

Written Exam at the Department of Economics summer 2019

Economics of Exchange Rates

Final Exam

August 16, 2019

(3-hour closed book exam)

Answers only in English.

This exam question consists of 3 pages in total

Falling ill during the exam

If you fall ill during an examination at Peter Bangs Vej, you must:

- contact an invigilator who will show you how to register and submit a blank exam paper.
- leave the examination.
- contact your GP and submit a medical report to the Faculty of Social Sciences no later than five (5) 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 16, 2019

Number of questions: This exam consists of 2 questions.

1. Central bank intervention

- (a) Explain how central bank interventions may affect the exchange rate.
- (b) Assume that the exchange rate is given by the standard exchange rate equation:

$$s_t = (1 - \theta) \sum_{i=0}^{\infty} \theta^i E_t [f_{t+i} | \Omega_t]$$

Ω_t is the public information set at time t . Show that we can rewrite this expression in the following way if we assume UIP and a non-zero risk premium

$$\Delta s_{t+1} = (i_t - i_t^* + \rho) + (1 - \theta) \sum_{i=0}^{\infty} \theta^i (E_{t+1} [f_{t+1+i} | \Omega_{t+1}] - E_t [f_{t+1+i} | \Omega_t]).$$

Explain how interventions affect the spot rate in this model.

- (c) What are the aims of Danish monetary policy and how does the Danish central bank implement this policy?
- (d) Summarize the empirical evidence on central bank interventions.

2. Central Bank intervention

- (a) Explain the underlying assumptions of the portfolio balance model.
- (b) Consider the following portfolio balance model.

$$W \equiv M + B_p + SF_p \tag{1}$$

$$M = m(r, E\dot{s}, Y, W) \quad m_r < 0, m_{E\dot{s}} < 0, m_y > 0, m_w > 0 \tag{2}$$

$$B_p = b(r, E\dot{s}, Y, W) \quad b_r > 0, b_{E\dot{s}} < 0, b_y < 0, b_w > 0 \tag{3}$$

$$SF_p = f(r, E\dot{s}, Y, W) \quad f_r < 0, f_{E\dot{s}} > 0, f_y < 0, f_w > 0 \tag{4}$$

Show that

$$dW = dM + dB_p + F_p dS + S dF_p,$$

$$m_w + b_w + f_w = 1,$$

$$m_r + b_r + f_r = 0,$$

and

$$m_{E\$/} + b_{E\$/} + f_{E\$/} = 0.$$

Explain the implication of these expressions and why they hold.

- (c) Derive the three asset market schedules.
- (d) Illustrate the model in a graph and motivate, using intuition, the slopes of the three asset market equilibrium schedules under the assumption that

$$\frac{1 - f_w}{f_r} > -\frac{b_w}{b_r}.$$

- (e) The Schweizerische Nationalbank decided to remove the cap on the Swiss Franc against the euro on January 15, 2015. This led to a massive demand for Danish kroner that strengthened the krona versus the euro, an appreciation. To defend the fixed exchange rate policy, the Danish Nationalbank intervened on the foreign exchange market. Use the graphical model to analyze the short-term effects of the sterilized central bank intervention used by the Danish Nationalbank to defend the fixed rate policy.
- (f) Solve the model and derive the effects of the sterilized foreign exchange operation in the previous question.

Hint: The inverse of the 3×3 matrix

$$\begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$$

can be written as

$$\frac{1}{D} \begin{bmatrix} a_{22}a_{33} - a_{23}a_{32} & -a_{12}a_{33} + a_{13}a_{32} & a_{12}a_{23} - a_{13}a_{22} \\ -a_{21}a_{33} + a_{23}a_{31} & a_{11}a_{33} - a_{13}a_{31} & -a_{11}a_{23} + a_{13}a_{21} \\ a_{21}a_{32} - a_{22}a_{31} & -a_{11}a_{32} + a_{12}a_{31} & a_{11}a_{22} - a_{12}a_{21} \end{bmatrix}$$

where the determinant $D = a_{11}a_{22}a_{33} - a_{11}a_{23}a_{32} - a_{21}a_{12}a_{33} + a_{21}a_{13}a_{32} + a_{31}a_{12}a_{23} - a_{31}a_{13}a_{22}$.