Problem Set

MA18Q1-M

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Staircase diagrams

One-dimensional discrete-time dynamics is characterized by a real-valued function

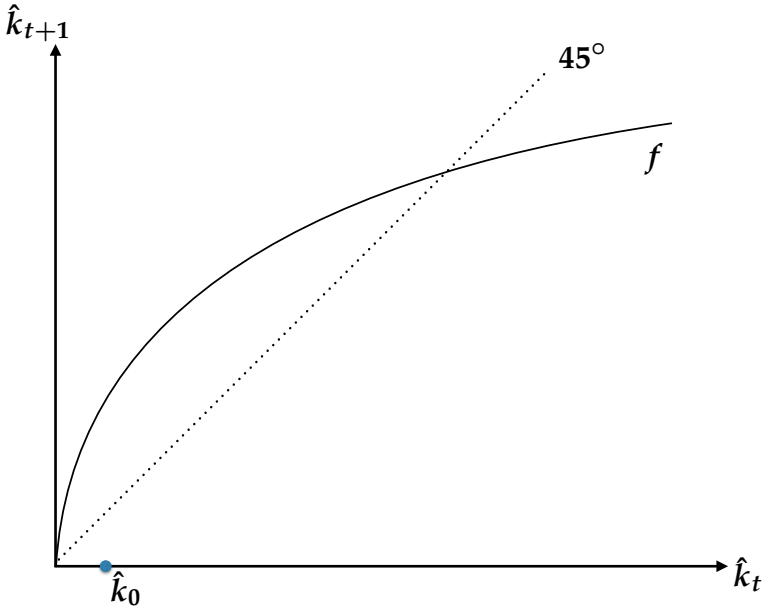
$$\hat{k}_{t+1} = f\left(\hat{k}_t\right),$$

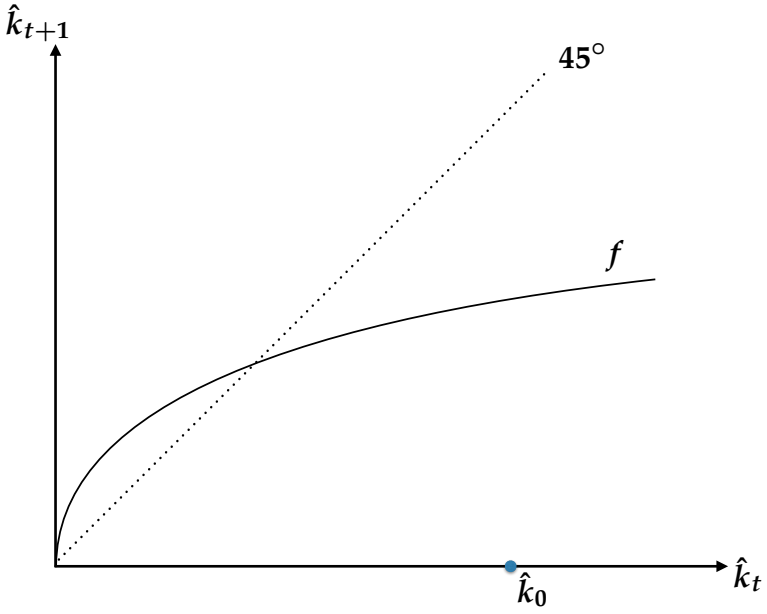
where $\hat{k}_0$ is given.

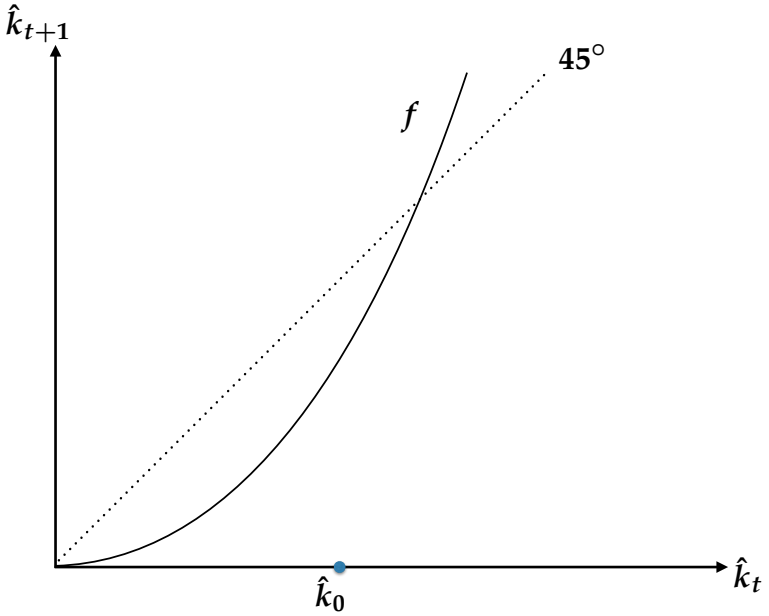
(1) Figures on the answer sheet show four instances of $(f, \hat{k}_0)$. For each case, draw a "staircase diagram" that describes the dynamic path that starts from the dots, $\hat{k}_0$.

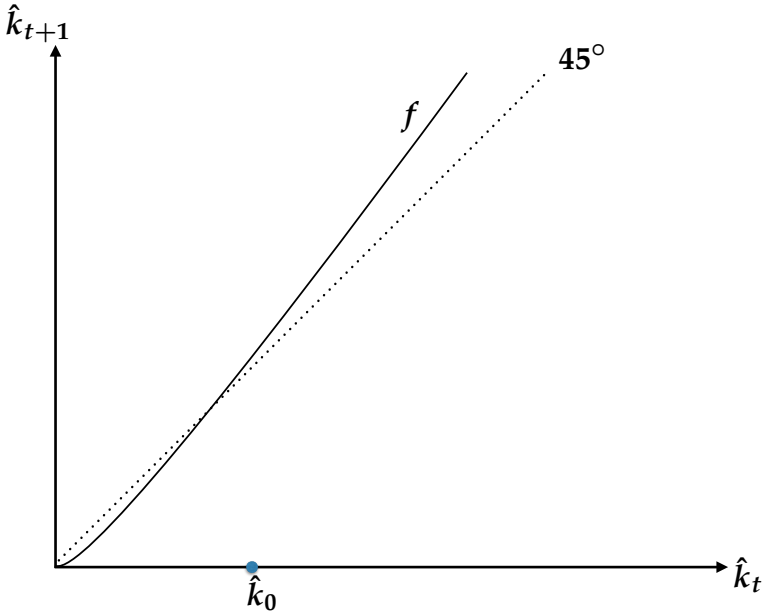
(2) An intersection of 45 degree line and the graph of f corresponds to a steady state; i.e., $\hat{k}_t = \hat{k}_{t+1}$. Convergence to or divergence from the steady state can be characterized by how f crosses the 45 degree line. Summarize your observations from Exercise (1).

(1)









(2)