

Universität Siegen

Fakultät III
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Exam "International Macroeconomics"
Winter Semester 2018-19
(2nd Exam Period)

Solution

Available time: 60 minutes

For your attention:

1. The exam is made up of 9 pages (including this cover page). Please check and see if the exam you are holding is **complete**.
2. For your answers, use the designated spaces. Should these not suffice, use the backside of the pages. Please do not use a **pencil**.
3. Additional materials you may use for the exam: a non-programmable calculator. (Smart phones and mobile **phones** are **not** allowed!)
4. 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	Sum	Mark
Points achievable	22	18.5	19.5	60	
Points achieved					

Problem 1: International Economic Relations: Stocks and Flows

- a) We look at net foreign wealth (NA^f). Which economic variables explain its change between $t=0$ and $t=1$? You may answer in words or in symbols. [6 points]

$$\Delta NA_1^f =$$

Solution:

$$\Delta NA_1^f = \underset{(2)}{CA_1} + \underset{(2)}{KA_1} + \underset{(1)}{\Delta_1^{\text{val}}} \underset{(1)}{NA_0^f} \quad (\text{instead of } CA + KA, \text{ students may use NL})$$

or: balance on current account
(0.5) (1.5)
balance on capital account
(0.5) (1.5)
valuation effects (or: capital gains/losses)
(1) (1)

- b) The following table documents how the balance of payments of the euro area – i. e. of all countries who have adopted the Euro – has evolved from 2011 through 2013. All numbers are in billions of Euros.

	2011	2012	2013
Current Account (credits – debits)			
Goods	36.7	134.3	207.4
Services	45.6	55.4	67.0
Primary Income	50.0	62.9	45.2
Secondary Income	-124.9	-132.5	-141.5
Balance	7.2	119.9	178.1
Capital Account Balance	15.0	11.9	22.9
Financial Account (net increase of assets – net increase of liabilities)			
Direct Investment	108.5	6.5	-13.7
Portfolio Investment	-318.2	-40.1	-11.1
Financial Derivatives and ESOs	3.8	33.8	32.7
Other Investment	85.5	208.2	369.8
Reserve Assets	9.7	15.7	4.7
Balance	-110.8	224.1	409.9
Net Errors and Omissions	-133.0	92.4	208.8

For which types of securities did Euro area liabilities increase more than assets in 2013? [3 points]

Solution: direct investment, portfolio investment
(1.5) (1.5)

c) We want to analyse the position "net errors and omissions" for the year 2013: its value then was 208.8.

c₁ How is that value calculated from the other values of 2013? (You may answer this question in words or by a numerical calculation.) [4 points]

Solution:

- current account balance + capital account balance should be equal to the balance on financial account:

$$178.1 + 22.9 \stackrel{?}{=} 409.9$$

- however, there is a gap of $409.9 - 178.1 - 22.9 = 208.9$
(1) (1) (1) (1)

or: "errors and omissions" is calculated as difference between financial account balance on the one hand and sum of current account and capital account balances on the other hand

c₂ The "errors and omissions" is due to transactions that were not recorded. Please explain if, in 2013, the sum of those missing transactions represents net inflows of money or net outflows. [9 points]

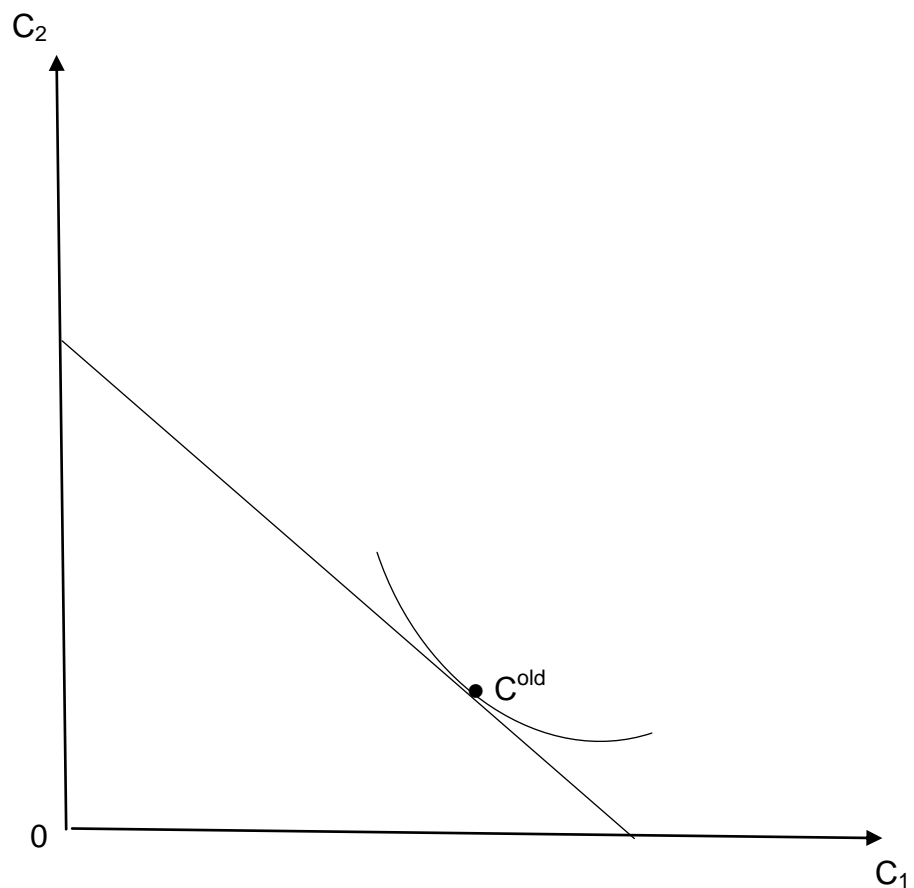
Solution:

- surpluses of current account (178.1) and of capital account (22.9) represent net inflows (3)
- surplus of financial account represents net outflow (409.9) (3)
- as outflows from financial account exceed inflows from other accounts, there are inflows missing (3)
- conclusion: "errors and omissions" represent net inflows

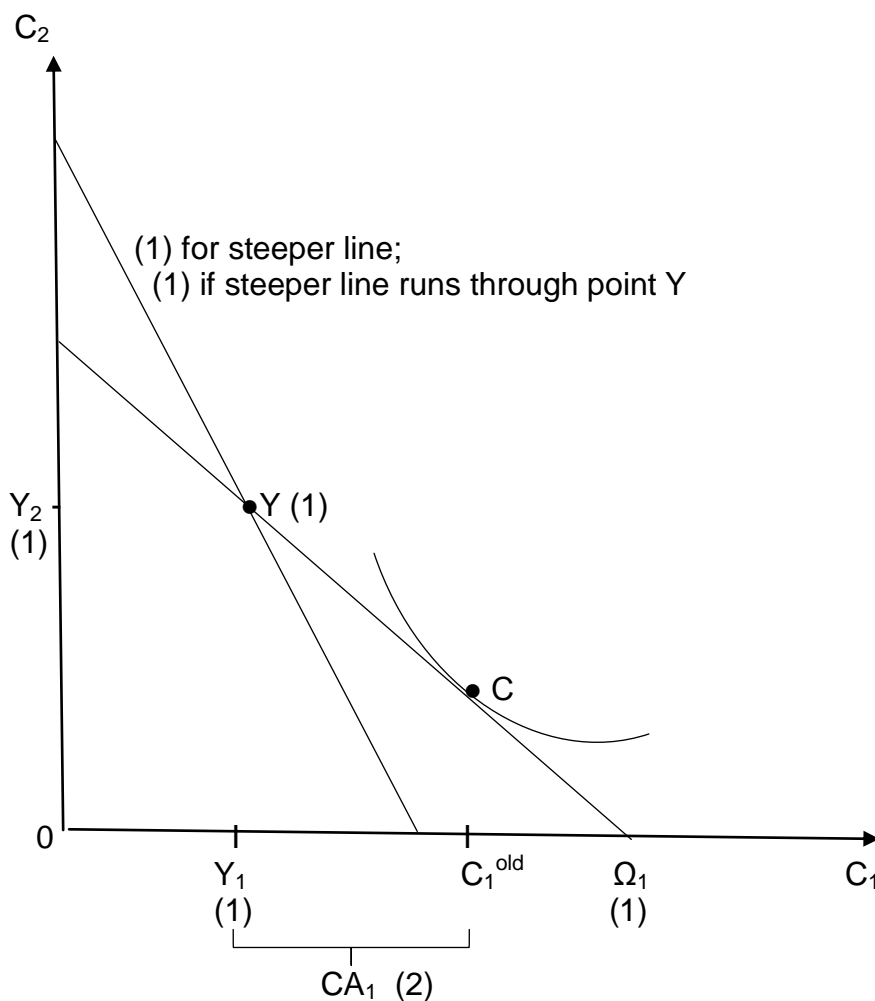
Problem 2: Small Open Economy with Exogenous Income

We consider a small open economy with exogenous incomes (Y_1, Y_2). The representative consumer (RC) has a two-period time horizon. The country has a current account deficit in the first period ($CA_1 < 0$).

a) In the following graph, point C indicates the initial consumption point. Please denote the endowment point as Y and also indicate the underlying incomes (Y_1, Y_2). In addition, please indicate the current account balance of period 1 (CA_1), and the present value of lifetime resources ("wealth" Ω_1). [6 points]



Solution:



b) In the world capital market, the real rate of interest (r) increases.

b₁ In the above graph, please draw a new budget line for that higher rate. [2 points]

Solution: see graph above

b₂ Please indicate the changes of the following variables (falls, rises, constant, unclear). [5.5 points]

C_1 :

C_2 :

CA_1 :

Ω_1 :

Solution:

C_1 : falls (1.5)

C_2 : unclear (1.5)

CA_1 : increases (1.5)

Ω_1 : falls (1)

b₃ How does lifetime utility (U) change? Please explain.

[5 points]

Solution:

U falls because RC is a debtor in the first period:

(1) (2)

higher r implies larger payment to Foreign in the second period

(1) (1)

Problem 3:

Consider an economy that has two companies ($j = 1, 2$) with a two-period time horizon ($t = 1, 2$). Both companies use the same technologies as represented by the functional form of the following production function:

$$(7.20) \quad Y_t^j = A_t \cdot F(K_t^j, L_t^j)$$

a) For (7.20), we assume constant returns to scale.

a₁ What does this assumption mean?

[3 points]

Solution: multiplication of all inputs by a non-negative factor x

(0.5) (0.5) (0.5)

implies multiplication of output by x

(0.5) (0.5) (0.5)

a₂ What does it imply for the marginal productivities of the production function?
[1 point]

Solution: depend on the factor ratios (or: on K/L) (1)

b) Both firms face the same interest rate (r) as well as the same period wage rates (w_t). They maximize the present value of current and future dividends. The maximization procedure results in a set of equations some of which are shown here:

$$(7.29a) \quad A_1 \cdot F_L \left(\frac{K_1^1}{L_1^1}, 1 \right) = w_1$$

$$(7.29b) \quad A_1 \cdot F_L \left(\frac{K_1^2}{L_1^2}, 1 \right) = w_1$$

$$(7.31) \quad A_2 \cdot F_K \left(\frac{K_1^2}{L_1^2}, 1 \right) - \delta = r$$

b₁ Please interpret the following equations: [4 points]

(7.29a):

(7.31):

Solution:

(7.29a): condition for optimal labor input (or: demand) of company 1 in period 1
(1) (1)

(or: marginal labor productivity of company 1 in period 1 must equal wage rate)

(7.31): condition for optimal capital input of company 1 in period 2

$$(1) \quad (1)$$

(or: marginal capital productivity of company 1 in period 2 must equal interest rate)

b₃ What is implied by (7.29a) together with (7.29b)? You may answer this question verbally or using equations. [4 points]

Solution: (the following can also be done in equations)

- set both equations equal (1)
- remember that A_1 and F_L are the same for both companies (1)
- thus: optimal capital intensity of labor is the same for both firms (2)

c) The autarky equilibrium of the economy is moreover described by the following equations:

$$(7.32) \quad L_1^1 + L_1^2 = L_1$$

$$(7.34) \quad \frac{K_1^1}{L_1^1} = \frac{K_1}{L_1}$$

$$(7.35) \quad K_1^1 + K_1^2 = K_1$$

Please interpret those equations.

[7.5 points]

(7.32):

(7.34):

(7.35):

Solution:

(7.32): equilibrium of labor market in period 1
(1) (1) (0.5)

(7.34): optimal capital intensity of labor of firm 1 equals ratio of national factor supplies
(0.5) (1) (0.5) (1)

(7.35): allocation of national supply of capital between sectors (firms)
(1) (0.5) (0.5)

(or: equilibrium of capital market of period 1)