Department of Economics
University of Toronto

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SOLUTIONS

ECO 209Y
MACROECONOMIC THEORY AND POLICY

Term Test #2

LAST NAME _____

FIRST NAME _____

STUDENT NUMBER _____

INSTRUCTIONS:

1. The total time for this test is 1 hour and 45 minutes.
2. Aids allowed: a simple calculator.
3. Use pen instead of pencil.

DO NOT WRITE IN THIS SPACE

Part I		_____/30
Part II		_____/10
Part III	1.	_____/10
	2.	_____/10
	3.	_____/10
	4.	_____/10

TOTAL _____/80

PART I (30 marks)

Instructions:

- Enter your answer to each question in the table below.
- Each correct answer is worth 2.5 marks. ***Note that a deduction of 0.5 mark will be made for each incorrect answer.*** Table cells left blank will receive a zero mark (i.e., no deduction).
- **Do NOT guess your answers!**

1	2	3	4	5	6	7	8	9	10	11	12
C	A	D	B	C	E	D	A	E	C	D	B

1. Consider the fixed-price model of a closed economy. If the demand for real balances increases at each level of the market rate of interest, which one of the following statements is correct?

A) The IS curve shifts up to the right and income increases.
B) The IS curve shifts down to the left and the LM curve shifts down to the right.
C) The LM curve shifts up to the left and income decreases.
D) The LM curve shifts up to the left and the IS curve shifts down to the left.
E) The LM curve shifts down to the right and income increases.

2. In a fixed-price model of a closed economy, a $1 billion increase in government infrastructure expenditure will have the largest impact on the rate of interest when it is financed by

A) borrowing from the private sector.
B) borrowing from the central bank.
C) cutting other expenditure programs.
D) raising income taxes to the rich.
E) raising income taxes to the middle class.

3. A policy of a balanced budget over the business cycle would

A) require increasing government expenditures when revenues are rising.
B) require increasing taxes when revenues are falling.
C) call for substantial government infrastructure investments in periods of economic boom.
D) allow for the implementation of countercyclical fiscal policies without affecting the level of the national debt.
E) allow for the implementation of countercyclical fiscal policies without affecting the debt-to-GDP ratio.

Use this space for rough work.

4. Suppose that average income per capita in Uruguay is 300,000 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 $2,500 in the Canada and 50,000 pesos in Uruguay. Using the Purchasing Power Parity exchange rate (e_{PPP}), what is the income per capita in Uruguay?

A) $12,000.
B) $15,000.
C) $18,000.
D) $20,000.
E) None of the above.

5. In a flexible exchange rate system with perfect capital mobility, which one of the following statements is correct?

A) Expansionary monetary policy will appreciate the domestic currency.
B) Fiscal expansion will be very effective in increasing equilibrium income.
C) Fiscal expansion causes an appreciation of the domestic currency.
D) An increase in exogenous exports will increase net exports.
E) None of the above is correct.

6. Consider the IS-LM framework in a fixed-price model of a closed economy. An increase in the rate of interest will cause

A) the IS curve to shift up to the right.
B) the IS curve to shift down to the left.
C) the LM curve to shift up to the left.
D) the LM curve to shift down to the right.
E) none of the above.

7. 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 vertical.
B) The BP curve is downward sloping.
C) The BP curve is upward sloping if the international rate of interest is greater than the domestic rate of interest.
D) The BP curve is horizontal.
E) The BP curve is not determinable.

8. Suppose that the assets market is in equilibrium and that money and bonds are the only assets in the economy. If households and businesses increase their demand for real balances, which of the following best describes the final outcome?

A) Both money holdings and bond holdings remain unchanged.
B) Money holdings decrease and bond holdings increase by the same amount.
C) Money holdings increase and bond holdings decrease by the same amount.
D) Both bond holdings and money holdings decrease by the same amount.
E) Bond holdings decrease but money holdings remain unchanged.

Use this space for rough work.

9. Suppose the government has a balanced budget and the money multiplier is equal to 2. If the government now finances a new expenditure of $1.5 billion by selling bonds to the TD Bank, by how much will the money supply increase?

A) $0.75 billion.
B) $1.5 billion.
C) $3 billion.
D) By more than $1.5 billion but less than $3 billion.
E) None of the above is correct.

10. Assume that the desired currency-deposit ratio is 0.20, the desired reserve-deposit ratio is 0.10, and total money supply is $4.8 billion. What is the amount of high-powered money if there are no excess reserves in the banking system?

A) $0.9 billion.
B) $1.0 billion.
C) $1.2 billion.
D) $1.6 billion.
E) None of the above is correct.

11. Suppose the Bank of Canada makes an open market purchase of $100 million, buys $50 million worth of euros and US dollars in the exchange market, and spends $75 million renovating the Bank's headquarter in Ottawa. As a result of these transactions, by how much will the monetary base increase?

A) $100 million.
B) $150 million.
C) $175 million.
D) $225 million.
E) Need to know the money multiplier to answer.

12. Last year, Germany's trade surplus stood at almost $300 billion and its current-account surplus was in excess of 8% of GDP. Of course, a current-account surplus implies that national savings exceed investment expenditure. Which one of the following is NOT an explanatory factor of Germany's current account imbalance?

A) The German government is running budget surpluses, thus contributing to high national savings.
B) German households are saving too much, thus contributing to high national savings.
C) Wage increases have not kept pace with productivity growth, thus allowing business savings to rise too much.
D) A business-labour union accord has restrained wage increases and kept export industries competitive.
E) Sharing a common currency with other European countries allows Germany to have an undervalued currency in real terms.

Use this space for rough work.

PART II (10 marks)

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

$C = 200 - 10\,i + 0.8\,YD$ | $X = 200 + 150\,e$
$I = 100 - 10\,i + 0.1\,Y$ | $Q = 300 - 50\,e + 0.1Y$
$G = 400$ | $CF = 25\,(i - 8)$
$TA = 0.25Y$ | $L = 0.2\,Y - 10\,i$
$TR = 0$ | $M/P = 200$

a) What is the equation for the *IS* curve in this model? **(2 marks)**

C = 200 – 10 *i* + 0.8 YD
= 200 – 10 *i* + 0.8 (Y – TA + TR)
= 200 – 10 *i* + 0.8 (Y – 0.25Y + 0)
= 200 – 10 *i* + 0.6 Y
= 200 – 10 *i* + 0.6 Y

NX = X – Q
= 200 + 150 e – 300 + 50 e – 0.1 Y
= – 100 + 200 e – 0.1 Y

AE = C + I + G + NX
= (200 – 10 *i* + 0.6 Y) + (100 – 10 i + 0.1 Y) + (400) + (– 100 + 200 e – 0.1Y)
= 600 + 200 e + 0.6 Y – 20 i

Y = AE
Y = 600 + 200 e + 0.6 Y – 20 i
600 + 200 e – 0.4 Y – 20 i = 0
i = 30 + 10 e – 0.02 Y

b) What is the equation for the *LM* curve in this model? **(1 mark)**

L = M/P
0.2 Y – 10 i = 200
10 i = – 200 + 0.2 Y
i = – 20 + 0.02 Y

c) What is the equation for the *BP* curve in this model? **(1 mark)**

NX + CF = 0

– 100 + 200 e – 0.1 Y + 25 (i – 8) = 0

– 100 + 200 e – 0.1 Y + 25 i – 200 = 0

– 300 + 200 e – 0.1 Y + 25 i = 0

25 i = 300 – 200e + 0.1 Y

i = 12 – 8 e + 0.004 Y

d) What are the equilibrium values of *Y*, *i* and *e*? **(6 marks)**

IS: i = 30 + 10 e – 0.02 Y ***(1)***

LM: i = – 20 + 0.02 Y ***(2)***

BP: i = 12 – 8 e + 0.004 Y ***(3)***

(1) – ***(2)*** → 50 + 10 e – 0.04 Y = 0 ***(4)***

(1) – ***(3)*** → 18 + 18 e – 0.024 Y = 0 ***(5)***

5 ***(5)*** – 9 ***(4)*** → 90 + 90 e – 0.12 Y – 450 – 90 e + 0.36 Y = 0.24 Y – 360 = 0

→ Y = 360/0.24 → Y = 1500

(2) → i = – 20 + 0.02 Y = – 20 + 0.02 (1500) = – 20 + 30 = 10 → i = 10

(3) → i = 12 – 8 e + 0.004 Y → 10 = 12 – 8 e + 0.004 (1500)

→ 8 e = 12 + 6 – 10 = 8

→ e = 1

PART III (40 marks)

Instructions: Answer the following four questions in the space provided. Each question is worth 10 marks.

1. **Critically comment on the following statement:** *"Some economists consider fiscal austerity to be the best strategy to restore growth and employment. According to this view, reducing public debt decreases interest rates and injects confidence in the private sector, freeing the basic instincts to invest and consume."* **(Consider a closed economy and assume that there is a recessionary gap at the initial equilibrium.)**

If the economy is in a recession (i.e., $Y < Y_{fe}$), then AE is insufficient. Therefore, an increase in (autonomous) AE is needed for the economy to move to a situation of excess demand (i.e., AE > Y) so firms would increase production. In other words, an autonomous increase in C, I or G is needed to trigger the virtuous multiplying process that will eventually restore equilibrium at full-employment. But which component of AE will initiate this expansionary process?

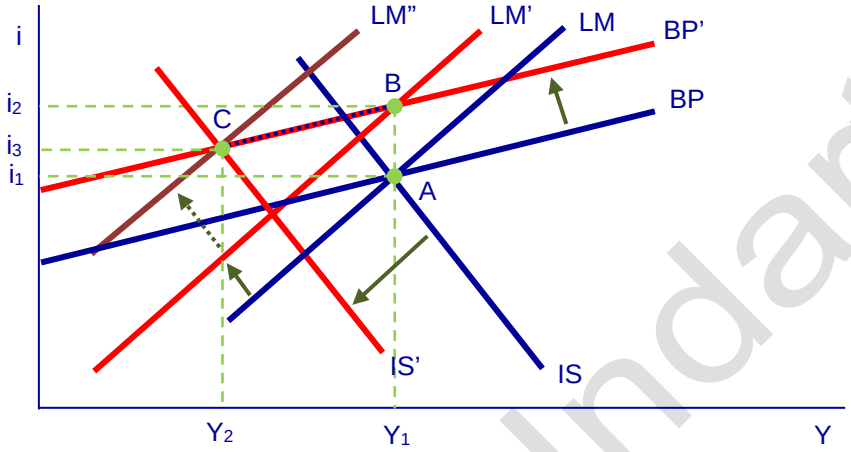
Will it be consumption expenditure? Consumers' confidence is usually very low during recessions and thus it will be very unlikely that they will initiate the process of economic expansion by increasing their expenditure. Indeed, consumers might be quite worry about the possibility of losing their jobs and thus will not be in the mood to increasing spending. Most likely they will do exactly the opposite, i.e., reduce spending (and increase savings) in case their pessimistic expectations come true.

What about investment expenditure? Will corporations start investing and creating new jobs? Do they need lower interest rates to do so? Although interest rates are at all time low (even though G has been at a historical high), most corporations do not need to borrow since they are currently sitting on a pile of money, but they are not spending it anyway. And why would they? In recessions, there is excess capacity — i.e., firms can produce more with the existing capital stock but they are not. So why would they increase investment and further expand their "excess" capacity? Corporations will start spending (i.e., investing) when the demand for their products starts increasing, i.e., when consumer expenditure increases and their excess capacity is reduced.

But the above statement is right that greater consumer and business confidence is needed to restore economic activity to pre-crisis levels, with the caveat that business confidence depends on consumer confidence being restored first. But how will this confidence be restored? The statement suggests that decreasing government spending (and the debt) will do the trick. In the first place, this rationale implies that the deficit and the debt might be actually responsible for the recession while the causation may go in the opposite direction: the government may be running a fiscal deficit because of the recession and the corresponding fall in revenues. Second, what will be the impact of the government reducing its deficit by decreasing G (or even by increasing taxes)? A decrease in G will cause the economy to move into a deeper recession, further reducing the confidence of both consumers and the business sector.

For consumers' and businesses' confidence to improve, a clear sign of rising employment and income must be observed — and for this to happen autonomous AE must increase and not decrease! Therefore, what the government should do is to increase G rather than decreasing it. An increase in G will contribute, first, to prevent the level of economic activity from dropping even lower and, second, to start restoring confidence in the economy and creating the conditions for further expansion. But increases in G will not move the economy to full employment. The economy will move to full-employment as a result of both C and I recovering their previous levels and beyond. But the latter requires consumers' and businesses' confidence to be restored, and this will not happen by itself. It needs something to trigger this change, and this something is the initial increase in Y resulting from expansionary fiscal policy.

2. **Critically evaluate the following statement:** *"A decrease in Canada's autonomous exports will cause the level of equilibrium income to fall, the rate of interest to rise, and the balances in both the current and the capital accounts to deteriorate."* **(Show your answer with the help of a diagram and <u>explain</u> the economics. Consider an open economy characterized by a fixed-price level, <u>fixed</u> exchange rate, and <u>imperfect</u> capital mobility.)**



Suppose that the economy is initially in equilibrium at point *A*. A decrease in autonomous exports reduces *NX*. Therefore, the *IS* curve shifts to the left to *IS'* and an excess supply arises in the goods market.

The decrease in autonomous exports causes the balance in the current account to deteriorate while leaving the balance in the capital account unchanged. Therefore, at point *A* there is now a deficit in the external sector (i.e., $BP < 0$ and thus the demand for foreign currency is greater than its supply). For the external sector to be in equilibrium at Y_1, the rate of interest must be higher (i.e., the balance in the capital account must improve by the same amount as the balance in the current account deteriorated). Therefore, *BP* would be zero at Y_1 when the rate of interest is i_2 — i.e., the *BP* curve shifts up to *BP'*.

The economy is still at point *A*. Since there is an excess demand in the exchange market, the central bank sells foreign currency to maintain the exchange rate fixed at the new level. Therefore, the supply of money decreases and the rate of interest rises. This is shown graphically by shift of the *LM* curve to *LM'*. Now the economy is at point *B* — both the money market and the external sector are in equilibrium but there is an excess supply in the goods market. (Note that the increase in the interest rate to i_2 causes the balance in the capital account to improve by the same absolute amount as the previous deterioration in the current account due to the decrease in autonomous exports.)

Now *Y* starts to decrease to eliminate the excess supply in the goods market and *i* starts to fall (because of the decrease in demand for real balances). The decrease in *i* worsens the balance in the capital account and creates a deficit in the exchange market, which the central bank eliminates by selling foreign currency. Therefore, the money supply decreases and the *LM'* curve shifts further to the left. This process continues as long as there is an excess supply in the goods market, i.e., until the *LM'* curves shifts all the way to *LM"*. Note that the money market is always in equilibrium (by assumption) and that the intervention of the central bank in the exchange market helps maintaining equilibrium in the external sector at all times as well. Therefore, during the process of adjustment, the economy is always at a point of intersection between the (shifting) *LM'* curve and the (static) *BP*' curve, i.e., the adjustment path is represented by a movement down along the *BP*' curve.

The statement is therefore false: the level of income decreases but the rate of interest rises, while the balance in the capital account improves (i.e., $i_3 > i_1$) and the balance in the current account deteriorates.

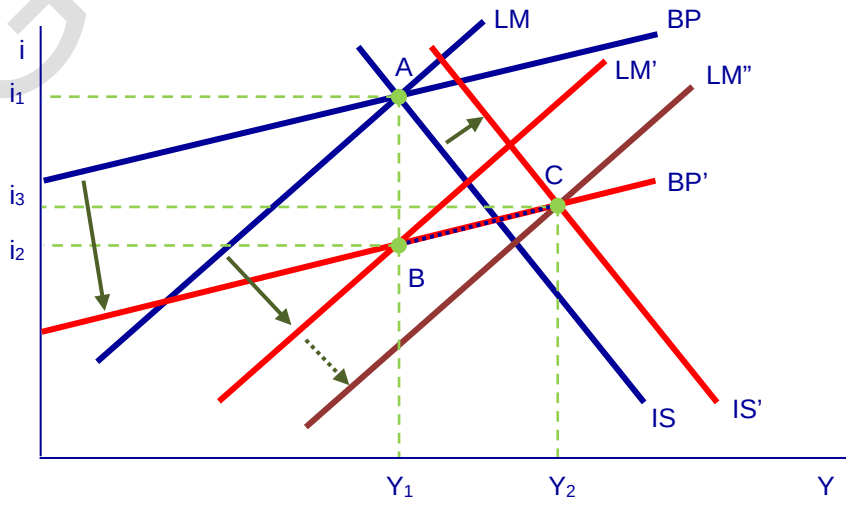
3. Critically evaluate the following statement: *"A devaluation of the domestic currency will cause the level of income to increase, the rate of interest to fall, the balance in the current account to improve, and the balance in the capital account to deteriorate."* **(Show your answer with the help of a diagram and <u>explain</u> the economics. Consider an open economy characterized by a fixed-price level, fixed exchange rates and imperfect capital mobility. Assume that there is a recessionary gap at the initial equilibrium.)**

Suppose that the economy is initially in equilibrium at point *A* (see diagram below). The devaluation of the domestic currency increases the international competitiveness of domestic goods, and thus *NX* increases. The increase in *NX* causes *AE* to increase and the *IS* curve shifts to the right to *IS'*. A situation of excess demand (i.e., *AE* > *Y*) emerges in the goods market.

At the initial equilibrium, the devaluation of the currency causes the balance in the current account to improve while leaving the balance in the capital account unchanged. Therefore, at point *A* there is now a surplus in the external sector (i.e., *BP* > 0 and thus the supply of foreign currency is greater than its demand). For the external sector to be in equilibrium at Y_1, the rate of interest must be lower (i.e., the balance in the capital account must deteriorate by the same amount as the balance in the current account improved). Therefore, *BP* would be zero at Y_1 when the rate of interest is i_2 — this means that the *BP* curve has shifted down and goes through point *B*.

The economy is still at point *A* (on the *LM* curve). However, since there is a surplus in the external sector and the central bank wants to keep the exchange rate at the new fixed level, the central bank will buy foreign currency. As a result, the domestic supply of money will increase and the *LM* curve will shift to the right to *LM'*. Now the economy is at point *B* — both the money market and the external sector are in equilibrium but there is an excess demand in the goods market. Note that the fall in the interest rate to i_2 causes the balance in the capital account to deteriorate by the same absolute amount as the previous improvement in the current account due to the devaluation.

Now *Y* starts to increase to eliminate the excess demand in the goods market and the domestic rate of interest starts to rise (because of the increase in demand for real balances). The increase in the rate of interest improves the balance in the capital account and creates a surplus in the external sector, which the central bank eliminates by buying foreign currency. Therefore, the money supply increases and the *LM'* curve shifts further to the right. This process continues as long as there is an excess demand in the goods market, i.e., until the *LM'* curves shifts all the way to *LM''*. Note that the money market is always in equilibrium (by assumption) and that the intervention of the central bank in the exchange market helps maintaining equilibrium in the external sector at all times as well. Therefore, during the process of adjustment, the economy is always at a point of intersection of the (shifting) *LM* curve and the (static) *BP*' curve, i.e., the adjustment path is graphically represented by a movement up along the *BP*' curve.
The statement is therefore true: as equilibrium moves from point *A* to point *C*, the level of income rises to Y_2, the rate of interest falls to i_3, the balance in the current account improves (due to the devaluation), and the balance in the capital account deteriorates (due to the fall in *i*).



4. **Critically evaluate the following statement:** *"An increase in the international rate of interest will cause the equilibrium income of a small economy to fall, its rate of interest to increase, the balance in its current account to improve, and the balance in its capital account to deteriorate."* **Show your answer with the help of a diagram and <u>explain</u> the economics. Consider an economy characterized by a fixed-price level, a <u>flexible</u> exchange rate, and <u>imperfect</u> capital mobility. Assume a recessionary gap and external balance at the initial equilibrium.**

As shown in the diagram below, the economy is initially in equilibrium at point *A*. Given the assumption of imperfect capital mobility, the *BP* curve has a positive slope. All else equal, the increase in *i** leaves the balance in the current account unchanged but causes the balance in the capital account to deteriorate, and thus now $BP < 0$ at point *A*. For *BP* to be in equilibrium at the level of income Y_1, the rate of interest should increase to i_1'. Therefore, the *BP* curve shifts up to *BP'*.

The economy, however, is still at point *A*. Therefore, $BP < 0$ and an excess demand arises in the exchange market and the exchange rate appreciates. The appreciation of the exchange rate causes the balance in the current account to improve, i.e., *NX* increases. Graphically, the increase in *NX* causes both the *BP'* and *IS* curves to shift — the *BP'* curve back to *BP*, and the *IS* curve out to *IS'*. The economy is still at point *A* but now there is equilibrium in both the money market and the external sector. There is, however, an excess demand in the goods market (i.e., point *A* lies below the *IS'* curve) and thus *Y* starts to increase.

As *Y* increases, the demand for money rises and *i* increases to maintain equilibrium in the money market. The increase in *i* causes now the balance in the capital account to improve (while leaving the balance in the current account unchanged), and thus the external sector moves now to a situation of a surplus (i.e., excess supply in the exchange market) and the exchange rate depreciates. Graphically, the gradual depreciation of the exchange rate causes the gradual shift up of the *BP* curve and the gradual shift down of the *IS'* curve.

The process just described continues until the excess demand in the goods market is eliminated. Graphically, the adjustment path can be depicted as a movement along the *LM* curve — the economy being always at a point of intersection between the (static) *LM* curve and the moving *BP* curve. Once the *BP* and the *IS'* curves shift, respectively, all the way to *BP"* and *IS"*, the money market and the external sector continue in equilibrium but now the excess demand in the goods market is also eliminated. A new equilibrium for the economy as a whole is thus reached at point *B*.

Therefore, the statement is incorrect: while an increase in *i** causes *i* to increase (but by less than *i**), the balance in the current account to improve (due to the appreciation of *e*, i.e., the initial appreciation is greater than the subsequent depreciation), and the balance in the capital account to deteriorate (due to *i* increasing by less than the increase in *i**), it also causes *Y* to rise (due to the increase in *NX*).