

# Chapter 1

## The Small Monetary Union of Two Countries

### 1. The Model

1) Introduction. In this chapter we consider a monetary union of two countries, let us say Germany and France. Take for instance an increase in union money supply. Then what will be the effect on German output, and what on French output? Alternatively take an increase in German nominal wages. Again what will be the effect on German output, and what on French output?

The monetary union is a small open economy with perfect capital mobility. For the small open economy, the world interest rate is given exogenously  $r_f = \text{const}$ . Under perfect capital mobility, the union interest rate agrees with the world interest rate  $r = r_f$ . Therefore the union interest rate is constant, too. The exchange rate between the monetary union and the rest of the world is flexible. German goods and French goods are imperfect substitutes for one another. We assume that the union countries are the same size and have the same behavioural functions. This model is in the tradition of the Mundell-Fleming model and the Levin model, see Carlberg (2000, 2001). The goods market equations are well consistent with microfoundations, see Carlberg (2002).

2) The market for German goods. The behavioural functions underlying the analysis are as follows:

$$C_1 = cY_1 \tag{1}$$

$$I_1 = \text{const} \tag{2}$$

$$G_1 = \text{const} \tag{3}$$

$$X_{12} = mP_2Y_2 / P_1 \tag{4}$$

$$X_{13} = h_e / P_1 \tag{5}$$

$$Q_1 = qY_1 \tag{6}$$

Equation (1) is the consumption function of Germany. Here  $C_1$  denotes German consumption, as measured in German goods.  $Y_1$  is German income, as measured in German goods. And  $c$  is the marginal consumption rate of Germany, with  $0 < c < 1$ . Equation (1) states that German consumption is a positive function of German income. According to equation (2), German firms decide on German investment. Here  $I_1$  is German investment, as measured in German goods. According to equation (3), the German government sets its purchases of goods and services. Here  $G_1$  is German government purchases, as measured in German goods.

Equation (4) is the export function of Germany relative to France. Here  $X_{12}$  denotes German exports to France, as measured in German goods.  $P_1$  is the price of German goods, as measured in euros.  $P_2$  is the price of French goods, as measured in euros.  $Y_2$  is French income, as measured in French goods. Then  $P_2 Y_2$  is French income, as measured in euros. And  $P_2 Y_2 / P_1$  is French income, as measured in German goods.  $m$  is the marginal import rate of France relative to Germany, with  $m > 0$ . Equation (4) states that German exports to France are a positive function of French income, a negative function of the price of German goods, and a positive function of the price of French goods. A 1 percent increase in French income causes a 1 percent increase in German exports to France. On the other hand, a 1 percent increase in the price of German goods causes a 1 percent decline in German exports to France. And a 1 percent increase in the price of French goods causes a 1 percent increase in German exports to France.

Equation (5) is export function of Germany relative to non-union countries. Here  $X_{13}$  denotes German exports to non-union countries, as measured in German goods.  $e$  is the exchange rate between the monetary union and the rest of the world (e.g. the price of the dollar in terms of the euro). Then  $P_1 / e$  is the price of German goods, as measured in dollars. And  $h$  is the price sensitivity of German exports to non-union countries, with  $h > 0$ . Equation (5) states that German exports to non-union countries are a positive function of the exchange rate and a negative function of the price of German goods. A 1 percent depreciation of the euro causes a 1 percent increase in German exports to non-union countries. The other way round, a 1 percent increase in the price of German goods causes a 1 percent decline in German exports to non-union countries. Equation (6) is the import function of Germany. Here  $Q_1$  is German imports from France and from non-union countries, as measured in German