

Advanced Macroeconomics

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Winter Term 2013/14

Problem Set 3:

Phase Diagram

Problem 1: Dynamics in c and k : solution via a phase diagram

Consider the dynamic system in c_t and k_t such that $\forall t \geq 0$

$$\begin{aligned}U'(c_t) &= \beta U'(c_{t+1})[f'(k_{t+1}) + (1 - \delta)] \\c_t &= f(k_t) - k_{t+1} + (1 - \delta)k_t,\end{aligned}$$

with one initial condition ($k_0 \neq k^*$) and one terminal condition (i.e. the Transversality-condition), as derived in the Lecture Notes.

Assume that preferences with respect to consumption are given by the particular function

$$U(c_t) = \frac{1}{1 - \Phi} \cdot c_t^{1-\Phi} \quad \text{with } \Phi > 0, \Phi \neq 1$$

- a) Find an interpretation for the parameter Φ .
- b) Derive a phase diagram in order to characterize the dynamics in c and k .
(\rightarrow Notice that in this particular case you do not need to linearize the consumption Euler equation.)
- c) Interpret the dynamics based on the phase diagram.