

Economics 170
International Macroeconomics
Homework 4
Due 2/11

1. Direct Sanctions, Reputation, and Default

Consider a two-period small open economy populated by identical households with preferences given by

$$\ln(C_1) + \ln(C_2),$$

where C_1 denotes consumption in period 1, and C_2 denotes consumption in period 2. Households receive an endowment of $Q_1 = 5$ in period 1 and of $Q_2 = 20$ in period 2. In addition, households start period 1 with a debt position including interest of 1. The world interest rate, r^* , is 10 percent. Assume, realistically, that there is no international judicial system capable of enforcing international debt contracts either in period 1 or in period 2. Suppose that if agents default in period 1, then they are unable to borrow or lend that period. Also, assume that if a household defaults in period 2, then foreign creditors can confiscate up to Δ units of goods in that period. Assume that if in equilibrium the domestic interest rate is higher than the world interest rate (i.e., if $r_1 > r^*$), the rents from financial rationing, given by $-(r_1 - r^*)B_1$ are rebated to domestic consumers in a lump-sum fashion.

- (a) Assume that $\Delta = 8$. Compute the equilibrium levels of consumption in periods 1 and 2, the trade balance in period 1, the net foreign asset position at the end of period 1, the level of welfare of the household, and the domestic interest rate.
- (b) Answer question (a) assuming that $\Delta = 6$, which implies that foreign creditors have a weaker capacity to punish period-2 defaulters.
- (c) Now answer question (a) in a more extreme case in which foreign creditors can punish period-2 delinquent borrowers by confiscating the modest amount $\Delta = 1$.

2. An Economy With Investment

Consider a two-period model of a small open economy with a single good each period. Let preferences of the representative household be described by the utility function

$$\ln(C_1) + \ln(C_2),$$

where C_1 and C_2 denote consumption in periods 1 and 2, respectively, and \ln denotes the natural logarithm. In period 1, the household receives an endowment of $Q_1 = 10$. In period 2, the household receives profits, denoted by Π_2 , from the firms it owns. Households and firms have access to financial markets where they can borrow or lend at the interest rate r_1 . (r_1 is the interest rate on assets held between periods 1 and 2.)

Firms invest in period 1 to be able to produce goods in period 2. The production technology in period 2 is given by

$$Q_2 = \sqrt{I_1},$$

where Q_2 and I_1 denote, respectively, output in period 2 and investment in period 1.

Assume that there exists free international capital mobility and that the world interest rate, r^* , is 10% per period (i.e., $r^* = 0.1$). Finally, assume that the economy's initial net foreign asset position is zero ($B_0^* = 0$).

- (a) Compute the firm's optimal levels of period-1 investment and period-2 profits.
- (b) State the maximization problem of the representative household and solve for the optimal level of consumption in periods 1 and 2.
- (c) Find the equilibrium levels of savings and the current account in period 1.
- (d) Now consider an investment surge. Specifically, assume that as a result of a technological improvement, the production technology becomes $Q_2 = 2\sqrt{I_1}$. Find the equilibrium levels of savings, investment, and the current account in period 1. Compare the results with those obtained in items 1 and 3 providing interpretation and intuition.