

# SOLUTIONS

## ECO 209Y MACROECONOMIC THEORY AND POLICY Term Test #2

December 5, 2019

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SURNAME  
(LAST NAME): 

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GIVEN NAME  
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### INSTRUCTIONS:

- The total time for this test is **1 hour and 50 minutes**.
- The only aid allowed is a **non-programmable** calculator.
- **Write your name and identifying information above but keep this test paper closed until the start of the test is announced.**
- There are three parts to the test: **Part I** consists of 16 multiple-choice questions (40 points); **Part II** consists of one quantitative problem (15 points); and **Part III** includes 2 short-answer questions (20 points). The **total** point-value of the test is **75 points**.
- The answers to the 16 multiple-choice questions of **Part I** must be recorded in the **bubble sheet** provided on **page 10** of this test paper. Only the answers recorded in the bubble sheet will be marked. Cells left blank will receive a zero mark for that question. No deductions will be made for incorrect answers.
- In **Parts II and III**, write your answers clearly and concisely in the space provided immediately after each question. **Your entire answer must fit in the designated space.** No extra space/pages are possible and you cannot use blank space for other questions.
- **It is best to write in PENCIL and use an ERASER as needed.** This way you can make sure to fit your final answer in the appropriate space.
- **Please write legibly.** If I can't read your handwriting, I can't award you any marks!

## PART I (40 points)

### **Instructions:**

Enter your answer to each of the 16 multiple-choice questions in the **bubble sheet** provided on **page 10** below. Each correct answer is worth **2.5 points**. **Note that no deduction will be made for incorrect answers.** Table cells left blank will receive zero points. **Do NOT guess your answers! Manage your time properly!**

1. Consider the fixed-price level model of a closed economy. All else equal, if the income-sensitivity of the demand for real balances increases, which one of the following best describes the likely outcome?
  - A) The *LM* curve will shift to the left with no change in its slope.
  - B) The *LM* curve will shift to the right with no change in its slope.
  - C) The *LM* curve will become flatter.
  - D) The *LM* curve will become steeper.
  - E) The *LM* curve will shift to the right and become flatter.
2. In the fixed-price level model of an open economy, expansionary fiscal policy is very effective in increasing national income when
  - A) the income-sensitivity of the demand for real balances is very large.
  - B) the marginal propensity to import is very small.
  - C) the interest sensitivity of consumption is very large.
  - D) the interest sensitivity of investment is very small.
  - E) both B) and D) are true.
3. If the government wishes to increase the level of national income, an increase in the interest-sensitivity of investment will make the use of
  - A) both fiscal and monetary policy more effective.
  - B) both fiscal and monetary policy less effective.
  - C) fiscal policy less effective and of monetary policy more effective.
  - D) fiscal policy more effective and of monetary policy less effective.
  - E) monetary policy more effective but will not affect the effectiveness of fiscal policy.
4. We can expect the *IS* curve to become flatter as
  - A) the interest-sensitivity of the demand for real balances increases.
  - B) the interest-sensitivity of investment decreases.
  - C) the real supply of money decreases.
  - D) the marginal propensity to consume increases.
  - E) the income-sensitivity of the demand for real balances increases.
5. If capital mobility is imperfect and import demand is completely insensitive to changes in the level of domestic income, which one of the following statements is correct?
  - A) The *BP* curve is horizontal.
  - B) The *BP* curve is vertical.
  - C) The *BP* curve is downward sloping.
  - D) The *BP* curve is upward sloping if the international rate of interest is greater than the domestic rate of interest.
  - E) The slope of the *BP* curve is not determinable.

6. In an *IS-LM-BP* model with fixed exchange rates and perfect capital mobility, expansionary fiscal policy will cause:
- A) a depreciation of the exchange rate.
  - B) both the *IS* and the *BP* curves to shift up.
  - C) output and the interest rate to increase.
  - D) a decrease in investment.
  - E) a decrease in net exports.
7. If the economy is experiencing a liquidity trap, then
- A) expansionary monetary policy will cause a large decrease in the equilibrium rate of interest.
  - B) contractionary fiscal policy will have little or no impact on equilibrium output.
  - C) contractionary monetary policy will cause a large decrease in equilibrium output.
  - D) expansionary monetary policy will have little or no impact on equilibrium output.
  - E) expansionary fiscal policy will cause a large increase in the equilibrium rate of interest.
8. Assume the government reduces its purchases, and the Bank of Canada responds by increasing the money supply. Which of the following is the most likely result?
- A) Investment and consumption will both remain unchanged.
  - B) Interest rates and consumption will both decrease.
  - C) Interest rates will decrease.
  - D) Income and interest rates will both decrease.
  - E) Income will decrease but interest rates will stay the same.
9. If the U.S. were to impose a further tariffs on all imports from China, which one of the following would best describe its impact on the U.S. economy?
- A) Exports would increase while imports would fall.
  - B) The current account deficit would be significantly reduced.
  - C) The rate of inflation would increase.
  - D) Real wages would rise.
  - E) None of the above is correct.
10. If capital flows were completely insensitive to differences between the domestic and the international rate of interest, which one of the following statements would be correct?
- A) The *BP* curve would be downward sloping.
  - B) The *BP* curve would be completely flat.
  - C) The *BP* curve would be completely vertical.
  - D) The *BP* curve would be upward sloping.
  - E) Not enough information to determine the slope of the *BP* curve.
11. Suppose that average income per capita in Uruguay is 650,000 pesos per year and that the nominal exchange rate for Uruguayan pesos is 0.04. Further suppose that a given consumption basket of goods and services costs \$3,750 in the Canada and 75,000 pesos in Uruguay. Using the *PPP* exchange rate, income per capita in Uruguay is:
- A) \$25,500.
  - B) \$28,250.
  - C) \$32,500.
  - D) \$38,250.
  - E) \$42,750.

12. Consider a small country with a fixed exchange rate system. The central bank has set the value of the exchange rate at a competitive level. The domestic price level now increases by 10% while the international price level rises by only 6%. If the central bank wants to keep the real value of its currency unchanged, it must \_\_\_\_\_ the exchange rate by approximately \_\_\_\_\_.
- A) devalue; 4%.
  - B) depreciate; 4%.
  - C) revalue; 4%.
  - D) appreciate; 4%.
  - E) devalue; 10%.
13. In an open economy with fixed exchange rates and perfect capital mobility, which one of the following statements is correct?
- A) Expansionary monetary policy is effective in stimulating aggregate expenditure.
  - B) Fiscal expansion is ineffective in stimulating aggregate expenditure.
  - C) Fiscal expansion causes a deficit in the exchange market.
  - D) An increase in exogenous exports causes the exchange rate to appreciate.
  - E) None of the above is correct.
14. China is being accused by Western countries of setting the value for its domestic currency too low. All else equal, which one of the following statements might describe the impact of an undervalued domestic currency on the Chinese economy?
- A) The prices of imported goods would be artificially low for Chinese consumers.
  - B) Inflation pressure would tend to decrease in the Chinese economy.
  - C) The Chinese money supply would tend to increase.
  - D) The balance in the capital account would improve for China.
  - E) None of the above is correct.
15. The ultimate objective of the so-called "starve the beast" theory is
- A) to eliminate government deficits.
  - B) to reduce wasteful expenditures by the government.
  - C) to improve efficiency in the economy.
  - D) to minimize the size of the government.
  - E) none of the above.
16. Albeit at a very slow pace, the Canadian economy has been expanding since 2008-09. Many economist believe that the economy is now at, or near, full employment and that a reversal is in the horizon. Given the present state of the Canadian economy, which one of the following policy options would be best if the economy were to go in recession in 2020?
- A) The government should reduce its deficit to stimulate private expenditure.
  - B) The Bank of Canada should reduce the rate of interest to stimulate consumption and investment expenditures.
  - C) The government should increase its expenditure on goods and services.
  - D) The government should reduce corporate taxes to stimulate investment.
  - E) The government should reduce income taxes to stimulate consumption expenditure.

## PART II (15 points)

Consider an open economy with a fixed-price level, fixed exchange rates, and perfect capital mobility. This economy is characterized by the following behavioural equations:

$$\begin{array}{ll} C = 60 + 0.8 YD & P^f = 2 \\ I = 200 - 20i + 0.1 Y & P = 1 \\ G = 300 & \\ TA = 0.25 Y & L = 0.2 Y - 10i \\ TR = 50 & M/P = \bar{M}/\bar{P} \\ X = 250 + 100 e^{P^f/P} & CF = 25 (i - i^*) \\ Q = 400 - 50 e^{P^f/P} + 0.1 Y & i^* = 9 \end{array}$$

- a) What is the equation for the *IS* curve in this model? [Note: Your equation for the *IS* curve should be expressed as a function of *e*.] (2 points)

Let's find first the expressions for *C* as a function of *Y* and for *NX*:

$$C = 60 + 0.8 YD = 60 + 0.8 (Y - TA + TR) = 60 + 0.8 (Y - 0.25 Y + 50) = \\ = 60 + 0.6 Y + 40 = 100 + 0.6 Y$$

$$NX = X - Q = 250 + 200 e - 400 + 100 e - 0.1 Y = -150 + 300 e - 0.1 Y$$

And thus the expression for the *AE* curve is:

$$AE = C + I + G + NX \\ = 100 + 0.6 Y + 200 - 20 i + 0.1 Y + 300 - 150 + 300 e - 0.1 Y \\ = 450 + 300 e + 0.6 Y - 20 i$$

Now we must equate *Y* and *AE* to find the expression for the *IS* curve:

$$Y = AE \\ Y = 450 + 300 e + 0.6 Y - 20 i \\ 450 + 300 e - 0.4 Y - 20 i = 0 \\ 20 i = 450 + 300 e - 0.4 Y \\ i = 22.5 + 15 e - 0.02 Y$$

- b) What is the equation for the *LM* curve in this model? [Note: Your equation for the *LM* curve should be expressed as a function of  $\bar{M}$ .] (2 points)

$$L = M/P, \text{ where } M/P = \bar{M}/\bar{P} = \bar{M} \text{ since } \bar{P} = 1 \\ 0.2 Y - 10 i = \bar{M} \\ 10 i = -\bar{M} + 0.2 Y \\ i = -\bar{M}/10 + 0.02 Y$$

- c) What is the equation for the  $BP$  curve in this model? [Note: Your equation for the  $BP$  curve must reflect the explicit assumptions of the model.] (1 point)

Since there is perfect capital mobility, the external sector will be in equilibrium (i.e.,  $BP = 0$ ) only when the domestic rate of interest is equal to the international rate of interest. Therefore, the expression for the  $BP$  curve is:  $i = 9$ .

- d) If the central bank sets the nominal supply of money at  $\bar{M} = 200$  and the value of the exchange rate at  $e = 0.9$ , what are the equilibrium values of  $Y$  and  $i$  in this model? (2 points)

$$IS: i = 22.5 + 15 e - 0.02 Y = 22.5 + 13.5 - 0.02 Y = 36 - 0.02 Y$$

$$LM: i = -\bar{M}/10 + 0.02 Y = -20 + 0.02 Y$$

And equating the  $IS$  and the  $LM$  curves we obtain equilibrium  $Y$ :

$$36 - 0.02 Y = -20 + 0.02 Y$$

$$0.04 Y = 56$$

$$Y = 1400$$

And plugging  $Y = 1400$  into the  $IS$  or  $LM$  curve we obtain equilibrium  $i$ :

$$i = 36 - 0.02 (1400) = 36 - 28 = 8$$

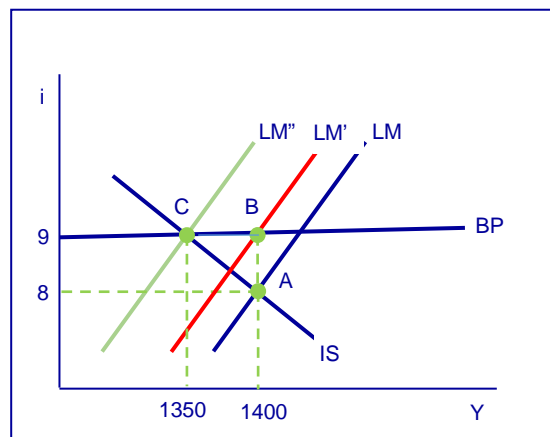
- e) What are the balances in the current account and the capital account in this equilibrium? (1 point)

$$NX = -150 + 300 e - 0.1 Y = -150 + 270 - 0.1 (1400) = -150 + 270 - 140 = -20$$

$$CF = 25 (i - i^*) = 25 (8 - 9) = -25$$

- f) What will the central bank have to do to maintain the exchange rate unchanged at  $e = 0.9$ ? **Briefly explain. (1 point)** What will be the new equilibrium values of  $Y$  and  $i$ ? **(2 points)** What will be the change in the nominal supply of money? **(1 point)** [Hint: Although not necessary, the use of a diagram might help you answer this question.]

At the initial equilibrium there is a deficit in the balance of payments:  $BP = NX + CF = -20 - 25 = -45$ . This implies an excess demand in the foreign exchange market, and thus the central bank sells foreign currency to maintain  $e = 0.9$ . The money supply thus decreases and the  $LM$  curve shifts to  $LM'$  (and  $i$  rises to  $i = 9$ ). This is shown by point  $B$  in the diagram.



Point  $B$  lies above the  $IS$  curve, indicating an excess supply in the goods market. Therefore,  $Y$  decreases. As  $Y$  falls, the demand for money decreases and  $i$  drops below  $i^* = 9$  (a movement down along the  $LM'$  curve). A deficit arises in the balance of payments (and an excess

demand in the exchange market), and the central bank sells foreign currency to maintain  $e = 0.9$ . The money supply decreases again and the  $LM'$  curve shifts to the left. The rate of interest gets back to 9 and this process continues as long as there is an excess supply in the goods market, i.e., until the  $LM$  curve shifts all the way to  $LM''$ . Note that equilibrium  $Y$  is achieved when the goods market is in equilibrium. And we find this equilibrium  $Y$  by plugging  $i = 9$  into the equation for the  $IS$  curve:

$$i = 36 - 0.02 Y \rightarrow 9 = 36 - 0.02 Y \rightarrow 0.02 Y = 36 - 9 \rightarrow Y = 27/0.02 = 1350.$$

And plugging  $i = 9$  and  $Y = 1350$  into the equation for the  $LM$  curve, we find the level of  $\bar{M}$ :

$$i = -\bar{M}/10 + 0.02 Y \rightarrow 9 = -\bar{M}/10 + 0.02 (1350) \rightarrow \bar{M}/10 = 27 - 9 = 18 \rightarrow \bar{M} = 180$$

Therefore, the change in the money supply is  $\Delta\bar{M} = -20$ .

- g) Suppose that full-employment income is  $Y_{fe} = 1425$ . All else equal, at what level should the central bank set the value of  $e$  to achieve internal and external balance? **(2 points)** What would happen to the money supply and the  $LM$  curve? **Briefly explain. (1 point)**

The central bank must revalue  $e$  sufficiently to achieve equilibrium in the goods market at  $i = 9$  and  $Y = 1425$ . Therefore, we obtain the required value of  $e$  by plugging these values for  $i = 9$  and  $Y = 1425$  into the expression for the  $IS$  curve derived above:

$$i = 22.5 + 15e - 0.02 Y \rightarrow 9 = 22.5 + 15e - 0.02 (1425) \rightarrow 15e = 9 - 22.5 + 28.5 = 15.$$

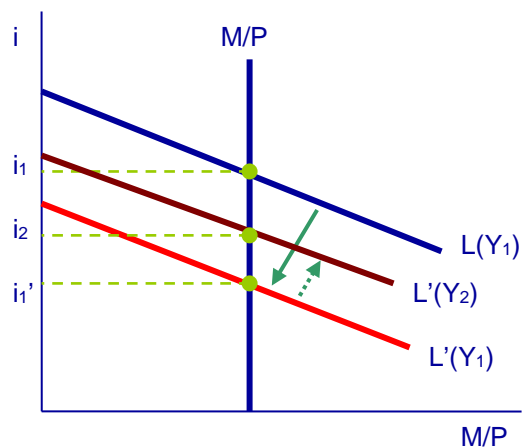
And, therefore, the central bank should set the value of the exchange rate at  $e = 1$ .

The revaluation of the exchange rate (i.e., devaluation of the domestic currency) will improve the balance in the current account, and thus a surplus will arise in the overall balance of payments. This will be further reinforced by the fact that the domestic rate of interest will tend to increase as  $Y$  rises, thus also improving the balance in the capital account. The central bank will buy foreign currency in the exchange market to maintain the value of the exchange rate at  $e = 1$ . Therefore, the money supply will increase and the  $LM$  curve will shift down to the right.

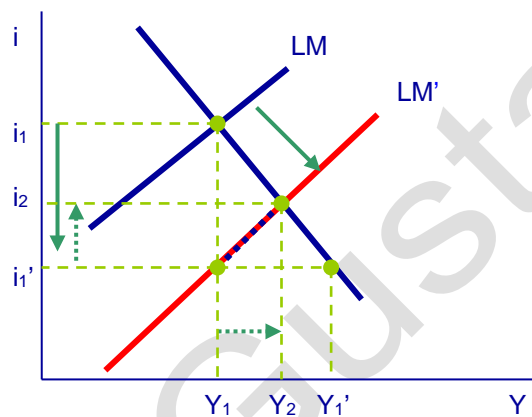
**PART III (20 points)**

**Instructions:** Answer the following two questions in the space provided. Each question is worth 10 points.

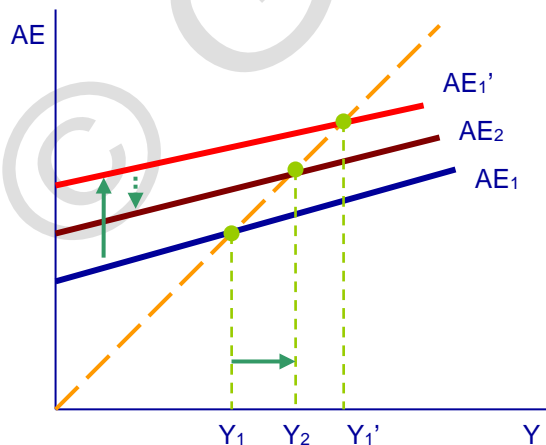
1. Critically comment on the following statement: “A decrease in the demand for money — e.g., as a result of greater use of credit cards — will have an expansionary effect on the level of equilibrium income.” (Show your answer with the help of graphs and explain the economics. Consider the IS-LM model for a closed economy. Explain the adjustment in both the goods and money markets. Assume an initial recessionary gap in the economy.)



Graphically, a decrease in the demand for money means that the liquidity preference curve corresponding to each level of income shifts down to the left. Therefore, as the demand for money falls, the rate of interest decreases. This can be observed in the diagram on the left – the liquidity preference curve  $L(Y_1)$  shifts down to  $L'(Y_1)$  and the rate of interest falls to  $i_1'$ . The money market now is in equilibrium at the rate of interest  $i_1'$  when income is  $Y_1$ , which means that the  $LM$  curve has shifted to  $LM'$  (see middle diagram).



The drop in the rate of interest causes desired investment to increase, and thus the  $AE$  curve shifts up to  $AE_1'$  (see bottom diagram). A situation of excess demand develops in the goods market and thus  $Y$  starts to increase. As  $Y$  increases, the liquidity preference curve starts shifting up and the rate of interest starts to rise (see upper diagram). Since the money market is assumed to be always in equilibrium, the adjustment path is a movement up along the  $LM$  curve (as  $Y$  increases so does  $i$  as the demand for money rises). As  $Y$  increases, the excess demand in the goods market is gradually reduced – and at the level of income  $Y_2$  the goods market is again in equilibrium (and the new equilibrium rate of interest is  $i_2$ ).

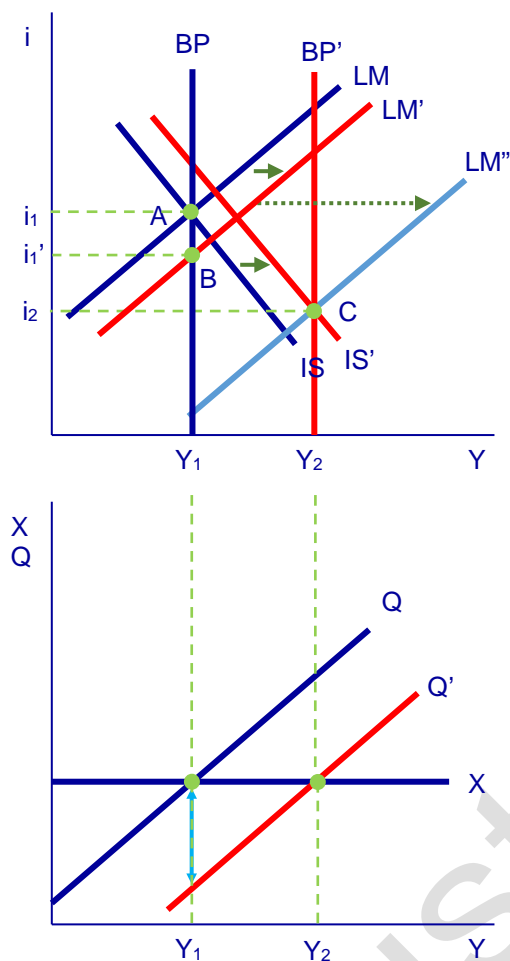


This can also be observed in the lower diagram – the  $AE$  curve starts shifting down as  $i$  increases until a new equilibrium is achieved in the goods market at  $Y_2$  and  $i_2$ . This means that the excess demand in the goods market is eliminated by a combination of an increase in  $Y$  (supply side) and a decrease in  $AE$  as  $i$  increases (demand side).

Therefore, the statement is correct. A decrease in the demand for real balances has an expansionary effect in the economy because it causes the rate of interest to fall (and investment to increase).



2. Assuming fixed exchange rates and no capital mobility, explain the impact of the imposition of tariffs on the import of final goods. In your answer, clearly indicate the effect on income, rate of interest, and current account. **(Show your answer with the help of IS-LM-BP and X-Q diagrams and explain the economics.)**



Suppose that initially the goods market, the money market, and the external sector are all in equilibrium. This equilibrium is shown graphically in the diagram on the left by the intersection of the  $IS$ ,  $LM$  and  $BP$  curves at point  $A$ . Note that since there is no capital mobility, the  $BP$  curve is vertical.

The imposition of the tariff rises the domestic price of imported goods, and thus  $Q$  decreases (and thus  $NX$  increases). Graphically, this is expressed by a shift downward of the  $Q$  curve (see lower diagram), and by a shift outward of the  $IS$  curve to  $IS'$  (because of the increase in  $NX$ ). Since the  $BP$  curve indicates the level of  $Y$  at which  $NX = 0$ , the  $BP$  curve shifts to  $BP'$  since  $BP = 0$  now at  $Y_2$ .

But the economy is still at point  $A$ . Therefore, while there is equilibrium in the money market at  $Y_1$ , there is now an excess demand in the goods market (i.e.,  $AE > Y$ ) and a surplus in the external sector (i.e.,  $X > Q$  and thus  $BP > 0$ ). The fact that  $BP > 0$  implies an excess supply in the foreign exchange market, and thus the central bank buys foreign currency to prevent a depreciation of the exchange rate. The purchase of foreign currency by the central bank causes  $M$  to increase and thus the  $LM$  curve shifts to  $LM'$  (and  $i$  falls to  $i_1'$ ). The economy is at point  $B$  now (see diagram).

At point  $B$  there is an excess demand in the goods market ( $AE > Y$ ). Also note that the intervention of the central bank in the exchange market prevented the depreciation of  $e$  in the current period, but the surplus in the balance of payments ( $BP > 0$ ) remained. Since  $AE > Y$ ,  $Y$  starts to increase and so does  $Q$ . Therefore, the surplus in the balance of payments starts to decrease. However, as long as  $BP > 0$  (and there is an excess supply in the foreign exchange

market), the central bank continues buying foreign currency and  $M$  continues increasing (and the  $LM$  curve continues shifting).

Therefore, as  $Y$  increases to eliminate the excess demand in the goods market, the surplus in the balance of payments decreases. At the end of the process, the goods market is back in equilibrium (i.e.,  $AE = Y$ ) at  $Y_2$  and the surplus in the external sector is also eliminated (because of the increase in  $Q$ ). At this point there is equilibrium in the foreign exchange market and the central bank stops buying foreign currency. The money supply thus stops increasing and the  $LM$  curve does not shift any more. However, during the period of adjustment, there is a constant (although decreasing) surplus in the balance of payments (i.e., excess supply in the foreign exchange market), and the central bank continues to purchase foreign currency (and thus  $M$  continues to increase). Therefore, the  $LM$  curve keeps shifting down until it reaches the position of the  $LM''$  curve (see diagram).

Therefore,  $Y$  increases as a result of the imposition of the tariff, while  $BP = NX$  remains unchanged. Note that  $Q$  first decreases due to the tariff, and then increases by the same amount due to the increase in  $Y$ . The impact on the rate of interest is however ambiguous since the increase in  $M$  reduces it while the increase in  $Y$  (and the demand for money) increases it. In the diagram it was assumed that  $i$  would fall (but it's only an assumption, it could be the other way around as well).