

# **Chapter 5**

## **Monetary Cooperation**

### **between Europe and America,**

### **Wage Competition between Germany and France**

1) The static model. As a point of reference, consider the static model. It can be represented by a system of three equations:

$$Y_1 = A_1 + 0.5\alpha M_{12} - 0.5\beta M_3 - \lambda W_1 - \mu W_2 \quad (1)$$

$$Y_2 = A_2 + 0.5\alpha M_{12} - 0.5\beta M_3 - \lambda W_2 - \mu W_1 \quad (2)$$

$$Y_3 = A_3 + \alpha M_3 - \beta M_{12} + \nu W_1 + \nu W_2 \quad (3)$$

The endogenous variables are German output, French output, and American output.

2) The dynamic model. At the beginning there is unemployment in Germany, France and America. To be more specific, unemployment in Germany is high, and unemployment in France is low. The targets of monetary cooperation are full employment in Europe and full employment in America. The instruments of monetary cooperation are European money supply and American money supply. Under monetary cooperation there are two targets and two instruments, so there is no degree of freedom. The target of the German labour union is full employment in Germany. The instrument of the German labour union is German nominal wages. The target of the French labour union is full employment in France. The instrument of the French labour union is French nominal wages.

We assume that the central banks and the labour unions decide sequentially. First the central banks decide, then the labour unions decide. In step 1, the European central bank and the American central bank decide cooperatively. In step 2, the German labour union and the French labour union decide simultaneously and independently. In step 3, the European central bank and the American central bank decide cooperatively. In step 4, the German labour union

and the French labour union decide simultaneously and independently. And so on.

Now have a closer look at step 1. It refers to monetary cooperation between Europe and America. Taking differences in equations (1), (2) and (3), the model of monetary cooperation can be written as follows:

$$\Delta Y_{12} = \alpha \Delta M_{12} - \beta \Delta M_3 \quad (4)$$

$$\Delta Y_3 = \alpha \Delta M_3 - \beta \Delta M_{12} \quad (5)$$

Here  $\Delta Y_{12}$  denotes the initial output gap in Europe,  $\Delta Y_3$  is the initial output gap in America,  $\Delta M_{12}$  is the required increase in European money supply, and  $\Delta M_3$  is the required increase in American money supply. The endogenous variables are  $\Delta M_{12}$  and  $\Delta M_3$ . The solution to the system (4) and (5) is:

$$\Delta M_{12} = \frac{\alpha \Delta Y_{12} + \beta \Delta Y_3}{\alpha^2 - \beta^2} \quad (6)$$

$$\Delta M_3 = \frac{\alpha \Delta Y_3 + \beta \Delta Y_{12}}{\alpha^2 - \beta^2} \quad (7)$$

As a result, there is a solution to monetary cooperation between Europe and America. In other words, monetary cooperation can achieve full employment in Europe and America. Step 2 refers to the output lag.

Next have a closer look at step 3. It refers to wage competition between Germany and France. The German labour union sets German nominal wages, forming rational expectations of French nominal wages. And the French labour union sets French nominal wages, forming rational expectations of German nominal wages. That means, the German labour union sets German nominal wages, predicting French nominal wages with the help of model. And the French labour union sets French nominal wages, predicting German nominal wages with the help of the model. Taking differences in equations (1) and (2), the model of wage competition can be written as follows (see Chapter 3):

$$\Delta Y_1 = -\lambda \Delta W_1 - \mu \Delta W_2 \quad (8)$$