

ECON4330 : Additional excercises

Answers to excises 1 and 2 will be made available on the semester page on March 5 2010

Exercise 1. The current account in an intertemporal equilibrium model

We look an infinite horizon model of savings and the current account in a small open economy. The time path for output is given exogenously (“endowment economy”). There is no investment

- 1) A representative consumer maximizes utility

$$U_t = \mathbf{E}_t \left\{ \sum_{s=t}^{\infty} \beta^{s-t} u(C_s) \right\} \quad (1)$$

where C_s is consumption in period s and $\beta < 1$ is a subjective discount factor. The budget constraint is

$$\sum_{s=t}^{\infty} \left(\frac{1}{1+r} \right)^{s-t} C_s = (1+r)B_t + \sum_{s=t}^{\infty} \left(\frac{1}{1+r} \right)^{s-t} \mathbf{E}_t (Y_s - G_s) \quad (2)$$

where r is the real rate of interest, B_t is net foreign assets at the beginning of period t , Y_s is GDP and G_s is government expenditure in period s .

Explain briefly the reasoning that is behind the inclusion of G_s in the budget equation for the consumer.

- 2) The maximization problem in 1) leads to the first-order condition (Euler equation)

$$\mathbf{E}_t[u'(C_s)] = \mathbf{E}_t[\beta(1+r)u'(C_{s+1})] \quad s = t, t+1, \dots \quad (3)$$

Interpret this condition.

- 3) Robert Hall’s theory of aggregate consumption states that

$$\mathbf{E}_t C_s = C_t \quad s = t+1, \dots \quad (4)$$

Interpret this equation and explain the assumptions that are needed to get from (3) to (4).

- 4) Define total wealth as

$$W_t = (1+r)B_t + \sum_{s=t}^{\infty} \left(\frac{1}{1+r} \right)^{s-t} (Y_s - G_s) \quad (5)$$

If equation (3) holds true, it follows that

$$C_t = \frac{r}{1+r} W_t = rB_t + \frac{r}{1+r} \sum_{s=t}^{\infty} \left(\frac{1}{1+r} \right)^{s-t} \mathbf{E}_t(Y_s - G_s) \quad (6)$$

State in words what this means. Discuss briefly whether it is likely to be a good description of aggregate consumption.

- 5) Suppose consumption demand is given by (7). Derive an equation for the current account surplus of the country in period t . Explain briefly how permanent and transitory income shocks will affect the current account.

Exercise 2 Playing with interest rate parity

Throughout this exercise you should assume that uncovered as well as covered interest rate parity holds. We are looking at two imaginary currencies that we call peso and dollar.

1. Suppose the exchange rate is expected to be 10 pesos to a dollar one year from now. The one-year interest rates are 10 per cent on pesos and 5 per cent on dollars. What is the exchange rate today?
2. Suppose the exchange rate today is 10 pesos to a dollar. The two year interest rate on pesos is 4 per cent per year, the two year interest on dollars 5 per cent per year. What is the expected exchange rate two years from now?
3. Historically the exchange rate between the two currencies has been 10 to 1 and. If it deviates from this, agents expect it to return to that level in the long run. The country with dollars is expected to go into a recession one year from now. The recession is expected to last for two years. During those two years the central bank is expected to keep the dollar interest rate below the peso interest rate. Sketch in a graph how you would expect the time path of the exchange rate to behave.
4. Suppose now that both countries are expected to go through the same type of recession as described above and that both central banks behave in the same way. However, the recession hits the peso country one year later than the dollar country. Sketch in a graph how the expected time path of the exchange rate would look like.
5. Suppose the one-year forward exchange rate is 10 pesos to the dollar, the current exchange rate is 9 pesos to the dollar and the peso interest rate is 5 per cent per year. What would it cost me to borrow pesos for one year?

By the way, what are the conditions for the two types of interest rate parity to hold?

Exercise 3: Explaining current account deficits

Write 1-2 pages (verbal) on the question:

“For some years developing countries in Asia has had huge current account surpluses while the US and UK have had huge deficits. To what extent can the models in OR Ch 1- 4 help explaining this?”

Find another student who has done the same and compare and discuss your writings