Adv. PSE I: Tutorial Questions for Chapter 2

Severin Weingarten[*]

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1 Erosion of Source Taxes (Ch. 2.0)

In the lecture you graphically derived the main result of the model in chapter 2.0: The rent to the immobile factor (which can be interpreted as labour or land) falls if the government increases the capital tax rate.

Derive this result formally! Use the following production function:

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

Hints:

1. *Maximize firm profits over K, to get the optimal K from the point of view of the firm.*

2. *Look at the graph derived in class. Use an integral to calculate the size of the area representing the rent to the immobile factor. Use the optimal K in this calculation.*

3. *Differentiate the result (the size of the area) with regard to τ. You should find that the rent to the immobile sector decreases as τ increases. Done.*

2 The Public Good Model (Ch. 2.1)

Answer question 1 from the winter 2012 exam.[1]

3 Policy Measures to Stabilize Tax Policy (Ch. 2.1)

The main result of the model in chapter 2.1 is that public good provision will be inefficiently low. In class, tax coordination was mentioned as a policy measure that can solve this problem.

Show formally that underprovision will not occur if governments agree to only change tax rates simultaneously and to the same extent. Start from the model-on-one-page available from the website of the tutorial. You do not have to redo any calculations that are given there.

Hints

1. *Totally differentiate the first-order condition $f_k = r + \tau^i$ with respect to k^i, τ^i, and τ^j. (In class we did the same but we only differentiated with respect to k^i and τ^i.)*

2. *Now assume that $\mathrm{d}\tau^i = \mathrm{d}\tau^j$ (i.e. countries coordinate tax adjustments) and solve for $\frac{\mathrm{d}k^i}{\mathrm{d}\tau^i}$. You should get zero.*

3. *What does this result imply regarding the rest of the model?*

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[*]Chair for Public Finance, severin.weingarten@uni-jena.de, http://sweingarten.de/
[1]All past exams are available from the homepage of the chair: http://www.fiwi.uni-jena.de/Lehre/Archiv+_+Past+Exams+.html