Universität Siegen

Fakultät III
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Exam “International Economics“
Summer Semester 2021
(1st Exam Period)

VERSION 1 **(90 minutes)**

Solution

For your attention:

1 For your answers, use the designated spaces. Should these not suffice, use the backside of the pages. Please do not write and draw with a **pencil.**

2. Additional materials you may use for the exam: a non-programmable calculator. (Smart phones and mobile **phones** are **not** allowed!)

3. ATTENTION: The names for variables have the same meaning as in the lecture. Insofar as you also use the same symbols for the variables as we did in the lecture you will not have to define these any further.

Question	**1**	**2**	**3**	**4**	**5**	**6**	**Sum**	**Mark**
Points achievable	14	19.5	19	12.5	11	14	90	
Points achieved								

Problem 1: Balance of Payments

We look at the German balance of payments. For the following transactions, please indicate:

- the accounts within the balance of payments where to do the two entries for the transaction (e. g. account of trade in goods)
- the number of the transaction and its value (credit entry: +, debit entry: -)

(1) A company from the Siegerland sells steel to a client in China in the amount of 50. The client will pay next year.

(2) The University of Siegen has a common bachelor program with a French university. German teachers give courses in Siegen to incoming French students while French teachers give courses to students from Siegen in France. The value of each teaching is estimated at 70, but no payments are made.

(3) A student from the University of Siegen gets his annual scholarship payment of 10 from an American foundation. The money is transferred from the foundation’s account in New York to the student’s account at the Siegerland-Sparkasse.

(4) A resident of Germany buys a company in Russia. To finance this purchase in the amount of 200, he takes a credit from an American bank.

(5) A resident of Germany is a shareholder of the French car producer Renault. Renault pays dividend in the amount of 20 from its Paris bank account to the German’s bank account in Frankfurt.

(6) A poor professor of economics from the University of Siegen has difficulty paying back the credit for his house to his German bank. His rich colleague from California supports him by making a bank transfer of 30 to the German’s bank account in Los Angeles.

(7) In order to devalue the euro against the US dollar in the market for foreign exchange, the European Central Bank decides to buy US dollars. Being part of the Euro System, the German central bank buys dollars in the amount of 200 from German commercial banks.

[14 points]

Solution:

(1) Account of trade in goods: + 50; commercial financial account: - 50
(0.5) (0.5) (0.5) (0.5)

(2) Account of trade in services: + 70; account of trade in services: - 70
(0.5) (0.5) (0.5) (0.5)

(3) Account of secondary income: + 10; commercial financial account: - 10
(0.5) (0.5) (0.5) (0.5)

(4) Commercial financial account: - 200; commercial financial account: + 200
(0.5) (0.5) (0.5) (0.5)

(5) Primary income account: + 20; commercial financial account: - 20
(0.5) (0.5) (0.5) (0.5)

(6) Capital account: + 30; commercial financial account: - 30
(0.5) (0.5) (0.5) (0.5)

(7) Commercial financial account: + 200; official settlements balance: - 200
(0.5) (0.5) (0.5) (0.5)

Problem 2: International Trade of a Small Country

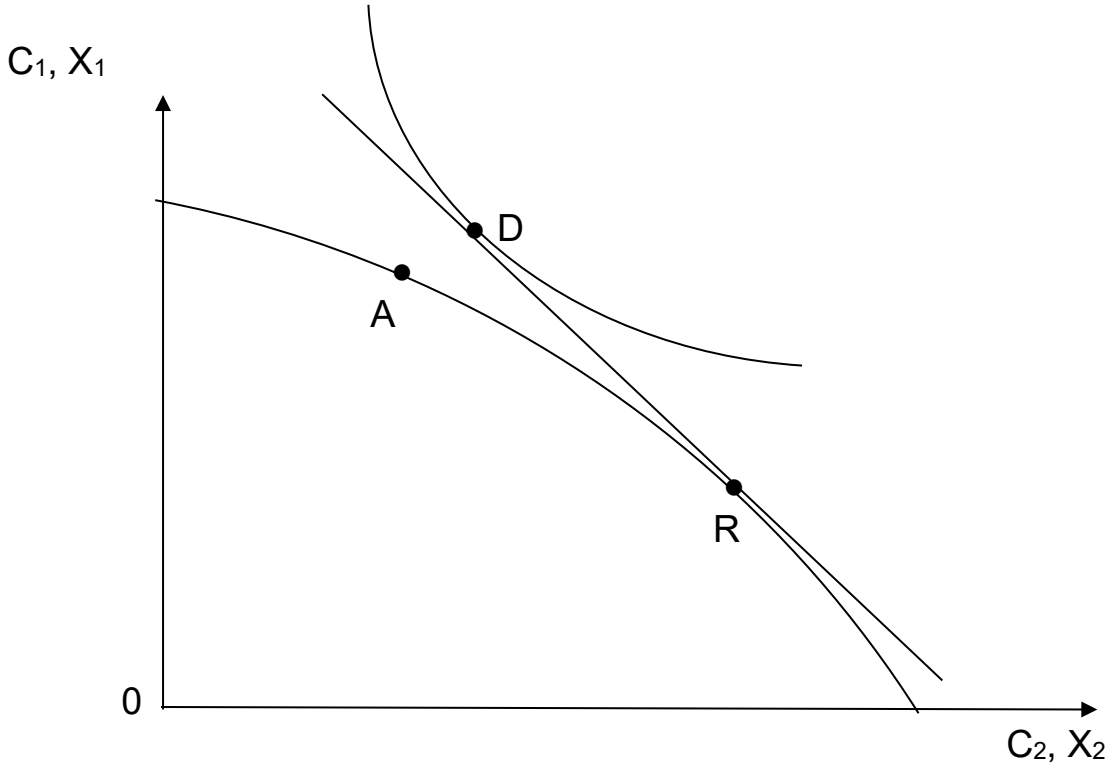
a) What is the characteristic feature of a “small” economy? Please explain your answer. [5 points]

Solution:

- prices of goods are exogenous (1)

- reason: demand and supply (or: quantities; or: market shares) (1)
of country are too small (1)
to have an impact (1)
on international prices (1)

b) For a small economy, the following diagram shows the autarky equilibrium in point A. The open-economy equilibrium is represented in points D and R.



b_1 Which good does the country export? Please explain your answer by referring to points A, D, R in the graph. [3.5 points]

Solution:

- good 2 (1)

- production in R exceeds consumption in D
(0.5) (0.5) (0.5) (0.5) (0.5)

b_2 Why does the country export the good mentioned in b_1 ? Please explain the country's export decision by referring to the price ratio (p_2/p_1). [6 points]

Solution:

- compared to autarky, p_2/p_1 has increased. (2)

- incentive for industry 2 to produce more (2)

- incentive for consumers to consume less of good 2 (2)

(or: to increase C_2 less than C_1)

c) Suppose the price of the <u>imported</u> good increases in the world market. Would that mean that the national budget line gets steeper or a flatter? Please explain. [5 points]

Solution:

flatter (1)

slope is determined by p_2/p_1 (2)

price of import good given by p_1 (1)

increase of p_1 reduces price ratio and thus slope (1)

Problem 3: Exchange Rates and Interest Rates

The forward exchange rate of the euro in terms of the US dollar is $e^F = 1.20$ [$/€]. A major commercial bank has made public a model that it uses to forecast future spot exchange rates. This model forecasts the spot rate in one year to be 1.10 [$/€]. Suppose that the market participants believe that this model is quite good, and they all start using it.

a) What would happen to the forward exchange rate? Please explain. (Hint: use the expectations theory of the forward rate.) [6 points]

Solution:

Speculation will drive e^F down to $e^e = 1.10$:

euro is “too expensive” in the forward market (or $e^F > e^e$) (2)

→ market participants will sell euro in forward market (2)

→ e^F will fall (or $e^F = 1.10$) (2)

b) Given the new value of e^F, what would happen to the current spot exchange rate (e) and to the one-year interest rates of the dollar ($i_\$$) and of the euro (i)? Please explain by using the covered interest rate parity; assume that it holds before the bank publishes its forecast. [13 points]

Solution:

after fall of e^F, parity does not hold any more

$$\text{instead: } e^F < e \cdot \frac{1 + i_\$}{1 + i} \quad \text{or: } \frac{e^F}{e} \cdot (1 + i) < 1 + i_\$ \quad (4)$$

reaction of market participants:

- invest in dollar market → $i_\$$ falls
  (2) (1)

- borrow in euro area → i rises
  (2) (1)

- to convert euro funds borrowed to dollars:

  sell euro in spot market against dollars → e falls
  (2) (1)

Problem 4: Nominal and Real Exchange Rates

a) For April 2021, the European Central Bank (ECB) published the following reference rate between the euro and the British pound (monthly average, rounded): 0.87.

a_1 Is that the direct rate of the British pound or its indirect rate? [1 point]

Solution: indirect (1)

a_2 Please indicate the dimension of the rate by using the currency symbols of the euro (€) and the pound (£). [1 point]

Solution: [£ / €] (1)

a_3 Please interpret the value (0.87) of that number. [2 points]

Solution: for one euro, you had to pay 0.87 pounds
(1) (1)

or: for one euro, you were payed 0.87 pounds

or: the price of one euro was 0.87 pounds

b) For April 2021, the ECB published an index of the nominal exchange rate of the British pound against the euro of 125.00 (first quarter of 1999 = 100). Please carefully interpret that number. [3 points]

Solution: the euro has appreciated by 25 % since 1st quarter 1999
(1) (1) (0.5) (0.5)

or: euro was 25 % more expensive in terms of the pound than in 1st q 1999

or: pound has depreciated by 20% since 1st quarter 1999

c) Suppose that the index of the real exchange rate between the pound and the euro calculated by the ECB was 0.90 in April 2021 (first quarter of 1999 = 100).

c_1 What is the methodological difference between the nominal and the real exchange rate? [3 points]

Solution:

real rate expresses an exchange rate between baskets of goods (2)

while nominal rate expresses an exchange rate in terms of monies (1)

c_2 How can we explain the fact that the nominal rate has increased from 100 to 125 while the real rate has fallen from 100 to 0.90? [2.5 points]

Solution: higher inflation in Britain than in euro area
(0.5) (1) (0.5) (0.5)

Problem 5: Income and Trade Balance

Consider the following equations:

(A) $Y = \bar{C} + c \cdot Y + \bar{I} + EX(Y^f) - IM(Y)$

(B) $Y^f = \bar{C}^f + c^f \cdot Y^f + \bar{I}^f + EX^f(Y) - IM^f(Y^f)$

(C) $TB = EX(Y^f) - IM(Y)$

a) Is this a model of a small economy? Please explain why or why not. [4 points]

Solution: no, because foreign exports depend on Home’s income
(1) (0.5) (0.5) (1) (0.5) (0.5)

b) In the domestic country, autonomous consumption ($\bar{C}$) falls. Using the following arrow scheme, please illustrate the impact of that fall in both countries. [7 points]

Step	Home	Foreign
1	fall of $\bar{C}$ ↓	
2		
3		
4		
5		
6		

Solution:

Step	Home		Foreign
1	fall of $\overline{C}$		
	↓		
2	fall of Y (1)		
	↓		
3	fall of IM (1)	→	fall of EX^f (1)
			↓
4			fall of Y^f (1)
			↓
5	fall of EX (1)	←	fall of IM^f (1)
	↓		
6	fall of Y (1)		

Problem 6: Relevance of International Economic Relations for Macroeconomic Aggregates

The following equation defines national wealth (W) as the sum of real capital (K) and net foreign assets (NA^f), where the latter is given by the difference between foreign assets (A^f) and foreign liabilities (L^f):

$$W = K + A^f - L^f$$

Consider the economy of Opulenza in the year 2015:

- Saving was 100 while net investment in real capital was 300. There were capital gains on the existing stock of real capital in the amount of 50.

- Domestic residents purchased foreign assets in the amount of 70; there were capital losses on foreign assets in the amount of 5.

- Domestic residents have taken foreign credit in the amount of 250. (No capital gains or losses on foreign liabilities.)

- The domestic economy has benefited from net capital transfers in the amount of 20.

a) Please calculate the balance on current account (CA): [3 points]

Solution:

$CA = S - I$ (or: $= 100 - 300$) $= -200$
(1) (1) (1)

b) What was the balance on financial account (FA)? Please show your calculation. [3 points]

Solution: $CA + FA + KA = 0 \rightarrow FA = -KA - CA = -20 + 200 = 180$
(2) (1)

c) Change in external wealth (i. e. net foreign assets).

c_1 What was the change in external wealth (net foreign assets) due to transactions? Please show your calculation. [1.5 points]

Solution: $\Delta^{trans} NA^f = \Delta^{trans} A^f - \Delta^{trans} L^f$ (or: $= 70 - 250$)
(0.5) (0.5)

$= -180$ (0.5)

c_2 What was the change in external wealth due to capital gains and losses? [1.5 points]

Solution: $\Delta^{val} NA^f = \underset{(0.5)}{\Delta^{val} A^f} - \underset{(0.5)}{\Delta^{val} L^f}$ (or: = - 5 - 0)

= - 5 (0.5)

d) Please calculate the change in total wealth (i. e. the change in national wealth). [5 points]

Solution: $\Delta W = \underset{(1)}{\Delta^{trans} K} + \underset{(1)}{\Delta^{val} K} + \underset{(1)}{\Delta^{trans} NA^f} + \underset{(1)}{\Delta^{val} NA^f}$

(or: 300 + 50 - 180 - 5)

= 165 (1)