Queen's University

Department of Economics

Economics 222 A and B

Midterm Test

2 March 2005 6-8 pm

Please read all questions carefully. Record your answers in the answer booklet provided. You are encouraged to draw diagrams to support your answers. Please label the axis and lines or curves on your diagrams. The exam has two parts.

Part A consists of true, false, uncertain questions. Marks will be awarded based on the logical arguments given to support your answers. Answer **FIVE** of the seven questions. Each question is worth 8 marks for a total of 40 marks.

Part B consists of long questions. Answer **TWO** of the three questions. Each question is worth 30 marks for a total of 60 marks.

The exam is 120 minutes long. Budget your time carefully.

Hand calculators are permitted for this exam.

PART A – True, False, Uncertain

Answer any **FIVE** of the following seven questions. Please explain whether they are true, false or uncertain. Each question is worth **8** marks for a total of **40** marks. *Answers without any explanations will receive zero marks.*

1. Assume that 2003 was used as a base year to measure inflation in Singapore. Production levels and prices of all goods in 2004 were the same as in 2003 except for computers. In 2004 the number of computers produced increased and the price of computers fell, while the total value of computer sales remained unchanged. In 2004 real GDP increased and the GDP deflator decreased.

2. Consider the following national accounts data taken from a small open economy.
GNP = 100 I = 10 NX = 0 TR = 4
NFP = 5 T = 12 C = 80 INT = 6
Based on this information, the government must have a budget deficit.

3. If the real interest rate is constant, both the nominal after-tax interest rate and the real after-tax interest rate increase when the inflation rate increases.

4. From December 2004 to January 2005, the U.S. unemployment rate fell from 5.4% to 5.2% and the size of the U.S. labour force fell from 148.203 million workers to 147.979 million workers. Without any additional data, it is not possible to determine whether the number of employed workers in the U.S. increased or decreased over this period.

5. Imagine a small open economy that is currently running a CA deficit. An increase in expected future MPK together with an increase in expected future wealth could potentially turn the CA deficit into a surplus.

6. Consider the United States and Japan as two large open economies, where initially Japan has a current account surplus. To fight a recession the Japanese government decides to increase its spending. This decision will eventually lead to lower in investment in both countries.

7. Suppose that the Canadian economy can be represented by the aggregate production function $Y_t = A_t K_t^{0.3} N_t^{0.7}$. From 2003 to 2004, output increased by 4%, the capital stock increased by 1% and employment increased by 2%. Growth accounting tells us that productivity growth must have been approximately 1% over the same period.

PART B – Long Questions

Answer any **TWO** of the following three questions. Each question is worth **30** marks for a total of **60** marks.

1. Consider a closed economy with a single production sector given by

$$Y = AK^{0.5}N^{0.5}$$

Assume that the productivity level $A = 2$, the real interest rate is $r = 0.1$, the depreciation rate on capital is $d = 0.1$, the price of a unit of capital is 1 and the effective tax rate on capital $\tau = 0.2$.

(a) If equilibrium employment in the labour market is $N^* = 4$, determine the equilibrium stock of capital K^*.

(b) Suppose that labour supply is given by $N^s = zw$, where z is someone unknown positive number. Given that $N^* = 4$, use your answer in part (a) to determine the value of z. What is the equilibrium wage in the labour market?

(c) Suppose that there is an increase in the effective tax rate on capital ($\tau > 0.2$). Use an appropriate set of diagrams to explain how this tax increase leads to a lower equilibrium wage and lower equilibrium employment in the labour market.

(d) Now suppose that workers always save a fixed fraction s of their wage income. Use an appropriate set of diagrams to explain how an increase in s affects the equilibrium level of capital stock K^*. (Hint: consider possible effects in the goods market.)

2. Individuals and government officials have a planning horizon of two years in the Netherlands. National income is expected to be the same in the next two years ($Y_1 = Y_2$). Government expenditures are planned to be $G_1 = G_2 = 100$ and taxes are set at $T_1 = T_2 = 100$. The real interest rate is $r = 0.10$. Assume that individuals smooth their consumption perfectly across time periods.

(a) Express consumption in each period as a function of national income and taxes. What is the amount of private saving?

(b) The government decides to change its tax scheme by announcing $T_1 = 50$. What will be the consumption in each period as a function of national income and taxes? What is the amount of private saving?

(c) If the interest rate were to rise to $r = 0.20$ (with $T_1 = 50$) what would consumption be in each period as a function of national income and taxes? What is the amount of private saving?

(d) Now assume that national income is expected to be higher in the second period so that $Y_1 < Y_2$ (with $T_1 = T_2 = G_1 = G_2 = 100$ and $r = 0.10$). Will private saving be positive or negative in the first period ?

(e) How will private saving in the first period and consumption in both periods change relative to part (d) if $r = 0.20$? (You only need to indicate whether saving and consumption will increase or decrease relative to part (d).)

3. The economy of Tajikistan can be represented by the production function $Y = K^{0.5}N^{0.5}$. The depreciation rate is $d = 0.10$, the labor force $N = 100$ and the capital stock $K = 900$. For simplicity assume that the population growth rate is zero.

(a) If the economy is in a steady state, what must be the savings rate?

(b) Is the capital stock in Tajikistan above or below the golden rule level?

(c) Find the savings rate that will move the capital stock to the golden rule level.

(d) Suppose that an increase in the savings rate moves an economy from a steady state with a capital stock *below* the golden rule level to a new steady state with a capital stock *at* the golden rule level. What happens to consumption in the short run? What happens to consumption in the long run?