

Written Exam at the Department of Economics summer 2021

Economics of Exchange Rates

Final Exam

June 8, 2021

(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 Bangsvej, you must:

- 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

Solution to Written Exam at the Department of Economics summer 2021

Economics of Exchange Rates

June 8, 2021

Number of questions: This exam consists of 2 questions.

1. Portfolio Balance Model

Consider the standard Portfolio Balance Model comprised of the following functions

$$W \equiv M + B_p + SF_p \quad (1)$$

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

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

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

Notation is standard.

- Consider the short-term version of this model, i.e., we assume that prices are constant. Illustrate the model above in a graph and provide intuitive explanations of the slopes of the three short-run asset market equilibrium curves.
- Use the graphical illustration of the model to analyze the effects of a non-sterilized foreign exchange operation where the central bank operates to depreciate the home currency. First, explain the central bank strategy and then use the graphical illustration to find how the interest rate and the exchange rate will be affected.
- We can solve the portfolio balance model given the assumptions that $dY = dE\dot{s} = 0$ to find that

$$\begin{bmatrix} dr \\ dW \\ dS \end{bmatrix} = \frac{1}{D} \begin{bmatrix} F_p m_w & 0 & -b_w F_p \\ -m_r F_p & 0 & b_r F_p \\ f_r m_w - f_w m_r & -b_r m_w + b_w m_r & b_r f_w - b_w f_r \end{bmatrix} \begin{bmatrix} dB_p \\ SdF_p \\ dM \end{bmatrix}$$

where $D = b_r m_w F_p - m_r b_w F_p$. Use the model above to derive the analytical effects of a non-sterilized intervention aimed at depreciating the currency. Explain carefully.

- (d) The central bank fears that inflation will increase as a result of the depreciated currency. Therefore they consider to use a sterilized intervention instead. Use the model above to derive the analytical effects of a non-sterilized intervention aimed at depreciating the currency. Is the effect on the exchange rate larger if domestic and foreign bonds are poor substitutes? Explain carefully.

2. Microstructure model

- (a) Give a short overview of how the foreign exchange market is organized and explain how order flows affect quotes.
- (b) Consider the following version of the micro-based exchange rate model. Assume that all dealers quote the same spot price to both other dealers and to their customers (quotes are publicly announced) and assume that the exchange rate is determined by fundamentals (as in most macro based models)

$$s_t = (1 - b) \sum_{i=0}^{\infty} b^i \mathbb{E} [f_{t+i} | \Omega_t^D]$$

Give a short motivation to this equation and explain how the spot exchange rate is determined.

- (c) Show that the model above can be re-written as

$$\Delta s_{t+1} = \frac{1-b}{b} (s_t - \mathbb{E} [f_t | \Omega_t^D]) + \varepsilon_{t+1}$$

by decomposing a change in the exchange rate into the unexpected and expected change. How is the spot exchange rate determined? Explain carefully how order flows affect the spot rate. Do public and private information available to customers affect spot rates?

- (d) Explain briefly the underlying assumptions of the portfolio shift model.
- (e) Use the portfolio shift model to explain how spot exchange rates are determined and pay special attention to how order flows affect quotes. Compare the predictions of the portfolio shift model with the macro based model in question (b).