

1.2 Introduction in Tax Competition

There is no better example of the way systems competition works than tax competition.

Everywhere we look there are tax reductions which have been triggered off by this competition.

Every country is trying to become an attractive location for investments.

Consequently, the following question arise:

- To what extent is it in the national interest to tax mobile capital?
- To what extent does source taxes deter the usage of capital
- Is the provision of public goods endangered?

1.2.1 The Erosion of Source Taxes*

A country produces a homogenous output using labor L and capital K , where $f(L, K)$ is a linearly homogenous production function with the standard properties:

$$f_K(L, K) > 0; \quad f_{KK}(L, K) < 0$$

$$f_L(L, K) > 0; \quad f_{LL}(L, K) < 0$$

$$f_{LK}(L, K) > 0; \quad f_{KL}(L, K) > 0;$$

- The amount of labor is fixed and is provided by domestic residents. Each unit of labor earns a wage rate of w .
- Capital is internationally mobile and is available in any amount at the market return r .

*This standard argument practically underlies all the literature on tax competition and originates from MacDougall (1960) and Richman (1963).

When there is no tax, a firm solves:

$$\max_K \quad \pi = f(K, L) - rK - wL.$$

Firms invest up to the point where

$$f_K(K, L) = r,$$

that is when the marginal product of capital is equal to the marginal cost.

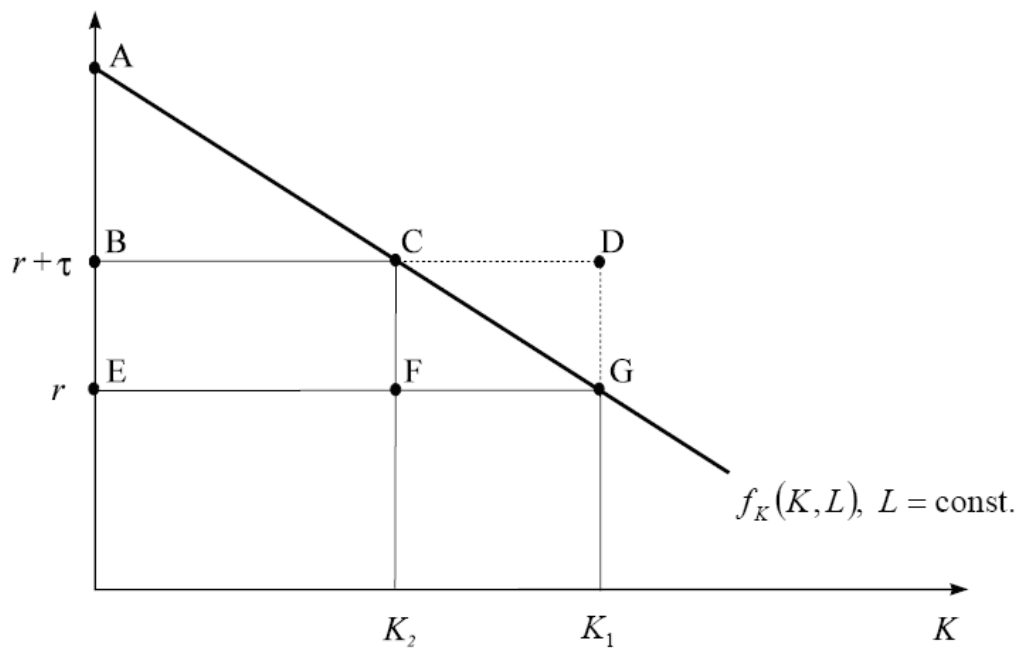


Figure 2.1 The erosion of source taxes in tax competition.

The above figure helps explaining the argument.

- Without a tax, the firms choose an amount of capital equal to K_1 .
- Total output amount to the area AGK_1O and can be split into:
 - labor income of the size AGE
 - and capital income of EGK_1O .

If the government levies a tax, τ , the maximization problem of a firm changes to:

$$\max_K \quad \pi = f(K, L) - (r + \tau)K - wL$$

and the first order condition becomes:

$$f_K(K, L) - \tau = r.$$

- The source tax of the size $\tau = BE$ induces the capital stock to fall to K_2 .
- Capital leaves the country until its marginal product net of tax is equal to the given world interest rate.

Since capital escapes taxation, the tax is shifted completely onto the immobile factor labor.

- Before taxation the labor income was equal to the area $AE G$.
- When capital leaves labor income diminishes to ABC .
- Collected tax revenue is equal to $BE C F$.
- Even in the case the tax revenue is redistributed to the wage earners they would face a loss of $CF G$!

Rationale: when the mobile factor capital is driven out of the country, the marginal productivity of the complementary immobile factor declines: $f_{LK}(L, K) > 0$.

⇒ Since a tax on the mobile factor (capital) drives away the mobile factor and hurts the owners of the immobile factor (labor) there is a tendency for a race to the bottom ($\tau = 0$)!

⇒ pessimistic view of capital taxation!

1.2.2 Arithmetic Example

Production function: $f(K, L) = \sqrt{KL}$.

Firm's optimization problem without taxes:

$$\max_K \quad \pi = \sqrt{KL} - rK - wL.$$

First order condition: $\rightarrow \quad K_1 = \frac{L}{4r^2}$

Firm's optimization problem with taxes:

$$\max_K \quad \pi = \sqrt{KL} - (r + \tau)K - wL.$$

First order condition: $\rightarrow \quad K_2 = \frac{L}{4(r+\tau)^2}$

\implies In case a source based tax on capital applies, $\tau > 0$, the optimal usage of capital declines, $K_2 < K_1$.

\implies The tax drives capital out of the country.

How is the surplus of the immobile factor, W^{IF} , affected by the tax on capital?

Surplus of the immobile factor in the presence of the source based capital tax, τ :

$$W^{IF} = \int_0^{K_2} \left[\frac{\sqrt{L}}{2\sqrt{K}} - (r + \tau) \right] dK$$

$$W^{IF} = \frac{1}{4} \frac{L}{(r + \tau)}.$$

The derivative $\partial W^{IF} / \partial \tau$ tells us how the surplus of the immobile factor changes if the tax rate is increased marginally:

$$\frac{\partial W^{IF}}{\partial \tau} = -\frac{1}{4} \frac{L}{(r + \tau)^2} < 0.$$

\implies Conclusion: Our intuition that increasing the source based tax on capital drives capital out of the country and thereby reduces the surplus of the immobile factor is correct.