Economics 732: Monetary Economics II
Spring 2003
Cornell University

Problem Set # 7

1. Two-sector model:

\[ Y_2 = \frac{K_2^{1/3} L_2^{2/3}}{3} \] and
\[ Y_1 = 9K_1^{2/3} L_1^{8/3} \]

Draw precisely the Harrod-Johnson diagram. Compute the incomplete specialization prices.

2. “Keynesian” Deficit Model:

\[ c = (1 - s) [f(k) + \delta], \]
\[ \Delta = n\Delta, \]
\[ f(k) = 3k^{1/8}, \ s = 1/10. \]

Plot steady-state \( k \) versus steady-state \( \Delta \). Plot steady-state \( c \) versus steady-state \( \Delta \). [Calculate \( k^* \), the golden-rule capital-labor ratio, and \( \tilde{k} \), the maximum-sustainable capital-labor ratio.]

3. Inventive Activity and Growth:

\[ C + Z = AK_1^{1/3} L_1^{2/3}, \]
\[ R = 7AK_2^{3/2} L_2^{7/2}, \]
\[ K_1 + K_2 = K, \ L_1 + L_2 = L = 1, \]
\[ wL_2 + rK_2 = \tau AK_1^{1/3} L_1^{2/3}, \]
\[ C = (1 - s)(1 - \tau)K_1^{1/3} L_1^{2/3}, \]
\[ Z = s(1 - \tau)AK_1^{1/3} L_1^{2/3}, \]

\( s \) and \( \tau \) are fixed positive fractions,

\[ \dot{K} = Z - \mu K, \]
\[ \dot{A} = R - \rho A. \]

Draw the phase diagram. Describe the dynamics. If the production functions are perturbed, are the dynamics altered?