Exercise 4

Economic growth: Theory and Empirical Methods, UC3M

Question 1: The file *students*3 initializes a problem of technological adoption along the balanced growth path. Suppose the economy increases the time spend in schooling u from 0.05 to 0.3 in period 1. Simulate the level of human capital for 500 periods by

1. computing the growth rate of human capital along the entire transition path using the result from above.
2. computing the resulting human capital next period along the transition path by $h(t+1) = h(t) + \dot{h}(t)$ with $\dot{h}(t) = h(t)g_h(t)$.
3. computing next period's technological frontier by $A(t+1) = A(t)(1+g)$.
4. plot $\ln A(t) - \ln h(t)$ over time.

Start a new loop where you compute

1. output per worker today $y(t) = \tilde{k}(t)^{\alpha} h(t)$.
2. the change in the capital per efficient worker $\dot{\tilde{k}}(t) = s\tilde{k}(t)^{\alpha} - (n + \delta + g_{hh}(t))\tilde{k}(t)$.
3. capital per efficient worker tomorrow: $\tilde{k}(t+1) = \dot{\tilde{k}}(t) + \tilde{k}(t)$.

Finally, plot the growth rate of human capital and output per worker over time. Why is the growth rate of output per worker initially lower than the growth rate of human capital?

Question 2: Earlier in the course, we have decomposed a country's output, among other, into a contribution of education and TFP. In light of the model of technological adoption, discuss why this statistical decomposition may be misleading.