The Indeterminacy of the Exchange Rate

• Suppose that people are free to hold and use any currency.

• To find the exchange rate, we need to examine the equality of world’s supply of money and demand for money.

\[ \nu_t^a M_t^a + \nu_t^b M_t^b = N_t^a (y^a - c_{1,t}^a) + N_t^b (y^b - c_{1,t}^b). \]

• We now have two unknown variables \((\nu_t^a, \nu_t^b)\) in one equation, so the exchange rate is difficult to be determined. The solution could be any number.

• Because \(e_t = \nu_t^a / \nu_t^b\), we can find the world market clearing equilibrium for any positive exchange rate.

\[ e_t \nu_t^b M_t^a + \nu_t^b M_t^b = N_t^a (y^a - c_{1,t}^a) + N_t^b (y^b - c_{1,t}^b), \]
\[ \nu_t^b [e_t M_t^a + M_t^b] = N_t^a (y^a - c_{1,t}^a) + N_t^b (y^b - c_{1,t}^b). \]

• When people are free to hold both countries’ currency, the country’s supply and demand determine the real value of world money supply but not the exchange rate.
Cooperative Stabilization

- In the absence of foreign currency control, the exchange rate cannot be determined. It simply depends upon people’s beliefs. As a result, the exchange rate could fluctuate according to fluctuations of these beliefs.

- What is the solution to the indeterminacy of the exchange rate?

- The first solution is called cooperative stabilization.

- Governments determine the rate of exchange and stand ready to exchange currencies at some given rate.

- Both countries’ monetary authority must be willing to accept any amount of one currency in exchange for another currency at the fixed rate.

- No one will worry about the shortage of any particular currency as long as the monetary authority can print any amount of one nation’s currency for that of another, so the fixed exchange rate can be maintained.
Unilateral Defense of the Exchange Rate

• Does such an unlimited commitment exist between sovereign nations?

• How can the fixed exchange rate be supported without the full cooperation of foreign central bank?

• To keep its exchange rate, the government commits to tax its citizens to acquire goods that may be sold in order to purchase the foreign currency demanded.

• If everybody believes this commitment, then the exchange rate will remain fixed over time. Nobody has an incentive to exchange currencies.

• This policy transfers resources from the citizens of the committed country to the citizens of the other. People from the first county will be worst off.
The optimal International Monetary System

• If political coordination were not a problem, what sort of international monetary system would we want?

• To eliminate costs of exchange currencies, nations wish to have a single currency to facilitate trade.

• The monetary authority is needed to be a sole issuer of fiat money. This would prevent countries that share a single currency from taxing each other through seigniorage.

• Single world money requires that nations surrender their sovereignty over monetary policy to some trusted authority.
Example 4.1

Suppose that country $a$ and country $b$ have foreign currency controls in effect. The demand for money is growing at 10.25 percent and 2 percent in country $a$ and country $b$, respectively. The fiat money supplies in country $a$ and country $b$ are growing at 5 percent and 6.25 percent.

a. What is the exchange rate $e_t$?

b. What is the rate of return on fiat money in each country?

c. What is the time path of the exchange rate between both countries ($e_{t+1}/e_t$)?

d. Suppose country $a$ desires to fix the exchange rate. How can country $a$ government set its gross rate of fiat money creation $z^a$ to accomplish this goal?
**Example (page 89)**

Suppose country $a$ and country $b$ are identical. In each country, the population of every generation is constant and equal to 100. Each young person wants real money balances worth 10 goods. The total money stock in country $a$ and country $b$ is $800$ and £600, respectively. The exchange rate is fixed at 0.5.

a. What are the values of money and consumptions of old people in each country?

Suppose that every old person decides to cut their real balances of country $a$ in half.

b. What will results in part a. be under cooperative stabilization?

c. What will results in part a. be under unilateral defense?