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**14.02 Principles of Macroeconomics**  
**Problem Set 6**  
**Fall 2005**

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Posted: Wednesday, November 23, 2005  
Due: **FRIDAY**, December 2, 2005

Please write your name AND your TA's name on your problem set. Thanks!

**Exercise I. True/False? Explain**

- 1) Assume that the Marshall-Lerner condition holds and  $\frac{P}{P^*} = 1$  so that  $\varepsilon = E$  (real and nominal exchange rates are the same). In the short run, in an open economy with flexible exchange rates and constant expectations about the future exchange rate ( $\bar{E}^e$ ), an expansionary monetary policy has an ambiguous effect on the trade balance.
- 2) In an open economy, an increase in the foreign interest rate always shifts up the LM curve. Assume constant expectations of the exchange rate  $\bar{E}^e$ .
- 3) Adopting a fixed exchange rate regime implies necessarily that the Central Bank gives up the monetary policy as a policy tool.
- 4) In the medium run, the choice of the exchange rate regime does not affect the equilibrium output level, but it does affect the equilibrium price level.
- 5) The AD curve in an open economy is unambiguously flatter than in a closed economy.
- 6) A group of countries is an optimal currency area if two conditions are both satisfied: the countries experience similar shocks and there is high factor mobility between them.

**Exercise II. Open economy IS-LM**

Consider the following open economy:

$$C = 215 + 0.3(Y - T)$$

$$I = 100 + 0.2Y - 750r$$

$$IM = 0.1Y\varepsilon + 100\varepsilon^2$$

$$X = 0.01Y^* - 110\varepsilon$$

$$T = 50$$

$$G = 50$$

$$Y^* = 10000$$

$$M^s = 500$$

$$M^d = PY - 2500i$$

$$i^* = 4\%$$

Suppose that  $P = P^* = 1$  and there is no inflation  $\pi^* = \pi = 0$ .

Assume that the country has a **fixed** exchange rate regime.

- 1) Is the Marshall-Lerner satisfied in this economy?
- 2) Calculate the equilibrium  $(Y, i, \varepsilon, TB)$ .
- 3) Assume that  $G$  increases by 55. What does the Central Bank have to do in order to keep the exchange rate fixed?
- 4) How does the trade balance change after the expansionary fiscal policy? Comment.

### Exercise III. Open-Economy AS-AD

Consider the following open economy:

$$C = 375 + 0.3(Y - T)$$

$$I = 210 + 0.2Y - 750r$$

$$IM = 0.1Y\varepsilon + 100\varepsilon^2$$

$$X = 0.01Y^* - 110\varepsilon$$

$$T = 50$$

$$G = 50$$

$$Y^* = 10000$$

$$M^s = 500$$

$$M^d = PY - 2500i$$

$W = P^e(z - 10u)$  where  $z = 10.1$  is a parameter that represents the workers' bargaining power and  $u$  is the unemployment rate.

The following is the price setting relation  $P = (1 + \mu)W$  where  $\mu = 0.25$  is the markup.

The production function is:  $Y = N$

The labor force is  $L = 10000$ .

- 1) Derive the AS relation in this open economy.
- 2) Derive the AD relation assuming that the economy has a **flexible** exchange rate. Express  $Y$  as a function of  $P_t$ ,  $P_{t+1}^e$ , and  $\varepsilon_t$ , using the approximation  $r = i - \pi^e$ .
- 3) Calculate the medium run equilibrium  $(Y, P, E)$ . Assume that in the medium run trade is balanced,  $P^* = 1$ , and  $P_{t+1}^e = P_{t+1} = P_t = P$ .
- 4) Now assume that the country has a **fixed** exchange rate regime with  $E = \bar{E}$ . Foreign countries have  $i^* = 0.36$ ,  $P^* = 1$ , and  $\pi^* = 0$ . Derive the AD relation.
- 5) Assume again  $P_{t+1}^e = P_{t+1} = P_t = P$  and calculate the medium run equilibrium  $(Y, P, E)$ .  
Can you pin down a unique value for  $\bar{E}$ ? Compare with part 3). What is the value of the Trade Balance in the medium run?
- 6) Assume that the economy is in a short run equilibrium with  $Y=500$ . Describe with words and graphs the dynamics to the medium run equilibrium under the two scenarios (flexible exchange rate and fixed exchange rate).