

ECO 209Y
MACROECONOMIC THEORY AND POLICY
Term Test #3

February 12, 2018

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SURNAME
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INSTRUCTIONS:

- The total time for this test is **1 hour and 45 minutes**. Manage your time properly!
- The only aid allowed is a **non-programmable** calculator.
- **Write your name and identifying information above but keep this test paper and the Supplement closed until the start of the test is announced.**
- There are three parts to the test: **Part I** consists of 14 multiple-choice questions (35 points); **Part II** is one quantitative problem (10 points); and **Part III** includes 3 short-answer questions (30 points). The **total** point-value of the test is **75 points**.
- This test includes **8 pages** plus the *Supplement*. The *Supplement* contains the multiple-choice questions but you must record your answers to each multiple-choice question in the table provided on the next page. **Anything written on the Supplement will not be graded.** We will only collect the test papers, not the *Supplement*.
- In Parts II and III, write your answers clearly and concisely in the space provided immediately after each questions. **Your entire answer must fit in the designated space.** No extra space/pages are possible. You cannot use blank space for other questions nor can you write answers on the *Supplement*.
- **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 (35 points)

Instructions:

- Enter your answer to each of the 14 multiple-choice questions (see the **Supplement**) in the table 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	2	3	4	5	6	7	8	9	10	11	12	13	14
C	D	E	D	A	D	B	B	D	A	A	E	C	B

PART II (10 points)

Consider the Neo-Keynesian monetary model of a closed economy where the equations for the IS curve and the real demand for money are, respectively, $i = 17.5 - 0.005 Y$ and $L = 0.2 Y - 20 i$.

- a) Suppose the central bank implements monetary policy following a money-supply rule where the endogenous money supply function is $M/P = 300 + 20 i$. What are the equilibrium levels of income and interest rate? (3 points)

To find the expression for the LM curve we must equate M/P and L :

$$300 + 20 i = 0.2 Y - 20 i \rightarrow 40 i = 0.2 Y - 300 \rightarrow i = 0.005 Y - 7.5$$

To find the equilibrium Y we must equate the IS and LM curves:

$$0.005 Y - 7.5 = 17.5 - 0.005 Y \rightarrow 0.01 Y = 25 \rightarrow Y^* = 2500$$

To find the equilibrium i we must plug this value for Y^* into the expressions for the IS or LM curves:

$$IS: i^* = 17.5 - 0.005 Y^* = 17.5 - 0.005 (2500) = 17.5 - 12.5 = 5$$

$$LM: i^* = 0.005 Y^* - 7.5 = 0.005 (2500) - 7.5 = 12.5 - 7.5 = 5$$

- b) If through an open market operation the central bank causes the supply of money to increase to $M/P = 400 + 20 i$, what are the equilibrium levels of income and interest rate now? (2 points)

To find the expression for the LM curve we must equate M/P and L :

$$400 + 20 i = 0.2 Y - 20 i \rightarrow 40 i = 0.2 Y - 400 \rightarrow i = 0.005 Y - 10$$

To find the equilibrium Y we must equate the IS and LM curves:

$$0.005 Y - 10 = 17.5 - 0.005 Y \rightarrow 0.01 Y = 27.5 \rightarrow Y^* = 2750$$

To find the equilibrium i we must plug this value for Y^* into the expressions for the IS or LM curves:

$$IS: i^* = 17.5 - 0.005 Y^* = 17.5 - 0.005 (2750) = 17.5 - 13.75 = 3.75$$

$$LM: i^* = 0.005 Y^* - 10 = 0.005 (2750) - 10 = 13.75 - 10 = 3.75$$

- c) Suppose instead that the central bank implements monetary policy following an interest-rate rule and the interest rate is set at $i = 4$. What are the equilibrium levels of income and interest rate? (3 points)

This means that the supply of money curve is horizontal at $i = 4$, which means that banks are willing to supply any quantity of money being demanded at that level of the rate of interest. Therefore, changes in the level of Y will affect the real demand for money and thus the equilibrium quantity of money in the economy, but will not affect the equilibrium rate of interest.

Since the money market will be in equilibrium only at $i = 4$, then the LM curve will also be horizontal at this level of the rate of interest. This means that the economy's equilibrium rate of interest will always be $i = 4$.

Therefore, the economy's equilibrium Y will be determined by the level of Y at which the goods market is in equilibrium at $i = 4$, i.e., it will be the point on the IS curve corresponding to $i = 4$. So let's plug this value for i on the expression for the IS curve:

$$4 = 17.5 - 0.005 Y \rightarrow 0.005 Y = 13.5 \rightarrow Y^* = 2700$$

- d) If the central bank reduces its target for the overnight rate and the banks decrease the rate of interest to $i = 3$, what are the equilibrium levels of income and interest rate now? (2 points)

This means that the supply of money curve is now horizontal at $i = 3$, which means that banks are now willing to supply any quantity of money being demanded at this level of the rate of interest.

Since the money market will be in equilibrium only at $i = 3$, then the LM curve will also be horizontal at this level of the rate of interest. This means that the economy's equilibrium rate of interest will always be $i = 3$.

Therefore, the economy's equilibrium Y will be determined by the level of Y at which the goods market is in equilibrium at $i = 3$, i.e., it will be the point on the IS curve corresponding to $i = 3$. So let's plug this value for i on the expression for the IS curve:

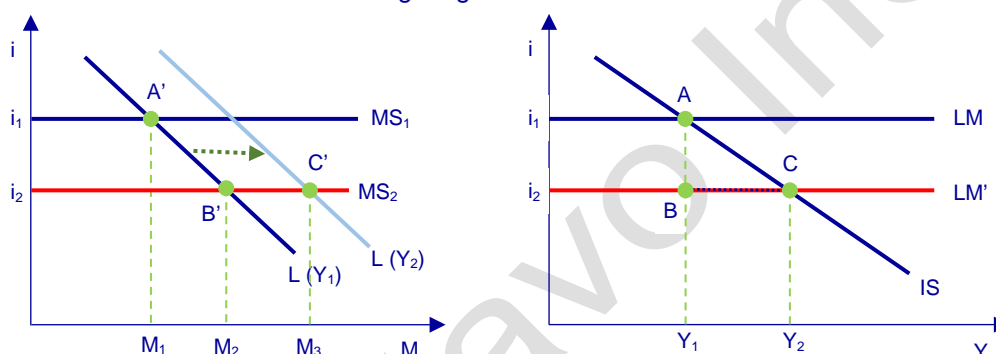
$$3 = 17.5 - 0.005 Y \rightarrow 0.005 Y = 14.5 \rightarrow Y^* = 2900$$

PART III (30 points)

Instructions: Answer the following three questions in the space provided. Each question is worth a maximum of 10 points.

1. Consider the Neo-Keynesian monetary model where the central bank implements monetary policy following an interest-rate rule. Suppose that the central bank reduces the target for the overnight rate of interest. What will be the economic impact of such a policy? **(Show your answer with the help of an IS-LM diagram and explain the economics. Assume a closed economy with a recessionary gap.)**

If the central bank implements monetary policy following an interest-rate rule, then it will set a target for the overnight rate of interest to affect the decision of the banks about the rate of interest they will charge when lending money to their customers (i.e., the prime rate is assumed to be a function of the target for the overnight rate of interest). In turn, it is assumed that banks will supply any quantity demanded at this rate of interest, i.e., that the supply of money is perfectly elastic (i.e., the money supply curve is horizontal) at this rate of interest. Therefore, the money market is in equilibrium only at this rate of interest, which means that the LM is also horizontal at this rate of interest. This can be observed in the following diagram.



At the initial target for the overnight rate the banks set the prime rate at i_1 , and thus the real money supply curve (MS_1) is horizontal at this level (see left-hand-side diagram above). The LM curve is thus horizontal at i_1 as well, i.e., the money market is in equilibrium only at i_1 (see right-hand-side diagram). Given the IS curve, the economy is in equilibrium at Y_1 (i.e., at point A). At this level of Y the corresponding real demand for money (i.e., liquidity curve) is $L(Y_1)$ and the real quantity of money is M_1 .

As the central bank decreases its target for the overnight rate, the banks soon enough also decrease the prime rate to i_2 to reflect the decrease in their borrowing costs. The real money supply curve (MS_2) is now horizontal at i_2 and the LM curve also shifts down to LM' . The economy moves from point A to point B (right-hand-side diagram), the money market being in equilibrium (B is a point on the LM' curve) but the goods market showing an excess demand (B is a point below the IS curve). Note that at Y_1 the stock of money increases to M_2 due to the decrease in i (left-hand-side diagram).

Y starts to increase to reduce the excess demand in the goods market, and thus the demand for money also increases (i.e., the L curve starts shifting to the right as Y increases). Equilibrium in the money market is being kept at all times but the rate of interest does not change because the supply of money is perfectly elastic. The adjustment path is thus a movement along the LM curve, i.e., maintaining equilibrium in the money market at all times while reducing the excess demand in the goods market as Y increases. The new equilibrium for the economy is reached at point C when Y increases to Y_2 (now both the money market and the goods market are simultaneously in equilibrium). Note that at Y_2 the stock of money increases to M_3 due to the decrease in Y with no change in i (left-hand-side diagram).

The decrease in the target for the overnight rate has therefore an expansionary effect on the economy: the decrease in the rate of interest causes AE to increase, thus creating an excess demand in the goods market, i.e., the condition for Y to expand.

2. The U.S. has been experiencing significant macroeconomic imbalances – large current account deficits and large government budget deficits. Its trade deficit with China accounts for a large share of its total current account deficit, while China's purchases of U.S. treasury bills largely contributes to financing its fiscal deficit. The Trump administration is now considering the imposition of stiff tariffs on the imports of Chinese goods to eliminate the current account deficit. In your view, what will be the likely economic impact of these tariffs on the U.S. economy? **(In your answer you must clearly explain the expected effect on GDP, interest rate, and the balances in the current and capital accounts. Note that you do not need to use diagrams to answer this question.)**

A tariff on Chinese goods would make them more expensive and thus the U.S. trade account deficit with China would be reduced. This, however, would not guarantee a significant and immediate reduction in the overall U.S. current account deficit. On the one hand, current trade deficits with other countries — e.g., Germany and Japan — would continue. On the other, countries like Indonesia, Malaysia, etc. would most likely start exporting to the U.S. what the U.S. was until now importing from China. Therefore, most likely the U.S. current account deficit would remain as is or, at most, it would be only marginally reduced in the short run (i.e., the direct impact of tariffs on AD – and thus on GDP – would be negligible).

What about the U.S. capital account? If China were no longer to have such a large trade account surplus with the U.S., China would not be able to continue accumulating reserves and buying U.S. treasury bills with it. Since there would be no guarantee that the countries that would take the place of China as suppliers of goods to the U.S. would invest their increasing surpluses in U.S. treasury bills, then the U.S. capital account surplus would most likely decrease. Of course, this likely deterioration of the U.S. capital account would contribute to a depreciation of the U.S. dollar and thus to a corresponding improvement in the current account.

So, even if not immediately, there would be an improvement in the current account after all. But at what cost to the economy as a whole?

Since, as explained above, external demand for U.S. treasury bills were to fall, the price of treasury bills would drop and the U.S. rate of interest would rise. Indeed, a larger share of the U.S. government budget deficit would now have to be financed with domestic savings, and thus a significant increase in the rate of interest would be the most likely outcome. Therefore, AD would fall and the U.S. economy would likely move into recession. (Another alternative would be for the Federal Reserve to finance the government deficit, but this would create inflationary pressure and turn out unsustainable in the long run.)

This shows that tariffs on Chinese goods cannot be seen as a solution for the U.S. current account deficit. The fiscal deficit of the government should be seen as ultimately responsible for the surplus in the capital account and, therefore, for the corresponding deficit in the current account. It is the external financing of the fiscal deficit that appreciates the U.S. dollar to a level that makes American goods and services less competitive in the international market with the resulting increase in the deficit of the current account. Therefore, the current account deficit will most likely continue as long as there is a fiscal deficit in need of external financing. But, of course, although the problem of the fiscal deficit must be addressed, it must be addressed in a way that it would allow for its gradual reduction to prevent the U.S. economy falling into recession.

3. Critically evaluate the following statement: *“Minimum wages are a good example of self-defeating interventionism since the well-meaning attempt to dictate higher wages ends up reducing employment and ultimately hurting the very workers they were supposed to help.”* **(Note: In your answer you should refer to the readings discussed in the case study on minimum wages.)**

Minimum wages are designed to protect vulnerable workers who lack bargaining power to obtain otherwise a decent pay package. It is also expected that higher minimum wages will contribute to poverty reduction by increasing the incomes (and standards of living) of this sector of the working population.

While workers in general, and low-wage earners in particular, tend to favour minimum wage increases, owners of the means of production tend to oppose such initiatives. The latter does not come as a surprise since wage increases necessarily cause profits to fall, at least in the short run. But the argument of business organizations against minimum wage increases tends to be more subtle, rarely claiming that their opposition is due to its negative impact on profit levels. Rather, business associations (and their “experts”) tend to argue that higher minimum wages translate into less employment, thus actually harming those who were supposed to help. But as suggested in the Washington Post article discussed in class, perhaps we shouldn’t pay attention to this until we see low-income people taking to the streets to demand lower minimum wages!

Do minimum wage-increases cause employment to fall? The evidence seems to suggest otherwise. As Card & Krueger showed in their seminal study, the 20% increase in New Jersey’s minimum wage in the early 1990s did not cause employment to decrease in the state’s fast-food industry as conventional model had suggested. Similarly, the more recent Seattle’s minimum wage-increase from \$9.32 to \$11 in April 2015, to \$13 in January 2016, and to \$15 in January of last year has not had a negative impact on the rate of unemployment. On the contrary, since April 2015 the rate of unemployment has fallen from 4.3% to 3.3% in the booming Seattle’s economy.

Two main studies have analyzed the Seattle experience to date. On the one hand, researchers from the University of California (UC) at Berkeley did not find any decrease in the fast-food industry’s employment as the minimum wage increased from \$9.32 to \$11 and then to \$13 (a total of a 40% increase in just eight months). On the other hand, researchers from the University of Washington (UW) found no significant impact on the fast-food industry’s employment when the minimum wage increased to \$11 but a fall in both the number of hours worked and the average income of low-wage workers when the minimum wage was further increased to \$13.

Since the UW results were published, many economists pointed out some serious methodological errors committed by UW researchers. The main shortcoming was that they left out of the study workers from establishments with more than one location, i.e., they left out 40% of those earning minimum wages. Further, while the wage-increase applied immediately to the larger establishments (those left out of the study) but only gradually to the smaller ones, they failed to consider the possibility that many fast-food workers might have sought and found since employment in the better paid larger establishments.

In any case, the non-negative effect of minimum wage-increases on employment should not come as a surprise. Indeed, it should be expected that Ontario’s recent minimum wage increase to \$14 – and to \$15 next January – will likely have a similar impact. It is estimated that about 25% of Ontario’s workers earn less than \$15 an hour and thus a significant percentage of the population will experience an important increase in income. And since the marginal propensity to consume of low-income earners is relatively high, this income increase will most likely translate into a significant increase in consumption expenditure and aggregate demand. Therefore, it should be expected that the economy will expand as a result of the minimum wage-increase, and particularly the sectors catering to the low-income segments of the population (e.g., the fast-food industry).

**DO NOT WRITE ON
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**NOTE THAT ANYTHING
WRITTEN ON THIS PAGE WILL NOT
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ECO 209Y
MACROECONOMIC THEORY AND POLICY

Term Test #3

February 12, 2018

SUPPLEMENT

INSTRUCTIONS:

- ***Read these instructions but keep this Supplement closed until the start of the test is announced.***
- This *Supplement* contains the test's multiple-choice questions but you must record your answers to each of the 14 multiple-choice questions in the table provided on page 2 of the test paper. ***Anything written on this Supplement will not be graded.*** We will only collect the test papers, not the *Supplement*.
- Each correct answer is worth 2.5 marks. Table cells left blank will receive a zero mark. ***Although no deduction will be made for incorrect answers, do NOT guess your answers!***
- The only aid allowed is a ***non-programmable*** calculator.

1. Suppose the Bank of Canada buys \$10 million of bonds in the open market and, at the same time, sells foreign currency for \$4 million. If the money multiplier is 2, in the new Neo-Keynesian monetary equilibrium the money supply will
 - A) increase by \$28 million.
 - B) increase by \$20 million.
 - C) increase by \$12 million.
 - D) fall by \$28 million.
 - E) fall by \$20 million.
2. Assume the stock of high-powered money is \$50 billion, the money supply is \$200 billion, the desired currency-deposit ratio is 0.2, and that there are no excess reserves in the banking system. What is the banks' desired cash-reserve ratio?
 - A) 0.5.
 - B) 0.4.
 - C) 0.2.
 - D) 0.1.
 - E) None of the above is correct.
3. 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 Bank of Montreal, the money supply will:
 - A) increase by \$0.75 billion.
 - B) increase by \$1.5 billion.
 - C) increase by \$3 billion.
 - D) increase by more than \$1.5 billion but less than \$3 billion.
 - E) remain unchanged.
4. Assume that the desired currency-deposit ratio is 0.2, the desired reserve-deposit ratio is 0.2, the money supply is \$42 billion, and the banking system has excess reserves of \$2 billion. In the new Neo-Keynesian monetary equilibrium the money supply will be:
 - A) \$36 billion.
 - B) \$40 billion.
 - C) \$44 billion.
 - D) \$48 billion.
 - E) None of the above is correct.
5. Suppose the Bank of Canada makes an open market sale of \$100 million, buys \$50 million worth of euros in the exchange market, and spends \$75 million renovating the Bank's headquarter in Ottawa. As a result of these transactions, the monetary base will:
 - A) increase by \$25 million.
 - B) increase by \$50 million.
 - C) increase by \$75 million.
 - D) decrease by \$50 million.
 - E) None of the above is correct.

6. Consider a new cash-deposit of \$10,000 to the Canadian banking system. Assuming that all banks are initially holding the desired level of reserves, the bank that initially receives this deposit will find itself with
- A) no excess reserves if there is no reserve requirement.
 - B) \$1,000 of excess reserves if its desired reserve ratio is 10 percent.
 - C) \$2,000 of excess reserves if its desired reserve ratio is 20 percent.
 - D) \$9,000 of excess reserves if its desired reserve ratio is 10 percent.
 - E) \$10,000 of excess reserves if its desired reserve ratio is 100 percent.
7. Consider an economy currently in monetary equilibrium. The public holds 20% of their real balances (M) in cash (CU_P). Banks hold 15% of the public's deposits (D) as reserves (R) and their reserves are \$45 million at the present time. Given the above, which one of the following statements is correct?
- A) The money multiplier (mm) is approximately 3.5.
 - B) The monetary base (B) is \$120 million.
 - C) The money supply is \$350 million.
 - D) The quantity of cash held by the public (CU_P) is \$80 million.
 - E) Both B) and D) are correct.
8. A profit-maximizing firm will hire additional units of labour
- A) as long as the nominal wage rate is greater than the value of the marginal product of labour.
 - B) as long as the value of the marginal product of labour is greater than the nominal wage rate.
 - C) as long as the nominal wage rate is smaller than the marginal product of labour.
 - D) as long as the real wage rate is greater than the marginal product of labour.
 - E) up to the point where the marginal product of labour is equal to the nominal wage rate.
9. Which of the following is NOT reflected in a shift of the AD-curve?
- A) A change in net exports due to an increase in the foreign price level.
 - B) A change in the interest sensitivity of the demand for real balances.
 - C) A change in government transfer payments.
 - D) A change in real money balances due to a change in the price level.
 - E) Both A) and D).
10. The concept of "diminishing marginal product of labour" suggests that the slope of the short-run production function
- A) increases as the quantity of labour decreases.
 - B) decreases as the quantity of capital increases.
 - C) increases as the quantity of labour increases.
 - D) equals zero for all quantities of labour.
 - E) is negative.

11. Suppose the Bank of Canada follows an interest-rate rule when implementing monetary policy. Which one of the following best describes the likely outcome of a decrease in the target for the overnight rate of interest?
- A) The banks' desired cash-reserve ratio will decrease and their reserves will rise.
 - B) The banks' desired cash-reserve ratio will rise and their reserves will decrease.
 - C) The banks' desired cash-reserve ratio and their reserves will both decrease.
 - D) The banks' desired cash-reserve ratio and their reserves will both rise.
 - E) The banks' cash-reserve ratio will remain unchanged and their reserves will decrease.
12. In the Post-Keynesian Structuralist model, the LM curve will have a negative slope if:
- A) the income elasticities of the demands for loans and money are both negative.
 - B) the income elasticity of the demand for loans is positive but the income elasticity of the demand for money is negative.
 - C) the income elasticity of the demand for loans is negative but the income elasticity of the demand for money is positive.
 - D) the income elasticity of the demand for money is greater than the income elasticity of the demand for loans.
 - E) the income elasticity of the demand for loans is greater than the income elasticity of the demand for money.
13. The Trump administration has recently reduced the U.S. corporate tax rate from 35% to 20%. Which of the following statements best describes the most likely impact of this tax change?
- A) Corporate profits will increase and thus productive investment and employment will rise.
 - B) The government deficit will rise, thus causing consumers' confidence to fall and consumption expenditure to decrease.
 - C) Corporate profits will increase, thus allowing greater compensation for CEOs and the payment of higher dividends to shareholders.
 - D) Corporate profits will increase and thus corporations will hire more workers and wages will rise.
 - E) The reduction in corporate taxes will pay for itself as a result of the expansion of the economy and the tax base.
14. Canada created more than 420,000 jobs in 2017 and the rate of unemployment in December fell to 5.7 percent. Some argue, however, that the Canadian economy may not be operating at full employment yet. Which one of the following suggests that the economy is not at full employment?
- A) Average real wages increased only moderately in 2017.
 - B) Many of those currently working part-time would prefer to hold full-time positions.
 - C) Many workers are overqualified for their jobs.
 - D) The participation rate is similar to the one at the start of the Great Recession.
 - E) All of the above do.