

**Concordia University
Department of Economics**

**ECON 203 – INTRODUCTION TO MACROECONOMICS
Fall 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 5 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 paper dictionary provided that they are approved by the invigilator(s). You may use 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. Nominal GDP measures the value of current:
A) Output at current market prices.
B) Output at constant market prices.
C) Output when prices are increasing only.
D) Income received by households.
E) Both C and D are correct.
2. Double counting can be prevented when computing GDP by:
A) Simply deducting a double-counting factor from the GDP estimates.
B) Subtracting the inflation effects on the goods and services produced.
C) Adding only the value contributed by firms at each stage of production.
D) Including the value of all output produced in the economy.
E) Both B and C are correct.
3. In Utopia, 400,000 people are in the labour force and the unemployment rate is 5%. When 30,000 Utopia's university students graduate and all of them have to search for jobs, the unemployment rate will immediately become:
A) 6.18%.
B) 7.5%.
C) 11.63%.
D) 12.5%.
E) 14.35%.
4. In terms of aggregate supply, the difference between the long run and the short run is that in the short run:
A) Employment is variable.
B) Real output is variable.
C) Income tax rates are fixed.
D) Nominal wages and other input prices are fixed.
E) Both C and D are correct.
5. If national income is \$1,500 billion and the level of AE is \$1,375 billion, then we can say that:
A) There will be an accumulation of inventories, the prices of goods and services will fall, and output will rise.
B) There will be an accumulation of inventories, the prices of goods and services will rise, and output will fall.
C) There will be a reduction in inventories, the prices of goods and services will fall, and output will fall.
D) There will be a reduction in inventories, the prices of goods and services will rise, and output will rise.
E) None of the answers is correct.
6. If consumption is \$40,000 when income is \$30,000, and consumption increases to \$48,000 when income increases to \$40,000, the Marginal Propensity to Save is
A) 0.2.
B) -0.2.
C) 0.2045.
D) -0.25.
E) None of the answers is correct.
7. 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 low.
C) Their crowding-in or crowding-out effect is very weak.
D) Their income tax system is a lump sum or constant tax system.
E) Both B and C are correct.
8. 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.' MPS is 0.1, the net income tax rate is 0.25, the marginal propensity to import is 0.025 and the government increases spending by \$40 million, then we would expect the U.S. GDP to increase by
A) \$50 million.
B) \$57.14 million.
C) \$64 million.
D) \$80 million.
E) None of the answers is correct.

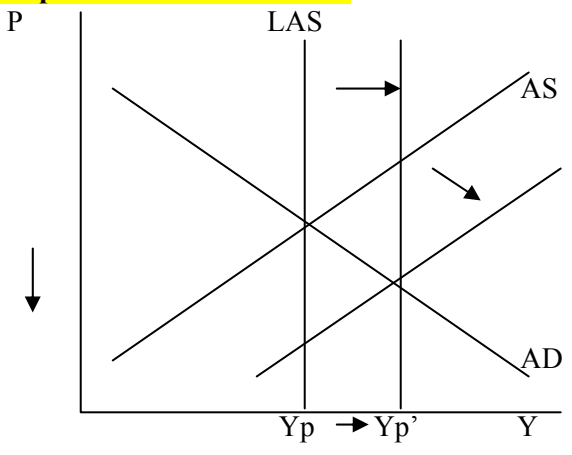
9. The potential output line or curve Y_p is
- Horizontal because it shows that price level changes will not affect the value of Y_p .
 - Vertical because Okun's law states that if Y_p growth exceeds actual Y growth, the natural unemployment rate will rise.
 - Upward-sloping because it shows that a higher price level will lead to a higher real output.
 - Upward-sloping because it shows that a higher price level will lead to a higher nominal output.
 - None of the answers is correct.
10. Assume that the reserve ratio is 0.1 and the currency drain ratio is 0.1. An initial deposit of \$1,000 will eventually lead to a total deposit creation in the amount of:
- \$5,000.
 - \$4,500.
 - \$4,000.
 - \$3,500.
 - \$3,000.
11. Suppose money demand is less than money supply in the economy. As the money market moves toward an equilibrium interest rate:
- We can expect bond prices to rise and the interest rate to rise.
 - We can expect bond prices to rise and the interest rate to fall.
 - We can expect bond prices to fall and the interest rate to fall.
 - We can expect bond prices to fall and the interest rate to rise.
 - We can expect bond prices to remain constant and the interest rate to fall.
12. Households and businesses often hold some of their wealth as non-interest earning money balances because
- Money balances always pay lower rates of return than the non-money assets.
 - Money balances provide convenience and lower risk than many other assets.
 - Money balances offer a better protection against rising prices than do many other assets.
 - The opportunity cost of holding money balances is lower than that of other assets.
 - All of the answers are correct.
13. Which of the following statements is (are) INCORRECT?
- The link between the foreign exchange rate and Canada's money market is the interest rate.
 - An increase in money supply in Canada will lead to lower interest rates and a depreciation in the Canadian dollar.
 - When interest rate in Canada increases, our capital account value is likely to fall and our Canadian dollar is likely to appreciate.
 - When interest rate in Canada increases, our capital account value is likely to rise and our Canadian dollar is likely to appreciate.
 - Both B and C are incorrect.
14. Suppose the Bank of Canada enters the open market and buys \$50 million of government bonds from the general public. This will:
- Cause an increase in interest rates.
 - Cause a decrease in the price of bonds in the bond market.
 - Cause the reserves in the banking system to rise, the monetary base to increase, and the system's lending capacity to increase.
 - Cause the reserves in the banking system to fall, the monetary base to fall, and the banking system's lending capacity to decline.
 - Both B and C are correct.
15. In the short run, the outcome of rising energy prices and lowering interest rates is that
- Output will always decrease.
 - Output may increase or decrease or remain the same.
 - The price level will always decrease.
 - The price level may increase, decrease or remain the same.
 - Both B and C are correct.
16. In the short run, if the central bank decreases interest rates, then consumption and investment will _____, aggregate _____ will shift _____, and short-run equilibrium output will _____, and potential output is _____.
- Increase; demand; right; increase; increased
 - Increase; supply; right; increase; unchanged
 - Increase; demand; right; increase; unchanged
 - Decrease; supply; left; decrease; unchanged
 - Decrease; demand; left; decrease; unchanged
17. With a fixed exchange rate system, what happens when the government increases its expenditures on goods and services?
- Domestic money supply increases.
 - Domestic money supply decreases.
 - Domestic money supply is not affected.
 - Private investment expenditure is crowded out.
 - Both C and D are correct.

18. When the Bank of Canada ___ the domestic interest rate to close an inflationary gap, it also indirectly causes ___ in the ___ for/of Canadian assets by foreign investors. Under the flexible exchange rate system this, in turn, increases the ___ for/of Canadian dollars, resulting in an/a ___ of the Canadian dollar.
- A) Raises; an increase; demand; demand; appreciation
 B) Raises; an increase; demand; supply; appreciation
 C) Raises; a decrease; supply; demand; depreciation
 D) Raises; a decrease; supply; demand; appreciation
 E) Cuts; an increase; demand; demand; appreciation
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) Long term interest rate; overnight loan market; ± 0.25
 D) Overnight interest rate; overnight loan market; ± 0.25
 E) Overnight interest rate; overnight loan market; ± 0.5
20. Why do economists argue that fiscal policy is weak when a country has a flexible exchange rate regime?
- A) Increases in G tend to crowd out private investment expenditure.
 B) Increases in G tend to lead to a depreciation of the domestic currency.
 C) Increases in G tend to lead to a decrease in the interest rate.
 D) Increases in G tend to decrease marginal propensity to save.
 E) All of the answers are correct.
21. 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 $KA > 0$, then this country is a lender.
 E) Both C and D are incorrect.
22. If the purchasing power parity holds, then the real exchange rate is equal to _____. If the inflation rate in the U.S. is 1% and Canada's inflation rate is 3%, then the nominal exchange rate of the Canadian dollar (C\$), from Canada's perspective, will ____.
- A) Any number; decrease by approximately 4%, which is a C\$ appreciation.
 B) Any number; increase by approximately 2%, which is a C\$ depreciation.
 C) Any number; decrease by approximately 2%, which is a C\$ appreciation.
 D) One; decrease by approximately 2%, which is a C\$ appreciation.
 E) One; increase by approximately 2%, which is a C\$ depreciation.
23. Which of the following best defines (1) an advance in technology and (2) the impact of an advance in technology?
- A) It refers to the ability to produce more output with more resources; it shifts the production function outward.
 B) It refers to the ability to produce more output with a fixed quantity of resources; it shifts the production function outward.
 C) It refers to the ability to produce the same output with a smaller quantity of resources; it shifts the production function inward.
 D) It refers to the ability to produce the same output with a larger quantity of resources; it shifts the production function outward.
 E) None of the answers is correct.
24. Consider an economy with a two-variable production function with labour-income-share at $2/3$ and capital-income-share at $1/3$. Assume that growth rate of real GDP is 6%. If both K and L grow at 3%, the growth of total factor productivity will be:
- A) 5%.
 B) 4%.
 C) 3%.
 D) 2%.
 E) 1%.
25. In Pluto, labour force and capital stock both grow at 2.5% a year but technology is constant. The production function exhibits constant returns to scale technology. At what rate will per capita GDP grow?
- A) Zero.
 B) 1.5%.
 C) 2.5%.
 D) 3.5%.
 E) 4.5%.

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).

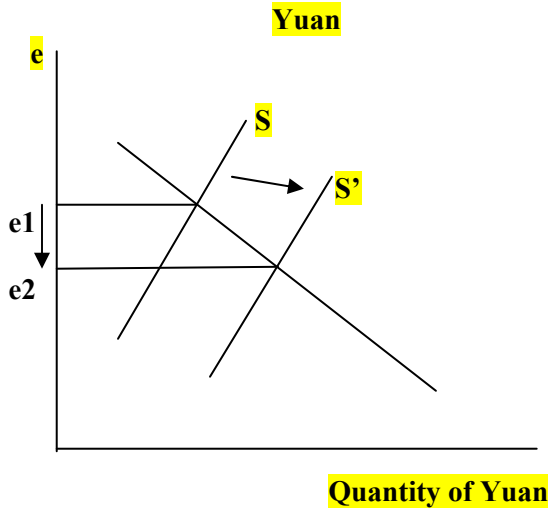
1. Suppose we have just discovered massive diamond deposits in the Yukon and Nunavut areas. As a result, we will be the largest diamond producer in the world for the next 100 years, and diamond production will become our main industry. In the absence of autonomous AD changes, the Bank of Canada needs to raise interest rates in order to maintain our current inflation target. [Hint: Use the appropriate diagram to support your answer.]

Ans: False → Y_p shifts to the right, so does the short run AS - BOC needs to cut interest rates to raise AD and keep the same inflation rate.



2. Canada is a major exporter of natural resources to developing countries. If the developing countries are experiencing an economic boom, we can expect the Canadian dollar to depreciate against their currencies in the short run [Hint: Use the appropriate diagram to support your answer.]

Ans: False → Export of natural resources would increase, so the demand for Canadian dollar would increase in the foreign exchange market, assuming imports from other countries would be unchanged. In other words, supply of foreign currencies would increase (as foreigners would sell their currencies to buy CANS) → The C\$ will become more expensive, or the price on one Chinese Yuan or one Indian Rupee will fall. Note that the e is defined as the price of one Yuan in C\$.



3. Canada ran trade deficits in 2009 and 2010. In order to eliminate these trade deficits, the Canadian government should increase government spending and encourage private savings [Hint: Use the leakage and injection equation(s) to support your answer.]

Ans: False → In the circular flow of GDP income, Leakages = Injections, i.e. $S + Z + NT = I + X + G$. We can also derive it as follows: $GDP Y = C + I + G + X - Z \Rightarrow Y - C = I + G + X - Z \Rightarrow Y - C - NT = I + G + X - Z - NT \Rightarrow S = I + G + X - Z - NT \Rightarrow S + Z + NT = I + X + G$

If Household Savings S equals I, we have $Z + NT = X + G \Rightarrow NT - G = X - Z$

To reduce the trade deficit, government will have to either reduce G or increase NT. If $S = I$, encouraging private savings will not affect X-Z.

Or, $NX = (S - I) + (T - G)$, so to get NX more positive, we need to increase S and cut G.

4. In November 2011, the Canadian government announced a moratorium (suspension/freeze/stop) on letting the parents of existing Canadian immigrants come to Canada as new citizens. Instead, these parents can visit Canada on visas as visitors. Assume that these parents will work in Canada once they have arrived as new citizens or on visas. With everything else held constant, this policy change will affect the value of Canadian GDP but not GNP.

Ans: False →

GDP measures the output of everyone who works inside Canada regardless of the citizenship.

GDP before policy change: The new arrivals will increase GDP.

GDP after policy change: The new arrivals will increase GDP.

GDP is not affected due to the policy change.

GNP measures the output of everyone who works in and outside of Canada but they have to be Canadian citizens.

GNP before policy change: The new arrivals will increase GNP.

GNP after policy change: The new arrivals will not increase GNP.

GNP would have been higher without the policy change.

5. In October 2011, the U.S. government announced a new federal stimulus package worth \$447 billion. The higher the automatic stabilizer in the U.S., the larger will be the increase in the U.S. GDP due to this stimulus package.

Ans: False → Automatic stabilizers keep the spending multiplier smaller and thereby partially offset the economy's expansion/contraction. Higher the automatic stabilizer is, the smaller the multiplier effect is. For example, taxes are automatic stabilizers, and higher the tax rates are, smaller the spending multiplier becomes. For example, with tax rate t, spending multiplier looks like $1 / (1 - MPC(1-t) + z)$. Higher "t" would generate a smaller multiplier.

6. Between late 2008 and mid-2010, we have seen significant volatility (ups and downs) in the global financial markets. The transaction, precautionary and asset motives for money demand all predict that our demand for money would rise.

Ans: False → The asset motive and the precautionary motive for money demand would predict an increase in demand for money when the financial markets fluctuate more. There is no effect coming from the transaction motive.

7. Fiscal policies can fully mitigate/control/offset aggregate demand shocks, while monetary policies can fully mitigate/control/offset aggregate supply shocks.

Ans: False → Fiscal and monetary policies both may fully mitigate aggregate demand shocks only by shifting the AD back to its original position. However, these policies may only keep the price level constant or Y constant in the presence of an AS shock.

Part III: Answer FOUR of the following five 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 Y_p and real output Y values for a fictitious country.

Year	Potential Y_p (\$ million)	Growth in Y_p (%)	Real Y (\$ million)	Growth in Y (%)	Unemployment Rate (%)	Output Gap (%)	Output Gap Type (- or +)
2005	670	-----	670	-----	7.38	0	----
2006	681.73	1.75	646.55	-3.50	10.01	-5.16	-
2007	676.61	-0.75	614.22	-5	12.13	-9.22	-

(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 (5 marks).

(ii) Suppose the economy is currently under a recessionary gap due to consumer pessimism. State the equations for budget balance (BB) and structural budget balance (SBB). Explain whether BB will be smaller or larger (in absolute term) than SBB under this economic recession, prior to any policy interventions. For simplicity, suppose $BB=SBB=0$ before this economic recession (3 marks).

Ans:

$BB = tY - G$

$SBB = tY_p - G$

BB will be larger in absolute term. Here tY_p is equal to G . However, in a recessionary gap, tY is smaller than G .

(iii) Suppose this economy operates under a fixed exchange rate system. Discuss the effectiveness of fiscal and monetary policies if we want to narrow this output gap. As an economist, which of these two types of policies would you recommend? Explain (4 marks).

Ans: Expansionary fiscal policy will be effective as long as the crowding out effect is less than the multiplier effect. Expansionary Monetary policy will not be effective under the fixed exchange rate system. If the central bank increases money supply, interest rates will decrease. This will lower the Demand for domestic assets and increase the demand for foreign assets creating downward pressure on the value of the currency. To maintain currency's value, the central bank will have to buy the domestic currency back. I would recommend fiscal policy. In combination, monetary policy can be used only if interest rate tends to rise after the fiscal policy is carried out.

(iv) In the long run, fiscal and monetary policies cannot affect Y_p . Briefly discuss how growth in per capita Y_p can be achieved in the long run (3 marks).

Ans: In the long run, the economy automatically reaches the potential GDP, regardless of any fiscal or monetary policy. Growth in per capita GDP can be achieved mostly by increasing the ratio of capital to labor in the production process, and improvements in technology.

Question 2: Three Main Macroeconomic Indicators (15 marks)

The following table is from the year 2009. Leave answers to two decimal places, if applicable.

Item:	Amount (\$ Billions)	Item:	Amount (\$ Billions)
Government expenditure	600	Consumption expenditure	1200
Wages paid to labor	800	Interest and investment income	150
Subsidies	???	Import	700
Indirect taxes	700	Depreciation	250
Profits	500	Fixed capital formation	500
Export	400	Changes in inventories	200

- (i) Find the value of nominal GDP. Show all steps and variables (2 marks).

Ans: $Y = C + I$ (Fixed capital formation + changes in inventories) + $G + X - Z = 1200 + (500 + 200) + 600 + 400 - 700 = \2200

- (ii) Find the value of subsidies. Show all steps and variables (2 marks).

Ans: $\$2200 = 800 + 700 + 500 + 150 + 250 - \text{Subsidy}$, so $\text{Sub} = \$200$.

- (iii) Suppose the GDP deflator in 2008=110 and the GDP deflator in 2009=105. Find the real GDP for 2009 (2 marks).

Ans: Real GDP for 2009 = $2200 * 100 / 105 = 2095.24$.

- (iv) Find the inflation rate between 2008 and 2009. Is this inflation or deflation? Explain (2 marks).

Ans: Inflation Rate = $(105 - 110) * 100\% / 110 = -4.55\%$. This is a deflation (i.e. negative inflation) as the price level fell.

- (v) Suppose you borrowed money from a commercial bank in 2008 at a nominal interest rate of 5%. You have to pay the 5% on your loan in 2009. Given your answer in (iv), find the real interest rate on your loan (2 marks).

Ans: Real Interest Rate = Nominal Interest Rate - Inflation Rate = $5\% - (-4.55\%) = 9.55\%$

- (vi) Now suppose the population in 2009 was 3,500. Of all adults, 2,600 were employed, 250 were unemployed, and 300 were not in the labour force.

- (a) How many Canadians are under the age of 15? (2 marks)

Ans: $3500 - (2600 + 250 + 300) = 350$

- (b) What is the unemployment rate (in percentage)? (3 marks)

Ans: Unemployment Rate = $[250 / (2600 + 250)] * 100\% = 8.77\%$

Question 3: The AE and AD/AS/LAS Models (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: $C = 100 + 0.75(Y-T)$
 - Investment expenditure: $I = 1,100 - 4,800i$
 - Government expenditure: $G = 400$
 - Taxes: $T = 0.2Y$
 - Exports=70
 - Imports=50
- B. Money market, all M^d values are in billions of C\$:
 - Interest rate: $i = 0.025$ or 2.5%.
 - Money demand: $M^d = 1,500 - 19,800i$.

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

**Ans: $Y = C+I+G+X-Z = 100+0.75(Y-0.2Y) + 1100-4800*0.025 + 400 + 70 - 50$
 $Y = 1500 + 0.6Y$
 $Y = 1500/0.4 = 3750$**

$M_s = 1005$

(ii) The Conference Board of Canada has recently announced that consumer confidence in Canada dropped in the month of December 2011. Let the drop in consumer confidence equal to 10 points, so now $C=90 + 0.75(Y-T)$.

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

Ans: The multiplier will remain to be $1/0.4 = 2.5$ as there has been no change in the MPC.

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

**Ans: Change in equilibrium income = $-10*2.5 = -25$
 New $Y = 3750 - 25 = 3725$**

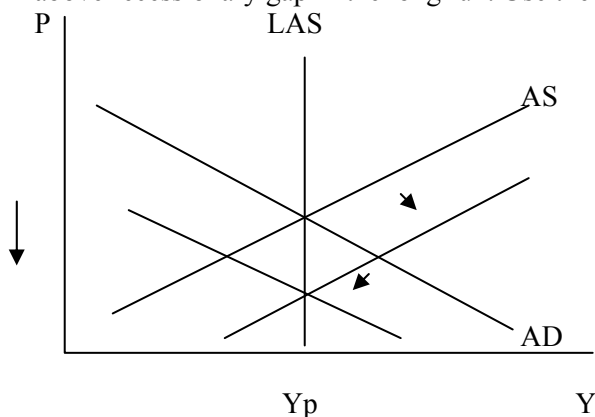
(c) Explain intuitively and numerically how the change in consumer confidence would affect the economy through the multiplier. Use two rounds of effects to demonstrate the multiplier effects. Let the first round be related to car purchases and the second round related to clothing (6 marks).

Ans: 1st round: Car purchase will decrease by \$10. This means the income of the workers in the car industry would fall by \$10.

2nd round: With income dropping by \$10, consumers also save some income taxes they would have paid. Taxes due drop by $0.2Y = \$2$. After-tax income only drops by \$8 rather than \$10. With $(Y-T)$ dropping by \$8 and $MPC = 0.75$, so consumption will drop by $0.75*\$8 = \6 .

Hence, the power series is $-\$10(1+0.6+0.6^2+0.6^3+\dots) = -\$10(1/1-0.6) = -\$10*2.5 = -\25 .

(iii) In the absence of fiscal or monetary policy interventions, describe how the economy will adjust and close the above recessionary gap in the long run. Use the AD/AS/LAS graph to support your answer (4 marks).



**$Y < Y_p \rightarrow$ U-rate $\uparrow \rightarrow$ Wages $\downarrow \rightarrow$ SRAS shifts right
 In the new equilibrium, $Y = Y_p$ and price level is lower.**

Question 4: 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 210, while the price level in Argentina has risen to 260. Suppose the nominal exchange rate between two countries in 1990 was \$1U.S.D = 1.1 AR Pesos. Define all exchange rates from Argentina's perspective.

- (i) Find the real exchange rate in 1990, from the perspective of Argentina (2 marks).

Ans: Real Exchange Rate = er of AR Pesos * Price Index in the U.S. / Price Index in Argentina
= 1.1 * 100/100 = 1.1

- (ii) Suppose Argentina had a fixed exchange rate system against the U.S. dollar. The initial nominal exchange rate in 1990 was fixed. Find the 2002 real exchange rate for Argentina. Has the Argentinean Peso experienced a real appreciation or depreciation by 2002? Explain (2 marks).

Ans: Real Exchange Rate in 2002 = 1.1 * 210/260 = 0.89

There has been an appreciation in the real exchange rate for Argentina by 2002. In dollar terms, the U.S. goods have become relatively cheaper than Argentinean goods. By this year, a dollar buys more US goods than it can buy from Argentina (i.e. The amount of dollars that can buy 1 unit of US goods, can buy only 0.89 unit of Argentinean goods)

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

Ans: The new e = 1.36, given that the real exchange rate E=1.1 and the prices are 210 and 260. Peso was overvalued. As the Argentinean price level is relatively higher, its Peso has to depreciate so that Argentina will be able to sell its goods and services.

- (iv) 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 U.S.\$ reserves (3 marks).

Ans: To keep the value of Peso fixed against dollar, the central bank of Argentina must have been buying Peso at a fixed dollar price. Its US\$ reserves would be falling.

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

Ans: Domestic money supply would decrease, interest rates would rise and GDP would fall due to decrease in the interest-sensitive spending.

- (vi) In reality, Argentina abandoned its fixed exchange rate in 2002 and the Peso was allowed to fluctuate. According to the Purchasing Power Parity, what is the new nominal exchange rate once the Peso has been allowed to fluctuate? Contrast your numerical answer here with your numerical answer in (iii) and explain why they may differ (4 marks).

Ans: Under flexible exchange rate, real exchange rate would become 1:

$$e * 210/260 = 1$$

$$\Rightarrow e = 260/210 = 1.24 \text{ Pesos/1 Us dollar}$$

The difference between 1.36 and 1.26 is that the PPP assumes prices are equalized across countries after the price levels are converted into the same currency. The PPP prediction may not hold because of the presence of transport costs, import taxes, non-traded goods, etc.

OR: CA + KA - change in OR = 0

In the case that we can ignore change in OR, if KA decreases from 5 to 3, then CA must increase from -5 to -3 to balance the balance of payments record. Certainly we can assume or ignore changes in OR here as Canada employs flexible exchange rate regime.

Question 5: Taylor Rule (15 marks)

The Taylor rule states that a central bank can monitor inflation and GDP by following the equation given by $i = i_0 + (\pi - \pi^*) + (Y - Y_p)$. 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 $\pi = \pi^*$, $Y = Y_p$ and $i_0 = 8\%$.

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

Ans: $i = 8\% + (0) + (0) = 8\%$

(ii) Now suppose a drop in investment confidence leads to $Y - Y_p = -5\%$. 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: $i = 8\% + (0) + (-5\%) = 8\% - 5\% = 3\%$

(iii) Suppose $\pi = \pi^* - 1.5\Delta i$. Find the new π (1 mark).

Ans: When i drops from 8% to 3%, $\pi = 2\% - 1.5*(3\% - 8\%) = 2\% - 1.5*(-5\%) = 2\% + 7.5\% = 9.5\%$

(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 weighing both of these effects. Now find the new i that the Bank should set knowing that $\pi = \pi^* - 1.5\Delta i$. [Hint: Solve the new i as an unknown and do not use the value found in part (ii).] (2 marks)

**Ans: $i = i_0 + (\pi^* - 1.5(i - i_0) - \pi^*) + (Y - Y_p) \Rightarrow i = 8\% - 1.5(i - 8\%) + (-5\%) = 3\% - 1.5i + 12\%$
 $\Rightarrow i = 15\% - 1.5i \Rightarrow 2.5i = 15\% \Rightarrow i = 6\%$**

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

Ans: $\Delta i = 6\% - 8\% = -2\%$, $\pi = \pi^* - 1.5\Delta i = 2\% - 1.5(-2\%) = 2\% + 3\% = 5\%$

(vi) Compare your answers from parts (i) and (iv): Discuss how the change in the interest rate will affect this country's capital account and current account if it currently operates under a flexible exchange rate system. For simplicity, ignore the Interest Rate Parity condition, i.e., people do not form expectations on future exchange rates (3 marks).

Ans:

**Lower interest rate \rightarrow Net Capital outflow increases \rightarrow Decrease in Capital account.
Net Capital outflow increases \rightarrow Lower value of currency \rightarrow increases net export \rightarrow Current account rises**

(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 (3 marks).

**Ans: Return on Domestic Assets = Return of Foreign Assets = Foreign i + expected change in e_r
Assuming foreign i has not changed, expected change in e_r has to be negative; i.e. we expect an appreciation in the C\$ in the future.**

(viii) Are your predictions on the value of the Canadian dollar consistent between parts (vi) and (vii)? Explain (2 marks).

Ans: Yes, they are consistent with each other. In part (vi) the C\$ is depreciating at present, before expectations about the future has formed. In part (vii), people are forming expectation that C\$ will appreciate in future compared to its current value. This expectation is natural as Canadian interest rates are expected to rise back again in future (due to currently falling asset demand & future possible inflationary pressure); this, combined with increased export would make speculators to form the expectation.

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 and the world since then. **Assume that $GDP=Y=Y_p$ in 2008, immediately before this banking crisis. Also assume that $BB=SBB=0$ for Canada prior to the banking crisis.**

Article 1: Timeline: Credit crunch to downturn

BBC News, Page last updated at 08:54 GMT, Friday, 7 August 2009 09:54 UK

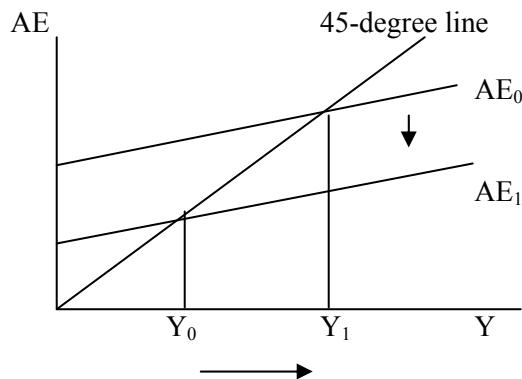
September 7th 2008: Mortgage lenders Fannie Mae and Freddie Mac - which account for nearly half of the outstanding mortgages in the US - are rescued by the US government in one of the largest bailouts in US history.

September 15th 2008: After days of searching frantically for a buyer, Lehman Brothers files for Chapter 11 bankruptcy protection, becoming the first major bank to collapse since the start of the credit crisis.

September 16th 2008: The US Federal Reserve announces an \$85bn rescue package for AIG, the country's biggest insurance company, to save it from bankruptcy. AIG gets the loan in return for an 80% stake in the firm.

September 25th 2008: In the largest bank failure yet in the United States, Washington Mutual, the giant mortgage lender, which had assets valued at \$307bn, is closed down by regulators and sold to JPMorgan Chase.

- (i) Article 1: Explain why banks can fail by discussing the money market multiplier (2 marks). In the absence of central bank interventions, discuss how the money supply and interest rates would be affected (2 marks). Use the $Y=AE$ graph to illustrate and explain how the money market results will transmit into the goods market (2 marks).



Ans: Banks can fail when borrowers default on their home loans. This means that banks liabilities are greater than their assets. Banks lend less and held more reserves and the money multiplier decreases. The money supply decreases and interest rates increase when the central bank does not intervene. Spending (I, C, NX) decreases and, through the expenditure multiplier effect, output (Y) decreases.

Article 2: Bank of Canada cuts key interest rate to 0.25%

Last Updated: Tuesday, April 21, 2009 | 2:10 PM ET CBC News

The Bank of Canada on Tuesday lowered a key lending rate again as the central bank reduced its economic outlook for 2009 and 2010.

The bank reduced the overnight rate by one-quarter of a percentage point to 0.25 per cent, which the bank said is the lowest effective rate. The lending rate will remain at the level until the middle of 2010 as the Bank of Canada tries to get the economy moving.

- (ii) Article 2: Explain why a target overnight interest rate (ONR) of 0.25% is the lowest effective rate possible (3 marks). If the Bank of Canada (BOC) had to intervene in the overnight market to keep the ONR from rising, should it use SRA or SPRA? Define the tool it should use and explain (3 marks).

Ans: The operating band for the overnight interest rate is $ONR \pm 0.25\%$. An ONR below 0.25% would result in a negative lower bound of the operating band. When the ONR increases, the central bank will use SPRA (special purchase and resale agreement) to increase the monetary base and decrease the interest rate.

Article 3: Impact of \$47B stimulus minimal, according to the Fraser Institute

Last Updated: Tuesday, March 23, 2010 | 5:09 PM ET [CBC News](#)

Billions of dollars of government stimulus spending didn't play much of a role in helping the Canadian economy rebound last year, according to a study from the Fraser Institute.

"Although the federal government has repeatedly claimed credit for Canada's improved economic performance in the second half of 2009, Statistics Canada data show that government spending and investment in infrastructure had a negligible effect on the country's improved economic growth," Niels Veldhuis, a Fraser Institute senior economist and one of the study's co-authors, says in a release.

- (iii) Article 3: In response to the banking crisis in 2008, the Canadian federal government has injected stimulus spending into the economy. However, according to the Fraser Institute, the effect on the economy was negligible. Use the concept of crowding-out to explain how the stimulus spending may have affected private investment expenditure and net exports (4 marks).

Ans: In response to the banking crisis and the recession, the federal government increases G to stimulate the economy. The increase in income will increase the demand for money and interest rates will go up. Spending (I, C, NX) decreases. An increase in interest rates will make borrowing for investment and durables more expensive and will make saving more attractive. Also, the domestic currency appreciates following an increase in interest rates.

- (iv) Article 3: How should the BOC change the target ONR if it wants to prevent crowding-out? Explain (2 marks).

Ans: The BOC should decrease the ONR to stimulate spending.

Article 4: Greek government austerity measures

19 October 2011 Last updated at 07:20 ET, BBC News

The five-year plan was changed to allow for more money to be raised through tax increases and less money to be saved through spending cuts.

The plan involves cutting 14.32bn euros (\$20.50bn; £12.82bn) of public spending, while raising 14.09bn euros in taxes over five years.

- (v) Article 4: Greece and other European countries have also been hit by the banking crisis. In contrast to Canada's stimulus spending, Greece has been trying to cut government spending and raise taxes in the midst of their recession. Explain the sensibility of these policies by discussing the Greek budget balance (BB) and structural budget balance (SBB) equations (2 marks).

Ans: The SBB will reflect these fiscal policy actions (the decrease in G and the increase in t) as $SBB = t \cdot Y_p - G$. Since Greece is going through a recession, $Y < Y_p$ and therefore, $BB = t \cdot Y - G$ will reflect a smaller deficit than before, if the government manages to raise more money through tax increases.

OR: Since $SBB < 0$ to begin with due to low t and high G , now if the Greek government further cuts t and raise G like Canada, the $SBB \ll 0$, and hence it cannot use fiscal stimulus. It needs to raise t and cut G in order to bring both SBB and BB under control. It is true that BB will reflect a larger deficit than SBB since $Y < Y_p$.

- (vi) Article 4: If Greece wants to minimize the detrimental impact of such austerity measures on its own GDP, should it hope that it has high or low values for their Marginal Propensity to Consume (MPC) and Marginal Propensity to Import (MPZ), respectively? Explain (4 marks)

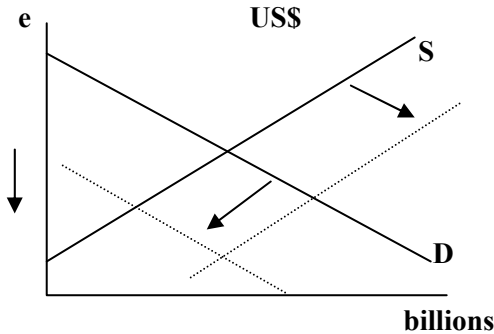
Ans: In order to minimize the effects of contractionary fiscal policy on consumption spending and imports, MPC should be low and MPZ should be high. This will decrease the expenditure multiplier. The slope of the AE function is lower.

Article 5: Canadian dollar strengthens as inflation jumps

Fri Oct 21, 2011 8:16am EDT, <http://ca.reuters.com/article/businessNews/idCATRE79K2O720111021>

TORONTO (Reuters) - The Canadian dollar strengthened against its U.S. counterpart in early trade on Friday after Canadian inflation came in above expectations. The Canadian dollar climbed to a session high C\$1.01 to the U.S. dollar, or 99.01 U.S. cents, in the first 30 minutes after the data was released, well above Thursday's North American session close at C\$1.0150, or 98.52 U.S. cents. The data showed Canada's annual "core" inflation rate jumped in September to its highest level since December 2008. The inflation rate sped up more than expected to 2.2 percent from 1.9 percent in August. Analysts had forecast a 1.9 percent rate.

- (vii) Article 5: Use the appropriate graph to explain why a higher inflation rate led to an immediate appreciation in the Canadian dollar (6 marks).



Ans: The BOC response to a high inflation rate is to increase interest rates. Portfolio holders will prefer Canadian financial assets to foreign assets and the supply of foreign currency will increase and the demand for foreign currency will decrease. The equilibrium exchange rate decreases, meaning that the domestic currency appreciates.

If students have shifted only the supply or demand curves, OK for full marks.

Article 6: 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.

Central bank governor Mark Carney has also taken up the cause in the past year, at times calling out corporate leaders to take advantage of government breaks, lower taxes, the strong loonie, and record-low interest rates, to prepare for the competitive nature of the post-crisis economy.

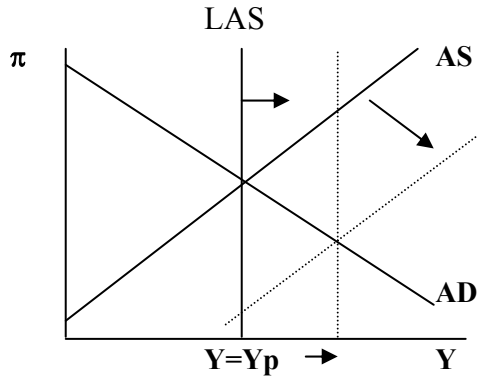
- (viii) Article 6: Suppose most Canadian firms have all the money they need to buy the new machinery and they do not need business loans to pay for such spending. Would the record-low interest rates affect their decision whether to buy the new machinery or not? Explain (2 marks).

Ans: The interest rate is the cost of borrowing and will influence investment decisions. At the same time, if investment is self-financed, the opportunity cost of this expenditure is the forgone interest income. Low interest rates will make saving less attractive and firms will choose to self finance investment.

- (ix) Article 6: Suppose Canada's population is going to remain constant in the next few years. Given this article, explain whether Canada's per-capita GDP will rise or fall in the next few years. Also explain the economic concept that can be used to explain this result (4 marks).

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

- (x) Article 6: If the BOC wants to maintain the current money supply or target overnight interest rate in the long run, should it adjust the long run targeted inflation rate to become higher or lower than the current 2%? Explain with the use of an AD/AS/LAS diagram but with the inflation rate on the vertical axis (4 marks).



Ans: K accumulation continues in the long run, so LAS shifts right. This would lead to lower inflation, so BOC needs to adjust target inflation to lower than 2%.

The End... Have a Great Holiday!