ECON 3123: Macroeconomic Theory I

Problem Set 4 Solution

Total Score: 100 points

Question 1 (22 points)

(a) (4 points) Point A, ZZ, axis label (2), $Y = Z$, value.

(b) (8 points) $Y \downarrow, C \downarrow, I \downarrow, NX > 0$. ZZ curve down, no change in NX curve. 2 points for notations.

(c) (10 points) Assume that the Marshall Lerner condition holds. (1 point) Then decreasing ϵ leads to an increase in NX. (1 point) NX moves upwards, ZZ moves back. Y, I the same, $C \downarrow$. $NX \uparrow$. 2 points for notations.

Question 2 (23 points)

(a) (6 points) Point A, $IM - LM$, UIP, (E^e, i^*) (1 point), axis label (4, $IS - LM$ must be i), value.

(b) (8 points) IS shifts to the left, $Y, C, I \downarrow$. No change in UIP. $E-$, $NX \uparrow$. 2 more points for notation.

(c) (9 points) Target lower interest rate. LM shifts downwards. $Y-$, $C \downarrow$. $I \uparrow$. Equilibrium point moves downwards along UIP. $E \downarrow$, $NX \uparrow$. 2 more points for notation.

Question 3 (29 points)

(a) (8 points) In an open economy,

$$\begin{aligned} Y &= C + I + G - \frac{IM}{\epsilon} + X \\ &= 10 + 0.8(Y - 10) + 10 + G - 0.3Y + 0.3Y^* \\ &= 0.5Y + 12 + G + 0.3Y^*. \end{aligned}$$

Then $Y = 24 + 2G + 0.6Y^*$. The multiplier is 2. (3 points)

In a closed economy,

$$\begin{aligned} Y &= C + I + G \\ &= 10 + 0.8(Y - 10) + 10 + G \\ &= 0.8Y + 12 + G. \end{aligned}$$

Then $Y = 60 + 5G$. The multiplier is 5. (3 points)

The difference is from import leakage. (2 points)

(b) (7 points) In the foreign economy, $Y^* = 24 + 2G^* + 0.6Y$. Substitute this into $Y = 24 + 2G + 0.6Y^*$. We get

$$Y = 24 + 2G + 0.6(24 + 2G^* + 0.6Y) = 38.4 + 2G + 1.2G^* + 0.36Y.$$

Then $Y = 60 + 3.125G + 1.875G^*$. $Y^* = 60 + 3.125G^* + 1.875G$. (4 points)

Plug in the numbers. We get $Y = Y^* = 110$.

Import leakage is now somehow returned. (2 points)

(c) (6 points) Solve $125 = 60 + 3.125G' + 1.875 \times 10$. We get $G' = 14.8$. Then

$$\begin{aligned} Y^* &= 60 + 3.125 \times 10 + 1.875 \times 14.8 = 119 \\ NX &= -0.3 \times 125 + 0.3 \times 110 = -1.8 \\ NX^* &= 1.8 \\ T - G' &= -4.8 \\ T^* - G^* &= 0. \end{aligned}$$

(d) (4 points) Solving the system. $G'' = G^{*''} = 13$. $NX'' = NX^{*''} = 0$. $T - G'' = T^* - G^{*''} = -3$.

(e) (4 points) Government can just wait the other country to expand the balance sheet to gain its leakage "for free".

Question 4 (26 points)

(a) (4 points) Use UIP and do the math.

(b) 22 free points.