Econ 3143, Fall 2020, AS3 (Chapter 16,17,18)

SOLUTION

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1. Label each of the following statement true, false, or uncertain. Explain briefly.

a) Changes in current one year real interest rate are likely to have a much smaller effect on current output than changes in expected future one-year real interest rate.

Uncertain. If there is only a change of current real interest rate, but there is no change in expectations, then the statement is true. This is because only changing the current real interest rate cannot lead to a large change in the present values and so it could not cause a large change in spending. Also, changes in income are not expected to last by only changing the current one-year real interest rate; therefore, there are limited effects on both consumption and investment. However, if the change in current real interest rate indicates a change of future policy (such as monetary policies etc), a change in current real interest rate may have a big effect on current spending.

b) According to the IS-LM model, a fiscal contraction must lead to a fall in output, regardless of the effect of expectations.

False. In current period, it is true that the decrease of current government spending will shift the IS curve to the left leading to a decrease in both spending and output. However, when account is taken of the effect on expectations, IS curve would shift to the right given an increase of the expected future output and a decrease of future interest rate. As a result, these expectations would increase spending and output. Therefore, a fiscal contraction needs not leading to a fall in output.

c) If the dollar is expected to depreciate against the yen, UIRP implies that the US nominal interest rate will be greater than the Japanese nominal interest rate.

True. By UIRP, $i_t = i^*_t - (E_{t+1} - E_t)/E_t$, if the dollar is expected to depreciate, then $(E_{t+1} - E_t)/E_t < 0$. So, $i^* < i$, the nominal interest rate is larger than the Japanese nominal interest rate.

d) The only way a country can eliminate its trade deficit is through a real depreciation.

False. For net export = $NX(Y, Y^*, \varepsilon)$, trade deficit can be eliminated through decrease Y, increase Y* or real depreciation.

e) Other things equal, the interest parity condition implies that domestic currency will depreciate in response to an increase in expected exchange rate.

False. By UIRP, (1+it) = (1+i*t)Et/Eet+1, when i and i* unchanged, Ee increases →E increases. Domestic currency will appreciate against foreign currency.

f) Countries with current account deficit must receive capital inflows.

True. Current account deficit must be balanced by the capital account surplus, which implies a capital inflow, assuming no statistical discrepancy.

g) If the Japanese nominal interest rate is equal to 0, foreigners will not hold Japanese bonds.

False. According to the UIRP (1+it) = (1+i*t)Et/Eet+1, the left hand side represents the return in terms of domestic currency from holding domestic bonds and the right hand side represents the expected return in terms of domestic currency from holding foreign bonds. That is, the return from holding Japanese bond depends not only on the nominal interest rate of the bond, but also the expected changes of exchange rate. When i*t = 0, the right hand side would just become Et/Eet+1. If the expected depreciation rate of domestic currency is higher (or the same as it, then foreigner may still want to hold Japanese bond even if its nominal interest rate is zero.

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2. For each of the changes in expectations in a) to c), determine whether there is a shift in IS curve, LM curve, or both, or neither. In each case, assume that the expected current and future inflation rate equal to zero and no other exogenous variables are changing. (for Chapter 16)

a) a decrease in expected future real interest rate.

The IS curve shifts right.

b) an increase in expected future taxes.

There are two effects.

First, an increase in expected future taxes tends to reduce expected future after-tax income (for any given level of income), and therefore to reduce consumption. This effect tends to shift the *IS curve to the left*.

Second, the increase in future taxes (a deficit reduction program) would require that the central bank reduce the real policy rate so that output returns to potential. At the lower real policy rate, there is more investment. More investment might, in the very long run, increase the level of potential and actual output. This could increase the

expected present discounted value of future output and thus shift the IS back to the right, even in the short run.

Net effect on IS curve is ambiguous.

[Usually, you may consider the situation in the short run if not specifically mentioned. Of course, in the examinations, you have to check the marks allocated to the question.]

c) a decrease of the current nominal interest rate.

The LM curve shifts down.

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3. 7th edition, Question 2 of Chapter 17 in the textbook. (Consider two fictional economies....)

Consider two fictional economies, one called the domestic country and the other the foreign country. Given the transactions listed in (a) through (g), construct the balance of payments for each country. If necessary, include a statistical discrepancy.

a. The domestic country purchased $100 in oil from the foreign country.

b. Foreign tourists spent $25 on domestic ski slopes.

c. Foreign investors were paid $15 in dividends from their holdings of domestic equities.

d. Domestic residents gave $25 to foreign charities.

e. Domestic businesses borrowed $65 from foreign banks.

f. Foreign investors purchased $15 of domestic government bonds.

g. Domestic investors sold $50 of their holdings of foreign government bonds.

Answer:

Domestic Country Balance of Payments ($)

Current Account		
Exports	25	
Imports		100
Trade Balance		-75 (=25-100)
Investment Income Received	0	
Investment Income Paid		15
Net Investment Income		-15 (=0-15)

Net Transfers Received		-25
Current Account Balance		-115 (=-75-15-25)

Capital Account

Increase in Foreign Holdings of Domestic Assets	80 (=65+15)	
Increase in Domestic Holdings of Foreign Assets	-50	
Net Increase in Foreign Holdings		130 (=80-(-50))
Statistical Discrepancy		-15 (=115-130)

Foreign Country Balance of Payments ($)

Current Account

Exports	100	
Imports		25
Trade Balance		75 (=100-25)
Investment Income Received	15	
Investment Income Paid		0
Net Investment Income		15 (=15-0)
Net Transfers Received		25
Current Account Balance		115 (=75+15+25)

Capital Account

Increase in Foreign Holdings of Domestic Assets	-50	
Increase in Domestic Holdings of Foreign Assets	80 (=65+15)	
Net Increase in Foreign Holdings		-130 (=-50-80)
Statistical Discrepancy		15 (=130-115)

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4. 7th edition, Question 7 of Chapter 17 in the textbook. (Retrieve the most recent WEO and find the Balances on Current Account).

The International Monetary Fund provides a number of publications on its Web site (www.imf.org). Extract from the Statistical Appendix of the World Economic Outlook (WEO) the table titled "Balances on Current Account," which lists current account balances around the world. Use the data for the most recent year to answer parts (a) through (c).

a. What is the sum of the world current account balances? Does the sum of the current account balances round the world equal zero as noted in the chapter? What are the sources of this discrepancy and what would it imply?

b. Compare the regions of the world in terms of borrowing and lending.

c. Egypt and Tunisia are two nations that have emerged from popular revolutions in 2010–2011. How do their current account balances reflect the economic impact of these uprisings?

d. The WEO usually provides projections for the following two years. What is the projected outlook in terms of regional borrowing/lending? How do you explain the projected changes for fuel and non-fuel export earnings?

Answer:

Sources: https://www.imf.org/en/Publications/WEO/Issues/2020/09/30/world-economic-outlook-october-2020> Statistical Appendix> Current Account Transactions (Tables A10–A12)

a. The sum of world current account balances should be zero. In 2019, the sum was positive (402.0 billion USD), which implies literally that the world as a whole was borrowing. Obviously, this cannot have been true.

b. A positive current account balance indicates that the nation is a net lender to the rest of the world, while a negative current account balance indicates that it is a net borrower from the rest of the world.

In 2019, the United States was the world's biggest borrower by far (-480.2 billion USD). The U.K. (–113.5 billion USD) was also a borrower. Germany (273.2 billion USD), and Japan (184.3 billion USD) were lenders.

c. From Table A12, the current account balance in these two countries showed negative value as a percent of GDP. It may be due to negative trade balance, negative net investment income or/and negative net transfer received because of instability of the economy.
(reference: https://www.imf.org/en/Publications/WEO/Issues/2018/09/24/world-economic-outlook-october-2018)

d. The projections in the October 2019 World Economic Outlook suggested no qualitative change in the answers to parts (a) through (c). The pattern of borrowing and lending remains more or less the same.

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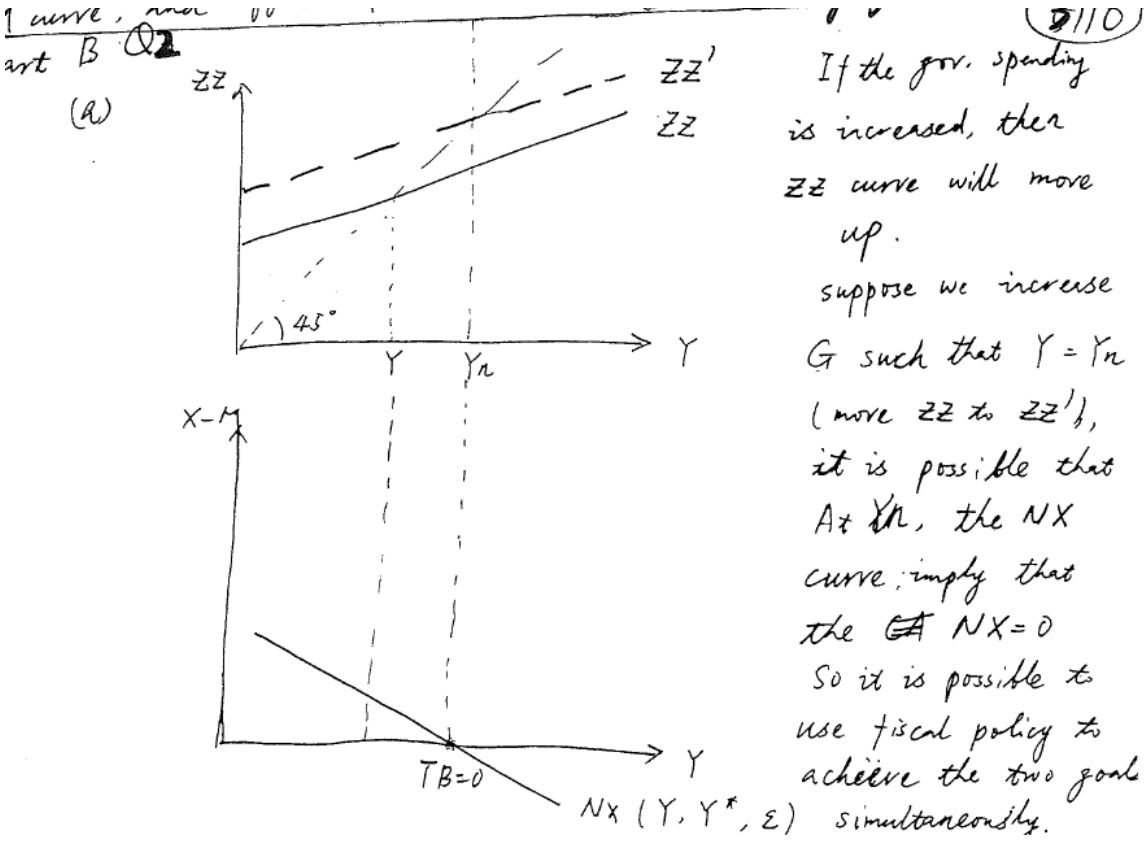
5. Suppose a country's output is **below** the policy makers' desired level of output and is experiencing a **trade surplus**. Assume that the policy makers' goals are to achieve the desired

level of output (i.e., natural level of output) and balanced trade. Suppose we do not consider the impact of expectations, answer the following questions. (Hint: using the ZZ and NX curves)

a) Is it possible to use fiscal policy to achieve these two goals simultaneously? What kind of fiscal policy you should use. Explain.



If the gov. spending is increased, ther ZZ curve will move up.
suppose we increase G such that Y = Yn (move ZZ to ZZ'), it is possible that At Yn, the NX curve imply that the ~~GA~~ NX = 0
So it is possible to use fiscal policy to achieve the two goals simultaneously.

b) If a fiscal policy cannot achieve the two goals simultaneously, what type of exchange rate and fiscal policy mix can be used? Discuss.

(b) But if at Y_n, NX imply a negative TB or a positive TB then an exchange rate policy will be needed to achieve balanced trade.

If at Y_n, the initial NX curve imply a trade deficit, then a depreciation will be needed; If the initial NX curve imply a trade surplus, then an appreciation is needed.

(c) A depreciation will shift the NX curve up
An appreciation will shift the NX curve down.

continued on next page

Note, they may say using the exchange policy to shift the TB to 0, then the economy may be above Y_n or below Y_n, so the fiscal policy can be used again to bring the economy back to Y_n. It is also OK.

Note, now they cannot answer like above paragraph, since I already explained that the first target is to get the output closer to the natural level. Given that there is a current account surplus, an appreciation policy will be used to move the CA to zero. But this will imply a decrease of output and this will push the output target even further away. So they should use an expansionary fiscal policy first, and then use the exchange rate policy.

c) If an exchange rate policy is used, which curve will shift? How does this affect the fiscal policy in part a)?

But, a depreciation will also move ZZ curve up,
an appreciation . . . . . down

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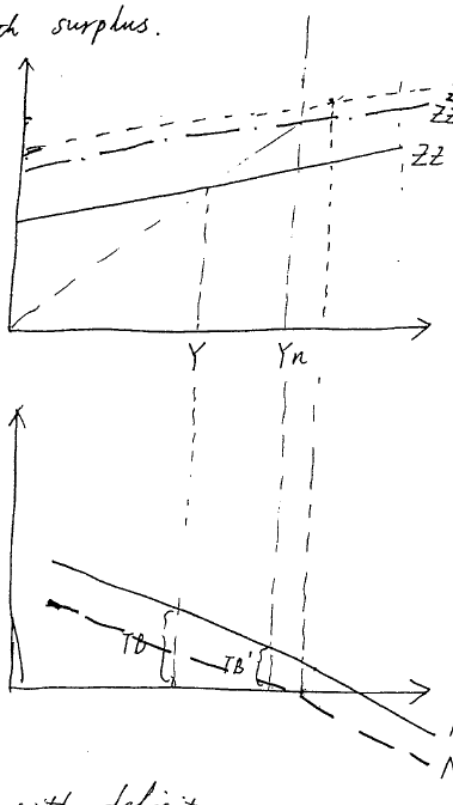
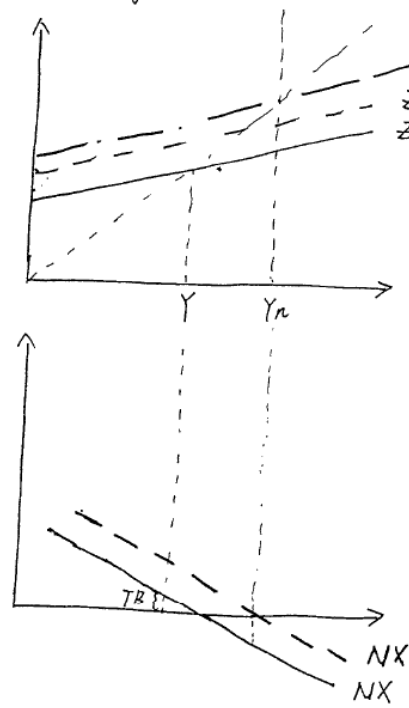
(i) The case with surplus.



since an appreciation will change both the NX curve and ZZ curve
In this case, the initial increase in G should be bigger than what needed to achieve Yn.
Then the appreciation will shift NX curve down and the ZZ curve down,

(ii) The case with deficit.



In this case, the initial increase in G should be smaller than what needed to achieve Yn.
Then the depreciation will shift NX and ZZ curve up.

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6. 7th edition Question 7 of Chapter 18 in the textbook. (Multipliers, Openness and fiscal policy)

Multipliers, openness, and fiscal policy

Consider an open economy characterized by the following equations:

C = c0 + c1(Y - T)

I = d0 + d1Y

IM = m1Y

X = x1Y*

The parameters m1 and x1 are the propensities to import and export. Assume that the real exchange rate is fixed at a value of 1 and treat foreign income, Y*, as fixed. Also assume that taxes are fixed and that government purchases are exogenous (i.e., decided by the government). We explore the effectiveness of changes in G under alternative assumptions about the propensity to import.

a. Write the equilibrium condition in the market for domestic goods and solve for Y.

b. Suppose government purchases increase by one unit. What is the effect on output? (Assume that $0 < m1 < c1 + d1 < 1$. Explain why.)

c. How do net exports change when government purchases increase by one unit?

Now consider two economies, one with m1 = 0.5 and the other with m1 = 0.1. Each economy is characterized by (c1 + d1) = 0.6.

d. Suppose one of the economies is much larger than the other. Which economy do you expect to have the larger value of m1? Explain.

e. Calculate your answers to parts (b) and (c) for each economy by substituting the appropriate parameter values.

f. In which economy will fiscal policy have a larger effect on output? In which economy will fiscal policy have a larger effect on net exports?

Answer:

a. $Y = C + I + G + X - IM \Rightarrow Y=c_0+c_1(Y-T)+d_0+d_1Y+G+x_1Y^*-m_1Y$

$Y=[1/(1-c_1-d_1+m_1)][c_0-c_1T+d_0+G+x_1Y^*]$

b. Output increases by the multiplier, which equals $1/(1-c_1-d_1+m_1)$. The condition $0< m_1< c_1+d_1<1$ ensures that the multiplier is defined, positive, and greater than one. As compared to the original multiplier, $1/(1-c_1)$, there are two additional parameters: d_1, which captures the effect of an additional unit of income on investment, and m_1, which captures the effect of an additional unit of income on imports. The investment effect tends to increase the multiplier; the import effect tends to reduce the multiplier.

c. When government purchases increase by one unit, net exports fall by $m_1\Delta Y= m_1/(1-c_1-d_1+m_1)$. Note that the change in output is simply the multiplier.

d. The larger economy will likely have the smaller value of m_1. Larger economies tend to produce a wider variety of goods, and therefore to spend more of an additional unit of income on domestic goods than smaller economies do.

e.

		ΔY	ΔNX
small economy	(m_1=0.5)	1.1	-0.6
large economy	(m_1=0.1)	2	-0.2

f. Fiscal policy has a larger effect on output in the large economy, but a larger effect on net exports in the small economy.

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7. 7th edition, Question 8 of Chapter 18 in the textbook (Policy coordination and the world economy)

Policy coordination and the world economy

Consider an open economy in which the real exchange rate is fixed and equal to one. Consumption, investment, government spending, and taxes are given by

$$C = 10 + 0.8(Y - T),\ I = 10,\ G = 10,\ \text{and}\ T = 10$$

Imports and exports are given by IM = 0.3 Y and X = 0.3 Y * where Y* denotes foreign output.

a. Solve for equilibrium output in the domestic economy, given Y*. What is the multiplier in this economy? If we were to close the economy—so exports and imports were identically equal to zero—what would the multiplier be? Why would the multiplier be different in a closed economy?

b. Assume that the foreign economy is characterized by the same equations as the domestic economy (with asterisks reversed). Use the two sets of equations to solve for the equilibrium output of each country. [Hint: Use the equations for the foreign economy to solve for Y* as a function of Y and substitute this solution for Y* in part (a).] What is the multiplier for each country now? Why is it different from the open economy multiplier in part (a)?

c. Assume that the domestic government, G, has a target level of output of 125. Assuming that the foreign government does not change G*, what is the increase in G necessary to achieve the target output in the domestic economy? Solve for net exports and the budget deficit in each country.

d. Suppose each government has a target level of output of 125 and that each government increases government spending by the same amount. What is the common increase in G and G* necessary to achieve the target output in both countries? Solve for net exports and the budget deficit in each country.

e. Why is fiscal coordination, such as the common increase in G and G* in part (d), difficult to achieve in practice?

Answer:

a. It is convenient to wait to substitute for *G* until the last step.

$$Y = C + I + G + X - IM = 10 + 0.8(Y - 10) + 10 + G + 0.3Y^* - 0.3Y$$

$$Y = [1/(1 - 0.8 + 0.3)](12 + G + 0.3Y^*) = 2(12 + G + 0.3Y^*) = 44 + 0.6Y^*$$

When foreign output is fixed, the multiplier is 2 (=1/(1-0.8+0.3)). The closed economy multiplier is 5 (=1/(1-0.8)). In the open economy, some of an increase in autonomous expenditure falls on foreign goods, so the multiplier is smaller.

b. Since the countries are identical, $Y=Y^*=110$. Taking into account the endogeneity of foreign income, the multiplier equals [1/(1-0.8 -0.3*0.6 +0.3)]=3.125. The multiplier is higher than the open economy multiplier in part (a) because it takes into account the fact that an increase in domestic income leads to an increase in foreign income (as a result of an increase in domestic imports of foreign goods). The increase in foreign income leads to an increase in domestic exports.

c. If $Y=125$, then $Y^*=44+0.6(125) = 119$. Using these two facts and the equation $Y=2(12+G+0.3Y^*)$ yields $125=24+2G+0.6(119)$, which implies $G=14.8$. In the domestic economy, $NX=0.3(119)-0.3(125) = -1.8$ and $T-G=10-14.8=-4.8$. In the foreign economy, $NX^*=1.8$ and $T^*-G^*=0$.

d. If $Y=Y^*=125$, then $125=24+2G+0.6(125)$, which implies $G=G^*=13$. In both countries, net exports are zero, but the budget deficit is 3.

e. In part, fiscal coordination is difficult to achieve because of the benefits of doing nothing and waiting for another economy to undertake a fiscal expansion, as indicated from part (c).

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8. Read the focus box "Disappearance of Current Account Deficit in Europe Periphery Countries: Good News or Bad News?" and answer the following questions:

a) Why the current account deficit decrease in Europe periphery countries since 2008?

b) In the article, it is stated that "Given that these countries are members of the Euro area, they could not rely on an adjustment of the nominal exchange rate to become more competitive, at least vis-à-vis their Euro partners." Can you use the knowledge we learn to explain this sentence?

c) Explain the "import compression".

Answer:

a. Two reasons for CA improvement. 1. Real exchange rate depreciation and their goods becomes more competitive. 2. Output decrease and so import decrease. Since export depends on demand from rest of world, the CA improves.

For the current account deficit decrease in Europe periphery countries since 2008, much of the adjustment has taken place through a decrease of import due to decrease in output. This is because for these economies, the first adjustment mechanism can only be achieved through price and wage adjustment, which is slow and difficult.

b. Since these countries are member of the Euro area, they are adopting fixed exchange rates against each other. In other words, the nominal exchange rates vis-à-vis their Euro partners are fixed. Also, since they are in the Euro zone and the interest rate is decided by the ECB (European Central Bank), this implies they cannot use expansionary monetary policy to reduce domestic interest rate to increase their output or to get a nominal exchange rate depreciation. Hence, to make their goods become more competitive (so as to increase export and output), which means to get a real depreciation (their goods are cheaper), they have to rely on decrease of wages and prices. But this takes a long time.

c. A decrease of import, triggered by a decrease in output, is known as a current account adjustment called “import compression.”
