Chapter 5: The Open Economy[1]

1 Savings and Investment in a Small Open Economy

1.1 Definitions

$NX = X - M = Y - (C + I + G)$

Trade surplus: $X > M$ (output > spending)

Trade deficit: $X < M$ (output < spending)

Net capital outflow: $S - I$ (net outflow of "loanable funds")

- $S > I \Rightarrow$ country is a net lender

- $S < I \Rightarrow$ country is a net borrower

World interest rate: r^*

1.2 Assumptions

1. Production function: $Y = \bar{Y} = F(\bar{K}, \bar{L})$

2. Consumption function: $C = C(\bar{Y} - T)$

3. Investment function: $I = I(r^*)$

4. Exogenous fiscal policy: $G = \bar{G}$ and $T = \bar{T}$

5. Domestic and foreign bonds are perfect substitutes: same risk, maturity, etc.

6. Perfect capital mobility: no restrictions on international trade in assets

7. Economy is "small" relative to the rest of the world: r^* exogenous

1.3 Equilibrium

The exogenous world interest rate determines savings and investment; the difference between savings and investment determines net capital outflow, which equals net exports.

$$S^* = \bar{Y} - C - \bar{G} \tag{1}$$

$$I^* = I(r^*) \tag{2}$$

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[1] Econ 302, Week 7, 10/16/2009; UW-Madison. TAs Lihan Liu and Scott Swisher.

1.4 Policy

$G \uparrow$ or $T \downarrow$ shifts savings curve to the left $\Rightarrow$ capital outflow $\downarrow \Rightarrow NX \downarrow$

Expansionary fiscal policy abroad raises $r^* \Rightarrow$ capital outflow $\uparrow \Rightarrow NX \uparrow$

Domestic investment demand $\uparrow \Rightarrow$ investment curve shifts right $\Rightarrow$ capital outflow $\downarrow \Rightarrow NX \downarrow$

2 Exchange Rates

2.1 Definitions/Assumptions

Nominal exchange rate (e): the relative price of the currencies of two countries. Let's define it as the units of foreign currency per US Dollar ($\frac{\yen}{\$US}$, for example).

Real exchange rate (ϵ): the relative price of the goods of the two countries. $\epsilon = e\frac{P}{P_f}$, where P is the domestic price level and P_f is the price level abroad.

Net exports function ($NX = NX(\epsilon)$): downward-sloping in the real exchange rate. When ϵ is relatively low, US goods are inexpensive abroad, so US net exports will be high.

2.2 Equilibrium

Real exchange rate ϵ adjusts in equilibrium so that net capital outflows (the supply of \$US to be invested abroad) equal net exports (the demand for \$US due to foreigners buying US goods).

$$NX(\epsilon^*) = S^* - I^* = \bar{Y} - C - \bar{G} - I(r^*) \tag{3}$$

2.3 Policy

$G \uparrow \Rightarrow$ national savings shifts left$\Rightarrow \epsilon \uparrow$ and $NX \downarrow$

Expansionary fiscal policy abroad raises $r^* \Rightarrow I \downarrow \Rightarrow$ national savings shifts right $\Rightarrow \epsilon \downarrow$ and $NX \uparrow$

3 Exercise: Small Open Economy

$Y = AK^\alpha L^{1-\alpha}$; $\alpha = \frac{1}{3}$; $A = 0.3$; $K = 1000$; $L = 8000$

$C = 23 + 0.72(Y - T)$

$I = 325 - 15.5r^*$ (real interest rate $= 5\% \Rightarrow r^* = 5$)

$Y = C + I + G + NX$; $G = 220$; $T = 155$

a)   What is aggregate output, Y?

b)   What is the level of consumption, C?

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

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

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

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

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

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.