Tax and Public Input Competition

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Two-sided competition

• Tax side: corporate tax rate, allowances, etc.

• Expenditure side: public input
  – Infrastructures
  – Public education
  – R&D
  – Police and justice …

• Tax competition → Public finance competition
Corporate tax rates in the EU25, 1990-2006

Sources: Devereux, Griffith and Klemm (2005), Eurostat, KPMG for statutory rates; Overesch (2005) for EATR (Effective average tax rates).
Public capital and statutory tax rate in 2002

Sources: Kamps (2004), WDI2005 and same as Figure 1.
Theory

• Zodrow-Mieszkowski (1986)
  – public good financed by lump-sum tax or capital tax \((G = tK)\);
  – capital mobility reduces the incentive to provide the public good:
    \[ F_K - t = r \]
  – under-provision of public goods compared to autarky.

  – challenge Z-M’s result;
  – Z-M assumption: \(F_{KG} < 1/K\)

• Our paper:
  – extends Z-M’s model to a public good which is used both by households and firms;
  – shows that Z-M’s result holds with regular assumptions;
  – tests Z-M’s prediction against Noiset et al.
The model

Production function: \( Y = F(L, K, G) \)

Public budget balance: \( G = t K \)

Government optimization: Max \( U(x, G) \)

National resource constraint: \( Y - x - G = r (\bar{K} - K) \)

International arbitrage condition: \( F_K - t = r \)
Domestic return as a function of public input, for a given capital stock

\[ \rho(G) = F_K(\overline{L}, \overline{K}, G) - t = F_K(\overline{L}, \overline{K}, G) - \frac{G}{\overline{K}} \]

World return \neq Domestic Return
Different strategies for a low-return country, variable capital stock

Constant $G$, variable $t$

Constant $t$, variable $G$

Variable $t$ and $G$

$\rho$

$r$

$\rho_0$

$K$

$\bar{K}$
\[ MRS_{G/x} = 1 - F_G + \frac{e_{K/t}}{1 - e_{K/t}} > 1 - F_G \text{ if } 0 < e_{K/t} < 1 \]

\[ e_{k/t} = -\frac{t}{K} \frac{1 - K F_{K^G}}{F_{KK} + t F_{KG}} > 0 \text{ if } F_{KG} < 1/K \quad \text{Z-M assumption} \]

\[ e_{k/t} = \frac{e^0_{k/t} - e^0_{k/G}}{1 - e^0_{k/G}} \quad \text{with} \quad \begin{cases} e^0_{K/t} = -\frac{t}{K F_{KK}} > 0 \\ e^0_{k/G} = -\frac{G}{K} \frac{F_{KG}}{F_{KK}} > 0 \end{cases} \]

\[ e^0_{k/t} < 1 \quad \text{at optimum, which implies} \quad e_{k/t} < 1 \]

We find \( e^0_{k/t} > e^0_{k/G} \quad \text{but} \quad e^0_{k/t} > 1 \)

Hence \( e_{k/t} > 0 \quad \text{but} \quad MRS_{G/x} < 1 - F_G \)
Interim conclusion

• Capital mobility creates an **incentive to lower** *t* and *G* (because $e_{k/t} > 0$)
  - under-provision of public goods if governments optimize

• But **governments seem not to optimize** (because $e^{0}_{K/t} > 1$)
  - over-provision of public goods because governments do not optimize
  - may be true also in a closed economy

• **Downward trend in corporate taxation**
  - movement towards small open economy optimum?
Empirical results


- Bilateral FDI flows across 11 OECD countries, 1984-2000
- Market potential of host, size of origin, bilateral distance
- Statutory tax rate, EATR, EMTR: semi-elast $\approx 3-4$
- Consistent with de Mooij & Ederveen (2003, 2005)
- Non-linear impact of taxation:
  - large/small tax differentials
  - positive/negative differentials
- Public invest/(consum+invest): 4 pp EATR $\leftrightarrow$ 1 pp invest ratio
New econometric analysis

- US majority-owned affiliates in 18 EU Member states
- Capital stock
- 11 industries, 1994-2003

- Gravity model: market size, distance, agglomeration
- Labor market: sector-level unit labor costs, flexibility
- Exchange rate
- Corporate taxation: statutory, EATR.
- Public capital stock per square km
- Household-oriented public goods: health, social exp.
<table>
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Semi-elast ≈ 4
Robustness checks

• Lagged explanatory variables
• EATR
• Household-specific public goods
Policy implications

1. Tax competition leads to a twist of resource allocation away from public goods towards private goods in any country, whatever it is a net exporter or a net importer of capital.

2. Any policy leading to a rise in the private return of public input may reinforce the country’s attractiveness.

3. Tax competition is expected to provide incentives for governments to raise public sector efficiency.

4. Tax competition twists the composition of public expenditures towards high-productivity public inputs away from unproductive public goods.

5. Tax competition-led efforts by the public sector to reduce inefficiencies will raise the composition bias of public expenditures in favour of public input at the expense of household-specific public goods.

6. Countries may adopt different strategies in the tax rate/public input space, according to their private return of public input. The higher the private return, the higher the tax rate and the public input provision at equilibrium.
Tentative conclusion

• Twofold competition on taxes and on public goods confirmed
  — public capital attracts private capital, others things equal

• Incentive to reduce both taxes and public capital

• Explanation to downward trends

• Some countries may resist if:
  – public input is financed by other taxes;
  – public sector becomes more efficient;
  – substitution between household-specific public goods and public inputs.

• Economic geography
  – GDP, distance, agglomeration.
Policy implication 1.

Public and private (non-residential) capital, % GDP, weighted EU averages*

Source: Kamps (2004), own calculations.
* unweighted averages deliver similar results.
Policy implication 4.

Expenditure shifting: public input/household-specific expenditures

Policy implication 6.

Public capital and statutory tax rate in 2002

Sources: Kamps (2004), WDI2005 and same as Figure 1.