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Analysis of the quarterly evolution of the Gross Domestic Product

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Abstract. *Gross Domestic Product is the most complex indicator of the results of a country's economy. The Gross Domestic Product expresses the concrete results obtained in the national economy and depending on its evolution, there are also possibilities for increasing consumption, domestic investment and last but not least the possibility of diversification of the national economy.*
The analysis of the evolution of the Gross Domestic Product was performed starting from the resources and uses that this indicator had in achieving these results. At the same time, the analysis is performed based on the raw data series, but also on the seasonally adjusted data series. In order to highlight the evolution of the Gross Domestic Product, analyzes were performed for periods of time starting with the year 2000, in order to capture the effects of the economic-financial crisis, but then also for shorter periods of time, 2017-2019 or 2018-2020. All this was done in order to highlight the evolution over time, but also to shed light on the danger that exists in terms of the negative effect of the health crisis, coronavirus, which will certainly have negative effects.
Probably if in the second quarter of 2020 we have a decrease in Gross Domestic Product of 12.3%, compared to the first quarter of 2020, it is not excluded that during the third and fourth semesters of 2020 we will also record non-compliant, inconclusive results, which may result in a double-digit reduction in Gross Domestic Product at the end of the year compared to the previous year 2019.
The analysis aimed precisely at highlighting these trends and the way in which the structural analysis on different groups of factors (resources, uses and other macroeconomic indicators, inflation, unemployment, foreign direct investment, domestic investment, etc.), have on the national economy. All should have a beginning to restructure strategies to halt the macroeconomic decline and bring it into a position of stabilization and then resumption of growth.

Keywords: GDP, indicators, resources, uses, factors, methods, statistical-econometric models.

JEL Classification: E01, F43, F44.

Introduction

In this article, the authors started from the raw and seasonally adjusted data series they had at their disposal, in order to perform a quarterly structural analysis, over different time periods.

A first analysis was the one from 2000 to 2020, the first semester, in which the trends of quarterly modification of the Gross Domestic Product were highlighted. Then, shorter periods (2017-2019 or 2018-2020) were performed, highlighting the effect of the health crisis, coronavirus, and the tendency to deepen the economic downturn in the context in which this crisis will be accompanied, combined, with the economic and financial crisis which is already showing its negative effects, but which is expected to intensify in the next period.

A series of statistical data were used, both as a gross series and as a seasonally adjusted series, revealing that an analysis carried out in the last two quarters of 2020 and the first semester of 2020 revealed a continuous decreasing trend. The data under analysis were thoroughly interpreted to identify the influences of the factors that contribute to the achievement and growth (modification) of the Gross Domestic Product.

For the last analyzed period of 2020, including June, it is found that all usable resources showed decreasing trends, having a negative influence on the change in Gross Domestic Product. Thus, agriculture shows delicate trends through the drought of this spring, so the contribution to the formation of Gross Domestic Product will be insignificant. HoReCa and tourism in general had particularly large negative contributions to the realization of the Gross Domestic Product. Also, net exports, calculated as the difference between exports and imports, increased in algebraic but negative figures, with an increasing contribution to the results obtained in terms of Gross Domestic Product of the first half of 2020 and certainly the same effect it will also have it in terms of results recorded in the third and fourth quarters of 2020.

The industry is also showing declining trends, especially in processing, with a declining turnover. Also, new orders and industrial production for export decreased. From the point of view of uses, it is also noted that they have decreased and will have negative influences on the global result indicator Gross Domestic Product, which was registered on June 30, but also of the one that will be registered at the end of 2020.

In highlighting the aspects that resulted from the study, a series of data and graphical representations were used, which are suggestive and highlight the almost inexplicable decline of the Romanian economy and consequently the level of Gross Domestic Product.

Literature review

Abo-Zaid and Tuzemen (2012) made a forecast of the inflation target over a period of 30 years. Aisen and Veiga (2013) studied how and to what extent economic growth is influenced by political instability. Anghelache, Iacob and Grigorescu (2020) analyzed the evolution of quarterly GDP in Romania based on gross data series and seasonally

adjusted data series according to the number of days worked, as well as the extent to which resources and uses contributed to the formation and growth GDP. Anghelache, Anghel, Căpușneanu and Topor (2019) focused on the possibility of using the regression model in the analysis of the correlation between GDP and some macroeconomic aggregates. Anghelache and Anghel (2017) addressed a series of aspects related to the evolution of the Romanian economy, measured by the value of GDP, modified by deflation methods. Anghelache (2000-2018) made an extensive analysis of the evolution of the Romanian economy, as a whole, but also of each economic sector. Chamberlin (2011) studied the correlation between GDP, real income and economic well-being. Garin, Lester and Sims (2016) dealt with a number of elements regarding the forecast of the nominal Gross Domestic Product. Ghysels and Osborn (2001) and Reis (2009) highlighted theoretical and practical notions of seasonal time series. Lahiri and Sheng (2010) studied the correlation between GDP and inflation, a similar topic being addressed by Macchiarelli (2013) who conducted a study on the countries of the EEC and the euro area. Mazurek (2012) conducted a comparative analysis of GDP growth in European countries. Nalewaik (2012) conducted a series of research on estimating real-time recession probabilities based on GDP.

Methodological aspects

In order to substantiate the content of the Gross Domestic Product indicator and to ensure a more realistic understanding and interpretation of the opinions and conclusions of the study, which is the basis of this article, we present some methodological aspects of the National Institute of Statistics and Eurostat on the content of this macroeconomic indicator of results. Thus, the quarterly Gross Domestic Product at market price (GDP), the main macroeconomic aggregate of the national accounts, represents the final result of the production activity of the resident producing units, during a period. Gross Domestic Product at market price is estimated by three methods, briefly described below: the production method, the expenditure method and the revenue method.

- Production method:

PIBT = VAB + IP - SP,
where:
GVA – gross value added at basic price;
IP – taxes on the product;
SP – subsidies per product.

- Expenditure method:

PIBT = CF + FBC + E - I,
where:
CF – actual final consumption;
FBC – gross capital formation;
E – export of goods and services;
I – import of goods and services.

- Income method:

PIBT = R + EBE + IMP - SUB,
where:
R – remuneration of employees;
EBE – gross operating surplus;
IMP – taxes on production and imports;
SUB – subsidies on production and imports.

The main data sources used to estimate the Gross Domestic Product are statistical (infra-annual surveys on industrial production, construction, services, trade; agricultural production account calculated on the basis of data provided by the Ministry of Agriculture; infra-annual surveys on earnings and the number of employees), financial-accounting sources (balance sheets of financial institutions) and administrative sources (execution of the state budget and local budgets, as well as the state social insurance budget; Balance of external payments).

The estimation of the production in current prices is made as follows: for non-financial companies (enterprises), households and non-profit institutions in the service of households are estimated, by branches of activity, by extrapolating in volume and price, or value, production during corresponding to the previous year, using the volume, price and value indices available from the statistical data sources; for financial companies and public administrations it is determined directly on the basis of data sources (balance sheets and budget executions).

The estimation of intermediate consumption is made for non-financial corporations (enterprises), households and non-profit institutions serving households is estimated, by industry, by applying the share of intermediate consumption in production calculated for the corresponding period of the previous year, for which there were complete and detailed data sources, based on the assumption of constant technological coefficients, and for financial companies and public administrations are determined directly based on data sources (balance sheets and budget executions).

In terms of gross value added, it is estimated as the balance between production and intermediate consumption.

The determination of taxes and subsidies on the product is based on the data from the budget executions.

The gross domestic product is estimated in current prices, in the prices of the corresponding period 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 chaining the volume indices.

In addition to the gross estimates of the quarterly gross domestic product, seasonally adjusted estimates are also determined by the regressive method, a method recommended by European regulations.

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

To adjust the series of main aggregates on the basis of which GDP is estimated by the three methods, the JDEMETRA software package version 2.2.0 (TRAMO/SEATS and X-13ARIMA-SEATS method) is used. It estimates the seasonal effect (events that occur at the same time, with the same magnitude and direction each year, such as: seasons, holidays, etc.), the number of working days different from one month to another and the effect of the calendar, such as Orthodox Easter, leap year and other national holidays) as well as identifying and correcting extreme values (occasional, transient or permanent level changes) and interpolating missing values.

The national accounts in Romania generally present seasonality, being adjusted according to the number of working days and calendar even if the effect of the latter is insignificant.

The seasonally adjusted series was obtained by removing the seasonal effect from the raw series, using 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.

The seasonally adjusted Gross Domestic Product is obtained by the direct method, which leads to a statistical discrepancy between the Gross Domestic Product and the sum of its seasonally adjusted components independently.

Seasonally adjusted series for the last 5 years and available quarters in the reference year are recalculated quarterly as a result of the revision of the quarterly and annual gross data series, as statistical and administrative data sources with a higher degree of coverage and accuracy, the introduction in the data series of the last available observation, the modification of the adopted models and the regression parameters.

Starting with the first quarter of 2012, the estimation and dissemination of the quarterly Gross Domestic Product changed by introducing a third estimate, called provisional data, which is published, approximately T + 95 days after the end of the reference quarter. The main objectives of this review are related to the integration of statistical, financial-banking and administrative information that became available or was rectified after the publication of the first provisional estimates, approximately T + 70 days after the end of the reference quarter and ensuring consistency between aggregates. based on the estimation of the quarterly Gross Domestic Product and the aggregates from the quarterly accounts of the institutional sectors, especially those of the Public Administration sector, with a dissemination term of T + 90 days from the end of the reference quarter.

Eurostat and the national statistical authorities of the European Statistical System have worked together to develop methodological guidelines and notes on how to address the methodological issues triggered by these changes in statistical production. This ensures that European statistics continue to be well-founded.

A methodological section has been opened on the Eurostat website to support European statisticians, but not only, in which new methodological guidelines and notes have been presented.

Data, results and discussions

The analysis of the economic evolution of a country is performed based on the study of the most complex indicator of results, the Gross Domestic Product. An analysis by year, but especially quarterly, offers the possibility of interpreting how a country's resources are used, highlights the effect of the seasonal nature of some activities, the influence of a period of economic and financial crisis and, lately, the crisis sanitary (COVID 19).

The analysis was subjected to the study in the form of raw series and seasonally adjusted series. The data series are constituted for different time periods, respectively 2000 quarter I – 2019 quarter I, for which the data are, in principle close to the final ones, so the conclusions reached are sufficiently reasonable. Then we performed an analysis starting with the fourth quarter of 2019, the first quarter of 2020 and the second quarter of 2020. This short-term analysis aims to highlight how the quarterly Gross Domestic Product began to deteriorate from one quarter to another, starting with year 2020.

The comparative study is carried out according to the previous quarter, the similar quarter of the previous year or for longer periods, semesters or years. This last variant aims to highlight the effect of the influence of some factors, events or economic-financial conditions that have been highlighted over time. Doing so leads to an up-to-date situation, which is the only one able to foreshadow the perspective of the evolution of the Gross Domestic Product and, in this way, the estimation of the evolution of the change of Romania's economic growth. The term modification was used because decreases were installed, which will follow, regarding the reduction, even dramatic, of the indicator Gross Domestic Product, i.e. the fall of the economic-financial situation.

If we take into account the most recent result of the Gross Domestic Product in the second quarter of 2020, compared to the first quarter of 2020 (-12.3%) or compared to the same quarter of 2019 (-10.5%), we can deduce the conclusion of the perspective reduction of Gross Domestic Product in the next period.

Next, according to these specifications, we will analyze the data we have.

- *The evolution of the quarterly Gross Domestic Product in 2019, compared to 2018*.

The seasonally adjusted series of Quarterly Gross Domestic Product for 2019 increased by 4.1%. The evolution of the quarterly Gross Domestic Product in the period 2017-2019, calculated as gross series and seasonally adjusted series, is presented in Table 1.

Table 1. *Evolution of the quarterly gross domestic product*

		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: Press release of the National Institute of Statistics no. 91/07.04.2020.

Gross Domestic Product – seasonally adjusted data – estimated for the fourth quarter of 2019 was 275347.2 million lei current prices, increasing – in real terms – by 1.5% compared to the third quarter of 2019 and by 4.2% compared to the quarter IV 2018.

The seasonally adjusted estimates of the Gross Domestic Product in provisional variants (1) and (2), as well as the differences between the two variants, are presented in the following table.

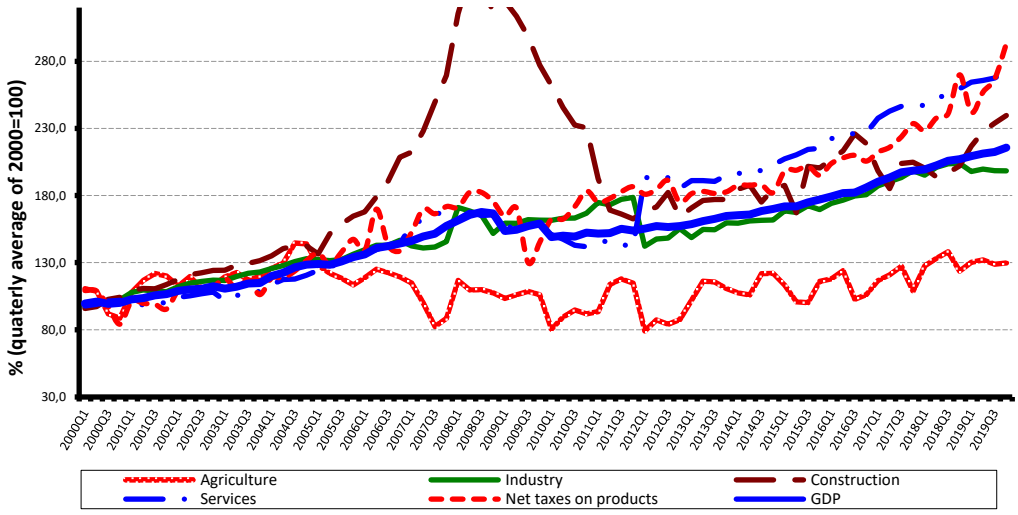
Table 2. *Quarterly gross domestic product, in 2019 – seasonally adjusted series*

		Quarter I	Quarter II	Quarter III	Quarter IV
Millions of lei current prices	Provisional (1)	252749,9	258152,1	264521,6	274004,9
	Provisional (2)	253866,5	260697,9	265643,7	275347,2
	Differences	1116,6	2545,8	1122,1	1342,3
In % compared to the previous quarter	Provisional (1)	101,1	100,9	100,6	101,5
	Provisional (2)	101,1	100,9	100,6	101,5
	Differences	0,0	0,0	0,0	0,0
In % compared to the corresponding period	Provisional (1)	105,0	104,4	103,2	104,2
	Provisional (2)	105,0	104,4	103,2	104,2
	Differences	0,0	0,0	0,0	0,0

Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

By graphically representing the evolution of the Gross Domestic Product, as a seasonally adjusted series, in the period 2000 quarter I – 2019 quarter IV, highlights the boom recorded before the economic and financial crisis. Then, there is the decline until 2011, after which the evolution of the Gross Domestic Product returned to normal evolutions.

Chart 1. *Gross Domestic Product Evolution – seasonally adjusted series*



The graphic representation also highlights the way in which it evolved quarterly during the analyzed period and the resources that formed the basis of the evolution of the Gross Domestic Product.

The data on the basis of which the quarterly evolution of the Gross Domestic Product was graphically represented, as a seasonally adjusted series, in the period 2000 quarter I – 2019 quarter IV, are presented in Table 3.

Table 3. *Romania's quarterly gross domestic product, in the period 2000-2019, seasonally adjusted data, quarterly average of 2000 = 100*

Period	Volume indices – %					
	Agriculture	Industry	Construction	Services	Net taxes on the product	Gross Domestic Product
2000Q1	110,6	96,8	95,9	97,8	109,3	99,6
2000Q2	108,8	99,1	97,3	99,0	108,9	100,9
2000Q3	91,9	101,9	102,6	101,3	97,6	99,4
2000Q4	88,7	102,2	104,1	102,0	84,2	100,1
2001Q1	108,0	107,8	109,4	98,4	101,4	102,7
2001Q2	116,9	109,7	110,8	98,7	99,7	103,6
2001Q3	122,0	108,9	110,5	99,4	99,0	105,7
2001Q4	120,0	108,4	113,7	100,4	95,5	106,6
2002Q1	112,7	112,1	117,6	104,2	109,3	108,9
2002Q2	119,7	114,6	121,0	105,3	110,8	110,1
2002Q3	111,0	116,0	122,4	106,8	110,4	110,5
2002Q4	112,8	117,0	124,2	108,1	112,2	112,5
2003Q1	119,4	116,7	124,4	101,7	118,1	110,6
2003Q2	122,7	119,7	128,1	105,4	111,0	112,1
2003Q3	117,1	122,0	129,5	108,5	116,7	114,5
2003Q4	119,9	123,1	131,5	108,5	106,2	114,8
2004Q1	125,9	125,6	135,1	113,8	118,6	120,1
2004Q2	129,6	127,7	140,5	117,4	118,7	122,4
2004Q3	144,7	130,8	142,5	117,8	123,9	126,5
2004Q4	144,1	132,9	142,5	120,6	131,6	128,5
2005Q1	127,9	132,3	136,5	124,3	137,1	128,9
2005Q2	122,1	131,5	151,6	126,7	128,5	128,4
2005Q3	118,4	132,3	158,8	130,1	137,8	130,9
2005Q4	113,4	136,2	164,6	134,0	147,4	134,2
2006Q1	118,9	139,6	167,9	137,1	139,3	136,2
2006Q2	125,1	142,9	179,1	139,8	169,9	141,0
2006Q3	122,6	142,9	190,7	142,9	142,7	142,3
2006Q4	119,5	146,7	208,5	143,9	138,9	144,3
2007Q1	114,9	142,4	212,3	158,1	152,6	146,1
2007Q2	100,1	140,9	227,9	162,2	169,9	149,5
2007Q3	82,5	141,7	249,4	166,3	166,5	151,5
2007Q4	88,6	145,7	269,5	167,5	171,8	157,4
2008Q1	116,9	171,0	315,4	162,5	171,4	161,4
2008Q2	109,6	168,4	344,9	167,6	182,7	165,6
2008Q3	109,9	165,3	343,4	165,2	182,4	167,7
2008Q4	107,5	151,8	315,5	165,6	175,5	166,7
2009Q1	103,3	159,4	325,0	157,7	164,5	153,6
2009Q2	106,1	159,3	313,5	155,0	170,7	154,5
2009Q3	108,6	162,0	298,6	158,0	130,0	157,2
2009Q4	106,1	161,7	277,2	156,1	145,4	159,2
2010Q1	80,5	161,5	262,0	150,9	162,5	149,0
2010Q2	89,5	163,1	245,5	147,4	162,5	150,1
2010Q3	94,7	163,2	232,4	143,0	171,8	149,4
2010Q4	91,9	166,8	230,5	141,9	183,5	152,3
2011Q1	93,6	174,7	192,5	144,8	174,9	151,7
2011Q2	113,7	173,1	169,1	146,6	177,8	152,0
2011Q3	118,0	177,1	166,1	143,6	183,0	155,2
2011Q4	114,8	178,6	162,6	141,8	186,6	153,9
2012Q1	79,2	142,2	168,3	193,1	181,0	155,3
2012Q2	87,4	147,6	171,4	194,9	184,6	157,2

Period	Volume indices – %					
	Agriculture	Industry	Construction	Services	Net taxes on the product	Gross Domestic Product
2012Q3	84,2	148,3	182,2	193,2	191,2	156,5
2012Q4	87,7	155,4	164,2	185,3	175,0	157,2
2013Q1	102,0	148,7	170,7	191,1	181,4	158,7
2013Q2	116,2	154,7	176,3	191,1	183,1	160,9
2013Q3	115,6	154,5	177,0	190,5	181,6	162,6
2013Q4	110,8	159,6	177,0	195,2	182,8	164,7
2014Q1	107,5	159,4	184,7	196,6	187,6	165,3
2014Q2	106,0	161,0	187,7	196,1	187,7	165,9
2014Q3	121,9	161,5	175,1	198,9	188,1	168,5
2014Q4	122,1	161,7	184,7	202,7	182,2	170,0
2015Q1	113,2	168,6	187,6	207,3	198,5	171,9
2015Q2	100,9	167,4	167,1	210,2	198,9	171,9
2015Q3	100,3	172,4	201,7	214,4	201,8	174,9
2015Q4	116,1	169,5	200,5	215,2	195,0	177,0
2016Q1	118,0	174,1	206,8	222,4	203,9	179,3
2016Q2	124,1	176,5	213,2	225,4	208,0	181,7
2016Q3	102,8	179,7	225,9	226,2	210,0	182,2
2016Q4	106,2	180,6	218,8	226,6	205,7	185,9
2017TQ1	116,7	187,1	198,4	237,6	212,3	190,3
2017Q2	121,0	190,3	185,1	242,8	216,0	193,4
2017Q3	127,3	193,4	203,9	246,4	223,8	197,3
2017Q4	109,0	198,5	204,8	246,0	233,5	198,5
2018Q1	127,6	195,1	200,4	247,3	228,3	199,4
2018Q2	133,2	200,9	193,8	251,7	237,8	202,4
2018Q3	138,2	203,6	196,8	256,1	241,0	205,8
2018Q4	123,7	204,1	202,1	259,5	270,0	207,0
2019Q1	130,2	197,9	216,7	264,4	242,0	209,3
2019Q2	132,1	199,7	227,6	265,7	257,2	211,2
2019Q3	128,8	198,4	233,8	267,5	266,9	212,5
2019Q1	129,9	198,4	239,6	272,3	293,1	215,7

Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

Table 3 also highlights the contribution of resources to the formation and growth of Gross Domestic Product.

The analysis of the evolution of the quarterly Gross Domestic Product, as gross series, is presented in Table 4. Thus, the estimated Gross Domestic Product for 2019 was of 1059803.2 million lei current prices, increasing – in real terms – by 4.1% compared to 2018. For the fourth quarter of 2019, the Gross Domestic Product was of 321360.6 million lei current prices, increasing – in real terms – by 4.3% compared to the fourth quarter of 2018.

The estimates of the gross series of the Gross Domestic Product in the provisional variants (1) and (2), as well as the differences between the two variants, are presented in the following table:

Table 4. *Quarterly gross domestic product, in 2019 – gross series*

		Quarter I	Quarter II	Quarter III	Quarter IV	Year 2019
Millions of lei current prices	Provisional (1)	201983,1	241862,7	289665,9	320373,1	1053884,8
	Provisional (2)	202920,0	245061,8	290460,8	321360,6	1059803,2
	Differences	936,9	3199,1	794,9	987,5	5918,4
In % compared to the corresponding period	Provisional (1)	105,0	104,4	103,0	104,3	104,1
	Provisional (2)	105,0	104,4	103,0	104,3	104,1
	Differences	0,0	0,0	0,0	0,0	0,0

Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

Tables 5 and 6 present the data on the evolution of the Gross Domestic Product, based on resources and uses, respectively.

Table 5. *The contribution of the resource categories to the formation and growth of the Gross Domestic Product, in 2019*

	Contribution to GDP formation – %		Contribution to GDP growth – %	
	Provisional (1)	Provisional (2)	Provisional (1)	Provisional (2)
Agriculture, forestry and fishing	4,1	4,1	0,0	-0,1
Industry	21,9	21,8	-0,3	-0,3
Construction	6,4	6,4	0,9	1,0
Wholesale and retail trade; repair of motor vehicles and motorcycles; transport and storage; hotels and restaurants	18,2	18,2	0,9	0,9
Information and communications	5,6	5,5	0,4	0,4
Financial intermediation and insurance	2,4	2,4	0,0	0,0
Real estate transactions	7,3	7,2	0,4	0,4
Professional, scientific and technical activities; administrative service activities and support service activities	7,9	7,8	0,4	0,4
Public administration and defense; social insurance in the public system; education; health and social assistance	13,5	13,6	0,3	0,3
Entertainment, cultural and recreational activities; repairs of household products and other services	3,4	3,4	0,2	0,3
Gross value added – total	**90,7**	**90,4**	**3,2**	**3,3**
Net taxes on the product	**9,3**	**9,6**	**0,9**	**0,8**
Gross Domestic Product	**100,0**	**100,0**	**4,1**	**4,1**

Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

Table 6. *The contribution of the use categories to the formation and growth of the Gross Domestic Product, in 2019*

	Provisional (1)	Provisional (2)	Provisional (1)	Provisional (2)
Total effective final consumption	**81,3**	**81,0**	**4,9**	**4,8**
Effective individual final consumption of households	71,2	71,5	3,7	4,5
Expenditure on final consumption of households	63,1	62,8	3,7	3,8
Expenditure on final consumption of non-profit institutions serving households	0,8	0,8	0,0	0,0
Expenditure for individual final consumption of general government	7,3	7,9	0,0	0,7
Effective final collective consumption of general government	10,1	9,5	1,2	0,3
Gross fixed capital formation	**23,7**	**23,6**	**3,7**	**3,8**
Stock change	**-1,0**	**-0,7**	**-2,8**	**-2,9**
Net export of goods and services	**-4,0**	**-3,9**	**-1,7**	**-1,6**
Export of goods and services	40,1	40,3	1,5	2,0
Import of goods and services	44,1	44,2	3,2	3,6
Gross Domestic Product	**100,0**	**100,0**	**4,1**	**4,1**

Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

Interpreting the contribution of the categories of resources and uses to the modification of the Gross Domestic Product, we will establish the contribution of each resource/use to the formation and growth of the Gross Domestic Product. By resources, in 2019, the dynamics of the Gross Domestic Product did not change in the provisional version (2) compared to the provisional version (1), and that of the gross value added increased by

0.1 percentage points (from 103.5% to 103,6%). The volume of gross value added registered more important changes in constructions (+0.5 percentage points), from 116.8% to 117.3% and retail and high from 104.8% to 105.1%. The volume of net taxes on the product decreased by 1.0 percentage points.

From the point of view of the use of the Gross Domestic Product, larger changes of the contribution to the increase of the Gross Domestic Product in 2019, between the two estimates, registered the Final Consumption of public administrations, from +1.2% to +1.0%, as a result of the reduction of its volume from 107.3% to 106.4%.

As a seasonally adjusted series, Gross Domestic Product increased. The data study shows that the total effective final consumption (81.0%) contributed to the increase of the Gross Domestic Product, which also registered an increase of 4.8% in the provisional version (2). Gross Capital Formation contributed 23.6% (provisional 2) to the formation of Gross Domestic Product, with an increase of 3.8%. The variation of stocks (-0.7%) and the net export of goods and services (-3.9%), also having decreases compared to the previous year, contributed negatively to the formation and growth of the Gross Domestic Product.

Table 7 shows the structural change of the Gross Domestic Product by resources and uses in the fourth quarter of 2019, compared to the fourth quarter of 2018. The changes in volume and price indices, compared to the fourth quarter, are highlighted in absolute and relative data. 2018. The data in this table are as a raw series.

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

	Achievements – millions of lei current prices –	**Volume indices – in % compared to the fourth quarter of 2018**	**Price indices – in % compared to the fourth quarter of 2018**
Agriculture, forestry and fishing	6535,8	103,0	118,6
Industry	70240,7	97,6	108,1
Construction	36061,6	118,2	112,6
Wholesale and retail trade; repair of motor vehicles and motorcycles; transport and storage; hotels and restaurants	58281,2	105,7	106,3
Information and communications	16549,0	106,1	106,1
Financial intermediation and insurance	8214,9	98,5	108,7
Real estate transactions	22129,0	108,0	103,5
Professional, scientific and technical activities; administrative service activities and support service activities	25585,8	101,9	106,3
Public administration and defense; social insurance in the public system; education; health and social assistance	37277,3	102,4	106,2
Entertainment, cultural and recreational activities; repairs of household products and other services	10101,2	104,8	106,1
Gross value added – total	290976,5	104,0	107,5
Net taxes on product [1)]	30384,1	106,5	104,9
Gross Domestic Product	**321360,6**	**104,3**	**107,3**
Effective final consumption	256021,2	107,7	105,6
Effective individual final consumption of households [2)]	226982,7	107,5	105,7
Expenditure on final consumption of households	198076,7	107,3	105,8
Expenditure on final consumption of non-profit institutions serving households	4779,5	103,0	103,7
Expenditure for individual final consumption of general government	24126,5	110,5	105,0
Effective final collective consumption of general government [3)]	29038,5	108,8	105,0

	Achievements – millions of lei current prices –	Volume indices – in % compared to the fourth quarter of 2018	Price indices – in % compared to the fourth quarter of 2018
Gross capital formation	77898,5	95,5	109,8
from which:			
Gross fixed capital formation	75089,6	115,7	106,4
Net export of goods and services	-12559,1	-	-
Export of goods and services	110569,8	106,4	102,1
Import of goods and services	123128,9	107,3	100,8

[1)] Represents the difference between taxes on product due to the State Budget (VAT, excise duties, other taxes) and product subsidies paid from the State Budget.
[2)] Comprises: expenditure of population households for purchasing goods and services in view to meet their members needs, the expenditure for individual consumption of public administration (education, health, social security and social activities, culture, sport, leisure activities, collection of household waste) and the expenditure for individual consumption of non-profit institutions serving households (religious organisations, trade unions, political parties, unions, foundations, cultural and sport associations).
[3)] Comprises the expenditure for collective consumption of public administration (general public services, national defence and territory security, public order and security, legislative and regulatory activities, research & development, etc.).
Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

Table 8 presents, structurally, the data on the formation and modification of the Gross Domestic Product based on the seasonally adjusted series, in the fourth quarter of 2019, compared to the third quarter of 2019.

Table 8. *Gross Domestic Product by categories of resources and uses, in the fourth quarter of 2019, seasonally adjusted series and according to the number of working days*

	Achievements – millions of lei current prices –	Volume indices – in % compared to the third quarter of 2019	Price indices – in % compared to the third quarter of 2019
Agriculture, forestry and fishing	10251,2	100,8	92,3
Industry	58864,9	100,0	102,2
Construction	17768,1	102,5	102,7
Wholesale and retail trade; repair of motor vehicles and motorcycles; transport and storage; hotels and restaurants	50465,3	102,5	102,4
Information and communications	15228,6	102,4	99,7
Financial intermediation and insurance	6616,0	100,5	101,6
Real estate transactions	20422,0	102,5	103,1
Professional, scientific and technical activities; administrative service activities and support service activities	20897,8	97,9	99,9
Public administration and defense; social insurance in the public system; education; health and social assistance	37262,1	100,2	102,5
Entertainment, cultural and recreational activities; repairs of household products and other services	9338,8	100,7	103,4
Gross value added – total	247114,8	101,3	101,2
Net taxes on product [1)]	27421,8	109,8	99,2
Statistical discrepancy	810,6	-	-
Gross Domestic Product	**275347,2**	**101,5**	**102,1**
Effective final consumption	225981,0	104,8	100,4
Effective individual final consumption of households [2)]	199315,7	104,2	101,0
Expenditure on final consumption of households	175256,5	104,1	101,4
Expenditure on final consumption of non-profit institutions serving households	2252,4	104,0	98,5
Expenditure for individual final consumption of general government	21806,8	107,7	95,5
Effective final collective consumption of general government [3)]	26665,3	115,8	90,9
Gross capital formation	59732,3	149,8	66,6
from which:			

Gross fixed capital formation	64850,7	96,8	103,2
Net export of goods and services	-9780,2	-	-
Export of goods and services	110606,0	102,3	101,3
Import of goods and services	120386,2	101,5	100,5
Statistical discrepancy	-585,9	-	-

[1)] Represents the difference between taxes on product due to the State Budget (VAT, excise duties, other taxes) and product subsidies paid from the State Budget.
[2)] Comprises: expenditure of population households for purchasing goods and services in view to meet their members needs, the expenditure for individual consumption of public administration (education, health, social security and social activities, culture, sport, leisure activities, collection of household waste) and the expenditure for individual consumption of non-profit institutions serving households (religious organisations, trade unions, political parties, unions, foundations, cultural and sport associations).
[3)] Comprises the expenditure for collective consumption of public administration (general public services, national defence and territory security, public order and security, legislative and regulatory activities, research & development, etc.).
Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

The situation of the modification of the Gross Domestic Product, as gross series in 2019, compared to 2018, by resources and uses is summarized in Table 9.

Table 9. *Gross Domestic Product by categories of resources and uses, in 2019, gross series*

	Achievements – millions of lei current prices –	**Volume indices – in % compared to 2018**	**Price indices – in % compared to 2018**
Agriculture, forestry and fishing	43479,7	96,8	108,3
Industry	230829,5	98,5	108,0
construction	67641,7	117,3	110,3
Wholesale and retail trade; repair of motor vehicles and motorcycles; transport and storage; hotels and restaurants	192359,8	105,1	106,3
Information and communications	58526,0	108,1	105,7
Financial intermediation and insurance	25699,7	99,2	109,4
Real estate transactions	76818,8	105,7	102,0
Professional, scientific and technical activities; administrative service activities and support service activities	83135,5	105,7	107,4
Public administration and defense; social insurance in the public system; education; health and social assistance	144163,8	102,5	110,2
Entertainment, cultural and recreational activities; repairs of household products and other services	35722,5	107,5	107,3
Gross value added – total	958377,0	103,6	107,5
Net taxes on product [1)]	101426,2	108,5	102,0
Gross Domestic Product	**1059803,2**	**104,1**	**106,9**
Effective final consumption	857666,9	106,0	105,8
Effective individual final consumption of households [2)]	757293,6	106,4	105,5
Expenditure on final consumption of households	665145,7	106,0	105,2
Expenditure for final consumption of non-profit institutions serving households	8823,5	102,3	103,6
Expenditure for individual final consumption of general government	83324,4	110,2	108,0
Effective final collective consumption of general government [3)]	100373,3	103,4	108,4
Gross capital formation	243016,5	104,0	107,8
from which:			
Gross fixed capital formation	250466,1	118,2	106,1
Net export of goods and services	-40880,2	-	-
Export of goods and services	427644,0	104,6	103,2
Import of goods and services	468524,2	108,0	102,1

[1)] Represents the difference between taxes on product due to the State Budget (VAT, excise duties, other taxes) and product subsidies paid from the State Budget.
[2)] Comprises: expenditure of population households for purchasing goods and services in view to meet their members needs, the expenditure for individual consumption of public administration (education, health, social security and social activities, culture, sport, leisure activities, collection of household waste) and the expenditure for individual consumption of

non-profit institutions serving households (religious organisations, trade unions, political parties, unions, foundations, cultural and sport associations).
[3)] Comprises the expenditure for collective consumption of public administration (general public services, national defence and territory security, public order and security, legislative and regulatory activities, research & development, etc.).
Source: Press release of the National Institute of Statistics no. 91/07.04.2020.

According to resources, it is found that the Gross Domestic Product increased, primarily due to industry, wholesale and retail trade and gross value added. As a use, Gross Domestic Product increased due to total actual final consumption and gross fixed capital formation. The net export of goods and services has contributed, as has been the case from 1990 to the present, in a negative way to the formation of the Gross Domestic Product.

- *The change of the Gross Domestic Product in the first quarter of 2020, compared to the fourth quarter of 2019*

Compared to the same quarter of 2019, the Gross Domestic Product increased by 2.4% on the gross series and by 2.7% on the seasonally adjusted series.

The evolution of the quarterly Gross Domestic Product in the period 2018-2020, calculated as gross series and seasonally adjusted series, is presented in Table 10.

Table 10. *Quarterly Gross Domestic Product Evolution*

		Quarter I	Quarter II	Quarter III	Quarter IV	Year
– in% compared to the corresponding period of the previous year –						
Gross series	**2018**	104,4	104,5	104,5	104,4	104,4
	2019	105,0	104,4	103,0	104,3	104,1
	2020	102,4	-	-	-	-
Seasonally adjusted series	**2018**	105,0	104,7	104,3	104,2	-
	2019	105,1	104,3	103,3	103,9	-
	2020	102,7	-	-	-	-
– in% compared to the previous quarter -						
Seasonally adjusted series	**2018**	100,6	101,3	101,5	100,6	-
	2019	101,5	100,6	100,5	101,2	-
	2020	100,3	-	-	-	-

Source: Press release of the National Institute of Statistics no. 177/07.07.2020.

As a seasonally adjusted series, the estimated Gross Domestic Product for the first quarter of 2020 was 272074.7 million lei, current prices, increasing – in real terms – by 0.3% compared to the fourth quarter of 2019 and by 2.7% compared to the first quarter 2019. The data are contained in Table 11.

Table 11. *Quarterly Gross Domestic Product, in the first quarter of 2020, seasonally adjusted series*

		Quarter I 2020
Millions of lei current prices	Provisional (1)	272415,1
	Provisional (2)	272074,7
	Differences	-340,4
In % compared to the previous quarter	Provisional (1)	100,3
	Provisional (2)	100,3
	Differences	0,0
In % compared to the corresponding period	Provisional (1)	102,7
	Provisional (2)	102,7
	Differences	0,0

Source: Press release of the National Institute of Statistics no.177/07.07.2020.

From the data contained in tables 10 and 11 there are increases compared to the fourth quarter of 2019. We must keep in mind that, compared to the first quarter of 2018 and 2019, the increase was much smaller. Thus, in 2018, compared to 2017, the increase was 0.6%, in the first quarter of 2019, compared to the first quarter of 2018, the increase was 1.5%, while in the first quarter of 2020, compared to the first quarter of 2019, the increase was 0.3%. This was due to the negative effects of the health crisis (COVID 19), which began to manifest itself in March 2020.

- *The change in the Gross Domestic Product in the second quarter of 2020 in real terms, compared to the first quarter of 2020, was -12.3%.*

Compared to the same quarter of 2019, the Gross Domestic Product registered, in the second quarter of 2020, a decrease of 10.5% on both the gross series and the seasonally adjusted series.

In the first half of 2020, the Gross Domestic Product decreased, compared to the first half of 2019, by 4.7%, on the gross series and by 3.9% on the seasonally adjusted series.

The signal estimates as well as the provisional ones of the quarterly Gross Domestic Product are affected by the difficulties created by the pandemic crisis and by the establishment of the state of emergency and the state of alert. In this sense, in the state of emergency and the state of alert, the production activity was reduced, tourism was brought to zero, the HoReCa activity stopped, exports were massively reduced, imports were reduced, but in a lower percentage, fund on which the deficit of the external balance of payments increased, foreign investment fell to about 230 million euros, an insignificant level compared to previous years. Although registered unemployment did not increase much, the unemployed population increased by about 1.3 million people.

The evolution of the consumer price index in the first six months of 2020 was 2.8%, and that of the harmonized index of consumer prices was 2.5%, compared to July 2019.

In turn, the average rate of consumer prices in the last twelve months (August 2019 – July 2020), was compared with the same period in 2019, of 3.2%, and based on the HICP, the average annual rate was 3.1%.

These issues, with regard to the increase in the CPI and the HICP, are influenced by the maintenance of administered prices and the decrease in the consumption of the population which has influenced the temptation to increase consumer prices. Also, the drastic reduction of HoReCa and tourism activities, presented a very small share in the calculation of prices for these categories of services and corresponding products.

In the third quarter of 2020, these deficiencies will influence the change in Gross Domestic Product, all resources and uses considered, as well as other statistical indicators with economic and social content (effect) (unemployment rate, unemployed population, inflation rate increase, debt increase internal and external public relations of Romania).

Table 12 shows the evolution of the Gross Domestic Product, as a gross and seasonally adjusted series, for the period I quarter 2018 – quarter II 2020. The data in this table are also presented in Chart 2.

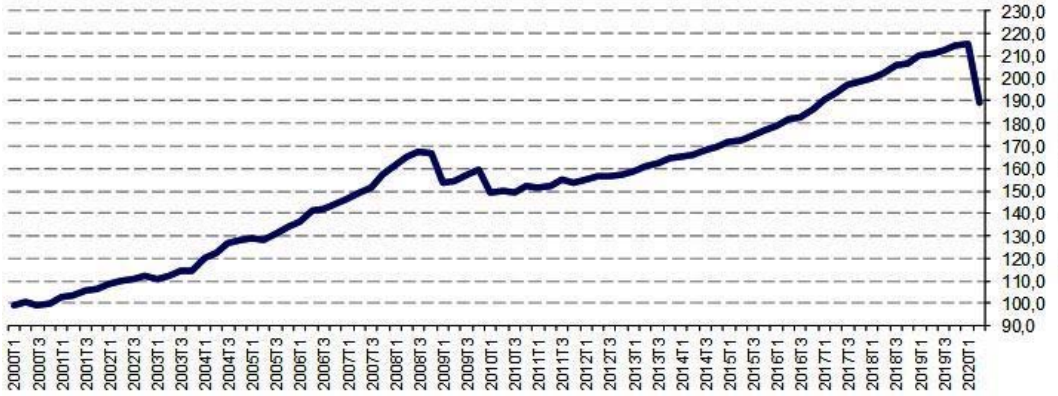
Table 12. *Quarterly Gross Domestic Product Evolution*

		Quarter I	Quarter II	Quarter III	Quarter IV	Year
– in % compared to the corresponding period of the previous year –						
Gross series	**2018**	104,4	104,5	104,5	104,4	104,4
	2019	105,0	104,4	103,0	104,3	104,1
	2020	102,4	89,5	-	-	-
Seasonally adjusted series	**2018**	105,0	104,7	104,3	104,2	-
	2019	105,1	104,3	103,3	103,9	-
	2020	102,7	89,5	-	-	-
– in % compared to the previous quarter –						
Seasonally adjusted series	**2018**	100,6	101,3	101,5	100,6	-
	2019	101,5	100,6	100,5	101,2	-
	2020	100,3	87,7	-	-	-

Source: Press release of the National Institute of Statistics no. 214/14.08.2020.

In the second quarter of 2020, compared to the previous quarter, the Gross Domestic Product decreased by 12.3%. Compared to the same quarter of 2019, the Gross Domestic Product decreased by 10.5%. In the first half of 2020, compared to the first half of 2019, the Gross Domestic Product decreased by 3.9%.

Chart 2. *Romania's quarterly Gross Domestic Product in the period 2000-2020 (seasonally adjusted data)*



Compared to the same quarter of 2019, the Gross Domestic Product in the second quarter of 2020 registered a decrease of 10.5%. In the first half of 2020, compared to the first half of 2019, the Gross Domestic Product decreased by 4.7%.

Conclusions

The article written on the basis of the study carried out by the authors on the quarterly evolution of the Gross Domestic Product, in a longer or shorter period of time, highlights a series of theoretical and practical conclusions. From a theoretical point of view, it was highlighted that the factors that determine the formation and modification of the Gross Domestic Product (resources and uses), had different effects during this period of time. By choosing the period 2000 to 2020, the first semester, we aimed to highlight the effect that the economic and financial crisis had from 2008-2010, but also updating the effects of the economic and financial crisis triggered in parallel or, rather, due to the coronavirus health crisis.

A delicate conclusion, but close to reality, is that the effects of the coronavirus crisis, which will be combined in the future with the economic and financial crisis, will have negative economic effects clearly superior to the crisis of 2008-2010. In this context, it is a question of stopping production, of reducing the influence of the effect of usable resources in the realization of the Gross Domestic Product. Of course, the economic and financial crisis has forced a halt in production in the national economy, with disastrous effects on industry, tourism, HoReCa and international trade. It is difficult to balance the possibility of quickly recovering the national economy, being about special financial resources, but also a strategy closer to reality, which would allow the resumption of activity in the branches of the national economy.

Another resulting conclusion is that agriculture will have a particularly unfavorable year in 2020. This is not only due to the health crisis or the economic-financial one, but also due to the climatic conditions, being able to speak of a crisis of a prolonged drought in the period until July.

It is very clear that a number of socio-economic issues will have significant declines, such as household incomes, pensions, aid, support for agriculture and other SME activities and are theoretical only because there are no financial resources to highlight the prospect of the recovery of the national economy.

From the point of view of resuming the activity, in addition to the fact that we depend on the evolution of coronavirus, we also depend on the capacity of the national economy to be able to relaunch investments in national infrastructures, but also to ensure the increase of population income. This is a delicate situation, which may lead in the long run to a collapse of the national economy.

The methods used in the study were based on statistical-econometric methods and models and were based on a series of data provided by the National Institute of Statistics or Eurostat.

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