

Seminar 2. Main macroeconomic aggregates and official data sources

1. The main macroeconomic aggregates

- ✓ *Nominal GDP* (expressed in current prices) represents the market value of all final G&S produced in an economy during a given time, expressed in current prices.
- ✓ *Real GDP* (expressed in comparable prices) represents the value of all final G&S produced in an economy during a given time expressed in the prices of a certain base year. In other words, real GDP will measure changes in physical output in the economy between two distinct periods of time by evaluating the production of the two periods at the same prices.
- ✓ $GDP_{fp} = GDP_{mp} - T_{ind} + Sv$
- ✓ $GNP = GDP + \text{Net factor payments from abroad}$ (Gross National Product)
 where Net factor payments from abroad = Net income earned by domestic residents – Net income earned by foreign residents
- ✓ $NNP = GNP - \text{capital depreciaton}$ (Net National Product = $GNP - \text{capital depreciaton}$)
- ✓ $NDP = GDP - \text{capital depreciaton}$ (Net Domestic Product = $GDP - \text{capital depreciaton}$)
- ✓ $NI = GNP_{fp} - \text{capital depreciaton}$ (National Income = $GNP_{fp} - \text{capital depreciaton} = NNP_{fp}$)
- ✓ $BD = G - T + TR + Sv$ (recap from Seminar1: $S - I = BD + NX$)

The links between the main macroeconomic aggregates are described in the following figure.

GNPmp	Net factor payments from abroad	Net factor payments from abroad	Capital depreciation	Capital depreciation	Capital depreciation
	NX	GDPmp	NNPmp	$T_{ind} - Sv$	$T_{ind} - Sv$
	I			NI= NNPfp	Net factor payments from abroad
	G				Profits
	C				Wages
					Rents
		Interests			
				Freelancers' income	

2. Main official statistical data sources for the case of Romania

- [1] NIS : <http://statistici.insse.ro:8077/tempo-online/#!/pages/tables/insse-table>
- [2] Eurostat : <https://ec.europa.eu/eurostat/data/database>
- [3] Worldbank : <https://databank.worldbank.org/reports.aspx?source=world-development-indicators>
- [4] IMF: <https://www.imf.org/en/Data>
- [5] NBR: <https://www.bnr.ro/Seturi-de-date-628-Mobile.aspx>

3. Computation methods of GDP

There are three distinct approaches used to compute GDP, namely: the production approach, the expenditure approach and the income approach. The GDP calculation methodologies used by the NIS

are SEC 2010 for GDP values from 1996 and SEC 79 for the 1990-1998 data series. The value of GDP is expressed in both current and comparable prices.

❑ *The Production approach (value added)*

This method evaluates the aggregate production of goods and services for final consumption of firms within a country during one year. According to the NIS, GDP is equal to the sum of the gross value added of different institutional sectors or industries, plus indirect taxes and minus product subsidies (which are not broken down by sectors and industries).

It also represents the balance of the production account of the total economy.

$$GDP_{pp} = \Sigma GVA + T_{ind} - Sv$$

Table 1. GDP computation using production method

	Current prices, year 2019	Comparable prices, year 2019 (base year 2018)
	bil. lei	bil. lei
Production of goods and services	2009.1	1900.4
(-) Intermediate Consumption	1050.7	1008.5
= Gross Value Added	958.4	891.9
(+) Taxes on product	103.8	102.0
(-) Subsidies (Sv)	2.4	2.6
= GDP	1059.8	991.3

Source: Tempo Online, NIS

❑ *The Expenditure approach*

This method involves determining GDP by calculating the total volume of expenditures made by households and firms within a year. Basically, according to NIS, GDP is obtained by summing the actual final consumption, gross fixed capital formation and change in stocks, as well as the level of net exports.

$$GDP_{mp} = C + G + I + NX = FC + GFCF + \Delta S + X - IM$$

where:

FC = Final consumption (C+G) includes goods and services purchased by resident institutional units for the direct satisfaction of human needs, both individual (C) and collective (G).

GFCF = Gross fixed capital formation consists of acquisitions by resident producers, less disposals of fixed assets over a period of time, plus certain additions to the value of non-produced assets realized as a result of the productive activity of producers or institutional units. Fixed assets are active products used in production for more than one year.

ΔS = The change in inventories is measured by the value of inventories, less the value of inventories and possible current losses of inventories due to physical damage, accidental damage or theft. Inventories represent goods, other than fixed capital, held at a given time by production units.

X = Exports of goods and services consist of operations with goods and services (sales, exchange in kind and donations) from Romanian residents to non-residents.

IM = Imports of goods and services consist of transactions with goods and services (purchases, exchange in kind and donations) from non-residents to residents of Romania.

Table 2. GDP computation using expenditure method

	Current prices, year 2019	Comparable prices, year 2019 (base year 2018)
	bil. lei	bil. lei
(+) Final consumption	852.8	799.4
(+) Gross fixed capital formation	239.6	208.5
(+) Stock variation (inventories)	10.9	17.2
(+) Exports	427.7	415.1
(-) Imports	471.2	448.9
= GDP	1059.8	991.3

Source: Tempo Online, NIS

□ *The Income approach*

This method calculates the total income received by the population and companies in the country within a year.

$$NDP_{fp} = Wages + Net\ profits + Net\ interests + Rents + Freelancers' \ income$$

$$NDP_{mp} = NDP_{fp} + T_{ind} - Sv$$

$$GDP_{mp} = NDP_{mp} + Capital\ depreciation$$

According to the data provided by the NIS, another form of income summation is the following:

$$GDP_{mp} = Compensation\ of\ employees + T_{ind} + GOS - Sv$$

where:

GOS = The gross operating surplus is the balance of the operating account and represents what remains of the value added created in the production process after the remuneration of employees and the payment of taxes on production.

Table 3. GDP computation using income method

	Current prices, year 2019
	bil. lei
(+) Compensation of employees	405.1
(+) Other taxes on production	9.6
(-) Other subsidies on production	10.4
(+) Gross operating surplus addition Mixed income	554.1
(+) Taxes on product	103.8
(-) Subsidies on product	2.4
= GDP	1059.8

Source: Tempo Online, NIS

We notice that for the year 2019 the same GDP value of approx. 1060 billion lei expressed in current prices resulted through all the three computation methods.