

**Concordia University
Department of Economics**

**ECON 203 – INTRODUCTION TO MACROECONOMICS
Winter 2012**

COMMON FINAL EXAMINATION VERSION 1 AND ANSWERS

FAMILY NAME: _____ **GIVEN NAME(S):** _____

STUDENT NUMBER: _____

Please read all instructions carefully.

1. This is a three-hour exam (180 minutes). The questions are worth 150 marks altogether. It is a good strategy to spend one minute per mark for your answers (150 minutes) and spend the remaining time (30 minutes) to review your answers.
2. The exam consists of four parts:
 - (i) Part I: 25 multiple-choice questions (25 marks);
 - (ii) Part II: Choose 5 out of 7 “true-false” questions (25 marks);
 - (iii) Part III: Choose 4 out of 5 long questions (60 marks), and
 - (iv) Part IV: One “current events” question (40 marks).
3. Write your name, student ID and answers to the multiple-choice questions on the computer scan-sheet with a **PENCIL**. For Parts II to IV, write all your answers on this exam. Do not use additional booklets.
4. You are allowed to use a non-programmable calculator and a dictionary. You may use either pen or pencil to provide your answers for Parts II to IV.
5. You are not allowed to tear any pages out of this exam.

Grades:

Part I: _____

Part II: _____

Part III: _____

Part IV: _____

Total: _____

Part I: Multiple Choice Questions. Write all answers on the computer sheet with a PENCIL (Total=25 marks).

1. A good produced in 2008 and held in inventory until it is sold in 2010 would be included in which year's GDP?
A) In 2008 GDP, under consumption expenditure.
B) In 2008 GDP, under investment expenditure.
C) In 2010 GDP, under consumption expenditure.
D) In 2010 GDP, under investment expenditure.
E) First included in 2008's GDP, but subtracted two years later and to be added to 2010's GDP.
2. Which of the following is (are) CORRECT?
A) GDP includes all market values of goods and services produced by Canadians working outside of Canada.
B) Since GDP measures the value of currently produced goods, second-hand transactions are included in GDP if the re-sale takes place within the current time period.
C) Higher prices will always lead to higher real GDP values.
D) In the base year, real and nominal GDP values are identical.
E) Both C and D are correct.
3. Suppose our current nominal wage is \$20 per hour, and the current CPI is 115. Our labour unions are currently negotiating with the firms for a new nominal wage for next year. Our unions want us to be able to afford the same goods and services that we typically buy. If we agree to a new nominal wage of \$24 per hour, this implies we believe the CPI for next year to be
A) 138.
B) 154.
C) 165.
D) 180.
E) Cannot be determined.
4. Okun's law suggests that if actual GDP decreases by 1% a year and potential GDP grows by 3% a year:
A) The unemployment rate will rise by 2 percentage points.
B) The unemployment rate will fall by 2 percentage points.
C) The unemployment rate will rise by 4 percentage points.
D) The economy will experience an inflationary gap.
E) Both C and D are correct.
5. Which of the following statements is (are) CORRECT?
A) If $Y > AE$, there will be an increase in unplanned inventory and Y will start to decrease.
B) The MPS is negative during an economic recession, but the MPS is positive during an economic boom.
C) A positive capital account means that the economy is a net lender in the international financial market.
D) The higher the price level, the higher the potential GDP.
E) Both A and B are correct.
6. The potential output line or curve Y_p is
A) Horizontal because it shows that price level changes will not affect the value of Y_p .
B) Vertical because Okun's law states that if Y_p growth exceeds actual Y growth, the natural unemployment rate will rise.
C) Upward-sloping because it shows that a higher price level will lead to a higher real output.
D) Upward-sloping because it shows that a lower price level will lead to a lower nominal output.
E) None of the answers is correct.
7. Changes in which of the following will affect the size of the multiplier?
I. Our own marginal propensity to import.
II. Our own consumer confidence index.
III. The GDP of our trade partners.
A) I only. B) II only. C) I and II only. D) I and III only. E) I, II and III.
8. Which of the following is INCORRECT?
A) The bigger the MPC, the higher the impact of a change in any autonomous variable on equilibrium output.
B) Discouraged job seekers exiting the labour force will lead to a drop in the unemployment rate.
C) Unanticipated deflation benefits borrowers.
D) For a given nominal interest rate, the real interest rate is lower when there is a high inflation rate.
E) A lump sum tax has no effect on the multiplier.

9. Assume that the tax rate t is 0.25, Y_p is 1,000 and G is 200. Which of the following statements is (are) INCORRECT?
- The structural budget balance is 50.
 - With negative GDP gap of 20%, the budget balance is 0.
 - There will be zero budget balance when Y is 900.
 - If Y increases, the structural budget balance will increase.
 - Both C and D are incorrect.
10. Suppose that the government increases spending by \$10 and increases autonomous taxes by \$10. We would expect this to:
- Have no effect on the level of national income.
 - Have a contractionary effect on national income.
 - Have an expansionary effect on national income.
 - Make the AE function flatter.
 - Both C and D are correct.
11. Which of the following best describe(s) automatic built-in stabilizers in Canada?
- Autonomous government spending automatically rises as GDP falls.
 - The size of the autonomous goods market multiplier varies inversely with the level of GDP.
 - The lower our income tax rates, the stronger are the automatic stabilizers, and the more stable is our GDP.
 - The higher our income tax rates, the stronger are the automatic stabilizers, and the more stable is our GDP.
 - Both B and C are correct.
12. Greece has recently introduced austerity plans into its economy in an effort to reign in its government debts by cutting government expenditure on education, health care and the hiring of public servants. Which of the following observation(s) will lessen the negative impact of these spending cuts on the Greece's GDP?
- Their marginal propensity to import is very low.
 - Their marginal propensity to consume is very high.
 - Their tax rate is very high.
 - Their crowding-in or crowding-out effect is very weak.
 - Both C and D are correct.
13. If the reserve ratio of all commercial banks is 0.2 and the currency deposit ratio of the public is 0.2, then an open market sale of bonds by the central bank of \$100 million will result in
- \$250 million increase in money supply.
 - \$300 million increase in money supply.
 - \$250 million decrease in money supply.
 - \$300 million decrease in money supply.
 - None of the above is correct.
14. Monetary base or "High-powered" money may best be described as:
- Always larger than M1.
 - The reserves of the Bank of Canada.
 - Cash held by the public and reserves of the commercial banks.
 - Loans issued by commercial banks.
 - Both C and D are correct.
15. The banking system finds that its desired reserve ratio is 6.25% (or 0.0625), and it is \$100 million short of reserves. If it is unable to obtain any additional reserves, it must decrease its money supply by
- \$100 million.
 - \$125 million.
 - \$1,600 million.
 - \$2,000 million.
 - \$2,225 million.
16. Suppose real GDP were to increase. How would this increase in real GDP affect the money demand function and the new equilibrium interest rate?
- Money demand shifts to the right and the interest rate rises.
 - Money demand shifts to the right and the interest rate falls.
 - Money demand shifts to the left and the interest rate rises.
 - Money demand shifts to the left and the interest rate falls.
 - Money demand does not shift, but rather it moves downward along the same money demand curve and the interest rate falls.

17. Consider a one-year bond with a principal or face value of \$100 and a coupon value of \$5. Which of the following statements is INCORRECT?
- A) If the interest rate is 5%, the present value of this bond is \$100.
 - B) If the interest rate is 0%, the present value of this bond is \$0.
 - C) If the interest rate is 8%, the present value of this bond is less than \$100.
 - D) If the interest rate is 2%, the present value of this bond is more than \$100.
 - E) The real interest rate of this bond could be negative.
18. In the short run, if the central bank increases interest rates, then consumption and investment will _____, and the aggregate _____ will shift _____. Eventually wages will _____, and potential output is _____.
- A) Increase; demand; right; increase; increased
 - B) Increase; supply; right; increase; unchanged
 - C) Increase; demand; right; increase; unchanged
 - D) Decrease; supply; left; decrease; decreased
 - E) Decrease; demand; left; decrease; unchanged
19. If funds in the overnight loans market are trading below the overnight rate target, then the Bank of Canada will _____ to _____ and _____ the overnight market rate.
- A) Make an SPRA; decrease the monetary base; push down
 - B) Make an SPRA; increase the monetary base; push up
 - C) Make an SRA; increase the monetary base; push up
 - D) Make an SRA; decrease the monetary base; push down
 - E) None of the answers is correct.
20. If China has a recession, it is likely that the Canadian dollar will ____ because our commodity exports to them will _____. In response, the Bank of Canada should ____ the target overnight interest rate if it wants to minimize GDP fluctuations.
- A) Appreciate; decrease; decrease.
 - B) Appreciate; increase; decrease.
 - C) Depreciate; increase; increase.
 - D) Depreciate; decrease; decrease.
 - E) Depreciate; decrease; increase.
21. Under a fixed exchange rate system in which the C\$ is fixed against the US\$, if the Bank of Canada (Bank) attempts to lower interest rates relative to the U.S. interest rates, then it would lead to _____.
- A) A downward pressure on the value of the Canadian dollar and a depletion of the Bank's US\$ reserves.
 - B) A downward pressure on the value of the Canadian dollar and an accumulation of the Bank's US\$ reserves.
 - C) An upward pressure on the value of the Canadian dollar and a depletion of the Bank's US\$ reserves.
 - D) An upward pressure on the value of the Canadian dollar and an accumulation of the Bank's US\$ reserves.
 - E) None of the answers is correct.
22. Interest rate parity means:
- A) Nominal interest rates in all countries have to be the same.
 - B) Real exchange rates in all countries have to be the same.
 - C) Differences in interest rates among countries reflect expected changes in exchange rates.
 - D) The balance of payments is not equal to zero.
 - E) Both C and D are correct.
23. A decrease in Canadian real GDP will:
- A) Increase the current account component in the Canadian balance of payments.
 - B) Decrease the current account component in the Canadian balance of payments.
 - C) Have no effect on the current account component in the Canadian balance of payments.
 - D) Increase the capital account component in the Canadian balance of payments.
 - E) Both B and D are correct.
24. The Solow residual found by growth accounting is:
- A) The difference between inputs of labour and inputs of capital.
 - B) A measure of the effects of changes in technology on output growth.
 - C) The profits firms keep for themselves.
 - D) The profits firms pay to their employees.
 - E) Both B and C are correct.

25. Why is the growth in capital per worker unable to provide a sustained, constant growth in output per worker and standards of living?
- A) Because of constant returns to scale.
 - B) Because of diminishing marginal product.**
 - C) Because population is always growing faster than the growth in capital.
 - D) Both A and B are correct.
 - E) All of the answers are correct.

Part II: Answer FIVE of the following seven questions in the allotted space. If more than five questions are answered, only the first five will be marked. State whether each statement is true or false and explain. Use graphs to support your answers when applicable. No marks will be awarded to simply stating “true” or “false” without explanation (Total=25 marks).

1. If the expenditures of the private firms are highly sensitive to interest rate changes, the crowding-out effect will be small.
Ans: False → Crowding out effect will be bigger because for every \$1 increase in G, Y increases by the multiplier, and Md will rise. For the given rise in Md and interest rate, if I is very sensitive to the interest rate increase, the drop in I will be large. The amount of I crowded out by the ↑ G will be large.

2. Suppose Iceland has fixed the value of its currency, the Krona, against the Canadian dollar. If the Bank of Canada continually increases its target overnight interest rate, Iceland will always be able to maintain its fixed exchange rate.
Ans: False → If BOC raises interest rates, Canadian financial assets become more profitable, Icelandic financial traders increase their demand for Canadian assets → this would increase demand for C\$ and create the pressure for the C\$ to appreciate, or the Krona to depreciate → the central bank of Iceland has to supply the C\$ demanded → Iceland will eventually run out of C\$ reserves, and would have to let its Krona float against the C\$.

3. If the US consumer price index is 120 and the Canadian consumer price index is 150, the Purchasing Power Parity theory predicts that the current nominal exchange rate of $e=1.1$ (from Canada’s perspective, that is, C\$1.1 buys US\$1) will have to fall to a new equilibrium value due to arbitrage.
Ans: False → PPP says $eP^{US}=P^C$, so the equilibrium e has to be 1.25. From arbitrage we know that Canadians would rather spend C\$132 ($1.1 \cdot 120$) to buy a basket of goods and services at US\$120 than to spend C\$150 to buy a basket of Canadian goods and services. As more Canadians sell C\$ to buy US\$, the C\$ will depreciate and $e=1.1$ will rise. The US\$ becomes more expensive, or appreciate, to offset the lower US general price level. In the end, e rises from 1.1 to 1.25.

4. In October 2011, the US government announced a new federal stimulus package worth \$447 billion. Suppose this stimulus attracts a lot of Canadian citizens to move to and work in the US. This move will increase Canada’s GNP but decrease Canada’s GDP.
Ans: False → GNP will be unchanged because it measures the production of Canadian nationals, regardless of location. GDP will ↓ because it measures production within Canada, regardless of nationality.

5. The concept of diminishing marginal product dictates that for populous countries, such as China and India, with their capital stocks held constant, their GDP per capita will rise continuously as their populations expand.
Ans: False → K/L will decrease. As $L \uparrow$, GDP rises but at smaller and smaller values (diminishing returns). As a result, GDP rises at a slower rate than L . GDP per capita Y/L will decrease.

6. The Bank of Canada can fully control the size of the money market multiplier.
Ans: False → It can control neither the reserve ratio, nor the currency ratio.

7. Suppose a country has strict capital control such that private investors are not allowed to buy or sell financial assets freely. If this country runs a current account deficit, its central bank will have to buy foreign exchange reserves, and its currency will face the pressure to depreciate.

Ans: False → Assuming CA=-5 and KA=0, there is an excess demand for foreign currency in order to pay for the CA deficit (since export revenues are not enough to cover import expenditures). The central bank has to sell foreign currencies, and this country's currency is going to depreciate.

Part III: Answer FOUR of the following five questions. If more than four questions were answered, only the first four will be marked (Total=60 marks).

Question #1: Unemployment and Inflation (15 marks)

Part I: GDP, CPI and Interest Rates (9 marks)

Suppose there is an economy that produces only four goods in 2011.

Papers: \$7,000 Books: \$16,000 Toner: \$3,000 Envelopes: \$4,000

The production of books requires the following amount of intermediate goods: Papers: \$2,000 Toner: \$1,500

The production of envelopes requires the following amount of intermediate goods: Papers: \$3,500

- (i) Find the total nominal GDP for the economy in 2011 (2 marks).

Ans: $(7000-2000-3500)+(3000-1500)+16000+4000=23,000$

- (ii) Find the value of paper sold as a final good in 2011 (2 marks).

Ans: $7000-2,000-3,500=1,500$

- (iii) Suppose the CPI for the year 2011 was 95. The base year is 2010. Find the real GDP for 2011 (2 marks).

Ans: $(23000/95)*100=24,210.53$

- (iv) Suppose you have borrowed \$500 from a commercial bank in the end of 2010, and the loan is to be repaid in the end of 2011 at the nominal interest rate of 6%. Calculate the real interest rate that you actually pay and explain whether you have gained or lost because of the changes in the Consumer Price Index (3 marks).

Ans: Real interest rate = nominal interest rate – inflation rate = 6% + 5% = 11%, it is a loss for the borrower.

Part II: Unemployment (6 marks)

Consider the following data collected from a country. The population of the country was 765.

Population under 15 years of age	146	Unemployed	94
Adults not in the labour force	142	Part-time workers looking for full-time jobs	24

- (i) Calculate the size of the labour force (2 marks).

Ans: Labour force = 765 - 146 - 142 = 477

- (ii) Calculate (to the nearest 0.1) the unemployment rate (2 marks).

Ans: Unemployment rate = $(94/477)*100=19.7\%$

- (iii) Suppose 12 of the 24 part-time workers looking for full-time jobs are going back to school full-time. Calculate the new unemployment rate (to the nearest 0.1) (2 marks).

Ans: The number of employed workers decreases, the number of unemployed stays the same, labour force decreases by 12. The new unemployment rate is $[94/(477-12)]*100=20.2\%$

Question #2: Economic Growth (15 marks)

Suppose a fictitious economy has the following average annual rates of growth between 1996 and 2005:

- Potential GDP (Y_p) 4.96%
- Labour force (L or N) 1.20%
- Capital stock (K) 1.80%

The share of labour income in national income is $2/3$ and the share of capital income is $1/3$. Use growth accounting to find the contributions to the annual growth in Y_p that came from:

(i) The growth in the labour force (2 marks).

Ans: The contribution to GDP growth of the growth in labour force = $2/3 \times 1.2\% = 0.8\%$

(ii) The growth in the capital stock (2 marks).

Ans: The contribution to GDP growth of the growth in capital = $1/3 \times 1.8\% = 0.6\%$

(iii) The Solow residual (2 marks).

Ans: The growth rate of A is $4.96\% - 0.8\% - 0.6\% = 3.56\%$

(iv) Consider a country such as Canada: We have experienced slow but steady labour force growth in the past few decades. Meanwhile, we have also been accumulating more capital stock over time. However, the rates of capital accumulation were lower than the rates of labour force growth. Discuss the economic concept that can be used to predict future per-capita Y_p growth in Canada (4 marks).

Ans: Diminishing marginal product.

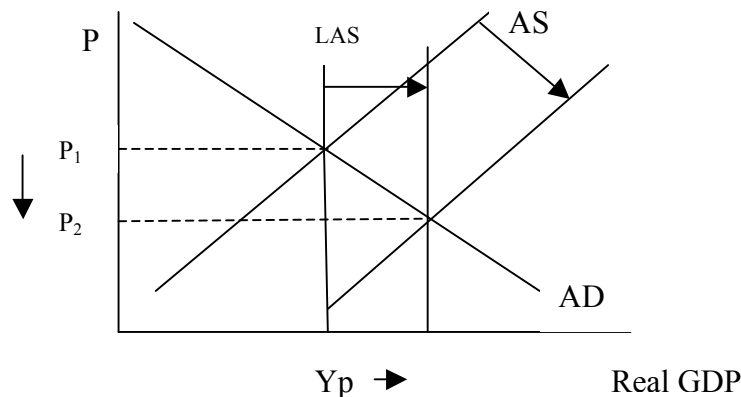
K and L are not growing at the same time with the rate of capital accumulation being smaller. This gap makes workers less and less productive, and hence per-capita Y_p will rise by smaller and smaller values.

(v) Consider part (iv): Briefly discuss the policy that the Canadian government can design in order to stimulate per capita Y_p growth (2 marks).

Ans: The government has to invest in improving production technology, or “A”, in the production function. This would allow per-capita GDP to stay constant.

(vi) Consider parts (iv) and (v): Use the AD/AS/LAS diagram to show how the Y_p and the long run price level (or inflation rate) will be affected (3 marks).

Ans: Price level goes down, Y_p and AS move to the right. Since A together with K and L grows.



Question #3: Taylor Rule (15 marks)

The Taylor rule states that a central bank can monitor price stability (low inflation) and output stability (GDP being close to the potential output Y_p) by an equation that links the interest rate with these two objectives. For Canada, suppose this has been estimated to be as follows: $i = i_0 + 1.7(\pi - \pi^*) - 0.4(UR - UR_n)$, where the unemployment rate difference from its natural level substitutes for the output gap.

Suppose the inflation target is $\pi^* = 2\%$, the natural rate of unemployment is $UR_n = 5\%$, and the equilibrium rate of interest that is compatible with these two is $i_0 = 8\%$. Also, suppose that the level of inflation π changes with the changes in interest rate according to the following formula $\pi = \pi^* - (i - i_0)$. Round your answers to 2 decimal places, if applicable.

- (i) Assume that we start from a situation where $\pi = \pi^*$, and $UR = UR_n$. Find the value of i (1 mark).

Ans: $i = i_0 + 1.7(\pi - \pi^*) - 0.4(UR - UR_n) = 8\% + 1.7(2\% - 2\%) - 0.4(5\% - 5\%) = 8\% + (0) - (0) = 8\%$

- (ii) Now suppose a drop in investment confidence leads to an increase in Unemployment Rate to 7%. Let us put aside inflation rates for now. According to Taylor rule, what interest rate should the Bank of Canada now set? (1 mark)

Ans: $i = i_0 + 1.7(\pi - \pi^*) - 0.4(UR - UR_n) = 8\% + 1.7(2\% - 2\%) - 0.4(7\% - 5\%) = 8\% - 0.8\% = 7.2\%$

- (iii) How would you expect π to change when i drops? Explain what happens to AE and AD (2 marks).

Ans: Even though firms may feel less certain about the future and hence have lower confidence, the drop in interest rates makes loans cheaper. They would now have more incentives to begin more investment projects. As the interest rate drops, firms will spend more on investment, so AE and AD will rise, therefore creates upward pressure on inflation.

- (iv) Replace the expression for π shown above (that links π to the change in interest rate) into the Taylor rule and solve for the new interest rate that will now combine the anticipated increase in inflation as well as the increase in the unemployment rate (4 marks).

Ans: $i = i_0 + 1.7(\pi - \pi^*) - 0.4(UR - UR_n) = i_0 + 1.7[\pi^* - (i - i_0) - \pi^*] - 0.4(UR - UR_n) = 8\% + 1.7[2\% - (i - i_0) - 2\%] - 0.4(7\% - 5\%) = 8\% + 1.7(-i + 8\%) - 0.4(7\% - 5\%)$

$i = 8\% - 1.7i + 13.6\% - 0.8\%$ and $i + 1.7i = 8\% + 13.6\% - 0.8\% = 20.8\%$ or $i = 20.8\% / 2.7 = 7.7\%$

- (v) Find the new π (2 marks).

Ans: The new $\pi = \pi^* - (i - i_0) = 2\% - (7.7\% - 8\%) = 2.3\%$

- (vi) Contrast the new interest rate you have found in part (iv) with the initial $i_0 = 8\%$: Canada has a flexible exchange rate system.

- (a) Explain whether the Canadian dollar is expected to appreciate or depreciate (2 marks).

Ans: A decrease in interest rates will lead to an increase in the demand for foreign currency and a depreciation of the C\$.

- (b) Also explain how the interest change will affect Canada's capital account, current account and the overall balance of payments (3 marks).

Ans: The depreciation of C\$ leads to greater exports and lower imports ($\Delta CA > 0$); Capital outflows increase, as domestic interest rates are relatively lower, therefore $\Delta KA < 0$. BP is still equal to zero by definition.

Question #4: Contrasting Fiscal and Monetary Policies in the AE Model (15 marks)

In this question we analyze the Canadian economy. The simplified economy is specified as follows:

- A. Goods market, all values are in billions of C\$:
- Consumption expenditure: $C = 140 + 0.8(Y-T)$
 - Investment expenditure: $I = 1,100 - 450i$
 - Government expenditure: $G = 250$
 - Lump-sum constant taxes: $T = 250$
 - Exports=70
 - Imports=10
- B. Money market, all M^d values are in billions of C\$:
- Interest rate: $i = 0.1$ or 10%.
 - Money demand: $M^d = 780 - 1,900i$.

- (i) Find the equilibrium Y (2 marks).

**Ans: $Y = 140 + 0.8(Y-250) + 1,100 - 450i + 250 + 70 - 10 = 0.8Y + 140 - 200 + 1055 + 250 + 70 - 10$
 $Y = 0.8Y + 1305$
 $Y = 1305 / 0.2 = 6525$**

- (ii) Find the numerical value of the goods market multiplier (2 marks).

Ans: The multiplier is $1/(1-0.8) = 1/0.2 = 5$

- (iii) Now suppose there is an impending federal election, and the government promises to use fiscal policies to stimulate the economy. Let G rise to 330. Solve for the new equilibrium Y (2 marks).

**Ans: $Y = 140 + 0.8(Y-250) + 1,100 - 450i + 330 + 70 - 10 = 0.8Y + 140 - 200 + 1055 + 330 + 70 - 10$
 $Y = 0.8Y + 1355$
 $Y = 1385 / 0.2 = 6925$**

OR

ΔY is $\Delta G \times \text{the multiplier} = 80, \text{ so the new } Y \text{ is } 6925.$

- (iv) Demonstrate how the increase in G affects the economy through the multiplier. Use two rounds of effects to demonstrate the multiplier effects. Let the first round be related to health care spending and the second round related to clothing (4 marks).

Ans: The increase in income in the health care sector is $\Delta G = 80$. Due to this increase in income, the demand for clothing increases by $MPC \times \text{initial } \Delta Y = 0.8 \times 80 = 64$. The overall change in income, for the 2 sectors is $80 + 64 = 144$.

- (v) Now consider monetary policies only. Suppose the BOC wants to drop the i to 0.05 or 5%, with G still at \$250. Solve for the new equilibrium Y (2 marks).

**Ans: $Y = 140 + 0.8(Y-250) + 1,100 - 450i + 250 + 70 - 10 = 0.8Y + 140 - 200 + 1100 - 450 \times 0.05 + 250 + 70 - 10$
Investment becomes 1077.5.
 $Y = 0.8Y + 1327.5$
 $Y = 1327.5 / 0.2 = 6637.5$.**

- (vi) Discuss how the economy will adjust from the fiscal and monetary policy changes in the short run to the long run. Are these policies effective in changing Y_p and the long run price level? Explain (3 marks).

Ans: The increase in G and the decrease in interest rates are temporary policies. They both lead to an increase in GDP. If these two policies manage to stimulate investment, then an increase in Y will be achieved over a long term. However, both policies will increase AD and prices in the economy. In order to keep inflation under control, the central bank should intervene and increase interest rates.

Question #5: Real Exchange Rate and Purchasing Power Parity (15 marks)

Suppose that in 2000, the price levels in United States and the Canada were 100. By 2003, the price level in United States has increased to 160, while the price level in the Canada rose to 150. Suppose the exchange rate between two countries was \$1USD = \$1.5CAD in 2000. Define all exchange rates from Canada's perspective.

- (i) Find the real exchange rate in 2000, from the perspective of Canada (2 marks).

Ans: The 2000 real exchange rate = $er * P_{USD} / P_{CND} = 1.5 * 100 / 100 = 1.5$

- (ii) Suppose Canada had a fixed exchange rate system against the U.S. dollar. The initial nominal exchange rate in 2000 was fixed. Find the 2003 real exchange rate for Canada. Has the Canadian dollar experienced a real appreciation or depreciation by 2003? Explain (2 marks).

Ans: The 2003 real exchange rate is $er * P_{USD} / P_{CND} = 1.5 * 160 / 150 = 1.6$.

Since $P_{USD} / P_{CND} = 160 / 150 > 1$, Canada's real exchange rate with the US has depreciated (the Canadian dollar experienced a real reduction in its value).

- (iii) Calculate the new nominal exchange rate of the Canadian dollar if it were to maintain its constant real exchange rate in part (i). Use your numerical answer to explain whether the Canadian dollar was overvalued or undervalued in 2003 (2 marks).

Ans: The 2003 real exchange rate is fixed at 1.5. In order to get the nominal exchange rate, we use the formula above and solve for er.

$1.5 = er * 160 / 150$ and $er = 1.5 * 150 / 160$, so $er = 1.40$.

Comparing with the year 2000, the Canadian dollar appreciated. The Canadian dollar is undervalued, because it should have taken 1.4 CND to buy one USD, not 1.5 CND. The value of the CND is too low.

- (iv) From 2000 to 2003, what actions must the Bank of Canada has taken in order to maintain the fixed exchange rate? Explain, and also explain how such actions have affected Canada's US\$ reserves (3 marks).

Ans: Maintaining a fixed exchange rate requires central bank intervention in the foreign exchange market. In this case, the central bank of Canada will intervene by buying foreign currency (USD) to maintain the exchange rate at 1.5. Central bank's official exchange reserves (of foreign currency holdings) will increase.

- (v) Based on your answer in (iv), how are Canada's domestic money supply and GDP affected? Explain (2 marks)

Ans: Canada's domestic money supply increases and, as interest rates decrease, the GDP increases.

- (vi) Suppose Canada has abandoned its fixed exchange rate in 2003 and the Canadian dollar is allowed to fluctuate. According to the Purchasing Power Parity, what is the new nominal exchange rate once the Canadian dollar has been allowed to fluctuate in 2003? Contrast your numerical answer here with your numerical answer in (iii) and explain why they may differ (4 marks).

Ans: When Purchasing Power Parity holds, the real exchange rate is 1. Therefore, the nominal exchange rate is equal to the relative price, $er = 150 / 160 = 0.94$.

Both (iii) and PPP predict that the C\$ will appreciate, or e will fall. The PPP goes further to assume that the e will fall until $e_{PUS} = P_c$. The new e will be 0.94, not just 1.4. In reality, the PPP may not hold due to transportation costs, import taxes, differentiated products, etc.

Based on the result from (iii), in 2003 100 USD can buy 140 CND and this pays for 50% more goods and services in Canada than in the US; in this case, PPP does not hold.

Part IV: Answer the following question. ANSWER ALL PARTS (Total = 40 marks).

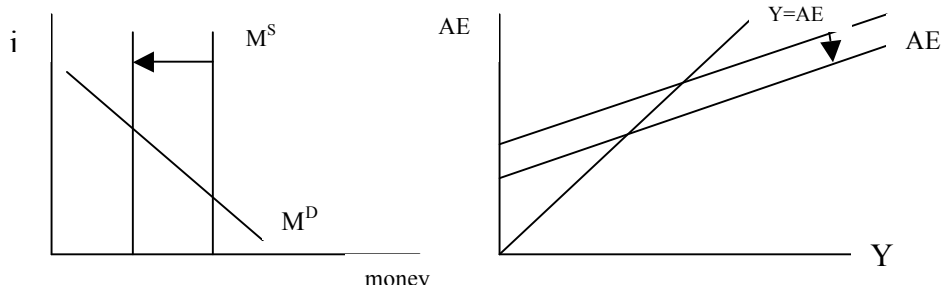
In 2008, the inflated housing markets in the U.S. and Europe created a liquidity crisis for the banking industry. This credit crunch has driven the world into a global recession. In this multiple-part question, we want to explore what has been happening in Canada and the world since then. Assume that $Y=Y_p$ in 2008, immediately before this banking crisis. Notice that Y_p is the horizontal intercept of the vertical LAS curve.

Article 1: Why should I care about the credit crunch?

Garry Marr And Jonathan Chevreau, Financial Post, Tuesday, Jan 15, 2008

Forget tomorrow, Canadians are already getting hit in the pocketbook by the debt-market crisis, and it could get a lot worse. David Dodge, former governor of the Bank of Canada, said this week the average Canadian could ultimately be "pulled down" as banks scramble to come up with a deal to save the debt market and prevent the loss of \$300-billion worth of outstanding loans. And that's just the tip of the iceberg.

- (i) Article 1: Explain whether commercial banks would have been able to pay their customers should all of them decide to close their accounts and withdraw their money at the same time (2 marks). Use the $M_d=M_s$ and $Y=AE$ graphs to illustrate and explain how the money market panic will affect the money market and goods market (4 marks).



Ans: Since not all outstanding loans will be paid back, the money supply in the economy decreases and interest rate increase. Commercial banks will not be able to meet depositors demand for cash due to the amount of loans created has been magnified via the money market multiplier. The increase in interest rates has a negative impact on borrowing, and aggregate expenditure decreases and shifts down. Output decreases as a result.

Article 2: Bank of Canada Buys C\$665 Million of Securities (bonds) for One Day

Bloomberg, By Greg Quinn, August 18, 2011

The Bank of Canada bought C\$665 million (\$672 million) of securities (bonds) for one day, the third such transaction since last week. The central bank announced the purchase, aimed to keep overnight lending rate close to its current target of 1 percent, on its website today from Ottawa. Today's purchase follows ones worth C\$375 million on Aug. 11 and C\$305 million on Aug. 10.

- (ii) Article 2: Explain how the BOC's purchase of bonds would affect bond prices and interest rates (2 marks). Was the target overnight lending rate facing the pressure to fall below 1% or rising above 1% prior to this BOC intervention? Explain. Define SPRA and SRA, and explain which was tool was used, according to this article (4 marks).

Ans: Rising ONR, bond prices will be falling, SPRA to increase money supply and decrease lending rate. Special purchase and resale agreement, to inject cash into the economy to decrease i. Sale and repurchase agreement, to collect cash out of economy to increase i.

Article 3: Canada's trade deficit nears record

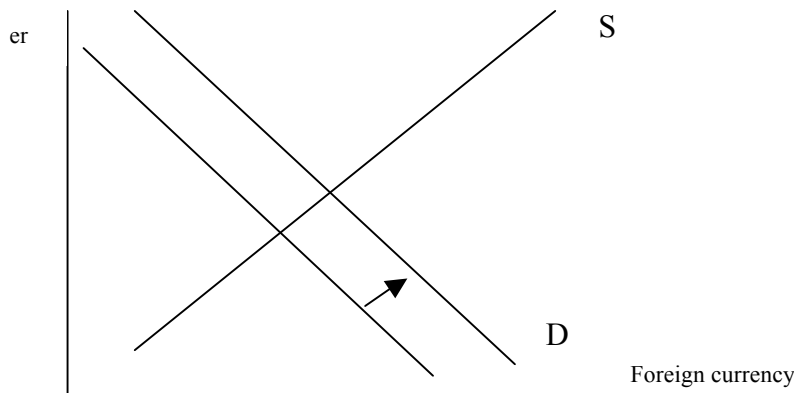
Tavia Grant From Thursday's Globe and Mail, Published Wednesday, Nov. 10, 2010

An unexpected surge in Canada's trade deficit is dragging on Canada's already sluggish economy. The country's trade deficit neared a record in September as exports fell, prompting several economists to predict that the sagging trade picture will knock three percentage points off third-quarter growth – a similar magnitude as in the second quarter.

Economists at Bank of Montreal and Desjardins Financial say weak trade will carve as much as three percentage points from GDP growth in the third quarter. "With American demand unlikely to pick up noticeably, sizable trade deficits are likely to persist," said BMO Nesbitt Burns economist Benjamin Reitzes.

Demand has not yet bounced back from the United States, Canada's largest trading partner and the destination of more than three quarters of exports.

- (iii) Article 3: If the BOC wants to stimulate our exports, how should it change our target overnight interest rate? Explain by using the demand-supply diagram for the US dollar (3 marks). Also discuss how this would affect our capital account, current account and balance of payments (3 marks).



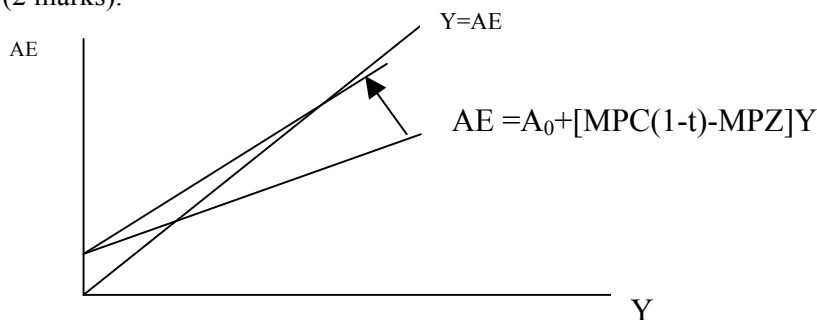
Ans: A decrease in interest rates will lead to an increase in the demand for foreign currency and a depreciation in the C\$ and to greater exports and lower imports ($\Delta CA > 0$); Capital outflows increase, therefore $\Delta KA < 0$. BP is still equal to zero by definition.

Article 4: How the recession helped U.S. exporters

Richard Gilbert Globe and Mail Blog Posted on Friday, January 27, 2012

A paradox of negative trade balances is that they can improve when the economy falters. This happened to the U.S. during 2009, the worst year of the recent recession, particularly during the middle third of that year. Comparing May-August 2009 with May-August 2007, the monthly trade deficit fell by 42 per cent from \$68.0-billion to \$39.2-billion.

- (iv) Article 4: Explain how the Marginal Propensity to Import (MPZ) of the US plays a crucial role in explaining the narrowing US trade deficits (2 marks). Suppose the MPZ of the US has fallen during the recession. Use the $Y=AE$ diagram to demonstrate this fall in MPZ (2 marks) and explain how the US goods market multiplier will be affected (2 marks).



Ans: This decrease the marginal propensity to import (MPZ) occurs as US imports decrease following a decrease in income. The imports function is $Z = Z_0 + MPZ * Y$. A decrease in MPZ will increase the slope of the AE function: $MPC(1-t) - MPZ$ and increase the Multiplier $1/[1 - MPC(1-t) + MPZ]$.

Article 5: The debate over Canadian debt data
Grant Robertson, Globe and Mail, Feb. 13, 2012

It's the one piece of economic data in Canada that has drawn more attention than any other in the past year. That number, of course, is the average measure of household debt in Canada, which recently hit a record 151 per cent of income. That means for every dollar of after-tax cash, the average Canadian family owes \$1.51, including mortgages, credit cards, credit lines and car loans. It's the upward trajectory of the debt ratio that has the Bank of Canada and even the International Monetary Fund concerned. By the second half of next year, some economists believe Canada will punch through the 160-per-cent mark – the same point the United States reached about five years ago, right before the American housing market began to crumble.

But is the three-digit number the best way to assess how indebted consumers really are? A growing number of economists and bankers say no, and more of them are beginning to openly question whether Canadian debt levels are being studied in the proper way.

- (v) Article 5: Canada has been in a recession for the past couple of years. Use the concepts of structural budget balance (SBB) and budget balance (BB), but from the perspective of the private households, to explain whether the 151% debt-to-income ratio is a concern (6 marks).

Ans: From a household's perspective, Y_p resembles the long term, stable income that it expects to earn over its life span or working years. Y resembles the temporary ups and downs in short term income due to temporary job losses or additional over-time income. Given that Y has been dropping in the past couple of years, it is very likely that more households have lost their jobs or have switched from full-time jobs to part-time jobs. As a result, the high household debt of 151% may very well be temporary, similar to the temporary BB deficit of the Canadian government. As the economy moves out of the recession, or as the households find better jobs, Y is likely to recover to Y_p . Consequently, it is also likely that the household debt as a percentage of income will drop from the 151%. This high debt ratio may not be that alarming if a portion of this high debt was the result of the temporary income loss.

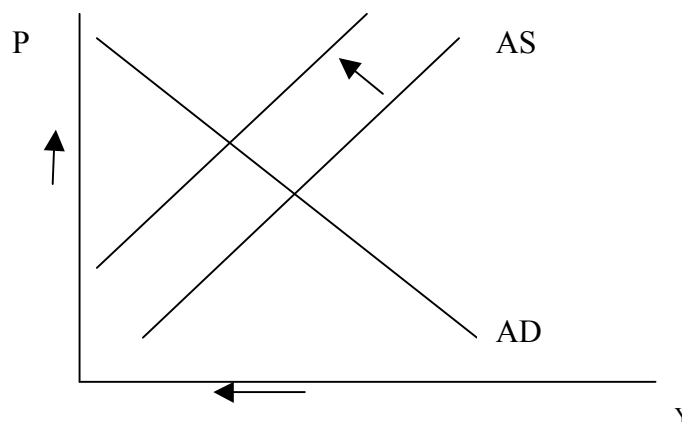
Article 6: Oil prices up on Iran risks
Agence France-Presse Posted at 03/06/2012

SINGAPORE - Oil prices edged higher in Asian trade Tuesday as geopolitical tensions over crude producer Iran's nuclear programme outweighed weak economic data from Europe and China, analysts said.

New York's main contract, light sweet crude for delivery in April, gained 18 cents to \$106.90 and Brent North Sea crude for April was up 21 cents to \$124.01 in morning trade.

"Oil prices edged up... in tug-of-war trading as supply risks and tensions over Iran's nuclear programme provided support, but concerns about global economic recession limited gains (in oil prices)," said Phillip Futures in a market commentary.

- (vi) Article 6: Use the AD/AS/LAS diagram to illustrate how Europe's GDP and the price level will be affected (2 marks).



Ans: Y decreases and the price increases, as producers in Europe face greater costs of production.

- (a) If the European Central Bank wants to keep the price level constant, how should it change interest rates? As a result, how would its GDP be affected? Explain in words, no need to draw (2 marks).

Ans: Prices increase as Europe's supply decreases (stagflation). The ECB would increase interest rates to decrease AD and prices. At the same time, the real GDP decreases, as C, I and NX are negatively affected by the increase in interest rates.

- (b) If the European Central Bank wants to keep $Y=Y_p$, how should it change interest rates? As a result, how would its price level or inflation rates be affected? Explain in words, no need to draw (2 marks).

Ans: An increase in AD would increase output back after the decrease in AS. This is achieved through expansionary monetary policy: a decrease in interest rates to stimulate investment and production. However, prices increase in this case.

Article 7: Canada's innovation window of opportunity

Barrie Mckenna Globe and Mail Nov. 23, 2011

Canada boasts a stable government, sound finances, boundless resources and an educated work force. But for all of those strengths, there's a dirty little secret about our economy.

We are under-performers compared to our economic potential. Canada's record on productivity is poor, and the country suffers from a long-lasting innovation gap. Outside of the mining and energy sectors, the list of Canadian companies making a meaningful impact on a global stage is exceedingly short. The most innovative one of all, Research In Motion Ltd. of Waterloo, Ont., has been put on the defensive by foreign competitors that have been stealing market share with products that are more cutting-edge than the BlackBerry.

Putting Canada on a more competitive footing will likely mean converting corporate profits into world-beating innovation.

- (vii) Article 7: Suppose Canada does manage to convert corporate profits into innovation, and for simplicity, this translates to higher capital accumulation rates in the long run. Explain how a constant per-capita GDP growth rate in Canada could be achieved in the long run. Refer to the relevant economic concept to support your answer (4 marks).

Ans: Assuming CRS, so growth rate of K/L is one. And the growth in Y_p/capita is brought by the growth in A , the government will have to increase education/research spending to increase A .

Ans: Given that $\% \Delta K > 0$, if we want to have a constant per-capita GDP growth rate, then $\% \Delta L$ has to be equal to the $\% \Delta K$. This result utilizes the concept of constant returns to scale, meaning that K and L both increase by the same proportion, and so GDP increases by the same proportion, and so GDP per capita stays constant.