

::Solutions::

Exam 2

- You have 75 minutes to complete this exam.
- You may use a calculator; you may **not** use any other device (cell phone, etc.)
- You may consult one page of notes (both sides); you may not use books, notebooks, etc.
- Show your work.

I understand that the honor code applies: I will not lie, cheat, or steal to gain an academic advantage, nor tolerate those who do.

Signature

Printed Name

1. [5 pts] The United States is a multi-trillion dollar net debtor (i.e., its external wealth is negative). The United States has also had positive net factor income from abroad for many years. Why is this surprising and what possible explanations are there for this state of affairs?

This is surprising because the US should be making interest payments on its external debt, and these payments are a part of NFIA.

Potential explanations: large valuation effects (exchange rate or capital gains), a higher rate of return on US-owned foreign assets compared to foreign-owned US assets; large inflows of labor income from abroad

2. [10 pts] The twin deficits hypothesis connects current account deficits and government budget deficits. Present an equation that connects the two deficits. Use the equation to explain how the two deficits may be connected.

We can write savings as government savings and private saving and relate it to investment and the current account

$$S_p + S_g - I = CA$$

If government savings is negative, then there is a government budget deficit. If private saving is not large enough to make up for the government deficit and domestic investment, then the country can tap the foreign market for funds. This would imply a current account deficit. Thus, a government deficit and a current account deficit may be connected.

3. [5 pts] Consider the following two transactions:

1. A U.S. tourist exchanges \$100 in U.S. dollar bills for \$100 worth of Pesos.
2. Intel, a U.S. firm, purchases \$10,000 of design services from an Indian software company. Intel pays with a check drawn on Chase, a U.S. bank.

For each transaction, show how the current account, the capital account, and the financial account change.

Tourist:

$$\Delta FA = +\$100(\text{dollar bills}) - \$100(\text{pesos})$$

KA and CA unchanged.

Intel:

$$\Delta CA = -\$10,000 \text{ (design services)}$$

$$\Delta FA = +\$10,000(\text{check})$$

KA unchanged.

4. [5 pts] Consider the IS curve. When the interest rate falls, output increases. Why is this effect stronger in an open economy compared to a closed economy? Explain your answer.

In the open economy there is an extra effect that works through the trade balance. The decrease in the interest rate will depreciate the currency. The depreciation leads to a real depreciation and home country goods are cheaper (and foreign goods more expensive). The trade balance increases, which increases demand and thus output.

Consider a world with two countries, home and foreign. Assume that prices are sticky and there are no international capital controls. The economy is initially in an equilibrium at (i_1, Y_1, E_1) . Use the IS-LM-FX framework to answer the following questions.

5. [5 pts] Home has a **floating exchange rate**. Is there a combination of policies (monetary and/or fiscal) the government can use to decrease the trade balance without changing the level of output? If so, clearly state the policies, show their effects on the IS-LM-FX diagrams, and explain the effects on the trade balance. If not, explain why.

To decrease the trade balance, we need to appreciate the exchange rate. To do this, we need to raise the interest rate.

Contractionary monetary policy combined with expansionary fiscal policy will increase the interest rate, appreciate the currency and decrease the trade balance. See the figures at the end.

6. [5 pts] How do the policy changes from question 5 affect each component of demand? Explain your answer.

C will not change since $Y-T$ has not changed. (or C increases because T fell)
I will decrease because i has increased.
G increases.
TB decreases.

7. [10 pts] Home has a **fixed exchange rate**. Is there a combination of policies (monetary and/or fiscal) the government can use to decrease the trade balance without changing the level of output? If so, clearly state the policies, show their effects on the IS-LM-FX diagrams, and explain the effects on the trade balance. If not, explain why.

To decrease the trade balance, we need to appreciate the exchange rate. To do this, we need to raise the interest rate.
With a fixed exchange rate, the interest rate has to stay constant to match that in the foreign country. So there is no combination of policies that can decrease the TB without changing output.

Consider a world with two countries, home and foreign. Assume that prices are sticky and there are no international capital controls. The home country fixes its exchange rate against the foreign country at \bar{E} . The economy is initially in an equilibrium at (i_1, Y_1, \bar{E}) . Use the IS-LM-FX framework to answer the following questions.

8. [10 pts] Suppose the foreign country lowers its interest rate, i^* . If the central bank does not respond, show the effects of this change in interest rate in an IS-LM-FX diagram. Label the new equilibrium (i_2, Y_2, E_2) .

See figures at the end. This part is in red and moves from points 1 to points 2.

9. [5 pts] Does the exchange rate appreciate or depreciate? Why? Explain your answer.

The exchange rate appreciates.

UIP says that $i = i^* + E^e/E - 1$. As i^* falls the home currency appreciates to keep the rate of return the same in each country.

10. [10 pts] How should the central bank respond to the change in the foreign interest rate? Show the effects of this response on your figures in question 8. Label the new equilibrium (i_3, Y_3, E_3)

Expand the money supply, shifting LM out. See figures at end. This part is in blue, moving to point 3.

11. [5 pts] Suppose the central bank wanted to keep the economy's output near Y_1 . Would the central bank prefer a steeper or flatter IS curve? Explain your answer.

The central bank would prefer a steeper IS curve so that output moves less when LM is shifted.

Consider a country that lives for two periods. It can access the international borrowing and lending market with $r = 0.1$. The country has an investment opportunity. If it chooses to invest \$10 today, its GDP will be $Q_0 = \$1000, Q_1 = \1150 . If it does not invest, its GDP will be $Q_0 = \$1000, Q_1 = \1100 . The household in the country has the utility function $U = \min\{C_0, C_1\}$.

12. [10 pts] Should the country invest? What is the optimal C_0 and C_1 ?

If invest, $C_0 = C_1 = 1066.2$
 If do not invest $C_0 = C_1 = 1047.6$
 Invest.

13. [10 pts] What is GNE , TB , CA , KA , and FA in each period? Summarize your results in the following table.

	Period 0	Period 1
<i>GNE</i>	$1066.2 + 10 = 1076.2$	1066.2
<i>TB</i>	$1000 - 1066.2 - 10 = -76.2$	$1150 - 1066.2 = 83.8$
<i>CA</i>	-76.2	$83.8 + (-76.2) = 76.2$
<i>KA</i>	0	0
<i>FA</i>	$+76.2$	-76.2

Challenging. Consider a country that lives for two periods. It can access the international borrowing and lending market at interest rate r . The country has an investment opportunity. If it chooses to invest \$50 today, its GDP will be $Q_0 = \$1000, Q_1 = \1150 . If it does not invest, its GDP will be $Q_0 = \$1000, Q_1 = \1100 . The household in the country has the utility function $U = \min\{C_0, C_1\}$.

[Note: The price of the investment has changed from the previous question.]

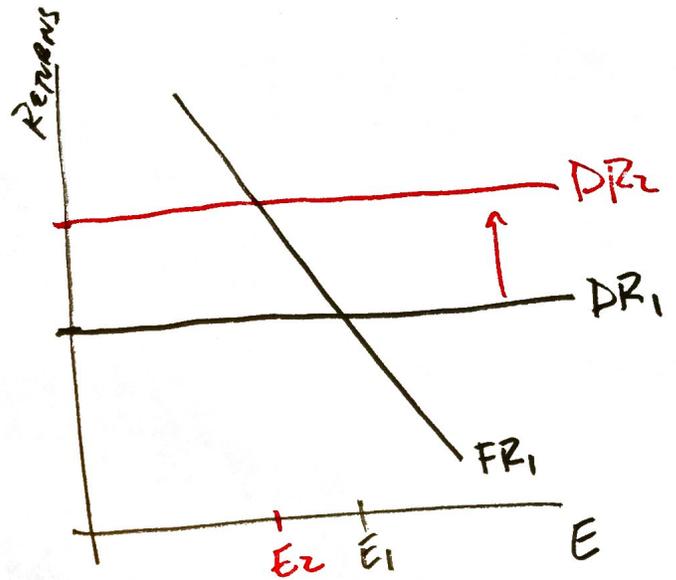
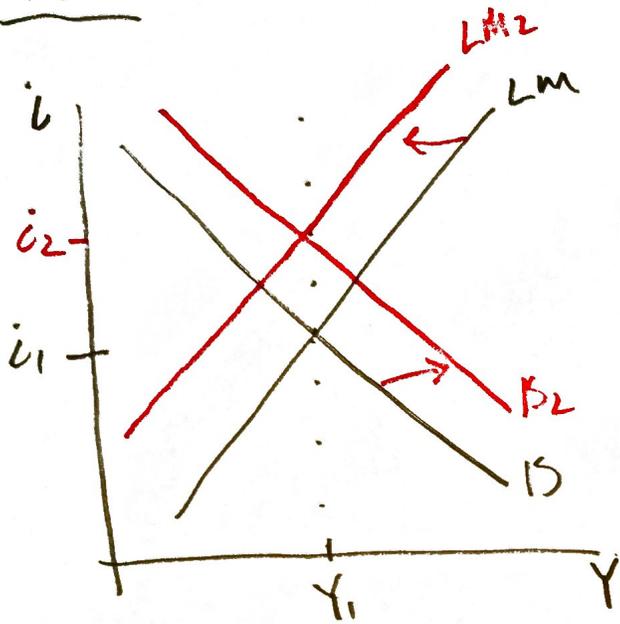
14. [5 pts] Is there an interest rate $r > 0$ such that the country would want to invest in this project? Explain your answer.

No. The investment returns \$50 in the future and costs \$50 today. I would only be willing to do this if the interest rate was zero.

Extra Space

Clearly label the question number, and leave a reference to this page near the question.

#5



#8

