 2005

# 1 Tax Competition in Fiscal Federalism

So far, we have analyzed incentives to compete for capital in a model in which capital mobility is the only link between regions.

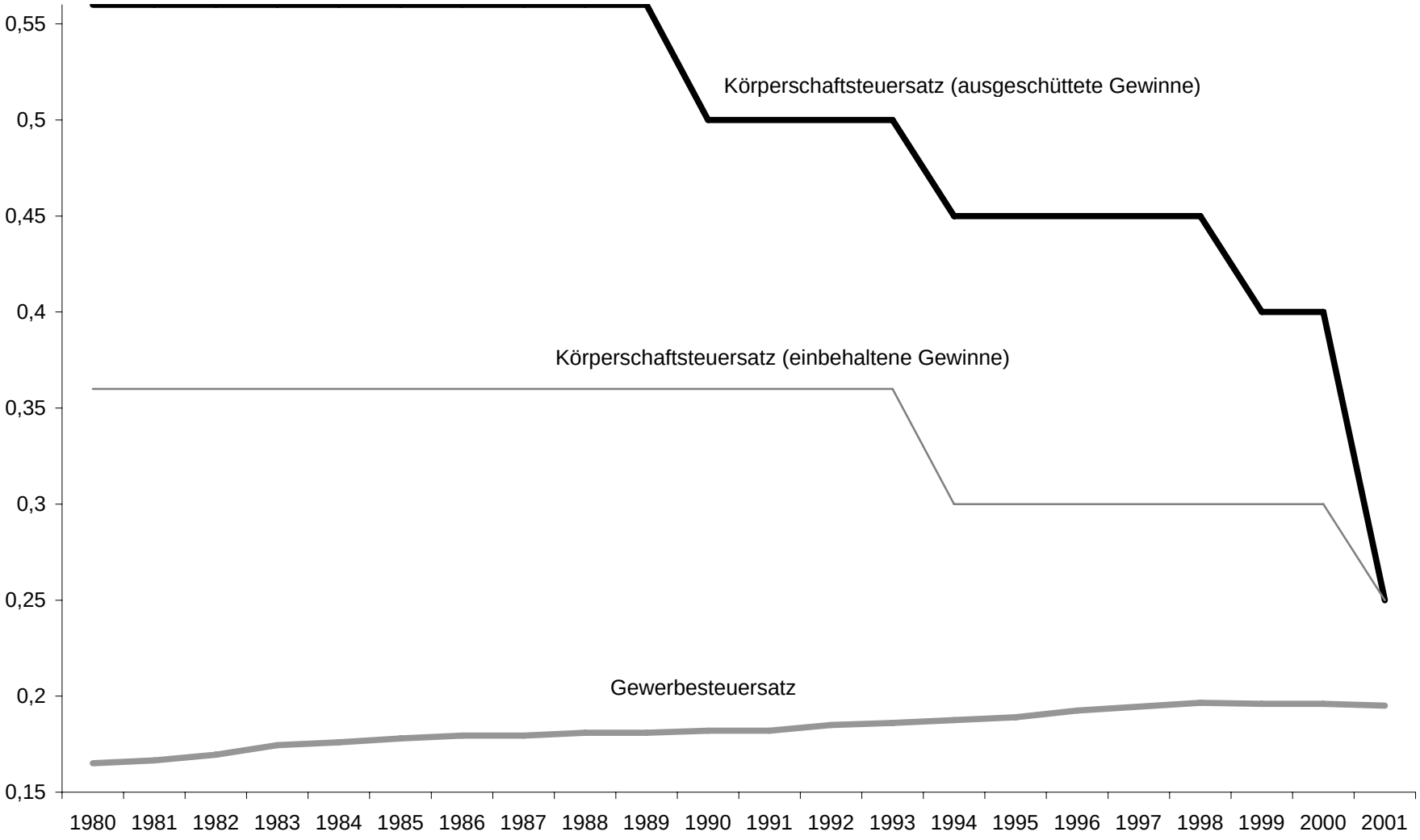
In reality, tax competition does not only arise between nation states, but also between regions of the same state.

Capital should be even more mobile than between nation states

$\Rightarrow$ conjecture: stronger tendency to "race to the bottom"

Puzzling at first sight, tax competition has not dominantly shaped local tax incentives, although capital is more mobile between municipalities than between nation states

## Gewerbe- und Körperschaftsteuersätze 1980-2001



**Question:**

Is the standard tax competition model able to reconcile the convergence in tax rates?

In this lecture we return to the tax competition model with public good provision (Zodrow and Mieszkowski, 1986).

We augment the public sector by an equalization system and a revenue-sharing program (based on Köthenbürger, 2002).

**Examples:**

Provincial governments in Canada levy a corporate tax rate (in addition to the federal government) and are linked by equalization system

In Germany municipalities levy a profit tax (Gewerbesteuer). Municipalities participate in an equalization system and in revenue-sharing agreements.

## 1.1 Public Sector

The modified budget constraint reads

$$g = tk - \alpha \bar{t} k + \beta \bar{t} \left( N - k \right). \tag{1}$$

- Lower-level governments collect capital tax revenues $tk$.

- They share a fraction $0 < \alpha < 1$ of standardized tax revenues with the federal level. $\bar{t}$ denotes the standardized tax rate.

- The third term displays entitlement payments due to fiscal capacity equalization. The system is conditioned on the difference between the region's fiscal needs, $N$, and the region's taxing capacity, $k$, multiplied by the standardized tax rate, $\bar{t}$. The difference is equalized at a rate $0 < \beta < 1$.

Differentiating Eq. (1) yields

$$\begin{aligned}\frac{\partial g}{\partial t} &= k + t\frac{\partial k}{\partial t} - \alpha\bar{t}\frac{\partial k}{\partial t} - \beta\bar{t}\frac{\partial k}{\partial t} \\ &= k + (t - \alpha\bar{t} - \beta\bar{t})\,\frac{\partial k}{\partial t}. \qquad (2)\end{aligned}$$

- The tax base reduction entitles the region to additional equalizing transfers at an amount of $-\beta\bar{t}\frac{\partial k}{\partial t}$

- It reduces the region's transfer obligations towards the federal government by $-\alpha\bar{t}\frac{\partial k}{\partial t}$.

$\Rightarrow$ both fiscal arrangements at least partly insulate the local budget from capital mobility.

## 1.2 Equilibrium Tax Policy

The government solves

$$\max_t \quad u\left(f(k) - f_k k + r\overline{k}, tk - \alpha\overline{t}k + \beta\overline{t}\left(N - k\right)\right)$$

Differentiating with respect to $t$ yields

$$u_c\left(-f_{kk}\frac{\partial k}{\partial t}k + \frac{\partial r}{\partial t}\overline{k}\right) + u_g\left(k + \left(t - \alpha\overline{t} - \beta\overline{t}\right)\frac{\partial k}{\partial t}\right) = 0.$$

At a symmetric equilibrium ($t^i = t^j = t = \overline{t}$)

$$\frac{u_g}{u_c} = \frac{1}{1 + \left(1 - \alpha - \beta\right)\epsilon_{k,t}} \qquad \text{with } \epsilon_{k,t} := \frac{\partial k}{\partial t}\frac{t}{k} < 0.$$

Results:

- The MCPF is decreasing in $\alpha$ and $\beta$.

Assume $\overline{t} = t$ :

- If $\alpha + \beta < 1$, local public funds are still negatively affected by the tax base response.

- If $\alpha + \beta = 1$, the local budget is completely insulated from capital mobility. The regional government has no incentive to engage in tax competition.

## 1.3 Evidence

Table 1 reports the magnitude of $\alpha + \beta$ for some German states.

The *effective* equalization rates differ across municpalities within a state. If municipalities are sufficiently poor, they receive supplementary transfers in addition to regular transfers (except of Nordrhein-Westfalen). These municipalities are subject to a higher effective equalization rate depicted in the respective second row.

Somehow surprising, the rate can be quite substantial possibly even completely insulating the budget from capital mobility at the margin.

The finding may help to explain the divergent local and federal taxing incentives reported above (Buettner, 2005).

| State | | $\alpha$ | $\beta$ | $\alpha + \beta$ |
|---|---|---|---|---|
| Baden-Württemberg | regular | 0.61 | 0.27 | 0.88 |
| | poor | 0.61 | 0.39 | 1.0 |
| Bayern | regular | 0.59 | 0.26 | 0.85 |
| | poor | 0.59 | 0.34 | 0.93 |
| Hessen | regular | 0.62 | 0.2 | 0.82 |
| | poor | 0.62 | 0.4 | 1.02 |
| Niedersachsen | regular | 0.62 | 0.29 | 0.91 |
| | poor | 0.62 | 0.38 | 1.0 |
| Nordrhein-Westfalen | regular | 0.55 | 0.4 | 0.95 |
| | poor | - | - | - |
| Saarland | regular | 0.51 | 0.48 | 0.99 |
| | poor | 0.51 | 0.53 | 1.04 |
| Schleswig-Holstein | regular | 0.48 | 0.26 | 0.74 |
| | poor | 0.48 | 0.47 | 0.95 |

Source: State and federal laws.

Table 1: Effective marginal equalization and revenue-sharing rates in 2001.