

Economics W4505

International Monetary Theory and Policy

Spring 2010

Homework 4

Due February 18 in class

An Open 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 ($B_0^* = 0$).

1. Compute the firm's optimal levels of period-1 investment and period-2 profits.
2. State the maximization problem of the representative household and solve for the optimal levels of consumption in periods 1 and 2.
3. Find the equilibrium levels of savings and the current account in period 1.
4. 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.