Macroeconomics II

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Problem Set 3:
Phase diagram: Optimal solution

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

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

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

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) Draw 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.