Concordia University
Department of Economics

ECON 203 – INTRODUCTION TO MACROECONOMICS
Winter 2011

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 6 long questions (60 marks), and
   (iv) Part IV: One "current events" question (40 marks).

3. Write your name, student ID and answers for the multiple-choice questions on the computer scan-sheet with a **PENCIL**. Please also write the **VERSION** of the exam on the computer scan-sheet. 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. In the economy of Pluto, the real GDP in 2010 was $100 million. Suppose Plutonians earned $20 million in Mars and Martians earned $45 million in Pluto. What is Pluto's GNP?
   A) $35 million.
   B) $165 million.
   C) $125 million.
   D) $75 million.
   E) Cannot be determined.

2. Which of the following is CORRECT?
   A) If double counting is allowed, the GDP measurement will be too low.
   B) GDP includes all market values of goods and services produced by Canadians working outside of Canada.
   C) 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.
   D) Higher prices will always lead to higher nominal GDP values.
   E) **It is possible to observe a rise in the unemployment rate and a** positive **real GDP growth rate for any given period of time.**

3. Suppose right now our money wage, or nominal wage rate, is $10 per hour, and the current CPI is 150. Our labour union believes that the CPI for next year will increase to 180. If we want to be able to afford the same goods and services that we typically buy, the new nominal wage rate that we should ask for in the coming year should be
   A) At least $10.5.
   B) At least $11.
   C) At least $11.5.
   D) At least $12.
   E) At least $12.5.

4. In Utopia, 200,000 people are in the labour force and the unemployment rate is 10%. When 20,000 Utopia's university students graduate and search for jobs, the unemployment rate will immediately become
   A) 9.09%.
   B) 15.25%.
   C) 18.18%.
   D) 20%.
   E) None of the answers is correct.

5. Assume that the economy is currently in a recession phase due to a weaker AD. In the absence of government or central bank intervention, the self-adjustment mechanisms will lead to
   A) Lower input prices, a leftward shift in the AS curve, and a rightward shift in the AD curve until Y=Yp.
   B) Lower input prices, a rightward shift in the AS curve, and downward movements along the given AD curve until Y=Yp.
   C) Lower input prices, no shift in the AS curve, a rightward shift in the AD curve until Y=Yp.
   D) Deflation, no change in input prices or the AS curve, a leftward shift in the AD curve until Y=Yp.
   E) A persistent recessionary gap that will never narrow.

6. If Y<AE, then inventory would
   A) Increase and Y would increase.
   B) Increase and Y would drop.
   C) Decrease and Y would increase.
   D) Decrease and Y would drop.
   E) Decrease and Y would remain constant.

7. If consumption is $25,000 when income is $20,000, and consumption increases to $26,500 when income increases to $22,000, the Marginal Propensity to Save is
   A) 0.4.
   B) -0.4.
   C) -0.2045.
   D) -0.25.
   E) None of the answers is correct.

8. The potential output line or curve Yp is
   A) Vertical because it shows that price level changes will not affect the value of Yp.
   B) Vertical because it shows that price level changes will affect the value of Yp.
   C) Vertical because Okun's law states that if Yp growth exceeds actual Y growth, the actual unemployment rate will fall.
   D) Upward-sloping because it shows that a higher price level will lead to a higher real output.
   E) Upward-sloping because it shows that a higher price level will lead to a higher nominal output.

9. The United Kingdom has recently introduced austerity plans into its economy in an effort to reign in its public 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 United Kingdom's GDP?
   A) Their marginal propensity to import is very low.
   B) Their marginal propensity to consume is very high.
   C) Their income tax system is a lump sum or constant tax system.
   D) Their crowding-in or crowding-out effect is very strong.
   E) All of the answers are correct.

10. In contrast to the United Kingdom, the U.S. government has opted for an injection of fiscal spending into its economy. If the U.S.' MPC is 0.8, the net income tax rate is 0.2, the marginal propensity to import is 0.04 and the government increases spending by $20 million, then we would expect the U.S. GDP to increase by
    A) $29.41 million.
    B) $30 million.
    C) $50 million.
    D) $100 million.
    E) None of the answers is correct.

11. A $1 increase in government spending will have a larger impact upon national income than a $1 cut in lump sum taxes because
    A) The government prints the money it spends.
    B) The consumers save a portion of the tax cut.
    C) When taxes are cut, so too is government spending.
    D) Taxes are leakages from the system.
    E) All of the answers are correct.

12. Which of the following statements is (are) CORRECT?
    A) If the economy's (Sp + T) - (G +I) is positive, it means that the economy's net export is negative.
    B) An open economy's private investment can be greater than the economy's private savings.
    C) A positive capital account means that the economy is a net lender in the international financial capital market.
    D) Other things remaining the same, the higher is the fiscal deficit, the lower is the net export.
    E) Both B) and C) are correct.

13. The direction of discretionary fiscal policy cannot be examined by the simple look at the changes in the actual budget deficits or surpluses. This is because
    A) Those changes may reflect the changes in the general price level.
    B) Those changes may reflect changes in the tax revenues as a result of change in GDP.
    C) Those changes may reflect the changes in the tax revenues as a result of change in imports.
    D) Those changes may reflect changes in the tax revenues as a result of change in potential GDP.
    E) All of the answers are correct.

14. Consider the budget balance (BB) equation of BB = tY – G. Assume that t is 0.2, potential output is 1000 and G is 180. Which of the following statements is (are) INCORRECT?
    A) The structural budget balance is 20.
    B) With negative GDP gap of 20%, the budget balance is -20.
    C) **With negative GDP** gap**, the structural budget balance will be larger than 20.**
    D) There will be zero budget balance when Y is 900.
    E) Both A) and B) are incorrect.

15. Which of the following statements is (are) CORRECT?
    A) The higher the reserve ratio, the lower is the creation of money.
    B) The higher the currency ratio, the higher is the creation of money.
    C) The higher the currency ratio, the higher is the reserve ratio.
    D) The higher the reserve ratio and the lower the currency ratio, the higher is the creation of money.
    E) Both A) and B) are correct.

16. If the public's currency ratio (cr) is 6.5% and the banks' desired reserve ratio (rr) is 3.5%, then an increase in high-powered money (H) of $100 will result in
A) An increase in deposits by $1000 and no change in public cash holdings.
B) An increase in deposits by $935 and an increase in the public's cash holdings by $65.
C) An increase in deposits by $1000 and a decrease in the public's cash holdings by $100.
D) A decrease in deposits by $100 and an increase in the public's cash holdings by $1000.
E) None of the answers is correct.

17. Suppose that an excess demand for money exists in the economy. As the money market moves toward an equilibrium interest rate, we can expect
A) Bond prices to rise and the interest rate to rise.
B) Bond prices to rise and the interest rate to fall.
C) Bond prices to fall and the interest rate to fall.
D) Bond prices to fall and the interest rate to rise.
E) Bond prices to remain constant and the interest rate to rise.

18. In the monetary transmission mechanism, what will follow after an increase in the money supply?
A) Consumption and investment will rise but net exports will fall.
B) Consumption and investment will fall but net exports will rise.
C) Consumption and investment will rise but net exports will remain constant.
D) Consumption, investment and net exports will fall.
E) Consumption, investment and net exports will rise.

19. Under its current operating procedure, the Bank of Canada implements monetary policy by announcing a target for the ____ , and then intervenes (if necessary) in the ____ in order to maintain this rate within a _____ percentage-point operating band.
A) Prime rate; money markets; ± 0.25
B) Mortgage rate; money markets; ± 0.25
C) Overnight interest rate; overnight loan market; ± 0.25
D) Overnight interest rate; overnight loan market; ± 0.50
E) Overnight interest rate; overnight loan market; ± 1.25

20. In the short run, if the central bank increases interest rates, then consumption and investment will _____, aggregate demand will _____, and short-run equilibrium output will _____, and potential output is _____.
A) Increase; shift right; increase; decreased
B) Increase; not shift; increase; unchanged
C) Decrease; shift right; increase; unchanged
D) Decrease; shift left; decrease; unchanged
E) Decrease; not shift; decrease; unchanged

21. In the short run, the outcome of higher energy prices and raising interest rates is that
A) Output may increase or decrease or remain the same.
B) Output will always decrease.
C) The price level will always decrease.
D) The price level may increase, decrease or remain the same.
E) Both B) and D) are correct.

22. Which of the following choices is INCORRECT?
A) If CA is –5, KA is +3, then this central bank has sold some of its foreign exchange reserves.
B) If CA is +5, KA is -3, then this central bank has accumulated more foreign exchange reserves.
C) If CA is +5 and KA is -3, then this country's currency will depreciate under a flexible exchange rate regime.
D) If CA>0, then this country is a lender.
E) Both B) and C) are incorrect.

23. If the purchasing power parity holds, then the real exchange rate is equal to ____. If the inflation rate in the U.S. is 12% and Canada's inflation rate is 6%, then the nominal exchange rate of the Canadian dollar (C$), from Canada's perspective, will
A) Any number; decrease by approximately 12%, which is a C$ appreciation.
B) Any number; increase by approximately 12%, which is a C$ depreciation.
C) Any number; decrease by approximately 6%, which is a C$ appreciation.
D) One; decrease by approximately 6%, which is a C$ appreciation.
E) One; increase by approximately 6%, which is a C$ depreciation.

24. If there is a time that interest rate parity does not exist, then
    A) There will be no international capital flows.
    B) Net exports will always be equal to zero.
    C) Currencies will not appreciate or depreciate.
    D) Capital will flow to the country offering the highest expected return.
    E) Both C) and D) are correct.

25. If Canada were to adopt a fixed exchange rate between the Canadian and U.S. dollars, then
    A) Canadian inflation rates would be higher than U.S. inflation rates.
    B) Canadian monetary policy would mirror U.S. monetary policy.
    C) Canadian fiscal policy as a demand management tool would be weakened.
    D) The purchasing power parity theory will always hold.
    E) All of the answers are correct.

Part II: True/False Questions. Answer FIVE of the following seven questions in the allotted space. If more than five questions were 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. Automatic stabilizing fiscal policies are more effective if taxes are collected in lump sums rather than as a percentage of income.
   Ans: False → Proportional taxes stabilize equilibrium income because as G↑, Y↑ and tax revenue also ↑ with Y since T=tY → As a result, the rise in Y will not be as high → opposite is true if G↓ → lump sum taxes, in contrast, do not affect tax revenue and hence the Y will ↑ by the exact magnitude of ΔG*multiplier.

2. Suppose a wave of patriotic sentiment sweeps Canada such that most Canadians are changing their import habits. They are now more likely to "buy Canadian" rather than import from other countries. As a result, the AE curve/line will become flatter and any increase in government expenditure will now create a larger effect on Canadian GDP compared to before the change in import habits.
   Ans: False → MPZ falls → AE steeper → Y higher if G ↑ as multiplier ↑ with a lower MPZ.

3. A fall in the price level increases the real value of assets, such as retirement savings, and increases spending by the owners of these assets. As a result, the aggregate demand (AD) curve will shift to the right.
   Ans: False → It will cause movements downward along the AD curve.

4. The monetary base includes bank reserves and deposits, and an open market operation sale will increase the monetary base.
Ans: False →Monetary base include reserves and currency in circulation; Open market sale reduces the monetary base because more bonds are sold and money is extracted from the economy.

5. 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 surplus, its official reserves will be depleted and its currency will face the pressure to depreciate. [Hint: Use the BP accounting identity to support your answers.]
Ans: False → ΔKA=0, and CA>0, then the central bank is accumulating more foreign currency reserves, which creates pressure for this currency to appreciate. With the CA>0, international demand for this currency increases, hence if the currency were flexible, it would have appreciated already → students may have quoted China as an example.

6. If the U.S. raises its interest rate and Canada does not follow suit, then our NX to the U.S. is likely to rise.
Ans: True → Higher U.S. interest rate means more demand for U.S. assets by Canadians, C$ will depreciate (e rises), hence our net exports will rise.

7. Under a fixed exchange rate regime, expansionary fiscal policies will not create "crowding out" effects.
Ans: True → ↑G, ↑Y, ↑Md, ↑I, creates pressure for this currency to appreciate, so central bank has to ↑Ms to keep interest rate constant → hence, no crowding out private sector expenditures.

Part III: Answer FOUR of the following six questions. Round your answers to TWO decimal places, if applicable. If more than four questions were answered, only the first four will be marked (Total=60 marks).

Question 1: Okun's Law (15 marks)

The table below gives information for the potential output Yp and real output Y values for a fictitious country.

Year	Potential Yp ($ million)	Growth in Yp (%)	Real Y ($ million)	Growth in Y (%)	Unemployment Rate (%)	Output Gap (%)	Output Gap Type (- or +)
2005	920	-----	920	-----	7.88		
2006	899.3	**-2.25**	966	**5**	**4.25**	**7.42**	**+**
2007	930.78	**3.5**	920.12	**-4.75**	**8.38**	**–1.15**	**-**
2008	888.89	**-4.5**	929.32	**1.00**	**5.63**	**4.55**	**+**

(i) Fill in the above table using Okun's law and other relevant equations. Also identify whether the output gaps are recessionary (-) or inflationary (+) for each year. Use the space below for your calculations, if needed (9 marks).

(ii) Suppose the economy is currently under an inflationary gap. Without any fiscal or monetary policy interventions, describe how the economy will narrow this output gap in the long run (3 marks).
Ans: Wages ↑ → SAS shifts leftward → Y↓→ Adjustment continue until Y = Yp

(iii) In the long run, fiscal and monetary policies cannot affect Yp. Discuss three ways in which how positive Yp growth rates can be achieved (3 marks).
Ans: Growth in labor force, capital stock and technological improvement.

Question 2: Three Main Macroeconomic Indicators (15 marks)

Part I: CPI, GDP Deflator, Inflation and GDP

There are only two goods, A and B, in the economy of Pluto. The prices of these goods, P_a and P_b (in $), are as follows:

Year	Pa	Pb	Qa	Qb
2005	10	20	Qa=100	Qb=100
2006	12	24	Qa=130	Qb=130

Assume that 2005 is the base year.

(i) Calculate the nominal GDP values for each of the two years (2 marks).
Ans: GDP(05) = $1000+$2000 = $3000 ; GDP(06) = $1560+$3120 = $4680
$10*100+$20*100=$3000
$12*130+$24*130=$4680
Anca: Maybe it's better to detail the calculations for the markers, for partial credit.

(ii) Calculate the real GDP value for the year 2006 (2 marks).
Ans: GDP(06,Real) = $1300+$2600 = $3900
$10*130+$20*130

(iii) Calculate the GDP deflator for the year 2006 (2 marks).
Ans: $4680/$3900*100 = 120

(iv) Calculate the Consumer Price Index (CPI) for the year 2006 (2 marks).
Ans: ($1200+$2400)/$3000 *100 = 120

(v) Let the inflation rate be defined by the CPI. Suppose the Plutonian borrowers borrowed $100 from the Plutonian lenders on January 1st, 2006 and promised to pay back $115 on December 31st, 2006. Find the real interest rate. Do the lenders or borrowers gain from this transaction? Explain (2 marks).
Ans: Real interest rate = nominal interest rate – inflation rate = 15% - 20% = - 5%, so borrowers gain.

Part II: Unemployment

Suppose the population of Canada is 3,400. Of all adult Canadians, 2,760 were employed, 240 were unemployed, and 150 were not in the labour force.

(i) How many Canadians are under the age of 15? (2 marks)
Ans: 250

(ii) What is the unemployment rate? (1 mark)
Ans: 8%

(iii) Assume that 50 of the previously retired workers are now looking for work. Find the new unemployment rate in Canada (2 marks).
Ans: 290/3050*100 = 9.51%

Question 3: Economic Growth and Growth Accounting (15 marks)

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

- Potential GDP (Yp) 8.89%
- Labour force (L or N) 3.6%
- Capital stock (K) 3.3%

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 Yp that came from:

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

Ans: The growth accounting equation is: Y = A + 2/3L + 1/3K
L = Labour force, and as 2/3 of L is contributed to the GDP (Y), that means:
Contribution from growth in labour force = 2/3 × 3.6% = 2.4%

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

Ans: The growth accounting equation is: Y = A + 2/3L + 1/3K
K = Capital stock, and as 1/3 of K is contributed to the GDP (Y), that means:
Contribution from growth in capital stock = 1/3 × 3.3% = 1.10%

(iii) The Solow residual (2 marks).

Ans: The Solow residual measured by A is founded by rearranging the growth accounting equation as follows: A = Y - 2/3L - 1/3K
Y is given in the question (Potential GDP = 8.89%), we found 2/3L in part (i) to be =2.4%, and 1/3K in part (ii) to be = 1.1%, therefore:
A = Y - 2/3L - 1/3K = 8.89% - 2.4% - 1.1% = 5.39%

(iv) Consider countries such as China and India: These countries have experienced rapid labour force growth in the past few decades. If the rate of capital stock accumulation were zero (i.e., capital stock constant) in these countries, discuss the economic concept that can be used to predict future per-capita Yp growth in these two countries (4 marks).

Ans: Diminishing marginal product, since K is constant and only L is growing → as L continues to ↑ and no additional K, workers become less and less productive, and hence per-capita Yp will rise by smaller and smaller values.

(v) Consider countries such as China and India: Suppose together with labour force growth, these countries 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 Yp growth in these two countries (4 marks).

Ans: Constant returns to scale (CRS), since both L and K are ↑ but K ↑ at a lower rate than L ↑, this means we do not have constant returns to scale → as a result, Yp per capita will still grow, but at smaller and smaller values.

(vi) Consider parts (iv) and (v): Briefly discuss a policy that these governments can design in order to solve these two problems (1 mark).

Ans: In order for Yp per capita to grow at a constant rate, we need K and L to grow at the same rate; government can encourage more savings, education, etc. to accumulate more K.

Question 4: 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 = 1200 – 450*i*
- Government expenditure: G = 280
- Lump-sum constant taxes: T = 280
- Exports=79
- Imports=0.2Y

B. Money market, all M^d values are in billions of C$:
- Interest rate: *i* = 0.1 or 10%.
- Money demand: M^d=800 – 3000*i*.

(i) Find the equilibrium Y and money supply (2 marks).

Ans: AE=C+I+G+NX=140+0.8 (Y-280)+1,200-450*0.1+280+79-0.2Y=1,430+0.6Y

At equilibrium, planned expenditure becomes actual expenditure on domestically produced goods and services, so AE=Y and the equation above becomes Y=1,408+0.8Y. From here, Y (1-0.6)=1,430 therefore, Y =1,430/0.4=3,575.

The money supply equals the money demand at equilibrium, therefore the money supply is 800-3000*0.1= 500.

(ii) The Conference Board of Canada has recently announced that consumer confidence in Canada rose in the month of March 2011. Let the rise in consumer confidence to be equal to 10 points, so now C=150 + 0.8(Y-T).

(a) Find the value of the goods market multiplier (1 mark).

Ans: 1/(1 - 0.6) = 2.5

(b) Find the new Y, by either using the long calculation method or by using the multiplier (2 marks).

Ans: ΔY = 2.5 * 10 = 25

New Y = 3,575 + 25 = 3,600

(c) Explain intuitively and numerically how the rise in consumer confidence would affect the economy through the multiplier. Use three rounds of effects to demonstrate the multiplier effects. Let the first round be related to car purchases, the second round related to clothing, and the third round related to food (6 marks).

Ans: Round 1 → ΔConsumer Confidence=10, so ΔY = 10.

Round 2 → ΔY= 10, but ΔC= 8 only, and not all 8 is spent on Canadian made cars because imports will also rise → imports rise by 0.2Y, so imports rise by 2 → the net rise in Y of Canada is only 6.

Round 3 → ΔY= 6, so ΔC = 4.8, but imports rise by 1.2, so net rise in Y of Canada is only 3.6.

(iii) Suppose the Bank of Canada (BOC) tries to reverse this effect on the economy. Find the new *i* and the money supply required in order to push the Y level back to the original Y level that you have found in (i) (4 marks).

Ans: Want ΔI=-10, so need new 1145=1200-450i, so new i=0.12 (0r 12.22%) and Ms=440.

Question 5: Exchange Rates, Central Bank Interventions and PPP (15 marks)

Suppose that in 1990, the price levels in the United States and Argentina were 100. By 2002, the price level in the United States has increased to 180, while the price level in Argentina has risen to 360. Suppose the nominal exchange rate between two countries in 1990 was \$1USD = 1.5 AR Pesos.

(i) Find the inflation rate of the United States and the inflation rate of Argentina, respectively (2 marks).
Ans: The inflation rate of the US is (180-100)/100 = 80%
The inflation rate of Argentina is (360-100)/100 = 260%
The US experienced lower inflation as their prices increased by 80%, while prices in Argentina increased by 260%.

(ii) Find the real exchange rate in 1990, from the perspective of Argentina (1 mark).
Ans: The real exchange rate in 1990 = $er*P_{USD}/P_{AR}=1.5*100/100= 1.5$

(iii) Suppose Argentina had a fixed exchange rate system against the US dollar. The initial nominal exchange rate in 1990 was fixed. Find the 2002 real exchange rate for Argentina. Has Argentina experienced a real exchange rate appreciation or depreciation by 2002? Explain (2 marks).
Ans: The real exchange rate in 2002 is $er*P_{USD}/P_{AR}=1.5*180/360= 0.75$.
Since $P_{USD}/P_{AR}=180/360 <1$, Argentina's real exchange rate with the US has appreciated (the Argentinean peso experienced a real increase in its value).

(iv) Explain why you would expect Argentina's net exports to rise or fall as a result of (iii) (2 marks).
Ans: Argentina's net exports would fall. Intuitively, a real appreciation in the value of the peso makes Argentinean goods more expensive for foreign buyers and imports less expensive for domestic consumers, thus decreasing the value of exports and increasing the value of imports, leading to a decrease in NX.

(v) Explain why the Argentinean peso was overvalued or undervalued (2 marks).
Ans: The Argentinian peso is overvalued, because it should have taken 3 AR (1.5*360/180= 3) to buy one USD, not 1.5 AR.

(vi) From 1990 to 2002, what actions must the central bank of Argentina has taken in order to maintain the fixed exchange rate? Explain, and also explain how such actions have affected Argentina'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 Argentina will intervene by selling foreign currency (\$US) to fix the exchange rate. Central bank's official exchange reserves (of foreign currency holdings) will fall.

(vii) In reality, Argentina abandoned its fixed exchange rate in 2002 and the Argentinean peso was allowed to fluctuate. According to the Purchasing Power Parity, what must be the new nominal exchange rate (from the perspective of Argentina) once the peso has been allowed to fluctuate? (3 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=360/180=2.

Question 6: Taylor Rule (15 marks)

The Taylor rule states that a central bank can monitor inflation and GDP by following the equation given by $i = i_0 + (\pi - \pi^*) + (Y - Yp)$. In reality, the Bank of Canada does seem to follow this rule, and set a targeted inflation rate π^*. For this question, suppose $\pi^* = 2\%$. Suppose the current inflation $\pi = \pi^*$, $Y = Yp$ and $i_0 = 6\%$.

(i) Find the value of i (1 mark).

Ans: $i = i_0 + (\pi - \pi^*) + (Y - Yp) = 6\%$

(ii) Now suppose a drop in investment confidence leads to $Y - Yp = -3\%$. Let us put aside inflation rates for now. According to Taylor rule, what interest rate should the Bank of Canada now set? (2 marks)

Ans: $i = i_0 + (\pi - \pi^*) + (Y - Yp) = 6\% + (-3\%) = 3\%$.

(iii) Suppose $\pi = \pi^* - \Delta i$. Find the new π (2 marks).

Ans: The new is $\pi = \pi^* - \Delta i = \pi^* - (i - i_0) = 2\% - (3\% - 6\%) = 5\%$

(iv) Suppose the Bank knew that the new π would be higher. In order to balance between inflation and GDP targets, it has to set a new interest rate weighting both of these effects. Now find the new i that the Bank should set knowing that $\pi = \pi^* - \Delta i$. [Hint: Solve the new i as an unknown and do not use the value found in part (ii).] (2 marks)

Ans: $i = i_0 + (\pi - \pi^*) + (Y - Yp) = i_0 + (\pi^* - \Delta i - \pi^*) + (Y - Yp) = 6\% + [2\% - (i - i_0) - 2\%] + (-3\%) =$
$= 6\% + (-i + 6\%) - 3\%$. So $i = 6\% - i + 3\%$ and $2i = 9\%$ or $i = 4.5\%$.

(v) Find the corresponding inflation rate (2 marks).

Ans: The new is $\pi = \pi^* - \Delta i = \pi^* - (i - i_0) = 2\% - (4.5\% - 6\%) = 3.5\%$

(vi) Discuss intuitively why this interest is higher/lower than the one you would have wanted to set in part (ii) (2 marks).

Ans: The initial drop in interest rate from 6% to 3% was designed to increase AD to reach the potential output. A rightward shift of the AD closes the recessionary gap but also raises prices (creates an upward pressure on inflation). The Taylor rule demonstrates that the Bank adopts a middle road to reach both objectives of output stability and price stability. So, instead of lowering the interest rate from 6% to 3% it lowers it from 6% to 4.5% (a higher interest rate in order to keep inflation under control).

(vii) Compare your answers from parts (i) and (iv). Write down the Interest Rate Parity equation and use it to explain whether we would expect an appreciation or a depreciation in the Canadian dollar in the future (4 marks).

Ans: The central bank has dropped the interest rate from 6% (point (i) result) to 4.5% (point (iv) result). According to the Interest Rate Parity equation, ic = iforeign + expected %Δe, and assuming iforeign has not changed, expected %Δe has to be negative. We expect an appreciation in the C$ in the future.

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

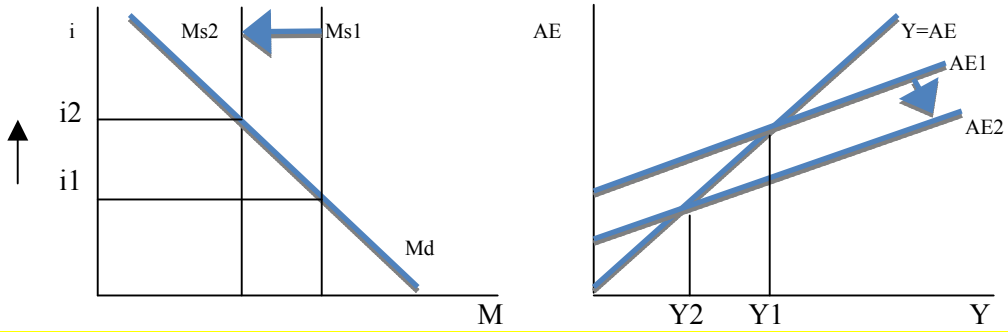
In 2008, the inflated housing markets and reckless over-lending by commercial banks in the U.S. and Europe created a liquidity crisis or "credit crunch" for the banking industry. In this multiple-part question, we want to explore what has been happening in Canada since then. Assume that Y=Yp in 2008, immediately before this banking crisis.

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 would compare what's going on now with the onset of the Depression period in the late 1920s and early 1930s," says Steven Hochberg, chief market analyst with Atlanta-based Elliott Wave International. "The potential is for it to be a lot worse simply because of the amount of credit outstanding." The total credit-market debt as a percentage of gross domestic product is more than double what it was during the Great Depression, he says.

(i) Article 1: Based on your understanding of the money market, discuss how the money supply would be affected and what causes such a change (1 marks). Use the Ms=Md and Y=AE graphs to illustrate and explain how the interest rates would be affected and why the world may slip into a global recession. Assume Ms is vertical (4 marks).

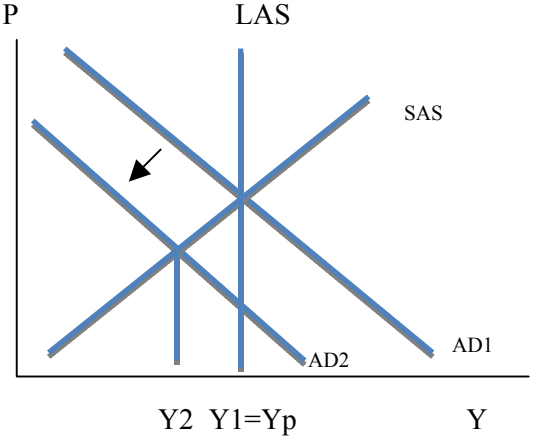


Ans: Since not all outstanding loans will be paid back, the money supply in the economy decreases and interest rate increases. This has a negative impact on investment, and aggregate expenditure decreases and shifts down. Output decreases as a result.

Article 2: Canada Keeps Lending Rate 0.25%, Repeats June Pledge
By Greg Quinn - January 19, 2010 14:10 EST, Bloomberg

The Bank of Canada (BOC) left its benchmark [target overnight] interest rate at a record low and repeated a pledge to leave it unchanged through June as a strong currency and weak U.S. demand slow an economic recovery. The target rate for overnight loans between commercial banks remained 0.25 percent, where it has been since April, as expected by all 26 economists surveyed by Bloomberg. The bank said that "**considerable excess supply remains**" and inflation won't return to policy makers' 2 percent target until the third quarter of next year. Investors expect Governor Mark Carney will leave the key rate unchanged until October.

(ii) Article 2: Monetary policy response → Use the AD/AS/LAS model to graphically illustrate that the Canadian economy is still under "considerable excess supply" (2 marks). Discuss whether the BOC should use SPRA or SRA to stop the target overnight rate from exceeding 0.25% (3 marks).



Ans: Operating under excess supply means that the economy is in recession: actual output is smaller than Yp and there is unused capacity (not all available resources are employed). BOC should use SPRA (special purchase and resale agreements) to prevent the target interest rate from increasing.

Article 3: What You Should Know About the "Bond Bubble"
By Larry Swedroe | Sep 2, 2010, CBS Money Watch

The financial media is spewing out an awful lot about the bond bubble. The implication is that somehow the market has made a huge pricing error and has overvalued bonds. The message delivered by the doomsayers is to avoid maturity risk as the bubble will surely burst and you'll be stuck holding very low yielding bonds. Clearly, there has been a massive inflow of funds into bonds, in the order of hundreds of billions of dollars. And investors chasing performance can certainly be a sign of a bubble, or extreme overvaluation.

Article 4: Canada Inflation Rate Quickens to 2.4% in December on 13% Jump in Gasoline
By Greg Quinn - Jan 25, 2011 7:34 AM ET Bloomberg

Canada's inflation rate accelerated in December as gains in gasoline, electricity and automobile insurance were tempered by a decline in clothing costs. Consumer prices rose 2.4 percent in December after a 2 percent gain in November, Statistics Canada said today.

(iii) Articles 3+4: Problems with monetary policies → Canada may have a bond market "bubble" that could burst in the near future. Explain how the Bank of Canada's monetary policies (which are similar to the U.S. Federal Reserves' policies) may have fueled this bubble (3 marks). Is the finding in Article 4 pointing to a more likely or less likely bubble burst? Explain (2 marks).

Ans: Bond prices have been pushed up by purchases of government debt by central banks in Canada and the US. Because yields and prices move in opposite directions, the rush into bonds has made yields lower.

Bond prices fall as inflation grows. Inflation hurts lenders, who get paid back in dollars that have less real value than those lent. Therefore, a bubble burst is more likely to burst.

Article 5: Home prices approaching bubble territory, BMO says
CTV.ca News Staff, Date: Fri. Mar. 4 2011 5:14 PM ET

The Canadian housing market could be headed for trouble if there is no moderation in prices in the months ahead, the Bank of Montreal says in a new report. Housing prices are currently about 10 per cent above what they were before the recession, which was already an all-time record. The bank says housing prices are rising faster than personal incomes, a worrisome trend which is making the market less stable.

The most concerning scenario is in Saskatchewan where the price-to-income ratio is 39 per cent above historic norms, followed by Newfoundland at 34 per cent; British Columbia and Manitoba, with each at 31 per cent; and Quebec at 29 per cent above normal levels.

(iv) Article 5: What monetary policy response is needed in order to deflate the housing bubble? (1 mark) Discuss the dilemma that the BOC is facing, i.e., how this bubble can be slowly deflated (rather than explode in the future) and how the same monetary policy would affect the Canadian dollar and economy (4 marks).

Ans: Historically, low interest rates, which have allowed Canadians to carry bigger mortgages, have made such prices possible. Higher interest rates and tighter mortgage rules would decrease sales and prices in the housing market. The BOC needs to raise interest rates slowly over time.

Higher interest rates would lead to lower investment and consumption spending, as the cost of borrowing increases. As a result, economy will be weaker. The Canadian dollar will be stronger as the demand for Canadian assets increases.

Article 6: Canada's budgetary deficit decreases sharply in first nine months of this fiscal year
English.news.cn 2011-02-26

OTTAWA, Feb. 25 -- In the first nine months of the 2010/11 fiscal year, Canada's budgetary deficit decreased to 27.4 billion Canadian dollars (about 27.93 billion U.S. dollars), from 39.4 billion Canadian dollars during the same period of last fiscal year, Department of Finance Canada announced Friday.

About 12 billion Canadian dollars of the 27.4 billion deficit was attributable to actions taken under Canada's Economic Action Plan, the department said.

(v) Article 6: Fiscal policy response → The federal government has been trying to lessen the recession by cutting taxes and increasing government expenditure through its Economic Action Plan. However, Article 6 says that fiscal deficits have been ***decreasing*** in Canada. Explain why this is possible (1 mark). Define budget balance (BB) and structural budget balance (SBB) (2 marks) and discuss which numbers in the article are referring to BB and SBB, respectively (2 marks).

Ans: BB will have a smaller deficit or absolute value, when the tax revenues increase faster than government spending.
BB = tY– G with t=the tax rate, Y=current income, G=government spending, BB=$27.4 billion, out of which $12 billion of deficit were caused by a short-term government policy. Therefore, it is likely that $27.4-$12=$15.4 billion is part of the structural budget balance deficit.
SBB = tYp – G with Yp=value of potential output.

Fiscal policy are the ones that affect/change the structural budget balance. The actual budget balance has been improving with the improvement of the economy (from $39.4 b down to $27.4 b). Of the $27.4 b deficit, $15.4 b would be the deficit, if the government had not gone through the Economic Action Plan (EAP). With the EAP (extra spending of $12.0 b) deficit went to $27.4 b. Therefore, the $12.0 b shows by how much the budget line was shifted down (the structural budget deficit).

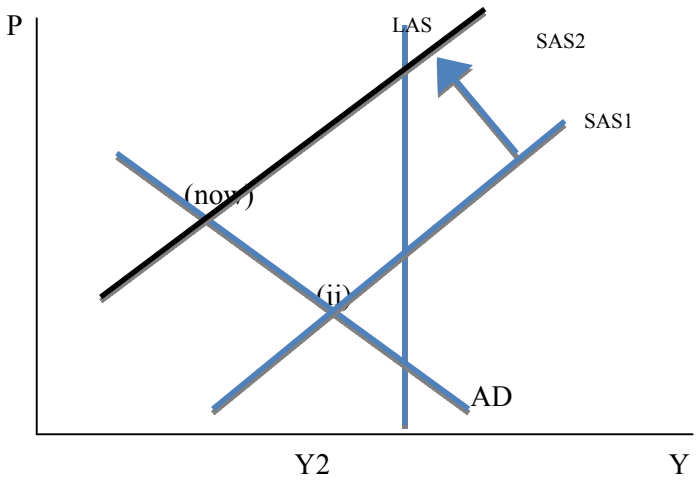
Article 7: Surging oil prices, Bank of Canada rate announcement to grab investor attention
By: Malcolm Morrison, The Canadian Press, Posted: 02/27/2011 9:04 AM

TORONTO - Volatile oil prices, the latest word from the Bank of Canada on interest rates and a report on economic growth at the end of last year will give investors plenty to chew over this week.

Traders will be focused on oil prices in particular following a dizzying ride on markets when crude surged as much as 13 per cent in a four-day period last week amid fears that violent unrest in Libya would result in huge shortfalls.

The spike in prices to over US$103 a barrel last week raised concerns that the sharply higher prices would derail the fragile economic recovery in many parts of the world. Crude ended the week at US$97.88 amid signs the crisis in Libya may have cut crude supplies less than previously estimated.

(vi) Article 7: Continuing from your AD/AS/LAS graphical result from part (ii), redraw it below and add in the effects of higher oil prices (2 marks). Discuss whether the BOC can maintain Y≈Yp and at the same time control the inflation rate at 2%, i.e., why is the BOC's rate announcement "to grab investor attention"? (3 marks)



An increase in oil prices shifts SAS to the left forcing the economy to clear at lower output and higher prices (stagflation). If prices increase by more than BOC's target for inflation (2%), then the monetary policy response will be to increase interest rates. However, this rise in interest rates may push the economy into an even deeper recession because AD shifts inward. The BOC faces the dilemma → raising interest rates can control inflation, but the cost is a weaker economy → if it cuts interest rates to boost the economy, inflation would rise even further.

Article 8: Strong Canadian job data pushes dollar higher
The Canadian Press Date: Friday Feb. 4, 2011 4:33 PM ET

TORONTO — The Canadian dollar closed higher against the U.S. currency Friday after Statistics Canada reported employment growth last month was much stronger than expected. But the currency finished the session off early highs as the greenback strengthened amid other data that showed a sharp drop in the U.S. jobless rate last month.

The loonie rose 0.26 of a cent to 101.17 cents US as Statistics Canada said that the Canadian economy generated just over 69,000 new jobs last month, spread across most of the country and evenly split between full-time and part-time. That was far higher than expectations of between 15,000 and 21,000 new jobs.

(vii) Article 8: How would the appreciation in the Canadian dollar affect our current account, capital account and the overall balance of payments, respectively? Explain the effects (3 marks). If the Bank of Canada wants to counter (minimize) this appreciation, what action should it take? Explain (2 marks).
Ans: $\Delta CA<0$ since an appreciation in the C$ will lead to lower exports and higher imports; the brighter outlook of our economy based on the job market report will lead to more capital inflow into Canada, so $\Delta KA>0$; BP is still equal to zero by accounting definition, so the $\Delta CA=\Delta KA$ in absolute value; BOC can cut interest rates to weaken the C$, which would raise CA and lower KA.

Article 9: Canadian firms ready to invest: Bank of Canada
The Canadian Press Date: Friday Oct. 8, 2010 10:50 AM ET

OTTAWA - Canadian business leaders appear to be finally gearing up to tackle the country's dismal productivity record with a much-needed infusion of cash to modernize their operations.

The Bank of Canada says its latest quarterly business outlook survey shows firms are preparing to increase investment in productivity-enhancing machinery and equipment over the next year, after a lengthy slumber. Forty-six per cent said they were hiking spending, while only 10 per cent said they would spend less -- a 36-point differential that is a record for the central bank's survey on this question.

Earlier this week, the C.D. Howe Institute warned that Canada's productivity gap with the U.S. and other large advanced economies was widening and that the situation could not continue without a hit to the country's standard of living.

(viii) Article 9: Suppose a country's standard of living is defined by its per-capita GDP. Explain why capital accumulation is required to maintain a constant standard of living and the economic concept that can be used to explain this result (5 marks).
Ans: With population and labour force growing, capital accumulation is needed to maintain the standard of living in an economy. If employment and capital stock grow at equal rates, total GDP grows at the same rate and per-capita GDP remains unchanged. This means that production involves constant returns to scale.

The End… Have a Great Summer!