UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Exam: **ECON4330 – Open economy macroeconomics**

Date of exam: Friday, May 30, 2008 **Grades are given: Friday, June 13**

Time for exam: 9:00 a.m. – 12:00 noon

The problem set covers 2 pages

Resources allowed:
- No resources allowed

Both parts are to be solved. In the evaluation they will be given equal weight.

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

Part A: The current account in two-period equilibrium models (weight 50 per cent)

We are looking at an open economy that exists for two periods. Output in each period Y_1 and Y_2 respectively, is given exogenously. A representative consumer maximizes expected utility

$$U = u(C_1) + \beta u(C_2) \quad (1)$$

where C_1 and C_2 are consumption in the two periods and β is a subjective discount factor, $0 < \beta < 1$. The country can borrow and lend in world markets at a given real interest rate, r.

There is no initial foreign debt. Hence, the budget constraint can be written

$$C_1 + \frac{C_2}{1+r} = Y_1 + \frac{Y_2}{1+r} \quad (2)$$

1. Derive the first order condition for optimal consumption and interpret it.
2. Discuss briefly the effect of an increase in the interest rate on consumption and the current account in the first period.
3. Suppose the rest of the world has the same preferences as the home country, but different output levels, Y_1^* and Y_2^*. Explain with a graph how the world interest rate will be determined.
4. Assume $Y_2 = Y_2^*$. Explain how the first period endowments Y_1 and Y_1^* then determine which country that will have a current account surplus in the first period.
5. We now extend the model to include a production side. Each country has access to the same technology and the technology does not change. The production function is $Y = F(N, K)$ where N and K are respectively the inputs of labor and capital. The production function is

homogeneous of degree one and has standard neoclassical properties. The labor input is the same in both countries and both periods, equal to $\bar{N}$. Each country has inherited a capital stock from the past, K_1 and K_1^* respectively, that can be used in production in period 1. The capital stock can be augmented by investment in period 1, which then adds to the input of capital in period 2, K_2 and K_2^*. At the end of period 2 the remaining capital stock is consumed. The budget constraint of the home country can then be written

$$C_1 + I_1 + \frac{C_2 + I_2}{1+r} = Y_1 + \frac{Y_2}{1+r} \qquad (2)$$

where $I_1 = K_2 - K_1$ and $I_2 = -K_2$. Explain how the home country's investment demand in period 1 is determined and briefly what the inclusion of capital means for the relationship between the world interest rate and the home country's current account in the first period.

6. Compare the capital stocks of the two countries in the second period. Suppose the home country has inherited more capital than the foreign country ($K_1 > K_1^*$). What does this imply for the current accounts in the two periods?
7. Finally, suppose international borrowing and lending had not been possible. From the point of view of wage earners in the home country, would this be an advantage or a disadvantage?

Part B Exchange rate determination (weight 50 per cent)

In this part of the exam no formal models or mathematical derivations are required.

1. Explain briefly the main factors that determine the demand for foreign currency by private investors.
2. Suppose a country has a freely floating exchange rate. Discuss the effect on the exchange rate of an increase in the domestic interest rate. What factors are important for the size of the effect? Illustrate with graphs.