14.54 Practice Questions

12-9-2004

1 Current Account With Investment

Consider a model with two countries and two periods. The two countries have symmetric preferences for conumption, defined by

$$U = \ln C_1 + \beta \ln C_2.$$

The countries have endowments of captial K_1 and K_1^*, with which they produce output in each period according to the technologies $Y = f(K)$ and $Y^* = f^*(K^*)$. Each country can invest by consuming less than they produce or borrowing from abroad.

$$K_2 = K_1 + I_1$$

The countries can consume their capital (as well as its product) in the second period, and they earn (or pay) intereset on their current account balance, so second period consumption is given by

$$C_2 = (1+r)CA_1 + Y_2 + K_2$$

1. Write C_2 as a function of K_1 and I_1. (Hint: apply the accounting identity for the current account when $G = 0$).

2. Citizens of both countries invest in second-period capital until its marginal product equals the world interest rate, that is $f'(K_2) = r$. If $f(K) = K + K^{1/2}$, write K_2 as a function of r and I_1 as a function of r and K_1.

3. Use the Euler condition $U'(C_1) = (1+r)U'(C_2)$ to solve for C_1 as a function of K_1, r, and β.

4. If both countries have the same production function in period one, but the home country is more productive in the second period ($f_2'(K) \geq f_2'^*(K) \forall K \in [0, \infty)$), and both countries have the same preferences and endowments of capital, describe the pattern of international lending and borrowing. What does this imply about the current accounts of countries that expect to have higher than average productivity growth?

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2   Nominal Debt Crisis

1. In Obstfeld's model, find the equilibria for the parameters $D_2 = 1.01$, $R = 1$, $D_1 = 0.4$, and $i^* = 0.05$.

2. What happens if the IMF, sensing an impending crisis, offers to roll over nearly all of the country's short term debt? How does this help?

3   Fiscal Crisis

1. Consider the model of fiscal crisis in the class notes. For the parameters $A = 0.1$, $k = 1000$, $c = 2$, and $D = 120$, find the firm's reaction function, the goverment's tax rule, and the best and worst equilibria.

2. What happens if $A = 0.13$? How does the increased profitability of investment change the possible outcomes?