Macroeconomics Analysis II, EC3102

Tutorial 7 (Solow model)

Question 1 *Technological transfer*

According to Investopedia, a closed economy "*An economy in which no activity is conducted with outside economies. A closed economy is self-sufficient, meaning that no imports are brought in and no exports are sent out. The goal is to provide consumers with everything that they need from within the economy's borders.*" But one of the problem with this kind of economy is that, it does not exchange technological knowledge with outside world and therefore the technological state can be more backward than the outside world. Now, if the government decides to open up the economy so that there are more exchanges with other outside economies in terms of trade and technology. Assume that the economy can acquire (or learn the technological knowledge from outside very quickly. Draw a relevant graph and explain what happens to this economy. *[You can ignore the effects of trade on the economy; also assume that there is only one time learning]*

Question 2 *Steady states are very "steady"*

Consider this scenario where a country A goes to war and conquers another country B and brings a lot of capitals from country/economy B back to its territory (country A. Assume that the two economies have the same technological state and that the country A is at the steady state when it conquers country B. Use a relevant graph to describe what would happen to this economy A over time.

Question 3 *Poverty Traps in the Solow Model*

Suppose the production function takes the form:

$y = f(k) = k^{\alpha}$ if $k < 1$ and

$y = f(k) = \lambda k^{\alpha}$ if $k \geq 1$,

where $\lambda > 1$. Otherwise continue to assume the standard Solow model. Specifically, assume there is no technological progress, $gr_A = 0$. Also assume that $s < \delta < \lambda s$.

a.

Comment on the form of the production function. First, what general aggregate production function ($Y = F(K,L)$) does it derive from? Second, what economic effects could give rise to the specific form of the production function given above?

b.

Show that there exist two steady states (graphically). Study their stability properties. Under which condition might the economy eventually end up in the low *k* steady state? Explain the intuition.

c.

Does this model have implications for the question of convergence? That is, whether countries are converging to similar per capita income?

d.

Suppose that the economy is in the low k steady state. Could a donation from an international aid agency help the country out of its "poverty trap"? If so, what is the minimum donation required?

e.

Could a change in the savings rate, s, lift the economy out of its poverty trap without outside assistance?