QUEEN'S UNIVERSITY AT KINGSTON

FACULTY OF ARTS AND SCIENCE

DEPARTMENT OF ECONOMICS

ECON 222 FINAL EXAMINATION

December 2007

Instructors:

Section A: David Byrne

Section B: Lucy Liu

Instructions:

This examination is THREE HOURS in length.

You may use a non-programmable hand calculator (with a gold or blue sticker or a Casio 991). No other aids are allowed in this examination.

Answer 2 of the 2 questions in Part A. Each question in Part A is worth 1 mark, for a total of 2 marks.

Answer 5 of the 6 questions in Part B. Each question in Part B is worth 6 marks, for a total of 30 marks.

Answer 1 mandatory question in Part C. The question in Part C is worth 20 marks.

Answer 3 of the 4 questions in Part D. Each question in Part D is worth 16 marks, for a total of 48 marks.

The total number of marks is 100.

For questions that involve a numerical part be sure to show your calculations and intermediate steps.

Read the questions carefully.

Please note: Proctors are unable to respond to queries about the intepretation of exam questions. Do your best to answer exam questions as written.

Section A: Freebies (Do both - 2 marks)

1. What is your first and last name?

2. What is your student number?

Section B: Short Answer (Do 5 of 6 - 30 marks)

For each statement, claim whether it is TRUE, FALSE, or UNCERTAIN, and justify your claim.

1. Consider two countries, Davecity and Lucyville, both have 100 citizens. The citizens of Lucyville all own 1 plant in Lucyville that produces \$1 of final goods and services. Similarly, each citizen of Davecity owns 1 plant in Davecity that produces \$1 of final goods and services. In addition, 60 of Davecity's residents own 1 plant in Lucyville, which each produces \$2 of final goods and services. We can conclude that the ratio of $\frac{GDP}{GNP}$ is equal to 1 for Davecity and 2.2 for Lucyville

2. Theory predicts national (aggregate) savings unambiguously rise when interest rates rise.

3. In an asset market equilibrium, characterized by the LM curve (where $\frac{M^d}{P} = \frac{M^s}{P}$), an increase in M^s reduces the equilibrium r for a given value of Y (which shifts down/out the LM curve), because of individuals re-balancing their portfolios of monetary (M) and non-monetary (NM) assets.

4. Consider the aggregate production function $Y_t = AK_t$. Starting from the savings=investment equation: $\Delta K_t + dK_t = sY_t$, where d and s are the depreciation and savings rates, and $\Delta K_t = K_{t+1} - K_t$, one can show this model predicts output growth depends on s.

5. Net export movement amplifies the effect of government spending in the open-economy IS-LM model.

6. During a speculative run on a country's currency, a central banks' reserves fall, regardless of whether the exchange rate is held above or below the fundamental value.

Section C: Mandatory Question (Do 1 of 1 - 20 marks)

1. This question is based on a closed economy which has a full employment level of output $\bar{Y} = 1000$. The following equations characterize the economy:

$$\begin{aligned} C^d &= 250 + 0.7(Y - T) - 500r \\ I^d &= 490 - 500r \end{aligned}$$

Government expenditures and taxes are $G = T = 200$. Money demand is given by

$$\frac{M^d}{P} = 0.5Y - 500(r + \pi^e)$$

where expected inflation is $\pi^e = 0.1$. The nominal money supply is $M = 1400$.

a. Derive the IS, LM, FE curves, and find the long run equilibrium for the economy. Find the equilibrium values of Y, r, P. Show this with an IS-LM graph.

b. Suppose investors in the economy lose confidence, causing I^d to become:

$$I^d = 230 - 500r$$

Find the new short-run (where P is fixed) equilibrium response to this investment shock by computing the values of Y, r. Illustrate the result of the shock with a graph.

c. In the long-run, prices will adjust so output returns to the full-employment level. Find the new long-run values for Y, r, P and compute the deflation rate in prices between part a. and c. Illustrate your findings with a graph.

d. Suppose now the government does not want deflation to occur as a result of the investment shock. Instead of allowing the long-run adjustment of part c., it decides to either cut T or raise G to offset the investment shock and bring the economy back to the long-run equilibrium of part a.. Assuming the government wants to run as small a deficit as possible, which policy should it pick?

Section D: Long Answer (Do 3 of 4 - 48 marks - 16 marks per question)

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1. Consider a world with only two countries, country A and country B. Output equals the full-employment level in each country. You are given the following information about each country:

Country A

Consumption	$C_A = 100 + 0.5Y_A - 500r^w$
Investment	$I_A = 300 - 500r^w$
Government Purchases:	$G_A = 155$
Full-employment Output:	$\bar{Y}_A = 1000$

Country B

Consumption	$C_B = 225 + 0.7Y_B - 600r^w$
Investment	$I_B = 250 - 200r^w$
Government Purchases:	$G_B = 190$
Full-employment Output:	$\bar{Y}_B = 1200$

   a. Write national saving in country A and country B as functions of the world real interest rate r^w.

   b. What is the equilibrium value of the world real interest rate?

   c. What are the equilibrium values of consumption and the current account balances in each country?

   d. Now suppose the level of government spending in country A increases to 245. What is the new equilibrium value of world interest rate? Comparing with the result in part (c), how does the new r^w affect the equilibrium consumption in country B?

2. An economy has the following production function

$$Y = 8K^{0.5}N^{0.5}$$

The population grows at the rate of $n = 1\%$ per year. The depreciation rate of capital is $d = 9\%$ per year. Saving is proportional to the disposable income: $S = 0.5(1 - t)Y$, where t is the tax rate on income, and Y is total output.

a. Initially suppose that there are no government purchases and the tax rate on income is $t = 0$. In the steady state, what are the values of the capital-labour ratio, output per worker, consumption per worker and investment per worker?

b. Now suppose the government purchases goods each year and pays for these purchases using tax on income. The government runs a balanced budget in each period and the tax rate on income is $t = 0.2$. In the new steady state, what are the values of the capital-labour ratio, output per worker, consumption per worker and investment per worker?

c. Illustrate the two steady states in part (a) and (b) in a fully-labelled diagram.

d. Suppose now the country wants to achieve the initial steady state level of capital-labour ratio in part (a). Given that $t = 0.2$, what fraction of the disposable income $(1 - t)Y$ would households have to save to obtain the steady state in part (a)?

3. For this question, assume interest rate parity holds. Currently the nominal interest rate in Canada is $i = 4\%$; the nominal interest rate in the U.S. is $i_{US} = 7\%$ and the nominal exchange rate is $e_{nom} = 1.05$.

    a. What is the future nominal exchange rate?

    b. Suppose the current price in Canada is $P = 1.05$ and the price level in the U.S. is $P_{US} = 1.02$. Does "Purchasing Power Parity (PPP)" hold between Canada and the U.S.? Explain.

    c. Now suppose in the future, the price level increases in both countries: in Canada, $P^f = 1.1$, and in the U.S., $P^f_{US} = 1.06$. Calculate the rates of inflation in each country.

    d. What is the percentage change in real exchange rate? Does "relative Purchasing Power Parity" hold between Canada and the U.S? Explain.

4. This question studies how macroeconomic changes in the U.S. might affect Canada. Throughout this question, Canadian real interest rates can differ from the U.S. interest rate. Suppose that you have the following information about the Canadian economy:

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\begin{aligned}
C^d &= 250 + 0.5Y \\
I^d &= 200 - 200r \\
G &= 0 \\
NX &= 0.1Y_{for} - 90 - 0.5e \\
e &= 80 + 600(r - r_{for}) \\
\frac{M^d}{P} &= 0.5Y - 500r
\end{aligned}
$$

You also know that $\bar{Y} = 900$ and $M = 800$.

    a. Suppose that $Y_{for} = 1500$ and $r_{for} = 0.1$. Find the long run equilibrium values of r, e, NX and P.

    b. Imagine that the U.S. economy suffers an adverse supply shock and output is decreased to $Y_{for} = 1400$, and the real interest rate becomes $r_{for} = 0.08$. Suppose that in the short run price is fixed. Find the short-run equilibrium values of r, e, NX and Y in Canada.

    c. What are the long-run effects on r, e, NX and P?

    d. Now suppose the Bank of Canada wants to avoid any change in the price level following the shock in part (b). Instead, it increases nominal money supply to restore Y to its full-employment level. By how much does the money supply have to rise?