

THE ECONOMY AS A SYSTEM

Copyright Mark Van Couwenberghe (2026)

OVERVIEW

THE ECONOMY AS A SYSTEM

- CH1: CIRCULAR FLOW DIAGRAM: RELATIONS BETWEEN ECONOMIC ACTORS
- CH2: CALCULATION GROSS DOMESTIC PRODUCT (GDP): PRODUCTION, INCOME AND EXPENDITURE APPROACH

CHAPTER 2 (LPD 2): GROSS DOMESTIC PRODUCT (GDP) CALCULATION: PRODUCTION, INCOME AND EXPENDITURE APPROACH

1. BASICS: WHAT IS GROSS DOMESTIC PRODUCT (GDP)?
2. DIFFERENCE NOMINAL AND REAL GDP
3. DIFFERENCE GDP AND GNP
4. IMPORTANCE GDP PER CAPITA
5. GDP CALCULATION: PRODUCTION, INCOME AND EXPENDITURE APPROACH

1. BASICS: WHAT IS GROSS DOMESTIC PRODUCT (GDP)?

1.1 CASE-STUDY

Read the following article:

DUTCH ECONOMY WORTH MORE THAN €1 TRILLION IN 2023

Gross domestic product (GDP) reached €1 033 billion in 2023, not adjusted for price changes. This makes the Dutch economy larger than €1 trillion for the first time.
GDP growth has been relatively strong in recent years. This is partly due to the recovery after corona, but also to high inflation in recent years. CBS reports this in the article 'The Dutch economy in 2023'. In 1995, GDP was still 330 billion euro. In 2002, GDP passed the 500 billion euro mark. Since 1995, only in 2009 and 2020 did the value of the economy decline. This was due to the credit crisis and the corona crisis.

CBS = Centraal Bureau voor de Statistiek

The GDP basically represents “the value of an economy”.

What is a trillion? .....

What does “not adjusted for price changes” mean?

.....

How do you explain that GDP grows due to inflation?

.....

.....

.....



1.2 DEFINITION

The Gross Domestic Product (GDP) is the total value of all final goods and service produced within an economy during 1 year.

1 TOTAL **VALUE**

2 OF ALL **FINAL GOODS AND SERVICES**

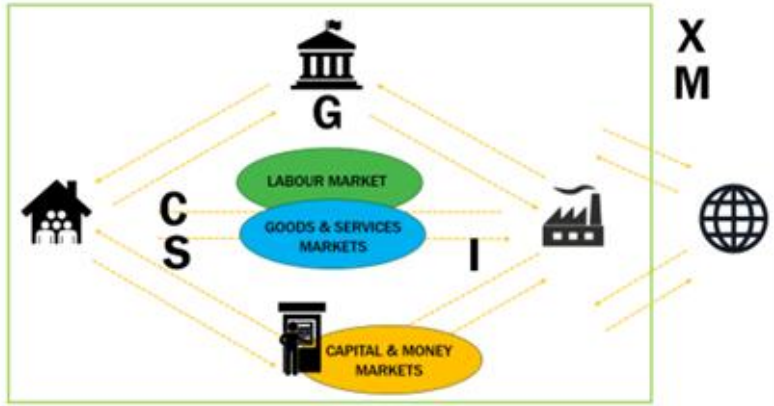
3 **PRODUCED**

4 **WITHIN AN ECONOMY**

5 DURING **1 YEAR**



1 VALUE



We measure by means of monetary flows



2 FINAL GOODS AND SERVICES



Only the value of final goods is measured, this to avoid double counting

Production phase	Added value	Value
Wheat growing	0,10	0 + 0,10 = 0,10
Making flour in flour mill	0,30	0,10 + 0,30 = 0,40
Baking bread	1,50	0,40 + 1,50 = 1,90
		1,90 = FINAL VALUE

The final value of a good or service is the sum of all added values in the production process

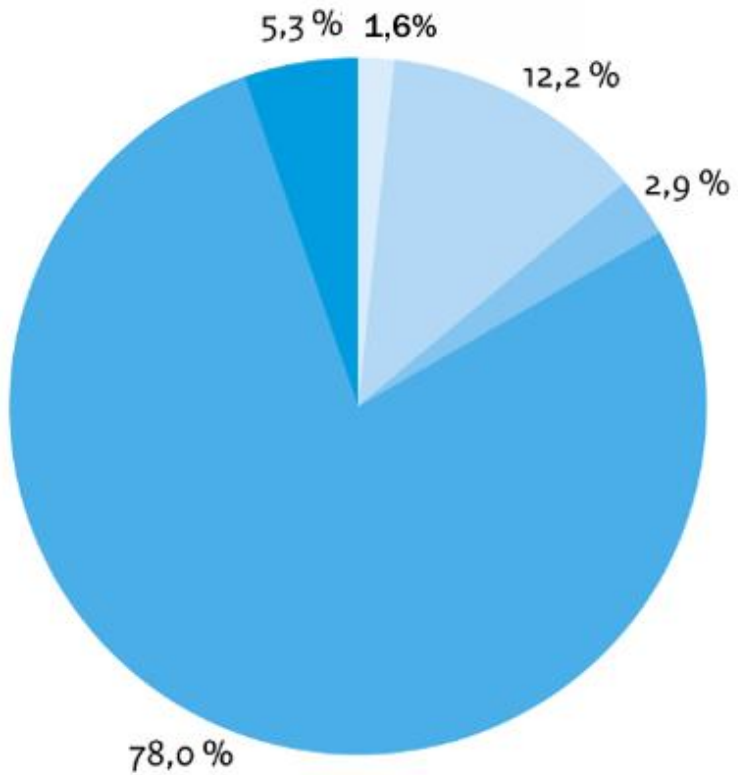
1,90 = 0,10 + 0,30 + 1,50

The production of added value can only happen through the use of factors of production (nature, labour, capital, entrepreneurship); they are remunerated for with income.

The sum of all incomes of the factors of production = national income.

3 PRODUCED

Every sector in the economy contributes to GDP.



Example: Dutch economy

Land- en tuinbouw	*Agriculture and horticulture*
Industrie	*Industry*
Energievoorziening	*Energy*
Handel, diensten en overheid	*Trade, services and government*
Bouw	*Construction*

1,6% Primary: agriculture and horticulture

20,4% Secundary: industry, construction and energy

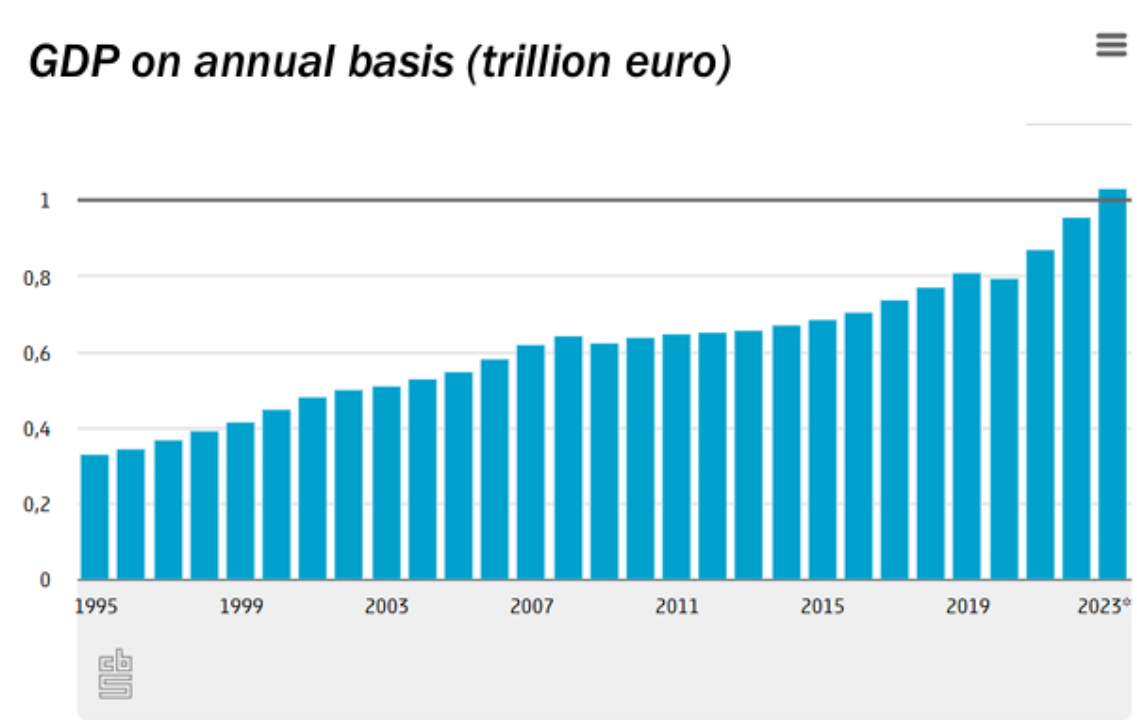
78% Tertiary & quartary: trade, services and government

4 WITHIN AN ECONOMY

Literally: within the boundaries/borders of an economy

(see also GNP)

5 1 YEAR



Example: Dutch economy

Standard measurement : on an annual basis

Also measurement at quarterly level (cyclical activity)

2. DIFFERENCE NOMINAL AND REAL GDP

Imagine an economy in which only 1 product is produced.

	NUMBER OF PRODUCTS (VOLUME IN PIECES)	PRICE PER PRODUCT (€)	NOMINAL GDP (€)	REAL GDP (€)
YEAR 1	100	1	100	100
YEAR 2 (inflation 10%)	100	1,1	110	100

It looks as if the economy has grown by 10% in 1 year, but that is purely a result of price increases. So there is no real growth.

Nominal GDP is not adjusted for price changes.
Real GDP is, however, adjusted for price changes. The calculation assumes a base or reference year (in this case, year 1).
To correctly calculate the evolution of an economy, we use real GDP.

The following calculation rules can be used to calculate nominal and real GDP:

	NOMINAL GDP	REAL GDP
YEAR 1 (base or reference year)	P1 * Q1	P1 * Q1
YEAR 2	P2 * Q2	P1 * Q2
etc	Px * Qx	P1 * Qx

The GDP deflator indicates the inflation level:

$$\frac{\text{NOMINAL GDP}}{\text{REAL GDP}} * 100$$

Example from previous slide: (110 / 100) * 100 = 110 = 10% inflation (deflator in base or reference year = 100)

EXERCISE: COMPLETE THE FOLLOWING TABLE

(2019 is reference year)

YEAR	VOLUME (billions of units)	PRICE (€ per unit)	NOMINAL GDP (bio €)	REAL GDP (bio €)	ECONOMIC GROWTH (%)
2019	500,40		625,50		
2020	512,91	1,35			
2021		1,43			3,60
2022	540,12		810,18		
2023		2,00			-1,20

3. DIFFERENCE GDP AND GNP

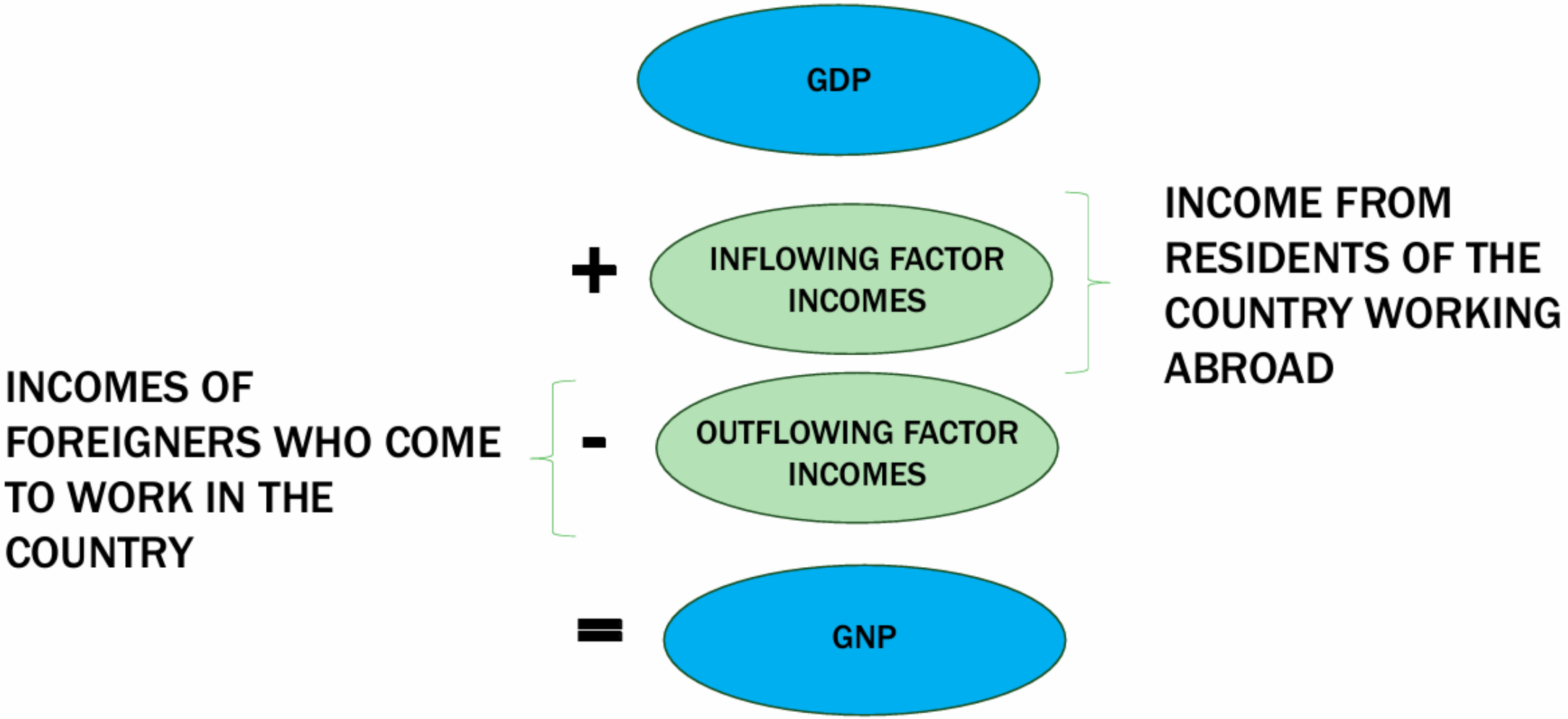
Look at the Dutch economy and its relationship with the Belgian economy: what does and does not belong to Dutch GDP?

DOES:
Production of goods and services by Belgian workers **on Dutch soil**

DOES NOT:
Production of goods and services by **Dutch nationals** on Belgian soil



Gross National Product (GNP) is the total value of all final goods and services produced during a year by the residents of an economy.



There are 679,819 Filipinos living in the United Arab Emirates (UAE), including 450,000 in Dubai, where they make up 21.3 per cent of the population.

In 2023, Filipinos in the UAE sent more than US$500 million in cash back to the Philippines.

Labour supplied by Filipinos in the UAE belongs to

- the **GDP of the UAE**
- the **GNP of the Philippines**



4. IMPORTANCE GDP PER CAPITA

We compare the Dutch and Chinese economies.



GDP: $1 trillion



GDP: $18 trillion

The Chinese economy is 18x larger than the Dutch (in GDP).
So is a Chinese person also 18x richer than a Dutch person?

Answer: NO





number of inhabitants: 18 million

number of inhabitants: 1,4 billion

China's ‘wealth’ must be distributed to a many times larger number of inhabitants.

Therefore, GDP per capita is the correct measure for comparing wealth between countries.

GDP per capita China: $12.857 < GDP per capita The Netherlands: $55.555

5. GDP CALCULATION: PRODUCTION, INCOME AND EXPENDITURE APPROACH

Take the pharma sector as a starting point.



Pharmaceutical products are manufactured

PRODUCTION



Pharma employees get wage/salary for this

INCOME



And spend the income earned on consumption

EXPENDITURE

Gross domestic product can be calculated from three approaches:

° from the PRODUCTION approach

° from the INCOME approach

° from the approach of EXPENDITURE

The three approaches lead to the same result.

PRODUCTION APPROACH	=	INCOME APPROACH	=	EXPENDITURE APPROACH
GDP is sum of added values of goods and services produced		GDP is sum of all incomes distributed to factors of production		GDP is sum of all purchases of goods and services (domestic: C, I, G, M) (world market: X)

MICRONOMIA







MICRONOMIA

MICRONOMIA is a fictional economy consisting of three sectors of activity: tomato farms (primary sector), tomato sauce factories (secondary sector) and pizzerias (tertiary sector).

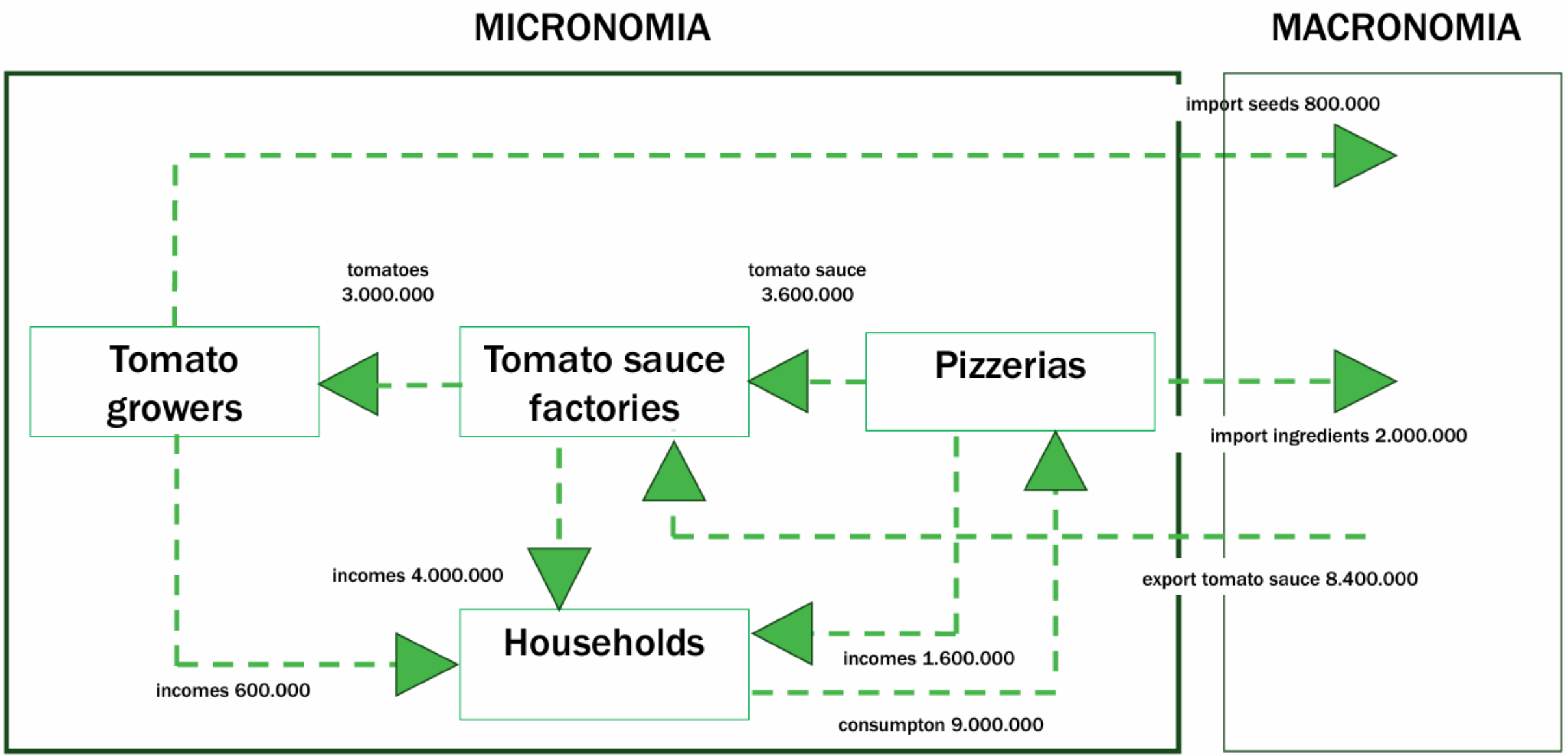
Tomato growers grow tomatoes and sell them to tomato sauce factories. Their total turnover is €3,000,000. The growers import plant seeds from neighbouring country MACRONOMIA for €800,000. They employ 50 workers. Each worker earns €12,000.

The tomato sauce factories sell their product to pizzerias and to MACRONOMIA. Their total turnover is €12,000,000. Of that, 70% is export. So the other 30% goes to the restaurants. 200 workers are working in the factories. Each worker earns €20,000.

Pizzerias import ingredients for making pizza from MACRONOMIA. Imports are €2,000,000. The inhabitants of MICRONOMIA are their customers. Total turnover of the restaurants is €9,000,000. The 100 employees in the pizzerias earn €16,000 each.

Let's calculate MICRONOMIA's GDP according to the three approaches.

But before starting with that: make a circular flow diagram (monetary flows!!!).


MICRONOMIA
MACRONOMIA
import seeds 800.000
tomatoes
3.000.000
tomato sauce
3.600.000
Tomato growers
Tomato sauce factories
Pizzerias
import ingredients 2.000.000
incomes 4.000.000
export tomato sauce 8.400.000
Households
incomes 1.600.000
incomes 600.000
consumpton 9.000.000

1. PRODUCTION APPROACH

SECTOR	TOMATO GROWERS	TOMATO SAUCE FACTORIES	PIZZERIAS
TURNOVER	3.000.000	12.000.000	9.000.000
PURCHASES	800.000	3.000.000	5.600.000
ADDED VALUE	2.200.000	9.000.000	3.400.000



ADDED VALUE = TURNOVER - PURCHASES

GDP = sum of added value =
2.200.000 + 9.000.000 + 3.400.000 = €14.600.000

2. INCOME APPROACH

SECTOR	TOMATO GROWERS	TOMATO SAUCE FACTORIES	PIZZERIAS
WAGES/SALARIES	600.000	4.000.000	1.600.000
PROFITS (°)	1.600.000	5.000.000	1.800.000
INCOMES	2.200.000	9.000.000	3.400.000

INCOMES = WAGES/SALARIES + PROFITS

GDP = sum of incomes =
2.200.000 + 9.000.000 + 3.400.000 = €14.600.000

(°) PROFITS = TURNOVER – PURCHASES - WAGES/SALARIES

3. EXPENDITURE APPROACH

SECTOR	TOMATO GROWERS	TOMATO SAUCE FACTORIES	PIZZERIAS
CONSUMPTION			9.000.000
EXPORT		8.400.000	
IMPORT	800.000		2.000.000

GDP = C + X - M

9.000.000 + 8.400.000 - 2.800.000 = €14.600.000