Problem Set
International taxation

Question 1 Consider an economy with three production factors: immobile labor (L), mobile capital (K), and public infrastructure (P). National income is given by

$$Y = L^{\alpha} K^{\beta} P^{\gamma},$$

with $0 < \alpha, \beta, \gamma < 1$. The return to capital is given by:

$$r = \frac{\partial Y}{\partial K} = \beta L^{\alpha} K^{\beta - 1} P^{\gamma}.$$

The local capital stock is endogeneous and as capital is fully mobile the equilibrium is characterized by

$$(1 - t)r = (1 - t^*)r^*,$$

where t is the domestic capital tax rate and t^* the foreign tax rate. Likewise, r and r^* denote the domestic and foreign return to capital, respectively.

1. Calculate the equilibrium capital stock and show that this will give an elasticity of the capital stock to the tax rate which is negative and greater than unity (in absolute terms) if $\beta > \frac{1-2t}{1-t}$.
2. Show that for a fixed level of public infrastructure (P) any increase in the domestic tax rate will reduce national income (Y). Show also that a reduction in the foreign tax rate would require a reduction in the domestic tax rate as well in order to ensure that national income remains unchanged.
3. Now suppose that tax revenues serve to finance infrastructure P so the stock of public infrastructure is given by

   $$P = trK.$$

   Show that national income is not monotonically decreasing with the domestic tax rate and that the optimal tax rate is positive. Explain this result. What does the model predict in terms of a possible 'race to the bottom'?

Question 2 Consider the model of fiscal competition based on Zodrow-Mieskowski when governments are not welfare maximizing. There are n symmetric regions and each

is ruled by a Leviathan government. The Leviathans engage in tax competition using a source-based capital tax. The governments's objective is to maximize the total amount of tax revenues tk minus the collection costs $c(t) = t^2$. Hence, the Leviathan in region i solves $\max_{t_i} \pi_i = t_i k_i - t_i^2$. Since world capital endowment is fixed, $n\overline{k} = \sum_{i=1}^{n} k_i$ has to hold in equilibrium.

1. Solve for the Leviathan's optimal tax rate. How is the capital stock in country i affected by an increase in the tax rate in country i?
2. How is the Leviathan's optimal tax rate affected by an increase in the number of competing regions?
3. Assume that the Leviathan has to bargain with another player (part of the government) over the surplus generated from the capital tax. The other player takes $1 - \alpha$ of the benefits the Leviathan makes from taxation. How does the share α affect the tax rate?