



Individual homework 2

Revised: November 14, 2011

Monday, November 21 at the start of class

1. Fiscal Policy and Growth (50p)

After reviewing the latest figures of investment rates for China and US, the US Government is considering a fiscal policy manoeuvre to increase investment rate in US. In this question you are asked to use the Solow model to evaluate the impact of this policy change. For simplicity assume that the US is a closed economy so that

$$Y = C + G + I$$

where Y is GDP, C is private consumption, G is government consumption and I is investment. Assume that the government currently taxes GDP at a 20% rate and all tax revenues go to finance government consumption expenditures, which are equal to 20% of GDP (so that $G = 0.2Y$). The private sector consumes 80% of after-tax GDP $((1-0.2)Y)$.

a) Compute the current US investment rate (I/Y) (5p)

Assume that aggregate production function is given by $Y = K^{.5}L^{.5}$, where K is the domestic capital stock and L is the number of workers and that the depreciation rate of capital is 8% per period.

b) Compute the steady state per-worker capital, private consumption, before and after-tax GDP (10p)

The government is thinking about increasing the tax rate to 25% of GDP. To do so government expenditure would have to increase from 20% to 21% of GDP (to pay for higher collection costs) but the remaining additional revenues (4% of GDP) will be used for investment. Assume that private citizens will continue to consume 80% of the after-tax GDP.

c) Compute investment rate (where investment now includes private and government investment) under the new policy (5p)

d) Compute the per-worker steady state level of the capital stock, consumption and after tax income following the change in tax policy. Based on steady state comparisons would you think the reform is beneficial for citizens? Why? (10p)

e) Starting from the pre-tax reform steady state, determine and graph (using excel) the transition path of investment, consumption, and after tax income for the first 50 periods after the tax reform. Does the tax reform increase consumption and after tax income right after its introduction? (10p)

f) Suppose that the private sector realizes that the government is now saving more so it responds to the change in tax policy by increasing its consumption from 80% of after tax income to 85% of after tax income. Does this change your evaluation of the impact of reform on steady state variables? How?(10p)

2. US, Mexico and China (50p)

Economists and policy makers have argued that Mexico is probably losing from the entry of China in the world markets. In this question you are asked to analyze further this conjecture using the Ricardian model of trade. To simplify things throughout the exercise assume that all prices are quoted in US dollars.

a) US and Mexico in Autarky

Assume that US and Mexico have 100 workers each and that each worker in the US can produce either 3 high tech goods or 2 low tech goods. In Mexico each worker can produce either 1 high tech good or 2 low tech goods. Assume that there is no trade between them, that the US produces and consumes 150 HT and 100 LT, and that Mexico produces and consumes 50 HT and 100 LT. Draw the production possibility frontier for US and for Mexico. Assume that the price of LT is 1 dollar both in the US and Mexico. What is the price of HT in both countries? Why?

b) US-Mexico trade

Now assume that US and Mexico start trading with each other and that after trade both HT and LT goods cost 1 dollar. Determine US and Mexico pattern of production at these prices. Assume that after trade Mexico consumes 100 HT and 100 LT while US consumes 200 HT and 100 LT. What is the value and composition of US and Mexican exports? Do both countries (as a whole) benefit from trade?

c) China enters

Now assume that China enters the world markets. Since China can produce LT goods with very cheap labor the world price of HT stays at 1 dollar but the price of LT goods falls to 1/4 of a dollar. Determine Mexico and US production at these new world prices. Show that Mexico can be worst off from the entry of China by showing that, at the new prices and production, Mexico cannot afford the consumption bundle it was consuming before (in point b). Show instead that the US is unambiguously better off. Suppose now that the Mexican authorities have the option of returning to isolation (i.e. return to the situation of point a). Should they do it?