

Problem Set 1 - Answers

Econ 513

1. Consider the pure endowment two year model of a small economy. The economy receives an endowment $Y_1 = 10$ in year 1 and $Y_2 = 15$ in year 2. Agents in this economy maximize the following utility function:

$$U = \log C_1 + \log C_2$$

where C_1 and C_2 is consumption in year one and two respectively. (note that there is no discounting of the future i.e. $\beta = 1$)

- a. What is the level of consumption in year 1 and 2 in this *closed* economy? What is the level of welfare?

Answer: In the closed economy case consumption equals production (endowment) $C_1 = Y_1 = 10$ and $C_2 = Y_2 = 15$. The welfare is $U = \log 10 + \log 15 = 5.01$.

- b. What is the equilibrium interest rate in this *closed* economy?

Answer: The interest rate is given by the Euler equation:

$$\frac{\beta U'(C_2)}{U'(C_1)} = \frac{1}{1 + r^A}$$

which in our case reduces to $r^A = \frac{C_2}{C_1} - 1 = 0.5$. Hence, the autarky interest rate is 50%.

- c. Suppose that a country can borrow on the world capital markets at interest rate $r = 10\%$. What is the consumption in year 1 and year 2? What is the total welfare?

Answer: From Euler equation we get that $C_1 = \frac{1}{1+r}C_2$ and from the budget constraint we know that $C_2 = Y_2 + (1+r)(Y_1 - C_1)$. Therefore we have two equations with two unknowns (C_1 and C_2). The solution is $C_1 \doteq 11.8$ and $C_2 \doteq 13.02$. Total welfare is $U = 5.03$.

- d. What is the current account year 1? What is the current account in year 2?

Answer: The current account in year 1 is $CA_1 = Y_1 - C_1 = -1.8$. The current account in year 2 is the trade balance $Y_2 - C_2$ plus net interest income $r(Y_1 - C_1)$. Therefore, the current account in year 2 is $CA_2 = Y_2 - C_2 + r(Y_1 - C_1) = 1.98 - 0.18 = 1.8$. Thus, in a model with no initial and final borrowing the current account deficit is exactly equal to the second year surplus $CA_1 = -CA_2$.

2. Describe the degree of openness of your country by answering the following questions:

- a. What is the share of international trade in GDP?

Answer: In the Czech Republic the share of imports and exports in GDP is 124% in 2000.

b. What is the current account as percent of GDP?

Answer: In the Czech Republic the current account was -5% of GDP in 2000.

c. What is the share of foreign equity in total equity holdings?(do not worry about this part if you can't find the data)

Answer: The data on holdings of foreign equity is not available but casual observation suggests that holdings of foreign equity in the Czech Republic are very small.