

Macroeconomics II

Leopold von Thadden

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Problem Set 5:

Solow-model

Problem 1: Solow-model and golden-rule discussion

Consider the central steady-state equation in $k^\#$ characterizing the Solow-model (as derived in the Lecture Notes):

$$s \cdot f(k_{So}^\#) = (\delta + \mu_{N^\#}) \cdot k_{So}^\#$$

- a) Find a relationship between $c_{So}^\#$ and $k_{So}^\#$.
- b) Let $k_{GR}^\#$ denote the golden-rule level of the capital stock per unit of effective labour. Show that $\frac{\partial c_{So}^\#}{\partial s} > 0$ if $k_{So}^\# < k_{GR}^\#$.
- c) Consider a permanent increase in the savings rate (starting out from a steady-state constellation characterized by $\frac{\partial c_{So}^\#}{\partial s} > 0$). Find a graphical representation of the time paths of $c_t^\#$ (ie consumption per unit of effective labour) and c_t (i.e. per capita consumption) before and after the shock occurs.
- d) Consider the Cobb-Douglas function

$$f(k^\#) = (k^\#)^\alpha$$

Let $\alpha = 1/3$ and $s = 0.15$. Show that these values imply $\frac{\partial c_{So}^\#}{\partial s} > 0$.