UNIVERSITY OF OSLO
DEPARTMENT OF ECONOMICS

Exam: **ECON4330 – Open Economy Macroeconomics**

Date of exam: Thursday, May 20, 2010 **Grades will be given: June 10, 2010**

Time for exam: 2:30 p.m. – 5:30 p.m.

The problem set covers 3 pages

Resources allowed:
- No resources allowed

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

Question A counts 1/4, question B 3/4.

Question A

During the recent financial crisis there has been large exchange rates movements that seem unrelated to changes in interest rates. Comment briefly on what may cause such changes in exchange rates.

Question B

Consider the following model of the price specie-flow mechanism:

IS-curve:

$$Y = C\left(Y, W, i_*\right) + X\left(\frac{EP_*}{P}, Y, Y_*\right) \tag{1}$$

where

$$W = -\frac{EF_*}{P} \tag{2}$$

Phillips-curve:

$$\dot{P} = P\gamma(Y - \bar{Y}) \tag{3}$$

where

$$\bar{Y} = \Phi(\bar{N}, \bar{K}) \tag{4}$$

Accumulation of foreign debt:

$$\dot{F}_* = i_* F_* - \frac{P}{E} X\left(\frac{EP_*}{P}, Y, Y_*\right) \tag{5}$$

The symbols are:

Y output

W net foreign assets (= minus real value of foreign debt)

C consumption function

X trade balance function

P price of home goods

P_* price of foreign goods

E nominal exchange rate

i_* interest rate (domestic and foreign interest rates are equal)

F_* foreign debt measured in foreign currency

$\bar{K}$ capital stock

$\bar{N}$ equilibrium employment

$\bar{Y}$ equilibrium output

Φ production function

$\gamma > 0$ a constant parameter.

The exogenous variables are E, i_*, Y_*, P_*, $\bar{N}$ and $\bar{K}$. For simplicity we assume that P_* is constant. The initial conditions are $P(0) = P_0$, $F_*(0) = F_{*0}$.

1) Explain in relation to the model what is meant by a temporary equilibrium and a stationary equilibrium.

2) The model can be summarized in two differential equations:

$$\dot{P} = \phi_1(P, F_*, x) \tag{6}$$
$$\dot{F}_* = \phi_2(P, F_*, x) \tag{7}$$

where x is a vector of all the exogenous variables.

Discuss the effect of the price of home goods on the growth rate of the foreign debt (ϕ_{21}).

3) Assume from now on that $\phi_{11} < 0$, $\phi_{12} < 0$, $\phi_{21} > 0$, $\phi_{22} < 0$. State the conditions for stability of the stationary state and confirm that the assumed signs of the partial derivatives ensure that the stability conditions are satisfied.

4) Draw a phase diagram for the two differential equations conforming to the sign assumptions in 3). Give brief intuitive explanations for the slopes of the curves for external and internal balance.

5) Suppose the economy is initially in a stationary equilibrium. Then the labor force increases through immigration. What is the impact on the curves for internal and external balance? What does this mean for the foreign debt, F_* and the price level P in the new stationary equilibrium? What does the transitional path look like? What are the long run effects on W and on the real exchange rate $R = EP_*/P$.

6) Suppose now that instead of being an exogenous constant, the capital stock can be augmented through real investment. Investment levels are determined by profit-maximizing producers. Focus exclusively on stationary states. How would the capital stock in stationary state respond to an increase in the labor force? What does this mean for the levels of W and R in the new stationary state?