
14.02 Principles of Macroeconomics

Problem Set 5

Spring 2003

Distributed Wednesday, April 23
Due Wednesday, April 30 in class

**PLEASE FILL IN THE BLANKS BELOW AND ATTACH THIS COVER SHEET
TO THE FRONT OF YOUR COMPLETED PROBLEM SET.**

NAME: _____

MIT ID NUMBER: _____

TA: _____

CLASS TIME: _____

Question 1: True/False/Uncertain

Decide whether each of the following statements is True, False or Uncertain (ie. neither always true nor always false). Justify your answer, in a few lines or a simple diagram if appropriate.

- a) The larger the marginal propensity to import (w.r.t. domestic GDP), the smaller the multiplier.
- b) Trade deficits are problematic as they lead to a flight of capital (i.e. capital flows from the domestic economy to the rest of the world).
- c) Countries “prefer” expansions in foreign demand to expansions in domestic demand.
- d) Coordinated fiscal policies across countries can avoid trade deficits.
- e) Given domestic inflation and the nominal exchange rate, inflation abroad tends to cause a depreciation in the real exchange rate.
- f) The J-curve implies that a depreciation will lead to an increase in the trade deficit in the long run.
- g) An increase in the government’s budget deficit always leads to a deterioration of the trade balance.
- h) A depreciation leads to a decline in the trade deficit in the short run, and an increase in domestic GDP in the long-run.
- i) Monetary Policy is more effective (in terms of affecting GDP) under fixed exchange rates than under flexible exchange rates.
- j) Fiscal policy is more effective (in terms of affecting GDP) under flexible exchange rates than under fixed exchange rates.
- k) The appearance of twin deficits is typical in an economy with 1) flexible exchange rates 2) expansionary fiscal policy 3) restrictive monetary policy, assuming that the net effect of these policies on output is zero.
- l) Maintaining a fixed exchange rate can be difficult as the foreign currency reserves of central banks are finite.
- m) The US trade deficit has declined in recent years.
- n) The degree of openness of the US economy has been very stable over the past century.
- o) The US\$ exchange rate is fixed vis-à-vis the Euro.

Question 2: NAFTA and Fiscal Policy

The creation of NAFTA has led to the abolishment of many trade barriers between Canada and the US. Let's analyze the implications of NAFTA for macro policies. Assume that the US economy is characterized by the following equations:

$$Y = C + I + G + X - IM$$

$$C = c_0 + c_1(Y - T)$$

$$I = I_0 + I_1Y$$

$$IM = mY$$

$$X = xY^*$$

where the usual notation is used, and Y^* denotes Canada's GDP. For simplicity, we assume that Canada is the only trading partner of the US. The real exchange rate is normalized to 1 for simplicity. Assume that $c_1 + I_1 < 1$ and $c_1 + I_1 - m > 0$.

- 1) What is the impact of a change in Canada's GDP on US GDP and the US trade balance? Explain. (Hint: You should calculate dY/dY^* and dNX/dY^*)
- 2) NAFTA increased trade between Canada and the US, i.e. an increase in x and m . How does such an increase in trade impact the results that you derived above? Explain your findings in words. (Hint: You should sign but do not have to calculate $d^2Y/(dY^*dm)$, $d^2Y/(dY^*dx)$, $d^2NX/(dY^*dm)$, $d^2NX/(dY^*dx)$).
- 3) Now let's study the effectiveness of fiscal policy. Does an increase in m and x due to NAFTA lead to more or less effectiveness of fiscal policy? Explain, considering the impact of fiscal policy on both output and the trade balance. (Hint: You should sign $d^2Y/(dGdm)$, $d^2Y/(dGdx)$, $d^2NX/(dGdm)$, $d^2NX/(dGdx)$)

Now assume that the following macroeconomic model characterizes Canada's economy:

$$Y^* = C^* + I^* + G^* + X^* - IM^*$$

$$C^* = c_0^* + c_1^*(Y^* - T^*)$$

$$I^* = I_0^* + I_1^*Y^*$$

$$IM^* = m^*Y^*$$

$$X^* = x^*Y^*$$

Assume from now on that $x < (1 - c_1 - I_1 + m)$ and $x^* < (1 - c_1^* - I_1^* + m^*)$.

- 4) Solve for US GDP as a function of (G, G^*, T, T^*) and the parameters. Interpret. Check your answer by showing when $m=x=0$, the usual equations of the closed economy apply.
- 5) What is the impact of US fiscal policy on US GDP? How does an increase in m and x impact the effectiveness of fiscal policy? Interpret, and compare with your answers from part 3).
- 6) What is the impact of Canadian fiscal policy on US GDP? How does an increase in m and x impact the effectiveness of fiscal policy? Interpret, and compare with your answers from part 2).

Question 3:

Assume that a country has a fixed exchange rate.

- 1) What are the implications of this exchange rate policy for the domestic interest rate?
- 2) In an IS-LM diagram, show the effects of an expansionary monetary policy for this economy. Explain. What are the capital flows implied by this policy? What happens to the trade deficit?
- 3) In an IS-LM diagram, show the effects of an expansionary fiscal policy. Explain. What are the capital flows implied by this policy? What happens to the trade deficit?
- 4) How would your answers change if the country had flexible exchange rate policy?