The analysis of the quarterly evolution of the gross domestic product in 2019

Constantin ANGHELACHE
Bucharest University of Economic Studies, Romania
"Artifex" University of Bucharest, Romania
actincon@yahoo.com
Ștefan Virgil IACOB
"Artifex" University of Bucharest, Romania
stefaniacob79@yahoo.com
Dana Luiza GRIGORESCU
Bucharest University of Economic Studies, Romania
danaluiza2004@yahoo.com

Abstract. *Gross Domestic Product is the most complex indicator of the results of a country. According to the methodology of the national accounts system, it is calculated quarterly and annually. The quarterly calculation of the Gross Domestic Product plays an important role both in establishing the situation at one time of the national economy's outcome, but also in obtaining accurate information about how the national economy has evolved and how it will evolve in the future.*

The analysis of the Quarterly Gross Domestic Product in 2019 showed an increase compared to the same quarter of the previous year 2018, as compared to the previous quarter. It has been found that overall in the third quarter the activity is a bit slower, i.e. the results are weaker, this probably taking into account the seasonal character of some activities marked during the summer holidays and many others. The analysis of the evolution of the Quarterly Gross Domestic Product was made on the basis of raw data series, but also on the basis of seasonally adjusted data series according to the number of days worked. The results are somewhat close and show an increase of the Gross Domestic Product in the last three years, reaching the end of 2019 to register a provisional increase of the Gross Domestic Product by 4.1%, compared to December or 2018. The analysis also expanded on how resources and uses contributed to the formation and growth of the Gross Domestic Product in each quarter and then annually. Some components of the resources and uses that had a negative effect were highlighted during the analysis, by increasing the price index on the results obtained within the national economy.

The analysis reveals a particular model of interpretation and quarterly study, which needs to be carried out in order to identify the stage in which the evolution of the economic activity is and the effect that the measures taken by the authorities in the national development programs have.

Keywords: Quarterly GDP, resources, uses, price index, volume index, estimator.

JEL Classification: E01, E20.

Introduction

In this article of quarterly analysis of the evolution of the Gross Domestic Product of Romania, the authors started from simple to complex, trying to identify the results that were obtained quarter by quarter, in order to identify some influences that determine the growth, reduction or at least maintaining, stagnating at a certain level the results obtained.

The analysis was made on the basis of the raw data series and the seasonally adjusted data series according to the number of days worked, but also according to the evolution of the price index and the volumes realized, which alone give the value indicator of the participation of each aggregate in the formation and growth of the Internal Product. Gross, but in the end I also give the effect that each sector of activity (each resource or use) has in achieving the growth of the Gross Domestic Product quarterly.

The analysis also came down to some interpretations over longer periods of time, precisely to highlight how the quarterly evolution of the Gross Domestic Product played an important or more modest role in the results obtained by the national economy of Romania.

The article presents a series of complex data provided by the National Institute of Statistics, using and interpreting the respective data in correlation and in close interdependence with the objective that must always be kept in mind, namely that of maintaining macroeconomic macrostability.

There are graphical representations, as well as possibilities of analysis based on the increase in volumes or price indices, in certain fields of activity and in total. The analysis also compares the results obtained according to the evolution of the main indicators that characterize the structural evolution and on the whole of the national economy quarterly and then annually. In fact, the study ends with an analysis of how the Gross Domestic Product evolved according to resources and uses according to the volume and price indices, as well as the resources and uses they had, revealing a series of issues to consider in the respective analysis. Of course, the analysis can also be extended by using statistical-econometric models, but this implies the extension of the respective study much extended in this variant compared to the objective that the authors had.

Literature review

Anghel, Burea and Dumbravă (2018) addressed a number of issues regarding the use of GDP for comparative analysis. A similar theme is studied by Anghelache, Soare and Popovici (2015). Anghelache (2018) has carried out an extensive study regarding the evolution of GDP in the European Union as a whole, as well as at the level of the Member States. Bachman (2011), as well as Censolo and Colombo (2008) analyzed a number of elements regarding the structure and effect of public consumption on the evolution of the economy. Barro and Redlick (2011) were concerned with identifying the macroeconomic impact of public spending. Issues related to Nominal Gross Domestic Product are highlighted by Bhandari and Frankel (2015) and Garin, Lester, and Sims (2016). Chamberlin (2011) studied the correlation between GDP, real income and

economic welfare at a country level. Some aspects of the economic welfare are also studied by Fleurbaey (2009). Foerster and Choi (2016), as well as Kaplan and Violante (2014) analyzed the effect of applying measures to stimulate consumption growth in order to recover from the financial crisis. Guner, Ventura and Yi (2008) and Macchiarelli (2013) studied the effect of policies applied at the macroeconomic level. Jorgenson and Slesnick (2008) studied the relationship between consumption and labor, while Pistoresi and Rinaldi (2012) analyzed the correlation between exports, imports and economic growth. Woodford (2010) analyzed the effect of financial intermediation on the market evolution.

Some methodological details

The Gross Domestic Product is the most complex and representative indicator that is calculated at the macroeconomic level, most accurately reflecting the results obtained over a period of one year. It is used for static, dynamic analysis but also for international comparisons. By analyzing the resources and uses, we obtain conclusive data on the national economy, the possibilities of growth and development. This indicator, in its evolution, compared to the demographic indicator, the population of the country, offers the possibility of appreciation of incomes per inhabitant, an aspect that leads to the assessment of the standard of living, to the quality of life.

The Gross Domestic Product can be calculated monthly, quarterly and finally annually, according to the methodology of the national accounts system. These calculations of GDP are performed for the purpose of intermediate and annual analysis, in order to obtain useful data in undertaking economic strategy measures. GDP can be calculated at factor prices or at market prices.

The quarterly Gross Domestic Product at market price (PIBT) represents the final result of the activity of the resident economic agents, during a period, respectively a quarter. The quarterly Gross Domestic Product at market price is usually estimated by two methods: the production method and the expense method.

The production method takes into account gross added value, inventions and subsidies on the product.

The expenditure method is based on the cumulation of the actual final consumption, the gross formation of capital, the export of goods and services and the import of goods and services.

Also, the GDP can also be calculated by the method of income, respectively the remuneration of the employees, the gross operating surplus, taxes on production and imports and subsidies on production and imports.

The main data sources used for the estimation of the Gross Domestic Product are the statistical ones (infra-annual surveys regarding industrial production, construction, services, trade; the agricultural production account calculated on the basis of the data provided by the Ministry of Agriculture; infra-annual surveys regarding the earnings and the number of employees) financial-accounting (accounting balances of financial

institutions) and administrative (execution of the state budget and local budgets, as well as of the state social insurance budget; balance of external payments).

The estimation of production at current prices is performed for non-financial companies (enterprises), population households and non-profit institutions serving population households are estimated, by activity branches, by extrapolation in volume and price, or in value.

Intermediate consumption is estimated for non-financial societies (enterprises), population households and non-profit institutions serving population households are estimated, by activity branches, by applying the weight of intermediate consumption in calculated production.

For financial companies and public administrations, intermediate consumption is determined directly on the basis of data sources (accounting balances and budgetary executions).

The gross value added is estimated as a balance between production and intermediate consumption, and the taxes and subsidies on the product are determined based on the data from the budget execution.

The gross domestic product is estimated in current prices, in the prices of the previous year and in average prices of the year 2000. The estimates in the average prices of the year 2000 are calculated by linking the volume indices. In addition to the gross estimates of the Gross Domestic Product, seasonally adjusted estimates are calculated using the regressive method recommended by the European regulations.

The seasonal adjustment aims to eliminate the seasonal influences within the data series in order to highlight the real economic evolution from consecutive periods.

The national accounts in Romania present, in general, a strong seasonality, being adjusted also according to the number of working days and calendar, even if their effect is insignificant.

The seasonally adjusted series was obtained by eliminating from the gross series the seasonal effect, with the help of correction coefficients, established according to the regression model used. The additive or multiplicative model used for regression is automatically identified by the JDemetra program depending on the nature of the series subject to adjustment.

Seasonally adjusted GDP is obtained by the direct method, which can lead to a statistical discrepancy between GDP and the sum of its seasonally adjusted components.

Starting with 2012, the policy of estimating and disseminating the Quarterly Gross Domestic Product was modified by introducing a third estimate, called provisional data (2).

Data, results and discussions

The analysis of the evolution of the Gross Domestic Product can be made on the basis of annual or quarterly data series. To clear the trend of evolution in the next period we will conduct a study on a quarterly basis.

In this sense, the Gross Domestic Product in the fourth quarter of 2019 compared with the third quarter of 2019 was, in real terms, higher by 1.5%. Compared to the third quarter of 2019, the Gross Domestic Product registered an increase of 4.3% on the gross series and 4.2% on the seasonally adjusted series.

Next we will resort to the seasonal evolution of the quarterly GDP in the period 2017-2019, calculated as gross series and seasonally adjusted series. The data series is presented in Table 1.

Table 1. *The evolution of the quarterly GDP, for the period 2017-2019*

		Quarter I	Quarter II	Quarter III	Quarter IV	Year
- in % compared to the corresponding period of the previous year -						
Gross series	**2017**	105.9	106.4	108.9	106.8	107.1
	2018	104.4	104.5	104.5	104.4	104.4
	2019	105.0	104.4	103.0	104.3	104.1
Seasonally adjusted series	**2017**	106.2	106.4	108.3	106.8	-
	2018	104.8	104.7	104.3	104.3	-
	2019	105.0	104.4	103.2	104.2	-
- in% compared to the previous quarter -						
Seasonally adjusted series	**2017**	102.4	101.6	102.0	100.6	-
	2018	100.5	101.5	101.7	100.6	-
	2019	101.1	100.9	100.6	101.5	-

Source: National Institute of Statistics, press release no. 61/10.03.2020.

From the data presented in the table it is observed that in all quarters of 2019, the GDP has increased in quarterly terms. In the third quarter of 2019, the growth was the smallest. The results regarding the analysis based on the data as gross or seasonally adjusted series are similar. In the five years under review, it is found that the calculated annual GDP decreased, respectively 107.1% in 2017, 104.4% in 2018 and 104.1% in 2019.

The Gross Domestic Product estimated based on the seasonal adjustment estimated for the fourth quarter of 2019 was 274.0049 billion lei, current prices rising, in real terms, by 1.5% compared to the third quarter 2019 and 4.2% compared to the quarter IV 2018. The data are summarized in Table 2.

Table 2. *Quarterly GDP evolution, in 2019 based on seasonally adjusted series*

	Quarter I	Quarter II	Quarter III	Quarter IV
Billions lei, current prices	252.7499	258.1521	264.5216	274.0049
In % compared to the previous quarter	101.1	100.9	100.6	101.5
In % compared to the corresponding period of the previous year	105.0	104.4	103.2	104.2

Source: National Institute of Statistics, press release no. 61/10.03.2020.

Analyzing over a longer period of time, we find out how the quarterly Gross Domestic Product evolved in the main branches of the national economy. The data are compared with the quarterly average calculated for the year 2000. In the Graph 1 these data are presented.

Graph 1. *GDP evolution – seasonally adjusted series*
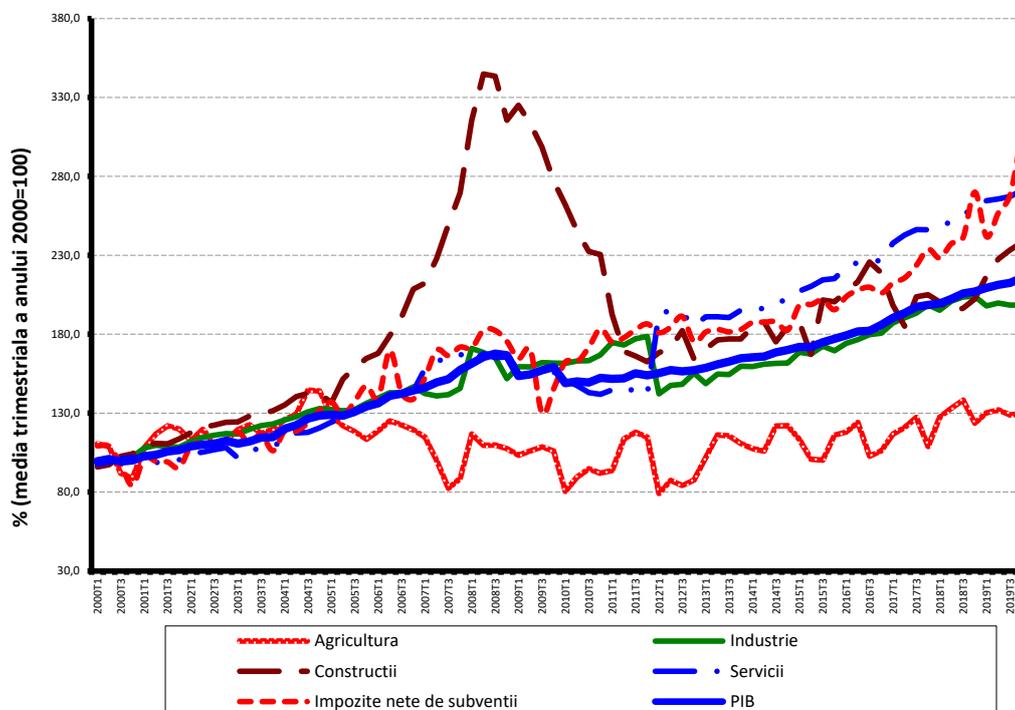
Source: INS release no. 61/10.03.2020.

From the analysis carried out on the basis of the gross series we find that the Gross Domestic Product estimated for the fourth quarter of 2019 was 320.3731 billion lei current prices, in real terms, with 4.3% increase compared to the fourth quarter of 2018. The data are summarized in Table 3.

Table 3. *Quarterly GDP, in 2019, gross series*

	Quarter I	Quarter II	Quarter III	Quarter IV	2019
Billions lei, current prices	201.9831	241.8627	289.6659	320.3731	1053.8848
In % compared to the corresponding period of the previous year	105.0	104.4	103.0	104.3	104.1

Source: National Institute of Statistics, press release no. 61/10.03.2020.

The estimated GDP for the whole of 2019 was 1,053.8848 billion lei at current prices, being 4.1% higher than in 2018.

The analysis of the contribution of the categories of resources and uses to the realization of the Gross Domestic Product

From the data presented in Table 4, it turns out that in 2019 the GDP growth compared to 2018, contributed the majority of the branches of the economy, positive contributions more important having the following branches: constructions (+ 0.9%), with a share of 6.4% in GDP formation and whose activity volume increased by 16.8%; wholesale and

retail trade; repair of motor vehicles and motorcycles; transportation and storage; hotels and restaurants (+ 0.9%), with a share of 18.2% in GDP formation and whose volume of activity increased by 4.8%; net taxes on the product (+ 0.9%), with a weight of 9.3% at GDP formation and whose activity volume increased by 9.5%.

In 2019, the industry made a negative contribution to GDP growth (-0.3%) as a result of reducing its volume of activity by 1.5%. This is a new situation and it seems that, due to the lack of technology, this branch will have a downward trend in terms of contribution, in absolute and relative figures to the formation of the Gross Domestic Product.

The estimations expressed are based on the data series in Table 4. It is found that the gross added value for the entire economy was 90.70% of the Gross Domestic Product.

Table 4. *The contribution of the resource categories to the formation and growth of the Gross Domestic Product, in the fourth quarter and the year 2019*

	Contribution to GDP formation %		Contribution to GDP growth %	
	Quarter IV	Year 2019	Quarter IV	Year 2019
Agriculture, forestry and fishing	2.0	4.1	0.1	0.0
Industry	22.0	21.9	-0.6	-0.3
Construction	11.2	6.4	1.6	0.9
Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; hotels and restaurants	18.0	18.2	0.8	0.9
Information and communication	5.2	5.6	0.3	0.4
Financial intermediation and insurance	2.6	2.4	0.0	0.0
Real estate transactions	6.9	7.3	0.6	0.4
Professional, scientific and technical activities; administrative service activities and activities of support services	8.0	7.9	0.2	0.4
Public administration and defense; social insurance from the public system; education; health and social assistance	11.7	13.5	0.3	0.3
Performing, cultural and recreational activities; repair of household products and other services	3.1	3.4	0.1	0.2
Gross value added – total	**90.7**	**90.7**	**3.4**	**3.2**
Net taxes on the product	**9.3**	**9.3**	**0.9**	**0.9**
Gross domestic product	**100.0**	**100.0**	**4.3**	**4.1**

Source: National Institute of Statistics, press release no. 61/10.03.2020.

From the point of view of the weights of the uses of the GDP, the increase was due, especially the final consumption expenditures of the households, whose volume increased by 5.9% contributing by 3.7% to the GDP growth and the gross formation of fixed capital, whose volume increased by 17.8%, contributing 3.7% to GDP growth. A negative contribution to GDP growth and in the fourth quarter, as in the whole of 2019, had a net export (-1.7%), a consequence of the 3.5% increase in the volume of exports of goods and services correlated with a higher increase in the volume of imports of goods and services, by 7.2%.

The data on the contribution of the categories of uses to the formation and growth of the quarterly and annual GDP are summarized in Table 5.

Table 5. *Contribution of the categories of uses to the formation and growth of the Gross Domestic Product, in the fourth quarter and the year 2019*

	Contribution to GDP formation %		Contribution to GDP growth %	
	Quarter IV	Year 2019	Quarter IV	Year 2019
Total actual final consumption	**80.6**	**81.3**	**6.5**	**4.9**
Effective individual final consumption of households	71.1	71.2	4.8	3.7
Expenditure for final consumption of households	61.8	63.1	4.4	3.7
Expenditure for final consumption of non-profit institutions in the service of households	1.5	0.8	0.0	0.0
Expenditure for individual final consumption of public administrations	7.8	7.3	0.4	0.0
The actual final collective consumption of public administrations	9.5	10.1	1.7	1.2
Gross fixed capital formation	**23.3**	**23.7**	**3.2**	**3.7**
Stock changes	**0.8**	**-1.0**	**-4.1**	**-2.8**
Net export of goods and services	**-4.7**	**-4.0**	**-1.3**	**-1.7**
Export of goods and services	33.4	40.1	1.1	1.5
Import of goods and services	38.1	44.1	2.4	3.2
The gross domestic product	**100.0**	**100.0**	**4.3**	**4.1**

Source: National Institute of Statistics, press release no. 61/10.03.2020.

Table 6 summarizes the contribution to the formation and growth of GDP in the fourth quarter of 2019 by resources and uses, taking into account the contribution made by the increase in volume compared to the fourth quarter of 2018 and the change in prices over the same period of comparison. Price indexes were found to have a negative influence, especially in agriculture, forestry and fisheries (118.8%), construction (112.5%), financial and insurance intermediation (108.7%) and industry (108, 4%). In terms of volume, significant contributions had gross product taxes (109.8%), construction (117.2%) and financial intermediation (108.0%).

From the point of view of the uses, as a realized volume, we notice the final collective consumption (118.8%), the gross formation of capital (115.2%), the individual final collective consumption and of the households (107.0%, respectively 7.2%). From the point of view of the price, the expenditure for the individual final consumption and of the public administration (112.8%), had a big negative contribution.

The data on the evolution of the quarterly GDP in 2019 based on the gross data series are summarized in Table 6.

Table 6. *Gross Domestic Product by categories of resources and uses, in the fourth quarter of 2019*

	Achievements billions RON current prices	Volume indices % compared to the quarter IV 2019	Price indices % compared to the quarter IV 2019
Agriculture, forestry and fishing	6.5463	103.1	118.8
Industry	70.4287	97.6	108.4
construction	35.7655	117.2	112.5
Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; hotels and restaurants	57.6794	104.5	106.4
Information and communication	16.5467	106.1	106.1
Financial intermediation and insurance	8.2181	98.5	108.7
Real estate transactions	22.1008	108.0	103.4
Professional, scientific and technical activities; administrative service activities and support service activities	25.5420	101.9	106.1
Public administration and defense; social insurance from the public system; education; health and social assistance	37.5717	102.3	107.1

	Achievements billions RON current prices	Volume indices % compared to the quarter IV 2019	Price indices % compared to the quarter IV 2019
Performing, cultural and recreational activities; repair of household products and other services	10.0588	104.3	106.1
Gross value added – total	290.4580	103.7	107.7
Net taxes on the product	29.9151	109.8	100.2
Gross Domestic Product	**320.3731**	**104.3**	**107.0**
Actual final consumption	25.8004	108.3	105.8
Effective individual final consumption of households	227.6414	107.0	106.5
Expenditure for final consumption of households	198.0350	107.2	105.9
Expenditure for final consumption of non-profit institutions in the service of households	4.7553	103.0	103.1
Expenditure for individual final consumption of public administrations	24.8511	105.9	112.8
Actual collective final consumption of public administrations	30.3629	118.8	100.5
Gross capital formation	77.1847	96.4	107.8
from which:			
Gross fixed capital formation	74.5805	115.2	106.2
Net export of goods and services	-14.8159	-	-
Export of goods and services	107.0142	103.1	102.0
Import of goods and services	121.8301	106.1	100.8

Source: National Institute of Statistics, press release no. 61/10.03.2020.

The analysis of the realization and growth of the Gross Domestic Product, based on the seasonally adjusted series according to the number of working days, after resources and uses will be made based on the data in Table 7. And in this case, the contribution of the volume and price changes will be considered. The volume increased in taxes and duties (114.2%) and in real estate transactions (102.5%). The prices did not increase too much, except for public administration and defense, social insurance, education, health and social assistance (104.3%) and cultural activities (103.5%).

From the point of view of the uses we see volume increases at the gross capital formation (148.4%), and the final collective consumption of the public administration (125.8%). Prices changed moderately, with significant decreases in gross capital formation (66.8%) and the final collective consumption of public administrations (83.1%).

The data regarding the evolution of GDP in the fourth quarter of 2019 compared to the third quarter of the same year, are summarized in Table 7.

Table 7. *Gross Domestic Product by categories of resources and uses, in the fourth quarter of 2019*

	Achievements billions RON current prices	Volume indices % compared to the quarter III 2019	Price indices % compared to the quarter III 2019
Agriculture, forestry and fishing	10.2546	100.8	92.4
Industry	58.9854	100.0	102.4
construction	17.6397	102.0	102.7
Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; hotels and restaurants	49.9771	101.8	102.4
Information and communication	15.2306	102.4	99.7
Financial intermediation and insurance	6.6180	100.6	101.6
Real estate transactions	20.2699	102.5	102.5
Professional, scientific and technical activities; administrative service activities and support service activities	20.8632	97.9	99.8

	Achievements billions RON current prices	Volume indices % compared to the quarter III 2019	Price indices % compared to the quarter III 2019
Public administration and defense; social insurance from the public system; education; health and social assistance	37.3720	100.1	104.3
Performing, cultural and recreational activities; repair of household products and other services	9.2934	100.4	103.5
Gross value added – total	246.5039	101.1	101.5
Net taxes on the product	26.4756	114.2	93.0
Statistical discrepancy	1.0254	-	-
Gross Domestic Product	**274.0049**	**101.5**	**102.0**
Actual final consumption	227.0997	105.2	100.5
Effective individual final consumption of households	199.0479	104.0	101.8
Expenditure for final consumption of households	175.2732	104.0	101.4
Expenditure for final consumption of non-profit institutions in the service of households	2.2429	104.0	98.2
Expenditure for individual final consumption of public administrations	21.5318	105.9	104.2
Actual collective final consumption of public administrations	28.0518	125.8	83.1
Gross capital formation	58.5318	148.4	66.8
from which:			
Gross fixed capital formation	64.3148	96.2	103.2
Net export of goods and services	-11.5113	-	-
Export of goods and services	107.4589	100.5	100.5
Import of goods and services	118.9702	100.7	100.3
Statistical discrepancy	-0.1153	-	-

Source: National Institute of Statistics, press release no. 61/10.03.2020.

By extending the analysis throughout the year 2019, by resources and uses, as well as by fields of activity, depending on the volume and price indices, we will identify some important aspects. The data are presented in Table 8.

Table 8. *Gross Domestic Product by category of resources and uses, in 2019*

	Achievements billions RON current prices	Volume indices % compared to the year 2018	Price indices % compared to the year 2018
Agriculture, forestry and fishing	43.4554	96.8	108.2
Industry	230.9857	98.5	108.0
construction	67.2990	116.8	110.2
Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; hotels and restaurants	191.6088	104.8	106.3
Information and communication	58.4979	108.1	105.7
Financial intermediation and insurance	25.7029	99.3	109.4
Real estate transactions	76.7885	105.7	102.0
Professional, scientific and technical activities; administrative service activities and support service activities	83.0685	105.7	107.3
Public administration and defense; social insurance from the public system; education; health and social assistance	142.4923	102.5	108.9
Performing, cultural and recreational activities; repair of household products and other services	35.5977	107.3	107.1
Gross value added – total	955.4967	103.5	107.2
Net taxes on the product	98.3881	109.5	98.1
Gross Domestic Product	**1053.8848**	**104.1**	**106.3**
Actual final consumption	857.1308	106.2	105.6
Effective individual final consumption of households	750.4099	105.3	105.6
Expenditure for final consumption of households	664.9652	105.9	105.3
Expenditure for final consumption of non-profit institutions in the service of households	8.7994	102.4	103.3

	Achievements billions RON current prices	Volume indices % compared to the year 2018	Price indices % compared to the year 2018
Expenditure for individual final consumption of public administrations	76.6453	100.3	109.1
Actual collective final consumption of public administrations	106.7209	112.8	105.6
Gross capital formation	238.5002	103.9	105.9
from which:			
Gross fixed capital formation	249.2985	117.8	106.0
Net export of goods and services	-41.7462	-	-
Export of goods and services	423.1073	103.5	103.3
Import of goods and services	464.8535	107.2	102.1

Source: National Institute of Statistics, press release no. 61/10.03.2020.

In terms of resources, the volume increased in constructions (116.8%), information and communications (108.1%). Price indices increased, with a negative contribution, in financial and insurance intermediation (109.4%), public administration and defense (108.9%), agriculture (108.2%), construction (110.2%) and industry (108.0%). The study, after use, indicates volume increases at gross capital formation (117.8%), actual collective final consumption of public administration (112.8%), import of goods and services (107.2%). Price indices increased at the individual final consumption of public administration (109.1%), gross capital formation (106.0%), actual final consumption (105.6%).

Conclusions

The data contained in the article based on the study by the authors ensure that some theoretical conclusions are reached. First of all, it is noted that the quarterly evolution of the Gross Domestic Product offers indicators on aggregates and on the total, which allow the possibility of inter-temporal analyzes of the way the Gross Domestic Product evolves and especially compared with the respective forecasts, to identify those measures that would be worth doing to ensure a more pronounced growth of the Gross Domestic Product.

Attention was paid to volume indices and price indices, establishing that price indices play a negative role on the contribution of components, aggregated to the formation of the Gross Domestic Product and especially to its growth.

A simplified study would lead to the conclusion that this 4.1% increase in 2019 is somewhat mitigated by the concomitant increase in the consumer price index or the harmonized price increase index. Therefore, another conclusion is that the harmonization of macroeconomic proportions and correlations must take into account measures that will reduce the inflation rate, but at the same time cause a more substantial increase in volume.

References

Anghel, M.G., Burea, D. and Dumbravă, Ș.D., 2018. Use of Gross Domestic Product in Comparative Studies. *Romanian Statistical Review, Supplement, 9*, pp. 115-127.

Anghelache, C., 2018. Comparative Analysis of the Development of the Gross Domestic Product in the Member States of the European Union. *Romanian Statistical Review, Supplement, 8*, pp. 119-134.

Anghelache, C. and Anghel, M.G., 2017. Econometric methods and models used in the analysis of the factorial influence of the gross domestic product growth. *Network Intelligence Studies, V(9)*, (1/2017), pp. 67-78.

Anghelache, C., Soare, D.V. and Popovici, M., 2015. Analysis of Gross Domestic Product Evolution under the Influence of the Final Consumption. *Theoretical and Applied Economics, XXII* (4), (605), Winter, pp. 45-52.

Bachman, R., 2011. Public Consumption over the Business Cycle. *Society for Economic Dynamics* in 2011 Meeting Papers with number 701.

Barro, R. and Redlick, C., 2011. Macroeconomic Effects from Government Purchases and Taxes, *The Quarterly Journal of Economics*, 126(1), pp. 51-102.

Bhandari, P. and Frankel, J., 2015. *Nominal GDP Targeting for Developing Countries*, National Bureau of Economic Research, Working Paper 20898, Cambridge.

Censolo, R. and Colombo, C., 2008. Public consumption composition in a growing economy. *Journal of Macroeconomics, 30* (4), pp. 1479-1495.

Chamberlin, G., 2011. Gross domestic product, real income and economic welfare. *Economic & Labour Market Review, 5* (5), pp. 5-25.

Fleurbaey, M., 2009. Beyond GDP: The Quest for a Measure of Social Welfare. *Journal of Economic Literature, 47* (4), pp. 1029-1075.

Foerster, A.T. and Choi, J., 2016. Consumption Growth Regimes and the Post-Financial Crisis Recovery. *Economic Review*, Second Quarter Q (II), pp. 25-48.

Garin, J., Lester, R. and Sims, E., 2016. On the Desirability of Nominal GDP Targeting. *Journal of Economic Dynamics and Control, 69*, pp. 21-44.

Guner, N., Ventura, G. and Yi, X., 2008. Macroeconomic Implications of Size-Dependent Policies. *Review of Economic Dynamics, 11* (4), pp. 721-744.

Jorgenson, D. and Slesnick, D., 2008. *Consumption and Labor Supply*, Journal of Econometrics 147, no. 2 (December 2008), pp. 326-335.

Kaplan, G. and Violante, G., 2014. A model of the consumption response to fiscal stimulus payments, *Econometrica*, 82 (4), pp. 1199-1239.

Macchiarelli, C., 2013. Similar GDP-inflation cycles. An application to CEE countries and the euro area. *International Business and Finance*, 27 (1), pp. 124-144.

Pistoresi, B. and Rinaldi, A., 2012. Exports, imports and growth. *Explorations in Economic History, 49* (2), pp. 241-254.

Woodford, M., 2010. Financial Intermediation and Macroeconomic Analysis. *Journal of Economic Perspectives*, 24 (4), pp. 21-44.

*** Institutul Național de Statistică, Comunicat nr. 61/10.03.2020.