Ch. 5 Exercise: Small Open Economy

Model:
$Y = F(K, L) = AK^{\alpha}L^{1-\alpha}$; $\alpha = \frac{1}{3}$; $A = 0.3$; $K = 1000$; $L = 8000$
$C = C(Y - T) = 23 - 0.72(Y - T)$
$I = I(r^*) = 325 - 15.5r^*$ (real interest rate $= 5\% \Rightarrow r^* = 5$)
$Y = C + I + G + NX$; $G = 220$; $T = 155$

(a) What is aggregate output, Y?

$$Y = AK^{\alpha}L^{1-\alpha} = 0.3(1000)^{\frac{1}{3}}(8000)^{\frac{2}{3}} = 0.3(10)(400) = 1200$$

(b) What is the level of consumption, C?

$$C = 23 + 0.72(Y - T) = 23 - 0.72(1200 - 155) = 775.4$$

(c) What is the level of investment, I, if $r^* = 7\%$?

$$I = I(r^*) = 325 - 15.5r^* = 325 - 15.5(7) = 216.5$$

(d) Taking your results in parts (a) - (c) as given, find NX.

$$NX = Y - (C + I + G) = 1200 - (775.4 + 216.5 + 220) = -11.9$$

Alternatively, we could make use of the national savings identities to derive the quantity (S-I), which is equal to net exports.

$$S_{public} = T - G = 155 - 220 = -65$$

$$S_{private} = Y - C - T = 1200 - 775.4 - 155 = 269.6$$

$$S = S_{total} = S_{public} + S_{private} = -65 + 269.6 = 204.6$$

$$NX = S - I = 204.6 - 216.5 = -11.9$$

(e) Is this country a net borrower or net lender? Trade deficit/surplus? Explain.

Spending (C + I + G) in this economy exceeds domestic production (Y). As a result, imports are greater than exports (NX negative); this country is a net borrower with a trade deficit. These two questions get at the same relationship: if you import more than you export, you must be borrowing from abroad to finance the extra purchases.

(f) Repeat parts (a) - (d) with G = 245 (increase in government spending of 25 units).

$$Y = 1200$$

$$C = 775.4$$

$$I = 216.5$$

$$S_{public} = T - G = 155 - 245 = -90$$

$$S_{private} = 269.9$$

$$NX = S - I = 179.6 - 216.5 = -36.9$$

Since A, K, L, T, α, and r^* are all constant, Y, C, and I are unchanged. This implies that S_{public} falls by 25 units and $S_{private}$ is unaffected. NX decreases by 25 units to -36.9; the trade deficit has increased.

(g) Do you observe complete crowding out in part (f)? Why or why not?

No, there is no change in investment spending in the open economy as a result of the increase in government spending because r^* is exogenous. In the closed economy, we would have seen complete crowding out of investment spending with the increase in government spending (under classical assumptions). The increase in government spending here causes a decrease in public savings, which in turn reduces the level of national savings. This leads to more imports and more capital flowing into this economy from the international sector. The trade balance (X-M) falls and we arrive at a new equilibrium.

(h) What happens to the domestic real exchange rate after the increase in government spending, *ceteris paribus*? Are foreign goods more or less attractive to domestic consumers? Explain.

The increase in government spending causes national savings to decrease, which results in a leftward shift of the net capital outflows (S – I) line and a higher domestic real exchange rate. This economy will find its exports less attractive abroad as the domestic currency appreciates (increases in value) relative to foreign currencies, so exports decline. On the other hand, foreign goods become more attractive as they are now relatively cheaper for domestic consumers; imports will increase. This is consistent with the decline in net exports (X-M).