ASPECTS REGARDING THE INFLUENCE OF INFLATION ON ECONOMIC GROWTH IN EU

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Abstract
Through this paper, we intend to perform a radiography of the inflationary phenomenon in European Union. We presented the methodology for quantification of the inflationary phenomenon and the main differences between the Consumer Price Index (CPI) and the Harmonized Index of Consumer Prices (HICP), the last being the indicator used to make comparisons of the inflation rate between the European Union states as well as the Eurozone
From the point of view of the methodology of scientific research, it was highlighted the influence of the inflation rate on the evolution of GDP, determined by the Pearson Coefficient.

Key words: *inflationary phenomenon, EU, macroeconomic indicators, GDP, Pearson coefficient*

JEL Classification: *E31, E50, F45*

I. EUROPEAN UNION - A SHORT PRESENTATION OF THE MACROECONOMIC INDICATORS

According to Eurostat's reports and statistics, it is estimated that the pace of economic growth in both Europe and the Euro area will remain moderate. The main factors conducive to economic growth continue to be: the decrease of the unemployment, the increase of the private consumption, but they are both counterbalanced by the weakening of other favourable factors.

Thus, in 2018, the EU's gross domestic product (GDP) amounted to 15.382 billion euros, and Romania's share was 1.27%, Germany, the United Kingdom and France generated more than half of the EU's GDP. Romania has contributed to the EU's GDP with a share of 1.27%, standing in front of Greece (1.16%) and the eleven Member States with a contribution of less than 1%: Malta, Cyprus, Estonia, Latvia, Lithuania, Slovenia, Croatia, Bulgaria, Luxembourg, Slovakia and Hungary.

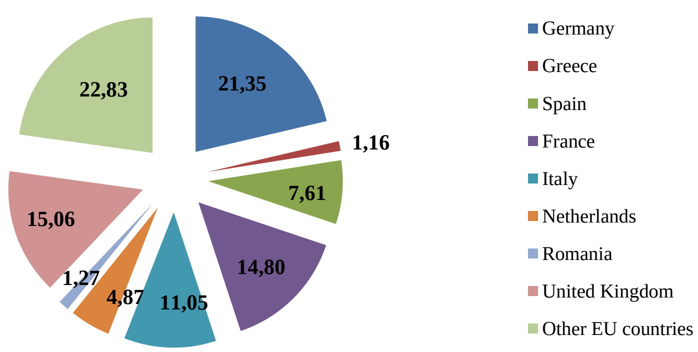

Fig. no 1. *The contribution of the EU Member States to the EU's GDP in 2018*
Source: *Eurostat (2019), The contribution of the Member States to the EU's GDP for 2017, http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do*

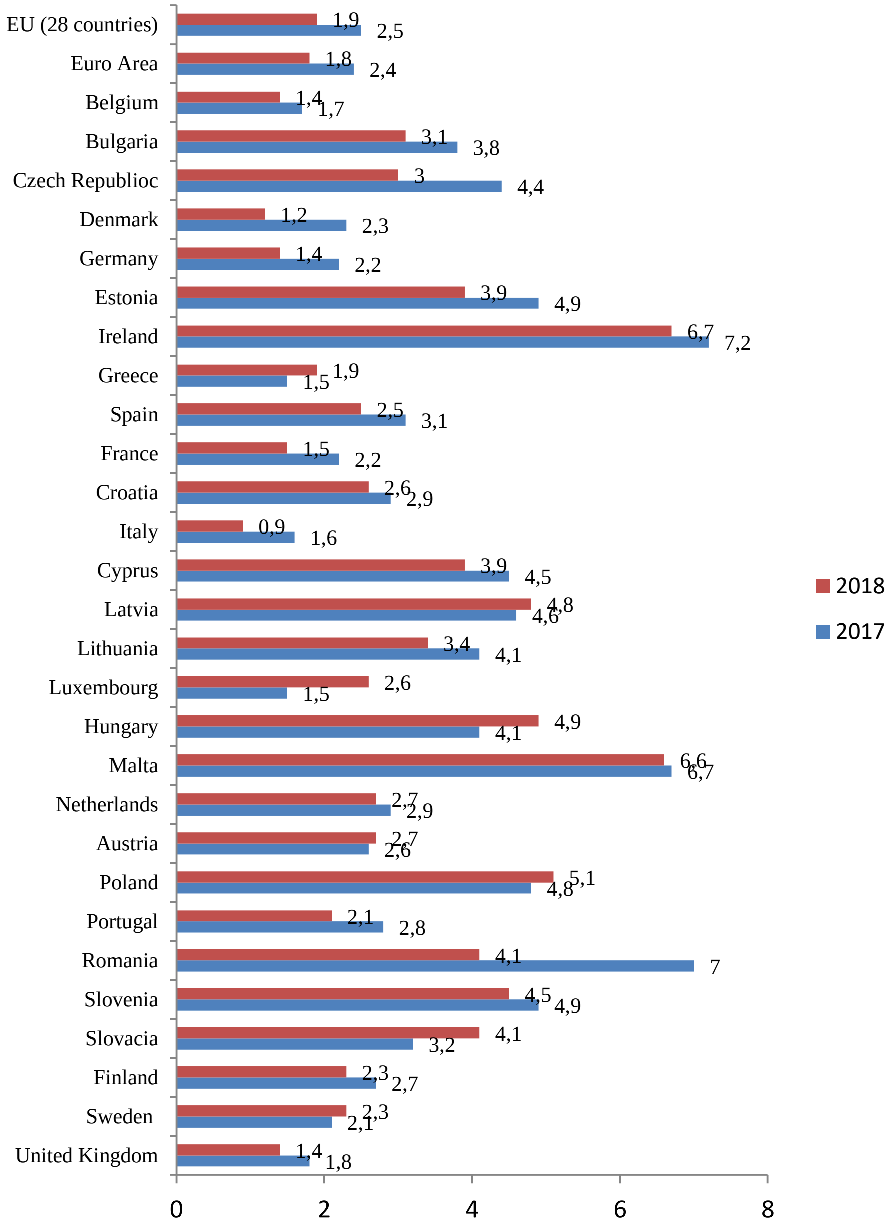

Fig.nr.2. *GDP's growth rate in the EU member countries compared to the previous year*
Source: *Eurostat (2019), GDP growth rate in the EU for 2017 and 2018*
http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00115

Germany has strengthened its EU economic leadership position, representing over one fifth (21.35%) of the EU's GDP. Although its share in the EU's GDP fell by 0.9 percentage points between 2017 and 2018, the United Kingdom maintained its second position (15.06%), slightly over France (14.8%), followed by Italy (11.05%), Spain (7.6%) and the Netherlands (4.87%).

The 19 Euro area Member States had a cumulative GDP of almost 11.200 billion Euros last year, accounting for 72.9% of EU's GDP. Germany (29.2%) and France (20.5%) made up 50% of the Euro area GDP, while Italy (15.4%) and Spain (10.4%) accounted together a quarter of it.

At the EU level, the private consumption remains the main growth driver in 2018, backed by the trend of growing the employment rate, but also wage growth.

Overall, it is estimated that the investment will increase by 3.5% in 2019. According to the forecasts, the employment in the EU and the Euro area will increase this year by 1.4% - a faster pace than in any other year since 2008, but which can be improved. It is estimated that new jobs will emerge due to the economic growth generated by the increase in the domestic market demand, moderate wage increases, budgetary policy measures and structural reforms in some Member States. The employment will continue to grow in 2019.

The unemployment rate in the European Union dropped down to 7.1% in April 2018, from 7.5% in August 2017 as against 8.3% in the same period in 2016. Thus, we can say that unemployment registered its lower level in 2008.

As for the Euro area, the unemployment rate fell to 8.5% in April 2018, from 9% in August 2017, compared to 9.8% in the same period in 2016. It is the lowest level since 2009. Among the member States in April 2018, the highest unemployment rates were recorded in Greece (20.5%) and Spain (15.9%). The opposite is the Czech Republic (2.2%), Malta (3%) and Germany (3.4%). Romania is below the EU average, with an unemployment rate of 4.6% in April 2018, down from 4.9% in August 2017.

Compared to August 2017, in April 2018, the unemployment rate dropped in all EU Member States. The most significant decreases were recorded in Portugal (from 8.8% to 7.4%) and Cyprus (from 10.5% to 8.6%).

The global budget balance is expected to improve in almost all Member States. If the same policies are maintained, it is expected that the share of the general government deficit of the GDP in the Euro area will fall to 0.8% in 2019 compared to 1.1% in 2017 and 0.9% in 2018, while the share of the GDP in debt is expected to fall to 85.2% compared to 89.3% in 2017 and 87.2% in 2018.

In 2017, Latvia and Bulgaria recorded a budgetary balance, while Lithuania, the Netherlands, Cyprus, Greece, Czech Republic, Germany, Sweden, Malta and Luxembourg had a budget surplus. More than half of the EU countries had a budget deficit, however, the lowest deficits as a GDP percentage were registered by Estonia (-0.3%), Croatia (-0.7%), and Austria (-0.9%). Eleven Member States had deficits between 1% and 3% of GDP, including Romania, which had a budget deficit of 3% of its GDP (in 2015 Romania's budget deficit was only 0.8% of the GDP). The lowest share of the government debt as a GDP percentage was registered by Estonia (9.4%), Luxembourg (20.8%), Bulgaria (29%), Czech Republic (36.8%) and Romania (37.6%). Thus, we can say that in 2016, Romania was ranked 5th, among the EU Member States with the lowest level of debt, with a value of the public debt in GDP significantly below the Euro zone level (88.9% of the GDP) and the European Union (83.2% of GDP).

Most of the Member States had public debt above 60% of GDP, with the largest shares of debt in Greece (180%), Italy (132%), Portugal (130.1%), Cyprus (107.1% %) and Belgium (105.1%).

II. ANALYSIS OF INFLATION IN EU

The Harmonized Index of Consumer Prices (HICP) is a set of consumer price indices in the European Union and it is calculated according to a harmonized interpretation and a set of definitions. HICP has the role of assessing the Euro area price stability as well as the convergence of price developments in the European Union. The HICP index is also used to make inflation comparisons at European level.

The following chart shows the HICP inflation rates in the Euro area and in the European Union. At the level of 2018, the Harmonized Index of Consumer Prices of the Euro area reached 1.8%, and the corresponding EU level was 1.9%. The comparison is based on the data and information provided by Eurostat for the years 2017 and 2018. Thus, analysing the chart below, we can see that in 2017, the lowest inflation rate was recorded in Iceland, with a value of 0.3%, as well as the lowest population density in Europe, whilst the highest inflation rate in 2017 was registered in Estonia and Lithuania, both reaching 3.7% of the inflation rate. In 2018, Denmark and Ireland enjoyed the lowest inflation rate, namely 0.7%, followed by Greece with an inflation rate of 0.8%. At the opposite end, Romania had the highest inflation rate in the EU, reaching 4.1%.

Each of the main components contributes in varying degree to the headline inflation in the Euro area. In terms of weights for 2019, 100 % for the headline HICP, services are the largest component, accounting for around 44.5 % of household monetary consumption expenditure in the Euro area. It is followed by non-energy industrial goods with around 26.4 %.

Food, alcohol & tobacco and energy account for 19 % and 10.1 %, respectively. Together, they comprise less than one third of euro area expenditure, but they can have significant impacts on the headline inflation as their prices tend to fluctuate significantly more than the other components'.

Taking into account the periodical economic and monetary analyses, the Council of Governors has decided that a monetary adjustment is essential in order to regain the inflation rates to lower levels, but close to 2%. The Council also decided not to interfere for a longer period of time with the changes in the representative rates of the European Central Bank, which would significantly outperform the net asset purchases.

Moreover, according to recent expert forecasts, the budget deficit is projected to continue to fall within the Euro zone throughout the projection horizon. This will happen with the reduction of interest payments and due to favourable cyclical conditions. It is also debated that overall in the Euro area the fiscal policy stance will remain neutral over the years 2018-2020. As for the euro area's public debt, it will not miss the high level it has reached, but it will continue to diminish.

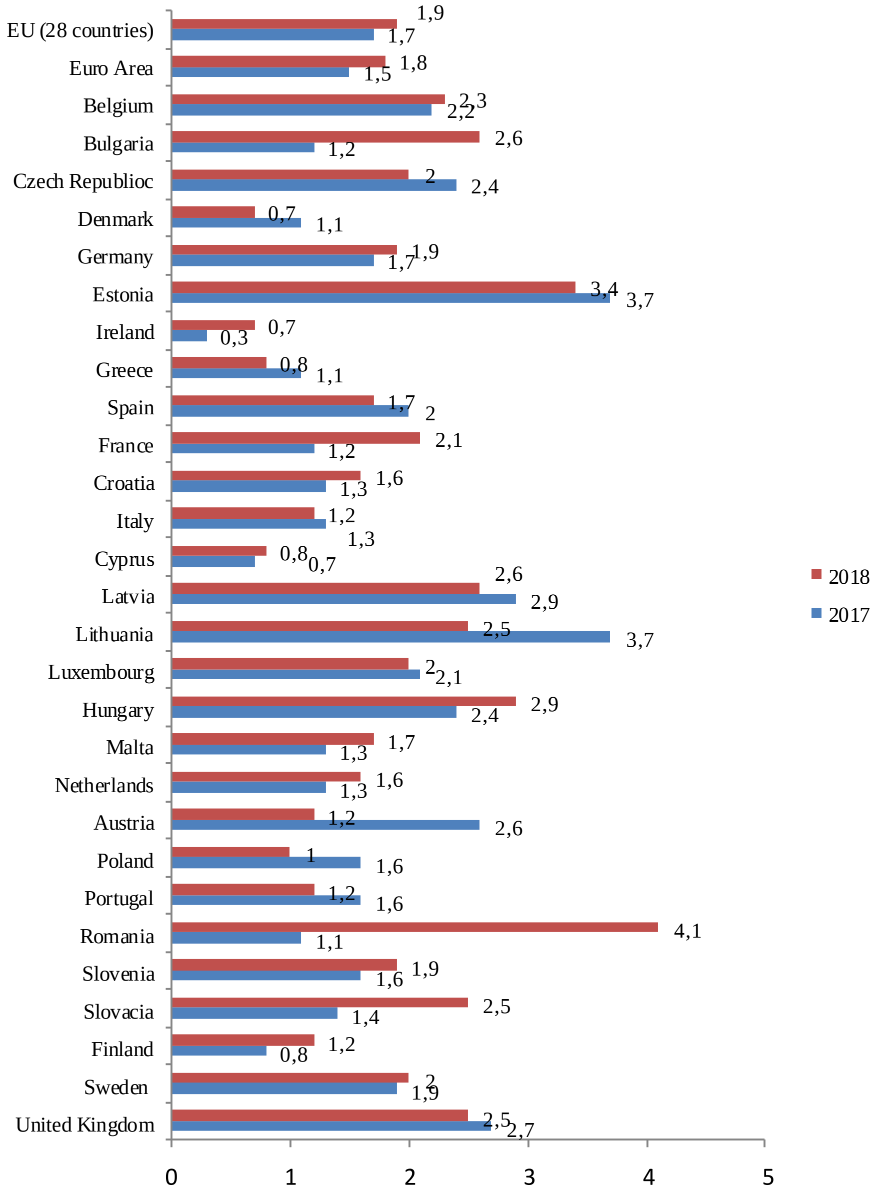

Fig. 3. *HICP - inflation rate in 2017 and 2018 - Annual average rate of change (%)*
Source: Eurostat (2019), *https://ec.europa.eu/eurostat/tgm/table.do?tab=table&language =en&pcode= tec00118 &tableSelection=1&footnotes=yes&labeling=labels&plugin=1*

In the following, we intended to analyse the influence that the inflation rate has on the GDP. As an analysis was made at EU28 level, over the period 2010-2018, we used GDP rate. In order to measure the intensity of the link between the inflation rate and the GDP (%), we calculated the Pearson correlation coefficient with SPSS for Windows.

The value of the Pearson correlation coefficient was --0,729, which shows a strong link between the two analysed variables - the inflation rate and the GDP(%), as the program also indicates, the value obtained is statistically significant.

Table no. 1.*The evolution of HICP - inflation rate and of the GDP in comparable prices, for 2010-2018, in the EU208 and Euro area*

Year	EU 28 countries GDP	EU 28 countries HICP (%)	Euro area GDP	Euro area HIPC(%)
2010	2.1	2.1	2.1	1.6
2011	1.8	3.1	1.6	2.7
2012	-0.4	2.6	-0.9	2.5
2013	0.3	1.5	-0.2	1.3
2014	1.8	0.6	1.4	0.4
2015	2.3	0.1	2.1	0.2
2016	2.0	0.2	2.0	0.2
2017	2.4	1.7	2.4	1.5
2018	1.9	1.9	1.8	1.8

Source*: Eurostat, 2019, http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tec00115*

	Pearson Coefficient
Inflation rate with GDP (%)	-0,729396809

Figure no. 4. *The influence of the inflation rate on the evolution of GDP (%), determined by the Pearson Coefficient*

From the graphical representation of the two indicators, but also from the value of the Pearson coefficient, it can be concluded that there is a very strong inverse relationship between the GDP and the inflation rate, ie an increase in the inflation rate leads to a reduction of the GDP value, and vice versa.

III. CONCLUSIONS AND PERSPECTIVES

The CPI calculation methodology involves taking into account consumer prices, including value added tax (product-related taxes), taking into account items that are included in the direct consumption of the population, excluding the following:

• The consumption made from own resources is the equivalent of the quantities of the products consumed by the population, which do not come from purchases (from stock, from own production, gifts received etc.);

• The expenses in the form of investment and accumulation (purchase of residences, building materials used to build new houses or major repairs to old houses), insurance rates, fines, gambling, taxes etc;

• The expenses related to the work pay for household production (plowing, sowing, taking care of gardens, orchards, vineyards, harvesting, hay mowing, medical treatment of the animals, etc.).

• The CPI excludes the interest and loan charges, which are perceived as financing cost, and not as a consumption expense.

The data collection process for CPI calculations consists of observing and recording prices in the 42 cities - county residence of Romania, out of which, according to the number of inhabitants, 68 research centres were selected. The units supplying the database, namely prices, were selected from among these research centres, taking into account the amount of sales of goods and services. Thus, 7200 units were listed in the nomenclature and it is desirable to keep them as long as possible, thus ensuring the continuity of the data and the comparability over time of the obtained results.

At the European Union level, the EU Regulation of the European Parliament and of the Council no. 792/2016 on the Harmonized Index of Consumer Prices (HICP) is the legal framework for the determination of harmonized consumer price indices, determined by comparable European methodologies, which are linked to the national consumer specificity and the price variation in each country. The Harmonized Index of Consumer Prices (HICP) is a set of EU consumer price indices, calculated according to a harmonized approach and a single set of definitions. The HICP is primarily designed to assess price stability in the Euro area and to converge price developments in the EU, but also to compare inflation at European level. Starting with January 2016, the HICP series are published with the reference year 2015 = 100.

The following table summarizes the main conceptual and methodological differences regarding CPI (Consumer Price Index) and HICP (Harmonized Index of Consumer Prices) calculation:

Table no. 2. *Conceptual and methodological differences on CPI (Consumer Price Indices) and HICP (Harmonized Index of Consumer Prices) calculations.*

Conceptual differences	**CPI**	**HICP**
Applied Classifications	In Romania, for the determination of CPI, a commodity and services nomenclature is used, structured on: ▪ 54 food items, ▪ 111 non - food and non - food items ▪ 50 service stations, significant for the consumption of the Romanian population	**In the European system**, for the determination of HICP, a consumption breakdown is used (COICOP - Classification of Individual Consumption on Destinations), which aggregates the items in the national system. The COICOP classification provides the index comparability at European level and it is structured, according to EU Regulation 792/2016, on 12 detailed divisions, 47 groups, classes, sub-classes.
The inclusion and geographical coverage area of the population	The **CPI** uses the "national" principle of consumption, following the consumption expenditures of the residents, regardless of whether they are made within the country or not.	The **HICP** measures the changes in the price and tariff developments for goods and services that have occurred in Romania. Thus, for the construction of the HICP, the "domestic" principle is used, taking into account the consumption of all households in the country, regardless of nationality, residential or social status, except for foreign embassies located on Romanian territory.

The weighting /sharing system	The shares used to determine **CPI**s are derived from the Family Budget Survey (FBS) and result from the average monthly expenditure of a household for the purchase of goods and the payment of essential services in order to meet the living needs. The structure of the expenditures made by the population is updated annually. Thus, starting with January 2017, CPI calculations use the shares obtained from the structure of the average household expenditure in 2015.	Since 2012, EC Regulation no. 1114/2010 on minimum standards for the quality of **HICP** shares entered into force. The implementation of the regulation for 2017 means the use of data on household final consumption expenditure of households in the 2015 national accounts and of the Household Budget Survey for the 2015 expenditure in order to determine the shares of the harmonized indices. The shares calculated like this are updated according to December 2016 prices.
Indices reference period	In the case of **CPI**: • calculated against the previous month of the same year, the index shows the price evolution from one month to the next; • compared to the previous December, the index highlights the development of the prices since the beginning of the year; • determined against the corresponding month of the previous year, the index demonstrates the evolution of prices, eliminating the seasonal character of this evolution.	In the case of **HICP**: • The index is determined and published against the average of 2015 (2015 = 100). This index reference period is used for the full chronological series of all HICP indices and sub-indices, according to EU Regulation 2010/2015. All Member States of the European Union comply with this rule for reasons of comparability, irrespective of the reference basis of the national indices and the used sharing system. This demonstrates that complementary computing operations are performed on the same data in order to obtain an index with a baseline of 2015 average; For reasons of comparability, the shares used by each State to determine HICPs are reported to the previous year's December.

The CPI and HICP are no longer next to each other, as the shares of different goods and services based on which the annual inflation rate is calculated may vary. When the two indices were at similar levels, the shares were determined, in both cases, according to family budget surveys. Currently, (from 2012), this household survey is used only for the determination of CPI, whereas for the HICP determination, the household consumption expenditure on the national accounts, obtained on the basis of the information on the sale of goods, by retail and service provision for the population.

The economic dynamics of the early 2019 was modest, although the underlying indicators are still solid. The economic growth will continue, but it will be moderate. The European economy still benefits from improved labour market conditions, favourable financing conditions and a slightly expansionist budgetary stance. Currently, the Euro Zone's GDP is now projected to grow by 1.3% in 2019 and by 1.6% in 2020 (the autumn forecast: 1.9% in 2019, 1.7% in 2020). And the EU's GDP growth projections have been revised downwards to 1.5% in 2019 and 1.7% in 2020 (the autumn forecast: 1.9% in 2019 and 1.8% in 2020).

Among the larger Member States, the declining growth revisions in 2019 were considerable for Germany, Italy and the Netherlands. Many Member States still benefit from a strong domestic demand, also supported by the EU funds.

The economic outlook presents a high level of uncertainty and the forecasts are exposed to negative evolution risks. The commercial tensions, which for some time have affected the general perception of the economy, have diminished to a certain extent, but remain a cause for concern. China's economy may slow down more than expected, and global financial markets and many emerging markets are vulnerable to sudden changes in risk perception and growth expectations. As for the EU, the Brexit process remains a source of uncertainty.

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