

International economics (2021–2022)

Final exam

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11 January 2022, 12.00

Surname: _____

First name: _____

ID or passport number: _____

Group: _____

Question	Points	Obtained
1	8	
2	8	
3	8	
4	8	
5	8	
Total	40	

Instructions

The exam consists of **five questions**.

In total, it is possible to obtain up to **40 points**.

Duration of exam: **1 hour and 30 minutes** (= 2.25 minutes per point or 18 minutes per question).

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1. Consider the following equation:

$$S = \frac{\frac{1}{P^H}}{\frac{1}{P^F}}. \quad (1)$$

- (a) What do the numerator (the part of the fraction above the line) and the denominator (the part of the fraction below the line) of the right-hand side of equation 1 represent economically? [1]
- (b) What is the economic intuition behind equation 1? [1]
- (c) What implication does equation 1 have for the real exchange rate? [1]
- (d) Is equation 1 (1) an accounting identity, (2) a definition, (3) a stock-flow equation or (4) a theoretical hypothesis? State briefly the reason for your answer. [1]
- (e) Is equation 1 supported by the data? [1]
- (f) Which are the main variables that drive P^H and P^F according to the monetary model of exchange rate determination with flexible prices? [1]
- (g) What is the logarithm of (1) the numerator, (2) the denominator and (3) of the whole fraction on the right-hand side of equation 1? [1]
- (h) Let s_t be the natural logarithm of S_t . When the *domestic* exchange rate (foreign currency per domestic currency) appreciates by 50% between $t - 1$ and t , $\Delta s_t = 0.405$. Which value does Δs_t take when the *foreign* exchange rate (domestic currency per foreign currency) appreciates by 50%? [1]

Total of question 1: [8]

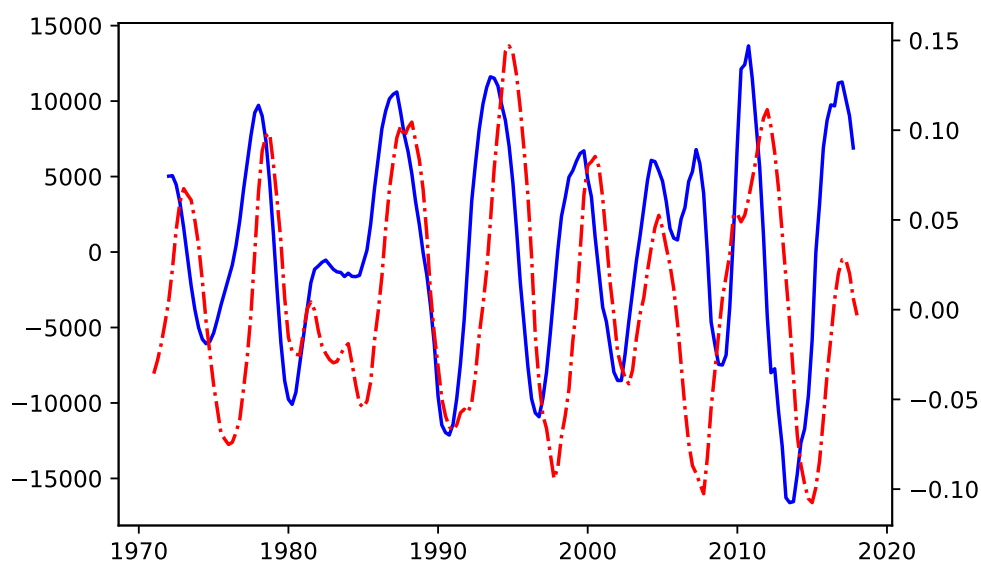


Figure 1: Current account and nominal effective exchange rate of Japan. The current account is shown as a solid line, the nominal effective exchange rate as a dash-dotted line. What is shown are the cyclical components of both variables, which were obtained by subtracting the centered six-year moving average from the respective series. The resulting series were furthermore smoothed using a centered two-year moving average. Both variables are shown at quarterly frequency. The current account is measured in millions of 2010 US dollars. Sources: Main Economic Indicators (OECD), Balance of Payments Statistics (IMF), International Financial Statistics (IMF).

2. Figures 1, 2 and 3 plot the time series of the current account (CA_t), the nominal effective exchange rate (s_t) and the real effective exchange rate (q_t) of Japan during the last half-century. Please describe the main empirical regularities and explain why the three variables interact in the way they do. [8]

Hints:

- Use the currency flow model as a starting point for your analysis.
- Be as "technical" as you can. That is, provide the equations that you consider relevant and distinguish clearly between the levels and the changes of the variables.
- Focus on the main dynamics of the three variables. That is to say, ignore small irregularities.
- To answer this question, you may go into a more detail than with the other questions.
- It may be a good idea to answer this question towards the end of the exam, so that you know how much time you have still available.

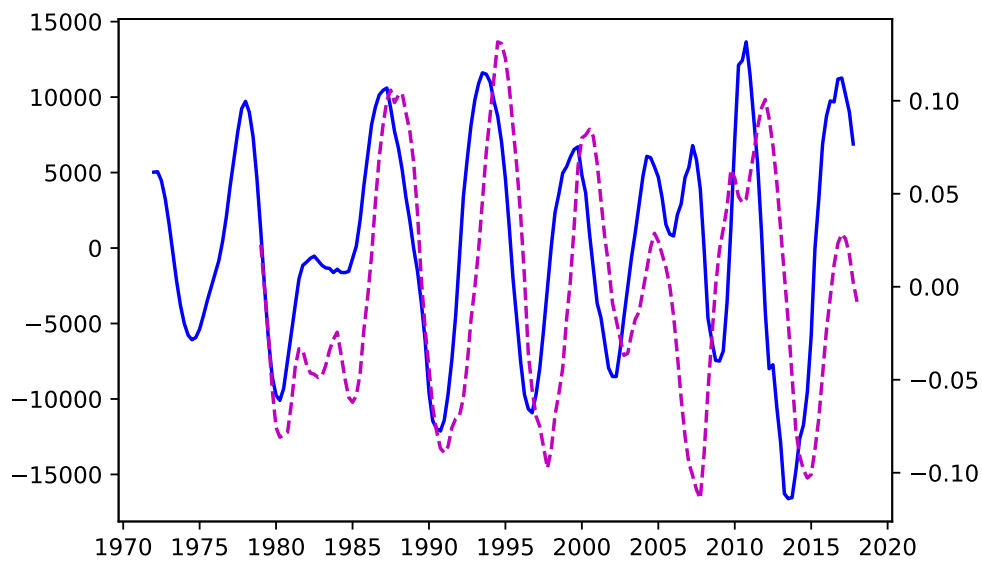


Figure 2: Current account and real effective exchange rate of Japan. The current account is shown as a solid line, the real effective exchange rate as a dashed line. What is shown are the cyclical components of both variables, which were obtained by subtracting the centered six-year moving average from the respective series. The resulting series were furthermore smoothed using a centered two-year moving average. Both variables are shown at quarterly frequency. The current account is measured in millions of 2010 US dollars. Sources: Main Economic Indicators (OECD), Balance of Payments Statistics (IMF), International Financial Statistics (IMF).

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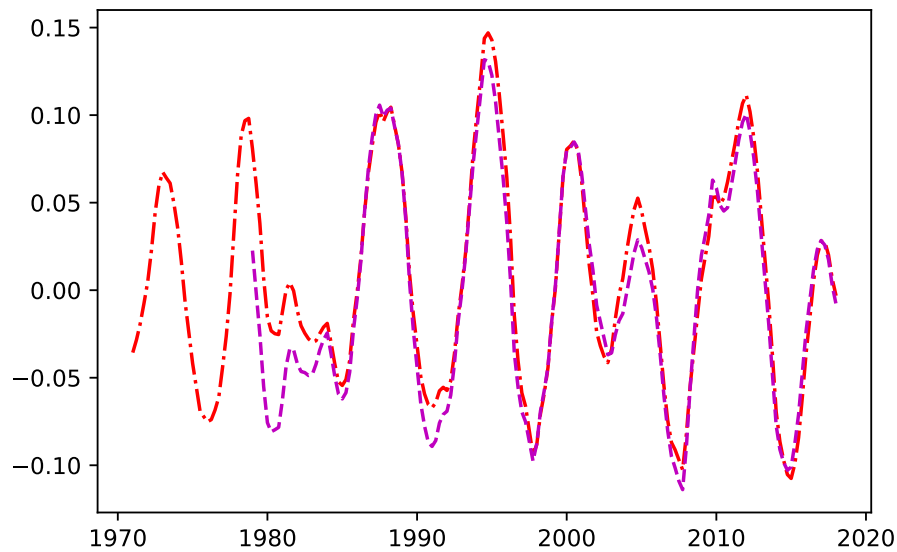


Figure 3: Nominal and real effective exchange rates of Japan. The nominal exchange rate is shown as a dash-dotted line, the real effective exchange rate as a dashed line. What is shown are the cyclical components of both variables, which were obtained by subtracting the centered six-year moving average from the respective series. The resulting series were furthermore smoothed using a centered two-year moving average. Both variables are shown at quarterly frequency. Sources: Balance of Payments Statistics (IMF), International Financial Statistics (IMF).

(Cont.)

(Cont.)

(Cont.)

Total of question 2: [8]

3. (a) Write down the structure of the balance of payments (as it is used in balance of payments statistics). [2]

CA

1. ...

2. ...

3. ...

(a) ...

(b) ...

4. ...

KA

1. ...

2. ...

FA

1. ...

2. ...

(a) ...

(b) ...

3. ...

(a) ...

(b) ...

(c) ...

4. ...

- (b) Now insert the correct plus and minus signs into the empty lines of table 1. [6]

Total of question 3: [8]

Transaction	CA				KA				FA				CA + KA	TB	Δe_t^{HF}	Δb_t^{HF}	Δm_t^{HF}	Δb_t^{HF}	Y^E	Y^P	Y
	1.	2.	3.	4.	1.	2.	1.	2. a)	2. b)	3. a)	3. b)	3. c)									
Export of olive oil	⊕											⊖	⊕	⊕				⊕		⊕	
A foreign investor buys Spanish government bonds																					
A Spanish investor receives dividends from Japanese shares																					
A Spanish firm buys a patent from a foreign firm																					
The Bank of Spain (Spanish central bank) sells official reserves																					

Table 1: Balance of payments transactions.

4. Suppose there are two countries, a home country (H) and a foreign country (F), and two goods, cheese C and wine W . Let a_{LC} be the unit labour requirement of the home country in the production of cheese, a_{LW} the unit labour requirement of the home country in the production of wine, a_{LC}^* be the unit labour requirement of the foreign country in the production of cheese and a_{LW}^* the unit labour requirement of the foreign country in the production of wine. Furthermore, let L be the hours of work available in the home country and L^* the hours of work available in the foreign country. The price of cheese in the world market is P_C and that of wine is P_W . Let Q and D denote the quantity of a good produced and the demand for that good, respectively.

Assume that the variables take the following values:

$$a_{LC} = 1, \quad (2)$$

$$a_{LW} = 1, \quad (3)$$

$$a_{LC}^* = 6, \quad (4)$$

$$a_{LW}^* = 2, \quad (5)$$

$$L = 100, \quad (6)$$

$$L^* = 400. \quad (7)$$

The world relative demand for cheese depends inversely on the relative price of cheese:

$$\frac{D_C + D_C^*}{D_W + D_W^*} = \frac{1}{\frac{P_C}{P_W}}. \quad (8)$$

Now answer the following questions:

- (a) Use the numerical values given above to show that having an absolute advantage in the production of a good is not the same as having the relative, or comparative, advantage in the production of that good. [1]

- (b) Using the numerical values given above, draw a diagram with world relative supply of cheese, $(Q_C + Q_C^*)/(Q_W + Q_W^*)$, and the world relative demand of cheese, $(D_C + D_C^*)/(D_W + D_W^*)$, on the horizontal axis and the relative price of cheese, P_C/P_W , on the vertical axis. Now draw the world relative supply curve and the world relative demand curve and indicate the equilibrium where the relative supply and demand are equal. [5]

- (c) Show that for the home country it is better to produce cheese and exchange it for wine than to produce wine itself. [2]

Total of question 4: [8]

5. (a) i) Which key variables does the gravity model of international trade in its basic form use to explain the volume of trade between two countries? Indicate with a plus or minus sign behind each variable whether you expect the effect on bilateral trade to be positive or negative. [2]
- ii) State four other variables that can be added to the gravity model that presumably have a significant effect on bilateral trade, too. Again, indicate with a plus or minus sign behind each variable whether you expect the effect on bilateral trade to be positive or negative. [2]
- (b) i) Show that $\Delta x_t \approx \frac{X_t - X_{t-1}}{X_{t-1}}$, where $x_t = \ln(X_t)$ and $\Delta x_t = x_t - x_{t-1}$. [1]
- ii) Apply the method of log-differencing to the definition of the real exchange rate, Q , to show how the rate of real appreciation is related to the rate of nominal appreciation and the domestic and foreign inflation rates. [1]
- iii) Suppose a country expects annual domestic inflation to equal 5% in the coming years and annual foreign inflation to equal 2%, yet wants to maintain a stable real exchange rate. By how much must the country allow the nominal exchange rate to appreciate or depreciate? What is the name of the exchange rate regime the country would have to put in place? [2]

Total of question 5: [8]

