

Interjurisdictional Spillovers, Decentralized Policymaking and the Elasticity of Capital Supply

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Supplementary Appendix

In this appendix we give a more detailed proof of the comparative static results in (5) and (6). Totally differentiating (2) for all $i = 1, \dots, n$ and (4) yields

$$(A1) \quad F''(k_i)dk_i - dt_i = d\rho,$$

$$(A2) \quad \sum_{i=1}^n dk_i = nS'd\rho.$$

Using $dk_i = (d\rho + dt_i)/F''(k_i)$ from (A1) in (A2) we obtain

$$(A3) \quad d\rho \left(nS' - \sum_{\ell=1}^n \frac{1}{F''(k_\ell)} \right) = \sum_{\ell=1}^n \frac{dt_\ell}{F''(k_\ell)}.$$

where we have replaced the index i by the index ℓ . To find the partial effects of tax rate changes, we set $dt_i \neq 0$ and $dt_\ell = 0$ for all $\ell \neq i$. Equation (A3) then immediately implies

$$(A4) \quad \frac{\partial \rho}{\partial t_i} = \frac{1}{F''(k_i) \left(nS' - \sum_{\ell=1}^n \frac{1}{F''(k_\ell)} \right)}.$$

Employing (A4) in (A1) we get

$$(A5) \quad \frac{\partial k_i}{\partial t_i} = \frac{1}{F''(k_i)} \cdot \left(\frac{\partial \rho}{\partial t_i} + 1 \right) = \frac{F''(k_i) \cdot \left(nS' - \sum_{\ell=1}^n \frac{1}{F''(k_\ell)} \right) + 1}{F''(k_i)^2 \cdot \left(nS' - \sum_{\ell=1}^n \frac{1}{F''(k_\ell)} \right)},$$

$$(A6) \quad \frac{\partial k_j}{\partial t_i} = \frac{1}{F''(k_j)} \cdot \frac{\partial \rho}{\partial t_i} = \frac{1}{F''(k_i)F''(k_j) \cdot \left(nS' - \sum_{\ell=1}^n \frac{1}{F''(k_\ell)} \right)}.$$

Summing (A5) and (A6) for all $j \neq i$ gives

$$(A7) \quad \frac{\partial k_i}{\partial t_i} + \sum_{j \neq i}^n \frac{\partial k_j}{\partial t_i} = \frac{1}{F''(k_i)} + \frac{\partial \rho}{\partial t_i} \sum_{\ell=1}^n \frac{1}{F''(k_\ell)} = \frac{nS'}{F''(k_i) \cdot \left(nS' - \sum_{\ell=1}^n \frac{1}{F''(k_\ell)} \right)}.$$

So far, we have not employed the symmetry property. Symmetry means that all jurisdictions choose the same tax rate $t_i = t$. Equations (2) and (4) then imply $k_i = S(\rho)$ and $F''(k_i) = F''$. Inserting into (A4) – (A7) establishes (5) and (6). Note that, due to $k_i = S(\rho)$, in

the symmetric situation the amount of capital demanded in a jurisdiction just equals the amount of capital supplied in this jurisdiction. It is important, however, that this neither implies that capital is immobile nor that there is no trade in capital. It may well be the case that a part of capital demand k_i is imported and a part of the capital supply $S(\rho)$ is exported. The special feature of the symmetric situation is that these imports and exports are just equal, implying that the *net* capital flows between jurisdictions are zero.