Written Exam for the M.Sc. in Economics winter 2013-14

International Monetary Economics

Master's Course

January 16, 2014

(3-hour closed book exam)

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This exam question consists of 3 pages (including this page) in total

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Number of questions: This exam consists of 2 questions.

1. **The Dornbusch model**
   Consider the Dornbusch overshooting model with an exogenous risk premium comprised of the following equations

$$r - r^* - rp = E\dot{s}^e \tag{1}$$

$$E\dot{s} = \theta\left(\bar{s} - s\right) \tag{2}$$

$$m - p = \eta y - \sigma r \tag{3}$$

$$y^d = \beta + \alpha\left(s - p + p^*\right) + \phi y - \lambda r \tag{4}$$

$$\dot{p} = \pi\left(y^d - y\right). \tag{5}$$

   (a) Give a brief interpretation of the main assumptions and economic mechanisms underlying the equations of the model.

   (b) Derive the money market and goods market equilibrium curves and illustrate the model in a graph [Hint: Start by deriving the equilibrium price level, then the expression for the equilibrium exchange rate.]

   (c) How are the slopes of the money market and goods market equilibrium curves affected by the inclusion of an exogenous risk premium?

   (d) Prove that the exchange rate overshoots in this model by deriving an expression for $\frac{d\dot{s}}{dp}$. What factors determine the size of the overshooting effect? Is the relative size of the risk premium determining the extent of overshooting?

   (e) Replace equation (2) by the following expression

$$\Delta s^e = \theta\left(\bar{s} - s\right) + P\dot{e} - P\dot{e}^*$$

   where $P\dot{e} - P\dot{e}^*$ is the long-run inflation differential between the domestic and foreign economies. Show that the solution for the short-run exchange rate is

$$s = (m - m^*) - \eta\left(y - y^*\right) + \sigma\left(\Delta P - \Delta P^*\right) - \frac{1}{\theta}\left(r - r^* - rp - \left(P\dot{e} - P\dot{e}^*\right)\right).$$

   [Hint: Assume that the money demand in the foreign country is given by $m^* = p^* + \eta y^* - \sigma r^*$.]

(f) Is there an exchange rate overshooting effect in this model also? Explain carefully the effects of a monetary expansion.

2. **Second Generation Currency Crisis model** Consider the Obstfeld second generation currency crisis model comprised of the following equations:

$$\mathcal{L} = \theta \dot{p}^2 + (y - \tilde{y})^2 + C(\dot{s}) \tag{6}$$

$$y = \bar{y} + \dot{p} - \dot{p}^e - v \tag{7}$$

$$\tilde{y} - \bar{y} = k > 0 \tag{8}$$

$$s = p - p^* \tag{9}$$

where notation is standard.

(a) Comment on the four equations above.

(b) What are the main underlying assumptions of the model? Explain the assumed sequencing of events in the model and how currency crises are generated.

(c) Define

$$\begin{aligned} C(\dot{s}) &= 0 \quad \text{if} \quad \dot{s} = 0 \\ C(\dot{s}) &= \bar{C} > 0 \quad \text{if} \quad \dot{s} > 0 \\ C(\dot{s}) &= \underline{C} > 0 \quad \text{if} \quad \dot{s} < 0. \end{aligned}$$

A devaluation or a revaluation will occur if

$$\frac{(\dot{s}^e + \upsilon + k)^2}{1 + \theta} > C(\dot{s}).$$

Solve this equation for υ and explain under what conditions there will be a devaluation or revaluation.

(d) Under the assumption that the shocks are uniformly distributed we can derive the following expression for the expected exchange rate

$$\mathrm{E}(\dot{s}) = \frac{1}{1+\theta} \left\{ \left[1 - \frac{\bar{\upsilon} - \underline{\upsilon}}{2V} \right] (\dot{s}^e + k) - \frac{\bar{\upsilon}^2 - \underline{\upsilon}^2}{4V} \right\} \tag{10}$$

where $\bar{\upsilon}$ is the devaluation trigger, $\underline{\upsilon}$ is the revaluation trigger and V $(-V)$ is the largest (smallest) possible value of υ. Illustrate the model in the $\mathrm{E}(\dot{s})$–$\dot{s}^e$–plane. Provide a detailed discussion about how this graph is constructed.

(e) Can this model be used to explain the ERM crisis? If so, why?

(f) What are the main differences between ERM I and ERM II?