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## INFLATION CANNOT BE STOPPED

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### Abstract

*The inflation analysis is an essential element that we must take into account in the context of the current economic and financial situation in the world. Crises (sanitary, financial and economic, natural gas, energy prices, agro-food prices) thwart any effort in the desire to stabilize and stop inflation.*

*The authors aim in this article to highlight the explosion of the inflation rate that is pouring out with negative effects, hard to imagine, on the evolution of the entire national economy.*

*In this article, the authors want to highlight on the basis of studies based on statistical and econometric methods the danger that the unprecedented evolution of inflation in the next period represents.*

*At the end of April 2022, the inflation rate is 13.8% or 3.7% higher than in March. In the period of the coming months, June – August, it is anticipated the continuation of the increase of inflation from one month to another. In this context, inflation of over 20% is looming.*

*The effects of this scourge are analyzed using the statistical methodology of the use of indices, indicators, dynamic series, graphical representations, databases and application in the use of statist-econometric methods, which highlight this anticipatory perspective, but difficult to imagine and control.*

**Keywords:** *inflation, crises, statistical-econometric methods and models, indices, indicators, data series.*

**JEL classification:** *C10, E30*

### Introduction

In this article we intend to analyze the evolution of the inflation rate in the last two years in order to identify on this way, using statistical-econometric methods, the evolution trend of this indicator.

In this respect, we started from the processing, analysis and interpretation of the existing data, provided by the National Institute of Statistics and Eurostat, with reference to the evolution of prices in Romania and, more broadly, in the European Union.

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We used statistical-econometric methods, mainly indices, indicators, dynamic series, analysis over time based on factors influencing the increase in inflation. We have also somewhat defined stagnation, given that, on the world market, we can expect an economic recession.

We have also used the graphical representations, the price structure in development to identify the categories of goods and services that have a greater influence on the growth of this flag called inflation.

### **Literature review**

Some methods of analysis, as well as the evolution in time of inflation, were studied by Anghelache, Gheorghe and Voineagu (2012), as well as by Fiti (2010). Also, Anghelache C., Anghel M.G. (2016) and Anghelache C., Anghel M. G. (2019) address from a theoretical and practical point of view problems related to the collection, sorting, arrangement of statistical series of data and those of economic modeling. Anghelache, Niță and Badiu, A. (2016) conducted studies on the evolution of the price index in Romania. Anghelache and Sacala (2015) presented a series of basic notions of inflation. Armantier and collaborators (2015) addressed a number of issues regarding inflation forecasts. Kim and Henderson (2005) addressed issues related to inflation and influence on nominal income growth. Sylvestre (2002) addresses some theoretical and practical elements of the use of econometric instruments in economics.

### **Methodologies**

For the easier understanding of the opinions expressed in this study, the main methodological aspects were extracted from the methodology used by the National Institute of Statistics and Eurostat. Thus, consumer price indices (CPIs) cover monetary expenditure on goods and services for final consumption, for all types of resident households, with the exception of institutional households, in order to provide the most relevant and accurate picture of inflation. The CPI can be regarded as a method of broadly measuring the prices of a fixed expenditure model.

The Harmonised Index of Consumer Prices (HICP) is a set of EU consumer price indices, calculated in accordance with a harmonised approach and a single set of definitions. The HICP is primarily designed to assess price stability in the euro area and convergence of price developments in the EU, but also for comparisons of inflation at European level.

Weighting - commensurate coefficient used in the calculation of a synthetic index (aggregate) for a collective of inedible elements directly, having as function the establishment of the relative importance of each element in the researched statistical collectivity.

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The monthly inflation rate represents the increase of consumer prices in one month, compared to the previous month.

The average monthly inflation rate is the average of the monthly price rises. It is calculated as a geometric average of the monthly indices of consumer prices with a chain base minus the basis of comparison equal to 100.

The average annual inflation rate represents the increase of consumer prices in one year compared to the previous year. This rate shall be calculated as a ratio, expressed as a percentage, between the average price index of a year and that of the preceding year, minus 100. In turn, the average price indices in the two years are determined as simple arithmetic averages of the monthly indices of each year, calculated against the same base (October 1990 = 100).

The annual inflation rate represents the increase of consumer prices in one month of this year, compared to the same month of the previous year. This rate shall be calculated as a ratio, expressed as a percentage, between the price index of one month of the current year and the index of the corresponding month of the preceding year, calculated against the same basis, minus 100.

Scope: the prices measured are those actually borne by consumers, so they include sales taxes on products such as value added tax.

The CPI is calculated on the basis of the elements that enter the direct consumption of the population and excludes: the consumption from own resources representing the equivalent of the quantities of products consumed by the population coming from sources other than purchases (from stock, from own production, received as a gift, etc.); expenditures of an investment and accumulation character (purchase of dwellings, building materials used for the construction of new dwellings or carrying out capital repairs to old dwellings), insurance rates, fines, gambling, taxes, etc.; expenses related to the payment of labor for household production (ploughing, sowing, hoeing, care of gardens and orchards of trees, vineyards, harvesting of crops, mowing of hay, medical treatment of animals, etc.). The CPI excludes interest and credit charges, referring to them as a financing cost, not as a consumer expenditure.

The CPI is calculated as a fixed-base Laspeyres index. Starting with January 2020, the calculation of the fixed-base monthly indices is made using the average prices in 2018 (2018 = 100) and the weightings in the same year determined on the basis of the average expenses in the Family Budgets Survey. The prices collected monthly are retail prices, including VAT.

The general formula for calculating the Laspeyres index is:

$$L_b = \sum I_b \left( \frac{p_o q_o}{\sum p_o q_o} \right)$$

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$L_{lo}$  = the aggregated index of the current month ( $I$ ) in 2020 compared to the reference year 2018;

$I_{lo}$  = indices of the current month compared to the average of 2018 by aggregation steps;

$\frac{p_o q_o}{\sum p_o q_o}$  = the weights related to the aggregation steps (relative importance of expenditure monthly averages per household for 2018).

***Needle of price indices at variety level:***

$$i_{v_i} = \frac{p_l^{v_i}}{\bar{p}_o^{v_i}} \bullet 100$$

$p_l^{v_i}$  = the price of the variety  $i$  recorded in the current month ( $I$ );

$\bar{p}_o^{v_i}$  = the annual average of the prices of the  $i$  variety in 2018.

The price of variety  $i$  recorded in the current month ( $p_l^{v_i}$ ) shall be calculated as a simple arithmetic mean from the three decal records, as follows:

$$p_l^{v_i} = \frac{p_{l_1}^{v_i} + p_{l_2}^{v_i} + p_{l_3}^{v_i}}{3} \quad \text{or} = \quad p_{l_1}^{v_i} \quad p_{l_2}^{v_i}$$

in which:

$p_{l_1 \dots l_3}^{v_i}$  = nominal prices for the three decades observed in the current month, for the variety  $V_j$ .

The second formula is applied for most assortments of non-food goods and services for which the collection is made only in the period 10 - 17 of the reference month.

***Calculation of price indices at assortment level, as a geometric average of variety indices, according to the formula:***

$$I_{l/18}^S = \sqrt[n]{\prod_{i=1}^n i_{v_i}} \quad n \leq 68$$

$n$  = number of price/tariff collection centres.

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**Calculation of indices at the level of groups of food goods, non-food goods and services** as a weighted arithmetic average of the indices at the level of expenditure items included in the group, as follows:

$$I_{t/18}^C = \sum I_{t/18}^{P_i} \left( \frac{w_o^{P_i}}{\sum w_o^{P_i}} \right)$$

$I_{t/18}^C$  = group price index in the current month (*t*) compared to the average of 2018;

$I_{t/18}^{P_i}$  = the price index at post level in the current month (*t*) compared to the average of 2018;

$w_o^{P_i}$  = the share of the job  $P_i$ ;

$\sum w_o^{P_i}$  = the weighting of the group of goods and services.

#### **Form of presentation of aggregation posts**

In the national system, in the construction of the CPI, a nomenclature of goods and services is used, structured on 54 posts of food products, 112 posts of non-food products and 50 service stations, significant for the consumption of the Romanian population.

In the European system, in the construction of the HICP, a classification of expenditure by consumption destination (ECOICOP – Classification of Individual Consumption by Destination) is used, which regroups the items in the national system. The ECOICOP classification ensures the comparability of indices at European level, and is structured, according to EU regulation 792/2016, on 12 detailed divisions, 47 groups, classes, sub-classes.

The CPI uses the *national* principle of consumption, tracking the consumption expenditure of residents, regardless of whether they are made within or outside the borders of the country.

The HICP measures the changes in the evolution of prices and tariffs related to goods and services that have occurred on the territory of Romania. Thus, for the construction of the HICP, the *domestic* principle is used, taking into account the consumption of all households on the territory of the country, regardless of nationality, residential or social status, except for foreign embassies located in Romania.

The weights used to calculate the CPI are obtained from the Family Budget Survey (ABF) and result from the structure of the average monthly expenditure incurred by a household for the purchase of goods and for the payment of services necessary to meet the living needs. Annually, the structure of expenditures made by the population is analyzed and updated. Thus, starting from January 2020, in the calculation of the CPI, the weights resulting from the structure of the average expenditures incurred by a household in 2018 are used.

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Since 2012, Ec Regulation No. Regulation (EC) No 1114/2010 on minimum standards for the quality of HICP weightings. The implementation of the regulation, for 2020, means the use of data on the final monetary consumption expenditure of households from the national accounts for 2018 and of the expenses from the Family Budgets Survey 2018 for the calculation of the shares of the harmonized indices. The weights thus calculated are then updated to the prices of December 2019.

### Data, results and discussions

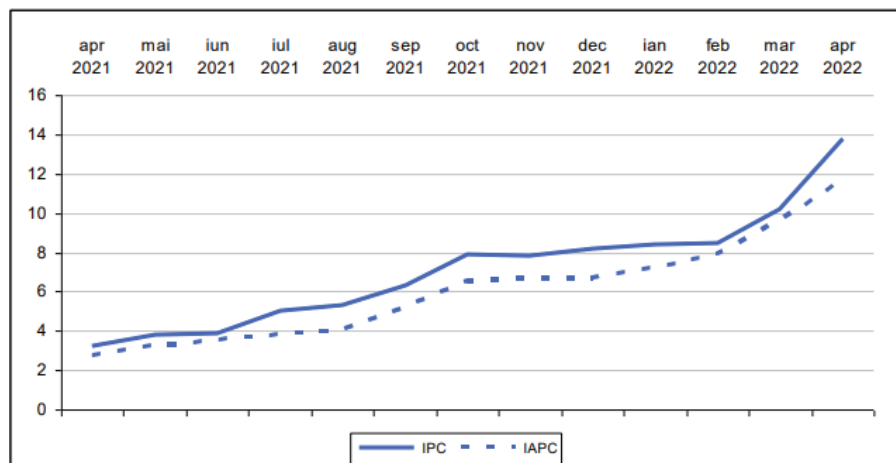
Analyzing and interpreting the data provided by the National Institute of Statistics, we find that the consumption rates in April 2022 compared to March 2022 increased by 3.7%. Also, the inflation rate at the beginning of the year, i.e. April 2022 compared to December 2021, is 7.9%.

What is worth taking into account is the fact that the annual inflation rate in April 2022, compared to April 2021, is 13.8%, and the average increase in consumer prices in the last 12 months, respectively May 2021 – April 2022, compared to the previous 12 months, respectively May 2020 – April 2021, is 7.4%.

The annual change in consumer prices is shown in Chart number 1.

### Annual change in consumer prices (%)

Chart 1



Source: *Communique INS number 115 / 11 May 2022*

If we analyze the evolution of the harmonized evolution of consumer prices, we find that in April 2022 compared to March 2022, it is 102,37%. Also,

the annual inflation rate in April 2022, compared to April 2021, calculated on the basis of the Harmonized Index of Consumer Prices (HICP) is 11.7%.

As regards the average consumption price response in the last 12 months, the following may 2021 – April 2022, compared to the previous 12 months, respectively May 2020 – April 2021, determined on the basis of the HICP, is 6.4%.

Data on the evolution of consumer price trends and the monthly inflation rate are presented in Table 1.

### Consumer price index and average monthly inflation rate (%)

Table 1

	April-22			Average monthly inflation rate	
	to:			in period I I – 30 IV	
	March-22	December-21	April-21	2022	2021
Food commodities	102.56	108.46	113.54	2.1	0.5
Non-food goods	105.45	108.94	116.35	2.2	0.9
Services	100.94	103.63	107.11	0.9	0.3
<b>TOTAL</b>	<b>103.74</b>	<b>107.88</b>	<b>113.76</b>	<b>1.9</b>	<b>0.6</b>

Source: Communiqué INS number 115 / 11 May 2022

We note that the largest increase in April 2022 compared to April 2021 was registered in the case of non-food goods, respectively 16.35%, followed by food goods with 13.54% and the smallest change in the case of services of 7.11%, and in total 13.76%.

Table number 2 shows the partial indices calculated by excluding certain components from the CPI.

### Partial indices calculated by excluding certain components from the CPI (previous month = 100)

Table 2

	Apr-22 %
(a) Total CPI excluding alcoholic beverages and tobacco	103.98
(b) Total IPC excluding fuels	103.98
(c) Total CPI excluding products whose prices are regulated*	103.92
(d) Total CPI excluding vegetables, fruit**, eggs, fuels, electricity, natural gas and products whose prices are regulated*	101.50
(e) Total CPI excluding vegetables, fruit**, eggs, fuels, electricity, natural gas and products whose prices are regulated*, alcoholic beverages and tobacco	101.56
<b>TOTAL</b>	<b>103.74</b>

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\* Products whose prices are regulated: medicines, thermal energy, C.F.R. transport, water transport, post and courier, identity card issuance services, car license, passport, water, sewerage, sanitation, urban public transport, rents set by the local administration.

\*\* In order to respond more accurately to the needs of inflation analysis, as of September 2014, the fruit group includes, in addition to fresh fruit and citrus fruit, other southern fruits.

Source: Communique INS number 115 / 11 May 2022

According to the presented data, we find the most significant increases in the values of the partial indices calculated for April 2022, compared to March 2022, are in the case of exclusion from the value of the consumer price index of the components of fuels and alcoholic beverages and tobacco, respectively 3.98%.

### **Conclusions**

From the study of this indicator it is concluded that in the conditions of cumulation of crises that influence in a conjugated way the world market and of each country, we can draw some conclusions, namely. Inflation, in a practical way, is out of control in the sense that the galloping evolution of the price of energy of all forms, is itself a phenomenon beyond the control of each nation.

Inflation leads to a reduction in real incomes and, as a consequence, dramatically influences the quality of life of the population.

These crises act in a conjugated manner and determinate reduced possibilities of tempering and, even less, eliminating the rise in inflation.

Inflation, paradoxically, has an effect of increasing gross domestic product over a period of time, since it increases the gross value added and the final indicators on which VAT is calculated, but in real terms also the effect of the production of goods itself is particularly negative.

The data recorded in the evolution of the inflation rate trend at the end of April are alarming, especially since they foreshadow a further increase of this indicator.

A final conclusion is that measures must be taken, both at the level of the European Union and at the level of each nation, so that the effects of the increase in the rate of inflation are somewhat anticipated and strengthened by some measures that can be taken.

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