
14.02 Principles of Macroeconomics
Problem Set 6
Fall 2005

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, ε, 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 ε_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).