Homework Assignment 3

Total points: 55 Due date: 16/11/2018

- Show your work in detail

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1. Consider a Cobb-Douglas production function in the Solow model.

   (a) Find k^*, y^* and c^* as functions of parameters, s, n, δ, g and α. (10)

   (b) Find the golden rule value of k. (5)

   (c) Find the savings rate you need to yield the golden-rule value k. (5)

2. Describe how each of the following affects the break-even and actual investment lines in the Solow model.

   (a) δ decreases. (5)

   (b) The rate of technological progress increases. (5)

   (c) $f(k) = k^{\alpha}$, and α increases. (5)

   (d) Workers put in more effort, i.e., all else constant, the output per unit labour is higher than before. (5)

3. Consider a case with technological progress but no population growth. The economy is on its balanced growth path. Now consider a one-time jump in the number of workers.

   (a) What happens to the output per unit of effective labour when the jump occurs? Why? (5)

   (b) After the initial change (if any), when the new workers appear, is there any further change in output per unit of effective labour? If yes, does it increase or decrease? Why? (5)

(c) After the economy comes back to a balanced growth path, how does the output per unit of effective labour compare to what it was before the jump in population? Why? (5)