

Written Exam at the Department of Economics summer 2018

## **Economics of Exchange Rates**

Final Exam

August 28, 2018

(3-hour closed book exam)

Answers only in English.

**This exam question consists of 3 pages in total**

*NB: If you fall ill during an examination at Peter Bangsvej, you must contact an invigilator in order to be registered as having fallen ill. In this connection, you must complete a form. Then you submit a blank exam paper and leave the examination. When you arrive home, you must contact your GP and submit a medical report to the Faculty of Social Sciences no later than seven (7) days from the date of the exam.*

### **Be careful not to cheat at exams!**

- You cheat at an exam, if during the exam, you:
- Make use of exam aids that are not allowed
- Communicate with or otherwise receive help from other people
- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text
- Use the ideas or thoughts of others without making use of source referencing, so it may appear to be your own idea or your thoughts
- Or if you otherwise violate the rules that apply to the exam

## Written exam for the M. Sc in Economics Economics of Exchange Rates

August 28, 2018

---

**Number of questions:** This exam consists of 2 questions.

---

### 1. Central Bank intervention

- Explain the difference between a sterilized, a non-sterilized and an oral intervention.
- Explain using the central bank balance sheet how a sterilized and a non-sterilized intervention may be carried out.
- What is the main objective of Danish monetary policy?
- How does the Danish central bank, Nationalbanken, use central bank intervention and other monetary policy instruments to carry out its objective?
- Are Danish central bank interventions effective? Put the effectiveness in an international perspective.

### 2. FX market micro structure

- Consider the following standard two-country micro based macro model:

$$s_t = \mathbb{E}_t^D[s_{t+1}] + \hat{r}_t - r_t - \delta_t \quad (1)$$

$$\mathbb{E}_t^D(\hat{r}_{t+i} - r_{t+i}) = (1 + \gamma_\pi)\mathbb{E}_t^D(\Delta\hat{p}_{t+1+i} - \Delta p_{t+1+i}) + \gamma_y\mathbb{E}_t^D(\hat{y}_{t+i} - y_{t+i}) - \gamma_\varepsilon\mathbb{E}_t^D\varepsilon_{t+i} \quad (2)$$

$$\varepsilon_t = s_t + \hat{p}_t - p_t \quad (3)$$

where notation is standard. Explain the underlying assumptions of this model and the rationale behind the equations stated above.

- Show that the nominal exchange rate (under the assumption of no bubbles) can be written as

$$s_t = (\hat{r}_t - r_t) + \mathbb{E}_t^D \sum_{i=1}^{\infty} \rho^i f_{t+i} - \mathbb{E}_t^D \sum_{i=0}^{\infty} \rho^i \delta_{t+i} \quad (4)$$

where

$$f_t = (1 + \gamma_\pi)(\Delta\hat{p}_{t+1} - \Delta p_{t+1}) + \gamma_y(\hat{y}_t - y_t) + \frac{1-\rho}{\rho}(p_t - \hat{p}_t). \quad (5)$$

provide an interpretation of these equations.

(c) If we assume that aggregate demand for foreign currency is given by

$$\alpha_t = \int_0^1 \alpha_t^n dn = \alpha_s (\overline{\mathbb{E}}_t^n s_{t+1} - s_t + \hat{r}_t - r_t) + h_t \quad (6)$$

and if we also invoke the risk sharing condition  $\mathbb{E}_t^D \alpha_t = 0$ , we find that the risk premium can be written as

$$\delta_t = \mathbb{E}_t^D \left[ s_{t+1}^e - \frac{1}{\alpha_s} h_t \right] \quad (7)$$

where  $s_{t+1}^e = s_{t+1} - \overline{\mathbb{E}}_t^n s_{t+1}$ . Discuss the implications of the risk premium relation. How are order flows linked to the risk premium?

(d) Show that equation (4) can be written as

$$s_t = (\hat{r}_t - r_t) + \mathbb{E}_t^D \sum_{i=1}^{\infty} \rho^i f_{t+i} + \frac{1}{\alpha_s} \mathbb{E}_t^D \sum_{i=0}^{\infty} \rho^i h_{t+i} - \frac{1}{\rho} \mathbb{E}_t^D \sum_{i=1}^{\infty} \rho^i s_{t+i}^e \quad (8)$$

Interpret this relation and discuss whether this model can solve the disconnect puzzle?