

Course in Macroeconomics and Global Economics
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Practice 4 Solutions

Exercise 1

1.
 - $Z = C + I + G - \frac{IM}{\varepsilon} + X$
In equilibrium we have $Y = Z$
 $Y = C + I + G - \frac{IM}{\varepsilon} + X$
 $Y = 10 + 0.8(Y - 10) + 10 + 10 - 0.3Y + 0.3\bar{Y}^*$
 $Y(1 + 0.3 - 0.8) = 22 + 0.3\bar{Y}^*$
 $Y = \frac{1}{0.5}(22 + 0.3\bar{Y}^*) = 44 + 0.6\bar{Y}^*$
Open economy multiplier = $\frac{1}{0.5} = 2$;
 - In a closed economy we have:
 $Y(1 - 0.8) = 22$
 $Y = \frac{1}{0.2}22 = 110$
Close economy multiplier = $\frac{1}{0.2} = 5$;
 - The multiplier is lower in open economy than it would be in closed economy as part of the increase in demand is absorbed by foreign production (imports).
2. We assume symmetry between the two countries so we have:
 $Y = 44 + 0.6Y^*$
 $Y^* = 44 + 0.6Y$
 $Y = 44 + 0.6(44 + 0.6Y)$
 $Y = 44 + 26.4 + 0.36Y$
 $Y(1 - 0.36) = 70.4$
 $Y = \frac{1}{0.64}70.4 = 110$
 $Y^* = 44 + 0.6 * 110 = 44 + 66 = 110.$

3. In order to solve for ΔG we need the value of the open economy multiplier (when both Y and Y^* are variables):

$$Y = 10 + 0.8(Y - 10) + 10 + 10 - 0.3Y + 0.3(44 + 0.6Y)$$

$$Y(1 + 0.3 - 0.8 - 0.18) = 22 + 13.2$$

$$Y = \frac{1}{0.32} 35.2 = 3.125 * 35.2 = 110$$

The multiplier is equal to 3.125. We can compute ΔG .

$$\Delta Y = 3.125 * \Delta G$$

$$15 = 3.125 * \Delta G$$

$$\Delta G = 4.8$$

4. • Net exports equation: $NX = X - \frac{IM}{\epsilon}$
 In order to find net exports we need to compute the new level of output of the foreign country (the increase in domestic output impacts on the level of output in the foreign country):
 $Y^* = 44 + 0.6 * 125 = 119$
 Net export of the domestic country $NX = (0.3 * 119) - (0.3 * 125) = -1.8$;
- Net export of the foreign country $NX^* = (0.3 * 125) - (0.3 * 119) = 1.8$;
 - $(T - G) = (10 - 14.8) = -4.8$ (budget deficit);
 - $(T^* - G^*) = (10 - 10) = 0$ (balanced budget);
 - The additional spending in the domestic economy has increased output for both countries, but at the expense of a trade deficit and budget deficit: the domestic country runs a budget deficit and has to finance it by borrowing from the rest of the world (the foreign economy gains additional output and a trade surplus).

Exercise 2

Investors choose between bonds taking into account differences in the interest rates and the expected change in the exchange rate. Arbitrage by investors implies that the domestic interest rate must be approximately equal to the foreign interest rate minus the expected appreciation rate of the domestic currency (interest parity condition):

$$i_t = i_t^* - \frac{E_{t+1}^e - E_t}{E_t}$$

Looking at the values of interest rates, in our example we expect a depreciation of 4% of the exchange rate of A's currency with respect to B's currency (or, equivalently, an appreciation of 4% of B's currency).

Exercise 3

Applying the uncovered interest parity condition

$$i_t = i_t^* - \frac{E_{t+1}^e - E_t}{E_t}$$

the exchange rate of Duckburg is expected to depreciate by 4%.

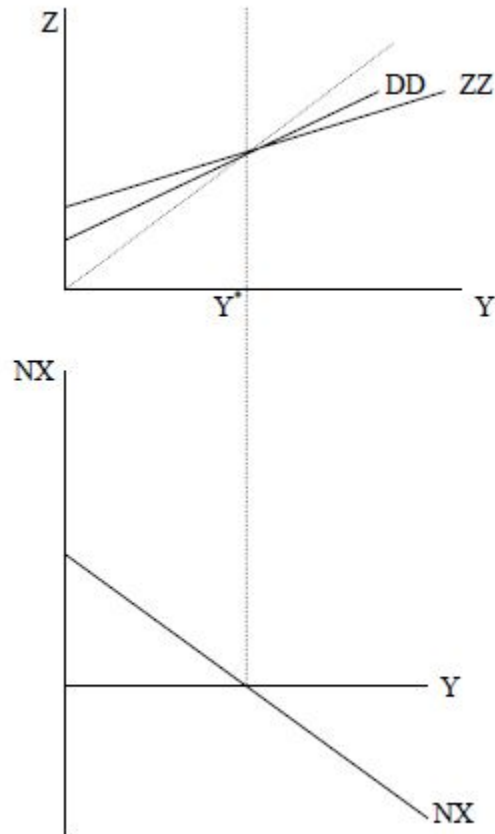
Exercise 4

- The total demand for domestic goods is: $Z = (C + I + G) + X - \frac{IM}{\varepsilon}$

The domestic demand for goods is: $DD = C + I + G$

In Italy $Z = DD$, so trade is balanced, $NX = 0$.

Italy and England trade only with each other so trade is balanced in England as well.



- $\varepsilon = -0.02Y_E + 0.04Y_I$
 $\varepsilon = \frac{EP}{P^*} = -0.02Y_E + 0.04Y_I$
 $\frac{EP}{P^*} = E \frac{80}{100}$
 $E \frac{80}{100} = [-0.02 * 2,250 + 0.04 * 1,150]$
 $E = \frac{10}{8}[-45 + 46] = 1.25$
 1.25 euros are needed in order to buy 1 pound.

Exercise 5

- In equilibrium $Y = Z$

$$Z = C + I + G - \frac{IM}{\varepsilon} + X$$

We know that $\varepsilon = 1$ so we can write:

$$Y = 100 + 0.8(1 - 0.25)Y + 340 + 120 - 110 - 0.3Y + 250$$

$$Y(1 - 0.6 + 0.3) = 700$$

$$Y = \frac{1}{0.7}700 = 1,000$$

- The sum of net payments to and from the rest of the world is called the current account balance.

In this case we have:

$$NX = \frac{X-IM}{\varepsilon} = 250 - (110 - 0.3Y) = 250 - 110 - 0.3 * 1,000 = 250 - 410 = -160$$

The trade balance is in deficit.

