

# Universität Siegen

## Fakultät III – Wirtschaftswissenschaften Univ.-Prof. Dr. Jan Franke-Viebach

Exam "Aggregate Economic Accounting Systems"  
Winter Semester 2019-20  
(2<sup>nd</sup> Exam Period)

### Solution

Available time: 60 minutes

#### For your attention:

1. The exam is made up of 8 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	4	5	6	7	Sum	Mark
Points achievable	10.5	18	12	19.5	9	10.5	10.5	60	
Points achieved									

**Problem 1: Households' Final Consumption Expenditure**

Households' final consumption expenditure is the sum of four elements:

- (1) Purchases of goods and services
- (2) Imputed expenditures
- (3) ...
- (4) ...

a) Please name the elements (3) and (4). [2.5 points]

**Solution:**

- Partial payments for goods and services provided by general government  
(0.5)                      (0.5)    (0.5)
- consumption made outside the home territory  
(0.5)                      (0.5)

b) We take a closer look at item (2): imputed expenditures. Please name two examples for this category and briefly explain one of them. [8 points]

**Solution:**

- owner-occupiers' imputed rents: (2)  
  - people living in dwellings they own (2)
  - are assumed to be selling housing services to themselves (2)
- own-account consumption of goods: (2)  
  - consumption of goods produced by people for themselves (4)
- income in kind: (2)  
  - goods and services employees receive as part of their wages (4)
- Financial intermediation services indirectly measured (or: FISIM): (2)  
  - bank services received free of charge (or: at prices below production cost) (4)

**ATTENTION: maximum 8 points**

**Problem 2: Essential Macroeconomic Indicators**

- a) An indicator of aggregate economic production should fulfil several requirements. Please name two of these. [4 points]

**Solution:**

- avoid double counting (2)
- measurable in practice (2)
- independent of non-economic factors (2)
- independent of the organisation of firms (2)

**ATTENTION: maximum of 4 points!!**

- b) Gross domestic product (GDP) versus gross national income (GNI)
- b<sub>1</sub> What is the arithmetic relation between GDP and GNI? Please complete the following equation. [5 points]

$$\text{GNI} = \text{GDP}$$

**Solution:**

$$\text{GNI} = \text{GDP} + \text{income received by residents from abroad}$$

(0.5)                      (1)                      (1)

- income created in the domestic country but paid to non-residents

(0.5)                      (1)                      (1)

- b<sub>2</sub> A company creates a value added of 200 in Germany. Part of it (50) is paid as dividend in the amount of 50 to a Russian investor. Please indicate how these transactions increase, decrease or leave unaffected the GDPs and GNIs of Germany and Russia. Please also indicate the amounts of the corresponding changes. [4 points]

GDP Germany :

GNI Germany :

GDP Russia :

GNI Russia :

**Solution:**

GDP Germany : increased by 200  
(0.5) (0.5)

GNI Germany : increased by 150  
(0.5) (0.5)

GDP Russia : unaffected (1)

GNI Russia : increased by 50  
(0.5) (0.5)

b<sub>3</sub> What is the conceptual difference between GDP and GNI, i. e. what is the difference in approach? [5 points]

**Solution:**

- GDP is based on the place of production (or: place of creation of income)  
(1) (1)
- GNI is based on the residence of the receiver of income  
(1) (1) (1)

**Problem 3: Calculation of Volume at Various Price Levels**

Let us take two products, A and B, with the following series of quantities and prices in each of the two periods:

	Period 1		Period 2	
	Quantity	Price	Quantity	Price
A	20	5	40	3
B	150	0.2	145	0.25

Please calculate, for each period, the amount at current prices, the volume at constant period 1 prices, the volume at constant period 2 prices and the growth rates for period 2. Fill out the following table: [12 points]

	Period 1	Period 2
Amount at current prices		
Growth rate	-	
Volume at period 1 prices		
Growth rate	-	
Volume at period 2 prices		
Growth rate	-	

**Answer:**

	Period 1	Period 2
Amount at current prices	130 (1.5)	156.3 (1.5)
Growth rate	-	20.2 (1)
Volume at period 1 prices	130 (1.5)	229 (1.5)
Growth rate	-	76.2 (1)
Volume at period 2 prices	97.5 (1.5)	156.3 (1.5)
Growth rate	-	60.3 (1)

**Problem 4: Current Accounts**

The following is a list of transactions made by an advertising firm. Place these various transactions correctly in the structure of accounts shown further below. (You do not need to calculate the balances of the accounts!) [19.5 points]

Revenue

1. Sales to customers 4500
2. Interest on bank account 30
3. Payment of claim for fire damage 10

Expenditure

4. Paper, ink and other supply used during the year 380
5. Rent paid for additional office space 150
6. Cost of electricity and telephones 60
7. CEO's remuneration 300
8. Gross staff wages and salaries 1500
9. Employers' social security contributions on staff wages and salaries 800
10. Dividend paid to shareholders 420
11. Profits tax payable 180
12. Purchase of computers and software 240
13. Interest on the bank loan for the purchase of computers 40
14. Payment to the security company for the protection of buildings 70
15. Property tax on office buildings 20

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<b>Production account</b>	
Uses	Resources
P2. Intermediate consumption	P1. Output
	P11. Market
	P12 For own final uses
<b>Generation of income account</b>	
Uses	Resources
D1. Compensation of employees:	B1. Gross value added
D11. Wages and salaries	
D121. Employers' actual social contributions	
D122. Employers' imputed social contributions	
D29. Other taxes on production	
D39. Other subsidies on production	
B2. Gross operating surplus	
<b>Allocation of primary income account</b>	
Uses	Resources
D4. Property income:	B2. Gross operating surplus
D41. Interest	D4. Property income:
D421. Dividends	D41. Interest
D43. Reinvested earnings on direct foreign investment	D421. Dividends
D45. Rents on land and sub-soil assets	D43. Reinvested earnings on direct foreign investment
B5. Balance of primary incomes	D45. Rents on land and sub-soil assets
<b>Secondary distribution of income account</b>	
Uses	Resources
D51. Taxes on income	B5. Balance of gross primary incomes
	D61. Social contributions:
D622. Private funded social benefits	D611 Actual social contributions
D71. Net non-life insurance premiums	D612. Imputed social contributions
D75. Miscellaneous current transfers	D72. Non-life insurance claims
B6. Gross disposable income	D75. Other current transfers 12
<b>Use of disposable income account</b>	
Uses	Resources
B8. Gross saving	B6. Gross disposable income

Exam WS 2019-20: "Aggregate Economic Accounting Systems" (2<sup>nd</sup> Exam Period)**Production account**

Uses		Resources	
[4] (1.5) P2. Intermediate consumption	380	P1. Output:	
[5] (1.5)	150	P11. Market	4 500 (1.5)[1]
[6] (1.5)	60	P12. For own final use	
[14] (1.5)	70		
B1. Gross value added	3 840		

**Generation of income account**

Uses		Resources	
D1. Compensation of employees:		B1. Gross value added	3 840
[7], [8] (1.5) D11. Wages and salaries	1 800		
[9] (1.5) D121. Employers' actual social contributions	800		
[15] (1.5) D122. Employers' imputed social contributions			
D29. Other taxes on production	20		
D39. Other subsidies on production			
B2. Gross operating surplus	1 220		

**Allocation of primary income account**

Uses		Resources	
		B2. Gross operating surplus	1 220
[13] (1.5) D4. Property income:		D4. Property income:	
D41. Interest	40	D41. Interest	30 (1.5)[2]
[10] (1.5) D421. Dividends	420	D421. Dividends	
D43. Reinvested earnings on direct foreign investment		D43. Reinvested earnings on direct foreign investment	
D45. Rent on land and sub-soil assets		D45. Rent on land and sub-soil assets	
B5. Balance of gross primary incomes	790		

**Secondary distribution of income account**

Uses		Resources	
[11] (1.5) D51. Taxes on income	180	B5. Balance of gross primary incomes	790
D622. Private funded social benefits		D61. Social contributions:	
D71. Net non-life insurance premiums		D611. Actual social contributions	
D75. Miscellaneous current transfers		D612. Imputed social contributions	
B6. Gross disposable income	620	D72. Non-life insurance claims	10 (1.5)[3]
		D75. Miscellaneous current transfers	

**Use of disposable income account**

Uses		Resources	
B8. Gross saving	620	B6. Gross disposable income	620



**Problem 5: Contributions to Growth**


We consider a closed economy:  $GDP_t = C_t + I_t$

Period	t = 1	t = 2
Consumption ( $C_t$ )	400	440
GCF ( $I_t$ )	100	105
GDP	500	545


- a) Please calculate the growth of GDP between period 1 and period 2 from the contributions to growth of  $C_t$  and  $I_t$ . [6.5 points]

**Solution:**

$$C_t : \frac{\overset{(0.5)}{440}}{\underset{(0.5)}{400}} \cdot \frac{\overset{(0.05)}{400}}{\underset{(0.05)}{500}} = \mathbf{0.10} \cdot \mathbf{0.80} = \mathbf{0.08}$$

Multiply!! 


$$I_t : \frac{\overset{(0.5)}{105}}{\underset{(0.5)}{100}} \cdot \frac{\overset{(0.05)}{100}}{\underset{(0.05)}{500}} = \mathbf{0.05} \cdot \mathbf{0.20} = \mathbf{0.10}$$

Add!! 

$$GDP_t : \underset{(0.5)}{0.08} + \underset{(0.5)}{0.10} = \underset{(0.5)}{0.09}$$

- b) Check your result from a) by comparing it with the growth rate of GDP directly calculated from GDP values of periods 1 and 2. [2.5 points]

**Solution:**  $545 / 500 - 1 = 0.09 \rightarrow$  Same result!

Divide!! 

**Problem 6: International Comparisons**

The following table shows data for Japan and the USA. It is designed to compare the welfare of the two countries over time.

GDP per head in volume, at 2005 PPPs, USA = 100											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Japan	70.5	70.7	70.2	70.0	69.6	68.8	68.8	69.6	69.7	68.4	70.4
USA	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a) Why does the table use volume data, not data at current prices? [3 points]

**Solution:** data at current prices include price changes;

(1) (1)

however, these do not indicate welfare changes (1)

or: only volume changes indicate welfare changes

b) In the headline of the table, we read "USA = 100".

b<sub>1</sub> What does that indicate?

[2 points]

**Solution:** all data are relative to the data of the USA

(1) (1)

or: are expressed as percentages of the US data

b<sub>2</sub> Why do we use "USA = 100"?

[5.5 points]

**Solution:** because we want to make directly visible

(0,5) (1)

differences in level compared to the USA and their changes

(1) (1) (1) (1)

**Problem 7: Calculation of Output : the Case of Insurance Companies**

The following are simplified data for an insurance company:

- Premiums received: 200
- Indemnities paid out on claims: 180
- Income from the investment of reserves: 30
- Purchases of consumables: 20
- Inventories at the start of the period 6; at the end of the period: 20

a) Calculate output, intermediate consumption and value added. [5.5 points]

**Solution:**

$$\text{Output} = 200 + 30 - 180 = 50$$

(0.5)    (0.5)    (0.5)    (0.5)

$$\text{Intermediate consumption} = 20 - [20 - 6] = 6$$

(0.5)    (0.5) (0.5)    (0.5)

$$\text{Value added} = 50 - 6 = 44$$

(0.5)    (0.5)    (0.5)

b) Now suppose that an exceptional claim raises the amount of indemnity payments for the same period to 300.

b<sub>1</sub> Recalculate the output using the same procedure as in a). [2 points]

$$\text{Solution: } 200 + 30 - 300 = -70$$

(1)    (1)

b<sub>2</sub> Please comment on the result in b<sub>1</sub>. [3 points]

**Solution:** result not meaningful (1)

reason: company has provided insurance services (or: fulfilled its role)

(1)    (1)