
Blanchard, Chapter 6, Q# 1.
a)- True
b)- False. If Singapore has balanced current account, and also export/GDP greater that one, then both import/GDP is also greater than one.
c)- False. Japan has a big economy, which despite huge import/export sectors, they are still small relatively.
d)- False. The difference in equal to expected depreciation rate. If there is no expectation of depreciation or appreciation, then interest rates must be equal.
e)- True, if it is assumed that Canadian dollar is the domestic currency and American dollar the foreign one.
f)- True, if it is assumed that Canada is the domestic country and the US is the foreign one.

Blanchard, Chapter 6, Q# 4.

a)-
i_{canada} = [(10000/9615.38) – 1]= 4%, and i_{US} = [(13333/12698.10) – 1]= 5%
b)-
$i_{canada} = i_{US}$ + Expected Depreciation Rate ➔ Expected Depreciation Rate = 4% – 5%= -1%
So we expect an appreciation of Canadian exchange rate: $1 US = 0.95 * (1-0.01) = $0.9405 CAN

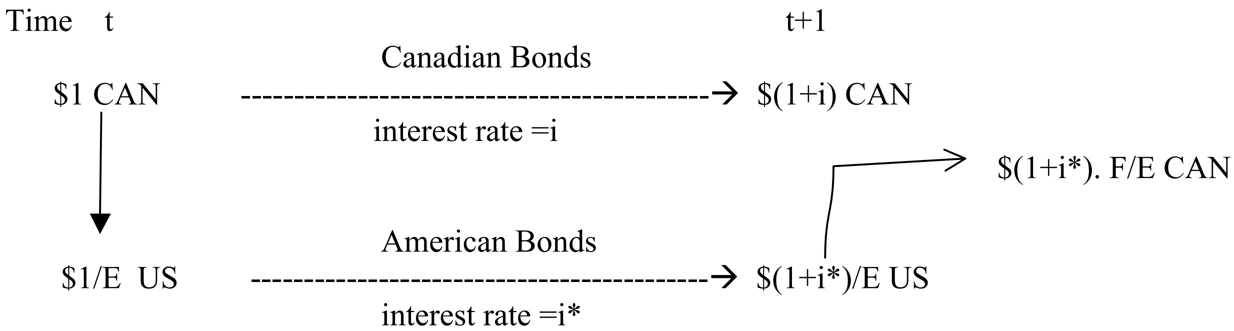
c)- In this case, it is better to buy American bonds, because rate of return would be higher than 5%.
d)-
If you substitute the expected exchange rate, E^e, by the actual exchange rate, E^a, in uncovered interest parity condition, then instead of the expected rate of return, you get the realized rate of return. So given the actual exchange rate in the next year, which is 0.9, and the US interest rate, 5% from above:

The realized rate of return= $i_{US} + (E^a - E)/E$ =0.05 +[(0.9-0.95)/0.95)] = 0.05 – 0.05263 =0.00263= –0.263%

e)- Uncovered interest parity applies only on "Expected Rates". So it implies that expected rate of return to foreign and domestic assets are equal. But the actual rates can be different depending on how different the expected and actual rates of return turn out to be. The later depends on how expected depreciation rate come true or not.

Blanchard, Chapter 6, Q# 5.

a)- Suppose nominal exchange rate is: \$1 US = \$ E CAN, and forward exchange rate for the next year is: \$ 1 US = \$ F CAN. If you have \$1 CAN, and have two options of American and Canadian bonds for investment, then you can consider these two options to invest your money, from now to the next year:



As you can see, when forward market exists, there is no necessity to rely on the expectations. You can really go to forward market and sign a contract to sell or buy foreign exchange in next year, at the guaranteed rate F today. There would not be any risk involved. That is why we use Covered (as opposed to uncovered) Interest Parity in this case. Covered Interest Parity relation implies that the two rates of return in above should be equal. So, $(1+i)= (1+i^*). F/E \Rightarrow i=i^* +(F-E)/E$

b)-

$4\% = 5\% + (F - 0.95)/0.95 \Rightarrow F = 0.9405$ CAN\$/US\$ The same as expected exchange rate.

The forward rate consistent with covered interest parity is the same as the expected exchange rate consistent with uncovered interest parity.

c)- If $F > 0.9405$, then $(1+i) < (1+i^*). F/E$, so we buy American bonds, and if $F < 0.9405$, then $(1+i) > (1+i^*). F/E$, so we buy Canadian bonds which are more profitable.

d)- Surprises can't change F, because we sign the contracts now and will be enforced at any condition. So the rates of return are guaranteed. But obviously the uncovered approach and expected exchange rate are affected by the surprises. So the realized (actual) and expected rates of return can be different.

Blanchard, Chapter 7, Q# 2.

a)- We have: $\varepsilon=E.P^*/P$, then using the proposition 7, and 8 you get the relationship.

b)-

If domestic inflation is higher than foreign inflation, then $\Delta\varepsilon/\varepsilon<0$, which means a real appreciation. Real appreciation implies more expensive domestic goods, and cheaper foreign goods. As a result, the import increases and exports falls, which leads to trade balance deterioration (given Marshal-Lerner Condition).

1-

i)-

Y= C+ G + I – Q+ X ➔ Y =c0 + c1.(Y – To) + G + Io – qY+ xY* ➔

Or equilibrium output:

$$Y = \frac{1}{(1-c1+q)}[c0 + c1.T0 + G + Io + xY^*]$$

The open economy multiplier is 1/(1-c1+q) <1/(1-c1), because q>0. It is smaller than the closed economy multiplier, because part of increase in G, in open economy, increases the demand for foreign produces goods.

ii)-

Y*= C*+ G* + I* – Q*+ X* ➔ Y =c0 + c1(Y* – To) + G* + Io – qY*+ xY ➔

Or equilibrium output:

$$Y^* = \frac{1}{(1-c1+q)}[c0 + c1.T0 + G^* + Io + xY]$$

The open economy multiplier is 1/(1-c1+q) <1/(1-c1), because q>0.

iii)-

$$Y = \frac{1}{K}[R + G + xY^*], \quad \text{and} \quad Y^* = \frac{1}{K}[R + G^* + xY], \quad \text{Where} \quad K = (1-c+q), \quad \text{and} \quad R = c0 - c1.To + Io$$

$$Y = \frac{1}{K}[R+G] + \frac{x}{K}Y^*, \quad \text{and} \quad Y^* = \frac{1}{K}[R+G^*] + \frac{x}{K}Y \quad \Rightarrow \quad Y = \frac{1}{K}[R+G] + \frac{x}{K^2}[R+G^*] + \frac{x^2}{K^2}Y$$

$$\Rightarrow Y - \frac{x^2}{K^2}Y = \frac{1}{K}R + \frac{1}{K}G + \frac{x}{K^2}R + \frac{x}{K^2}G^*$$

$$\Rightarrow \quad (\frac{K^2 - x^2}{K^2})Y = \frac{K+x}{K^2}R + \frac{1}{K}G + \frac{x}{K^2}G^* \Rightarrow [\frac{(K+x)(K-x)}{K^2}]Y = \frac{K+x}{K^2}R + \frac{1}{K}G + \frac{x}{K^2}G^*$$

$$\Rightarrow \quad Y = \frac{R}{K-x} + \frac{K}{K^2-x^2}G + \frac{x}{K^2-x^2}G^*$$

$$\Rightarrow \quad Y = \frac{(c0 - c1.To + Io)}{1-c+q-x} + \frac{(1-c+q)}{(1-c+q)^2 - x^2}G + \frac{x}{(1-c+q)^2 - x^2}G^*$$

$$\Rightarrow \quad Y^* = \frac{R}{K-x} + \frac{K}{K^2-x^2}G^* + \frac{x}{K^2-x^2}G$$

$$\Rightarrow \quad Y^* = \frac{(c0 - c1.To + Io)}{1-c+q-x} + \frac{(1-c+q)}{(1-c+q)^2 - x^2}G^* + \frac{x}{(1-c+q)^2 - x^2}G$$

$$\Rightarrow \boxed{Y - Y^* = \frac{1}{1-c+q+x}.(G - G^*)}$$

iv)-

$$\Delta Y = \frac{(1-c+q)}{(1-c+q)^2 - x^2}.\Delta G \quad ➔ \quad \Delta G = \frac{(1-c+q)^2 - x^2}{1-c+q}N \quad ➔ \quad \Delta G = [(1-c+q) - \frac{x^2}{1-c+q}].N$$

For the foreign country: $\Delta Y^* = \frac{x}{(1-c+q)^2 - x^2}.\Delta G = \frac{x}{(1-c+q)}N$

v)-

$$\Delta Y = \frac{(1-c+q)}{(1-c+q)^2 - x^2}.\Delta G + \frac{x}{(1-c+q)^2 - x^2}.\Delta G^*, \quad \text{and} \quad \Delta G = \Delta G^* \Rightarrow \Delta Y = \frac{1}{(1-c+q)-x}.\Delta G$$

$$\Delta G = \Delta G^* = [(1-c+q)-x].N$$

$$\Delta Y^* = \frac{(1-c+q)}{(1-c+q)^2 - x^2}.\Delta G^* + \frac{x}{(1-c+q)^2 - x^2}.\Delta G, \quad \text{and } \Delta G^* = \Delta G \quad \Rightarrow$$

$$\Delta Y^* = \frac{1}{(1-c+q)-x}.\Delta G \quad \Rightarrow \Delta Y^* = \Delta Y = N$$

vi)-

Open economy multiplier = 1/(1-0.8+0.3) = 2 Closed economy multiplier = 1/(1-0.8) = 5

Y=Y*=(10 - 0.8 * 10 + 10)/((1-0.8+0.3-0.3) +
(1-0.8+0.3)/[(1-0.8+0.3)^2-0.3^2]* 10 + 0.3/[(1-0.8+0.3)^2-0.3^2]* 10=
Y=Y*= 110.

NX = x.Y* - q.Y= 0.3 * 110 – 0.3 * 110 = 0 ➔ Balanced trade
NX* = x.Y - q.Y*= 0.3 * 110 – 0.3 * 110 = 0 ➔ Balanced trade

vii)-

ΔG= [(1-0.8+0.3)-0.3^2/(1-0.8+0.3)]*15 =0.32 * 15 =4.8
ΔY*= 0.3/(1-0.8+0.3) *15 = 0.6 *15 = 9

NX = x.Y* - q.Y= 0.3 * 119 – 0.3 * 125 = -1.8 ➔ Trade deficit for the domestic country
NX* = x.Y - q.Y*= 0.3 * 125 – 0.3 * 119 = 1.8 ➔ Trade surplus for the foreign country

Domestic country budget deficit= BD = G – T = 14.8 - 10= 4.8
Foreign country budget deficit= BD* = G* – T* = 10 - 10= 0

viii)-

ΔG= ΔG*= [(1-0.8+0.3)-0.3]*15 =0.2 * 15 =3
ΔY*= ΔY= 15

NX = x.Y* - q.Y= 0.3 * 125 – 0.3 * 125 = 0 ➔ Balanced trade
NX* = x.Y - q.Y*= 0.3 * 125 – 0.3 * 125 = 0 ➔ Balanced trade

Domestic country budget deficit= BD = G – T = 13 - 10= 3
Foreign country budget deficit= BD* = G* – T* = 13 - 10= 3

ix)- By comparing parts(vii) and (viii), it is clear when only domestic country imposes 4.8 units of the expansionary fiscal policy, it increases its output by 15 units, but creates 1.8 units of trade deficit, and 4.8 units of budget deficit. However, foreign country gains 9 units of output increase, and 1.8 units of trade surplus at no cost, because its budget is still balanced.
But, when the two countries are required to contribute equally in fiscal policies, domestic country would be better off, because with imposing only 3 units of expansionary fiscal policy, receives the same level of output expansion, but no trade deficit and smaller budget deficit (only 3 units), while foreign country has to run budget deficit, and gets no trade surplus. So coordination may not come easy, because of lack of incentive to be the first country to impose fiscal policy.

2-

a)-

Export does not change, $X(\varepsilon,Y^*)$, but import function changes to $Q((1+\tau)\varepsilon,Y)$. So net export function would be: $NX = X(\varepsilon,Y^*) - \varepsilon.\ Q((1+\tau)\varepsilon,Y)$.

b)- It is clear when τ increases from zero to a positive number, everything else constant Q goes down, therefore NX goes up, which means trade balance improves. Using your graph in your textbook or notes, this means, that ZZ curve shifts up, while DD curve remains still, therefore, NX curve shifts up.

c)- The situation for foreign country is exactly reverse, export goes down, while import remains the same, therefore trade balance deteriorates.

$X^*(1/[\varepsilon(1+\tau)],Y)$, $Q^*(1/\varepsilon,Y^*)$, and $NX^* = X^*(1/[\varepsilon(1+\tau)],Y) - 1/\varepsilon.\ Q^*(1/\varepsilon,Y^*)$.

d)- After the retaliation, the import, export and trade balance functions would be as follows:
$X(\varepsilon/(1+\tau),Y^*)$, $Q((1+\tau)\varepsilon,Y)$. So net export function would be: $NX = X(\varepsilon/(1+\tau),Y^*) - \varepsilon.\ Q((1+\tau)\varepsilon,Y)$.

If the countries are similar, they go back to the same output, and trade balance levels prevailed before imposing both the tariffs. But total level of trade, $X+\varepsilon Q$ is lower, because both X, and Q are lower.

3-

a)-

Consider the Marshal-Lerner Condition: $\dfrac{\frac{\Delta NX}{X}}{\frac{\Delta\varepsilon}{\varepsilon}} = \dfrac{\frac{\Delta X}{X}}{\frac{\Delta\varepsilon}{\varepsilon}} - \dfrac{\frac{\Delta Q}{Q}}{\frac{\Delta\varepsilon}{\varepsilon}} - 1$. You need to remember that import elasticity with respect to real exchange rate is a negative number, because import is a decreasing function in real exchange rate. So we can rewrite the Marshal-Lerner condition in terms of absolute value of import elasticity:

$$\dfrac{\frac{\Delta NX}{X}}{\frac{\Delta\varepsilon}{\varepsilon}} = \dfrac{\frac{\Delta X}{X}}{\frac{\Delta\varepsilon}{\varepsilon}} + \left|\dfrac{\frac{\Delta Q}{Q}}{\frac{\Delta\varepsilon}{\varepsilon}}\right| - 1$$

Now, if export is elastic relative to real exchange rate, then: $\dfrac{\frac{\Delta X}{X}}{\frac{\Delta\varepsilon}{\varepsilon}} > 1 \Rightarrow \dfrac{\frac{\Delta NX}{X}}{\frac{\Delta\varepsilon}{\varepsilon}} > 0$

Or, if import is elastic relative to real exchange rate, then: $\dfrac{\frac{\Delta Q}{Q}}{\frac{\Delta\varepsilon}{\varepsilon}} < -1 \Rightarrow \left|\dfrac{\frac{\Delta Q}{Q}}{\frac{\Delta\varepsilon}{\varepsilon}}\right| > 1 \Rightarrow \dfrac{\frac{\Delta NX}{X}}{\frac{\Delta\varepsilon}{\varepsilon}} > 0$

b-

The export elasticity relative to real exchange rate = 0.12/0.1=1.2

The import is inelastic relative to real exchange rate = -.05/0.1=-0.5

By substituting these numbers is Marshal-Lerner condition you get the trade balance elasticity relative to real exchange rate: $\frac{\frac{\Delta NX}{X}}{\frac{\Delta \varepsilon}{\varepsilon}} = 1.2 + 0.5 - 1 = 0.7 > 0$, which is positive.

So a10% depreciation improves the trade balance by 7%.

c-

Trade balance must have positive elasticity, or:

$$\frac{\frac{\Delta NX}{X}}{\frac{\Delta \varepsilon}{\varepsilon}} > 0 \quad \Rightarrow \quad \left[\frac{\frac{\Delta X}{X}}{\frac{\Delta \varepsilon}{\varepsilon}} + \left| \frac{\frac{\Delta Q}{Q}}{\frac{\Delta \varepsilon}{\varepsilon}} \right| - 1 \right] > 0 \Rightarrow \quad \frac{\frac{\Delta X}{X}}{\frac{\Delta \varepsilon}{\varepsilon}} + \left| \frac{\frac{\Delta Q}{Q}}{\frac{\Delta \varepsilon}{\varepsilon}} \right| > 1$$

This means Marshal-Lerner can hold in some cases, where both import and export are inelastic. Suppose export elasticity = 0.6, and import elasticity = -0.5, then trade balance elasticity=0.1, still positive. So in general it suffices to have:

$$\frac{\frac{\Delta X}{X}}{\frac{\Delta \varepsilon}{\varepsilon}} > 0.5, \quad \text{and} \quad \frac{\frac{\Delta Q}{Q}}{\frac{\Delta \varepsilon}{\varepsilon}} < -0.5 \quad \Rightarrow \frac{\frac{\Delta NX}{NX}}{\frac{\Delta \varepsilon}{\varepsilon}} > 0$$