# MONEY AND THE CURRENT INFLATIONARY CRISIS

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***Abstract:*** *The year 2021 marked increases in inflationary processes in many countries, the phenomenon accelerated in 2022 and began to fade in 2023. The phenomenon was present, with different dynamics, in all European states, but also countries on other continents, such as the USA. The analyzes of the process have located the causes in the global prices of energy products, food prices, the Russian-Ukrainian war, the intensification of blockages at the supply level and in the supply chains, the recovery of domestic demand, against the background of the reopening of the economy following the pandemic crisis, etc. Certainly all of this had an impact, but most analyzes neglect the relationship between prices and money. Most of the world's economies after the financial crisis of 2007-2010, applied policies of quantitative easing, through which the central bank buys securities from the financial market and, in return, feeds the economy with money, which had the effect of increasing currency stocks in circulation. Later, starting in 2020, the pandemic crisis shut down the economy, the supply of goods and services falling in varying proportions, but central banks continued to issue impressive amounts of currency. Accordingly, this paper attempts to argue that the real cause of the inflationary crisis, which began in 2021, is the surplus of currency that existed and still exists in the economy.*

***Keywords:*** *inflation, causes, money, aggregate supply.*
***JEL Classification:*** *E31.*

## 1. Inflation trends over the last three decades

We have analysed the evolution of inflationary processes over a relatively long period, 27 years, particularly in European countries and the United States. The indicator analysed was the harmonised index of consumer prices and the source of the information was the Eurostat database, in order to ensure comparability. We also converted the aforementioned indices into inflation rates (the purpose of the analysis) and changed the basis of calculation, from 2015, the first year for which Eurostat statistics presented data.

**Table 1. Inflation dynamics in some European countries and the US**

| Tara | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Austria | 1,17 | 0,81 | 0,52 | 1,96 | 2,29 | 1,69 | 1,29 | 1,96 | 2,11 | 1,69 | 2,20 | 3,23 | 0,40 | 1,69 | 3,56 | 2,57 | 2,11 | 1,46 | 0,81 | 0,97 | 2,23 | 2,12 | 1,49 | 1,39 | 2,76 | 8,62 | 7,71 |
| Belgium | 1,50 | 0,89 | 1,14 | 2,68 | 2,43 | 1,55 | 1,53 | 1,86 | 2,53 | 2,33 | 1,81 | 4,49 | -0,01 | 2,33 | 3,36 | 2,63 | 1,25 | 0,49 | 0,62 | 1,77 | 2,22 | 2,32 | 1,25 | 0,43 | 3,22 | 10,34 | 2,28 |
| Denmark | 1,96 | 1,23 | 2,03 | 2,79 | 2,32 | 2,40 | 1,85 | 0,97 | 1,80 | 1,76 | 1,73 | 3,64 | 0,99 | 2,17 | 2,66 | 2,38 | 0,51 | 0,40 | 0,20 | 0,00 | 1,10 | 0,69 | 0,69 | 0,39 | 1,94 | 8,48 | 3,34 |
| Finland | 1,21 | 1,35 | 1,32 | 2,95 | 2,67 | 2,00 | 1,29 | 0,15 | 0,77 | 1,28 | 1,57 | 3,93 | 1,63 | 1,69 | 3,32 | 3,15 | 2,22 | 1,21 | -0,16 | 0,39 | 0,84 | 1,18 | 1,13 | 0,39 | 2,06 | 7,18 | 4,33 |
| France | 1,27 | 0,69 | 0,56 | 1,82 | 1,78 | 1,93 | 2,18 | 2,33 | 1,90 | 1,89 | 1,61 | 3,15 | 0,11 | 1,74 | 2,29 | 2,21 | 1,00 | 0,60 | 0,09 | 0,31 | 1,16 | 2,10 | 1,30 | 0,52 | 2,07 | 5,91 | 5,66 |
| Germany | 1,59 | 0,52 | 0,65 | 1,41 | 1,90 | 1,37 | 1,10 | 1,70 | 2,03 | 1,75 | 2,30 | 2,70 | 0,22 | 1,20 | 2,48 | 2,11 | 1,65 | 0,71 | 0,70 | 0,40 | 1,69 | 1,86 | 1,44 | 0,28 | 3,21 | 8,70 | 6,07 |
| Greece | 5,43 | 4,52 | 2,15 | 2,90 | 3,63 | 3,93 | 3,45 | 3,02 | 3,48 | 3,31 | 3,00 | 4,23 | 1,35 | 4,70 | 3,11 | 1,04 | -0,85 | -1,39 | -1,10 | 0,02 | 1,13 | 0,78 | 0,51 | -1,26 | 0,57 | 9,30 | 4,16 |
| Ireland | 1,30 | 2,14 | 2,52 | 5,18 | 4,02 | 4,74 | 3,93 | 2,29 | 2,24 | 2,63 | 2,88 | 3,22 | -1,71 | -1,64 | 1,25 | 1,85 | 0,50 | 0,30 | 0,00 | -0,20 | 0,30 | 0,70 | 0,89 | -0,49 | 2,37 | 8,11 | 5,18 |
| Italy | 1,90 | 2,01 | 1,54 | 2,63 | 2,29 | 2,64 | 2,82 | 2,25 | 2,20 | 2,27 | 1,99 | 3,55 | 0,77 | 1,65 | 2,92 | 3,25 | 1,32 | 0,20 | 0,10 | -0,10 | 1,40 | 1,18 | 0,68 | -0,19 | 1,94 | 8,76 | 5,87 |
| Luxembourg | 1,39 | 0,96 | 1,03 | 3,77 | 2,40 | 2,05 | 2,54 | 3,23 | 3,77 | 2,96 | 2,65 | 4,08 | 0,01 | 2,80 | 3,73 | 2,89 | 1,70 | 0,70 | 0,06 | 0,04 | 2,11 | 2,02 | 1,65 | 0,00 | 3,47 | 8,16 | 2,93 |
| Netherlands | 1,86 | 1,78 | 2,03 | 2,33 | 5,11 | 3,87 | 2,22 | 1,39 | 1,48 | 1,66 | 1,57 | 2,22 | 0,97 | 0,93 | 2,47 | 2,83 | 2,56 | 0,32 | 0,21 | 0,11 | 1,29 | 1,60 | 2,68 | 1,12 | 2,82 | 11,64 | 4,10 |
| Portugal | 1,88 | 2,22 | 2,17 | 2,81 | 4,41 | 3,70 | 3,23 | 2,51 | 2,13 | 3,05 | 2,42 | 2,64 | -0,89 | 1,38 | 3,56 | 2,78 | 0,43 | -0,15 | 0,50 | 0,64 | 1,55 | 1,17 | 0,30 | -0,13 | 0,94 | 8,11 | 5,26 |
| Spain | 1,88 | 1,75 | 2,24 | 3,49 | 2,82 | 3,59 | 3,10 | 3,06 | 3,39 | 3,55 | 2,85 | 4,12 | -0,24 | 2,05 | 3,04 | 2,44 | 1,53 | -0,20 | -0,63 | -0,34 | 2,04 | 1,74 | 0,77 | -0,34 | 3,01 | 8,32 | 3,40 |
| Sweden | 1,81 | 1,01 | 0,56 | 1,30 | 2,68 | 1,94 | 2,31 | 1,03 | 0,82 | 1,51 | 1,68 | 3,35 | 1,94 | 1,90 | 1,37 | 0,93 | 0,45 | 0,20 | 0,70 | 1,14 | 1,86 | 2,04 | 1,72 | 0,65 | 2,66 | 8,06 | 5,91 |
| European Economic Area | 1,72 | 1,30 | 1,19 | 1,91 | 2,21 | 2,07 | 1,96 | 1,99 | 2,16 | 2,21 | 2,32 | 3,66 | 1,01 | 2,09 | 3,08 | 2,62 | 1,50 | 0,57 | 0,12 | 0,29 | 1,72 | 1,90 | 1,48 | 0,75 | 2,91 | 9,16 | 6,35 |
| Cyprus | 3,31 | 2,33 | 1,15 | 4,86 | 1,99 | 2,79 | 3,97 | 1,90 | 2,02 | 2,25 | 2,17 | 4,38 | 0,17 | 2,57 | 3,48 | 3,10 | 0,38 | -0,27 | -1,55 | -1,22 | 0,68 | 0,78 | 0,55 | -1,10 | 2,26 | 8,09 | 3,93 |
| Czechia | 8,16 | 9,59 | 1,87 | 3,94 | 4,47 | 1,43 | 0,00 | 2,56 | 1,62 | 2,09 | 2,88 | 6,31 | 0,55 | 1,20 | 2,16 | 3,59 | 1,33 | 0,50 | 0,20 | 0,70 | 2,38 | 1,94 | 2,57 | 3,34 | 3,32 | 14,77 | 11,96 |
| Estonia | 9,30 | 8,79 | 3,09 | 3,93 | 5,63 | 3,59 | 1,38 | 3,03 | 4,12 | 4,45 | 6,74 | 10,61 | 0,20 | 2,73 | 5,08 | 4,22 | 3,25 | 0,47 | 0,07 | 0,80 | 3,65 | 3,42 | 2,27 | -0,63 | 4,48 | 19,45 | 9,11 |
| Hungary | 18,45 | 14,22 | 9,96 | 9,95 | 9,09 | 5,24 | 4,68 | 6,78 | 3,48 | 4,03 | 7,93 | 6,03 | 4,03 | 4,73 | 3,92 | 5,66 | 1,71 | 0,02 | 0,06 | 0,45 | 2,38 | 2,92 | 3,42 | 3,37 | 5,21 | 15,27 | 17,03 |
| Lithuania | 10,33 | 5,37 | 1,45 | 1,09 | 1,54 | 0,34 | -1,09 | 1,16 | 2,67 | 3,76 | 5,82 | 11,10 | 4,16 | 1,19 | 4,12 | 3,16 | 1,17 | 0,24 | -0,68 | 0,68 | 3,71 | 2,54 | 2,24 | 1,06 | 4,63 | 18,85 | 8,69 |
| Latvia | 8,07 | 4,30 | 2,11 | 2,62 | 2,54 | 1,96 | 2,95 | 6,18 | 6,88 | 6,57 | 10,09 | 15,25 | 3,26 | -1,22 | 4,22 | 2,28 | 0,02 | 0,69 | 0,21 | 0,10 | 2,90 | 2,55 | 2,75 | 0,08 | 3,24 | 17,24 | 9,06 |
| Malta | 3,93 | 3,69 | 2,30 | 3,03 | 2,52 | 2,62 | 1,92 | 2,73 | 2,52 | 2,57 | 0,70 | 4,68 | 1,83 | 2,05 | 2,52 | 3,22 | 0,98 | 0,77 | 1,17 | 0,90 | 1,27 | 1,73 | 1,53 | 0,79 | 0,71 | 6,13 | 5,56 |
| Poland | 14,94 | 11,86 | 7,07 | 10,06 | 5,43 | 1,90 | 0,66 | 3,70 | 2,17 | 1,25 | 2,59 | 4,20 | 4,03 | 2,66 | 3,88 | 3,63 | 0,80 | 0,10 | -0,70 | -0,20 | 1,60 | 1,18 | 2,14 | 3,63 | 5,25 | 13,21 | 10,90 |
| Slovakia | 6,02 | 6,68 | 10,44 | 12,19 | 7,15 | 3,51 | 8,43 | 7,48 | 2,79 | 4,26 | 1,89 | 3,94 | 0,92 | 0,70 | 4,08 | 3,74 | 1,46 | -0,10 | -0,35 | -0,48 | 1,39 | 2,54 | 2,77 | 2,01 | 2,82 | 12,12 | 10,99 |
| Slovenia | 8,33 | 7,91 | 6,12 | 8,95 | 8,63 | 7,49 | 5,65 | 3,66 | 2,44 | 2,54 | 3,81 | 5,52 | 0,86 | 2,06 | 2,08 | 2,81 | 1,93 | 0,37 | -0,76 | -0,15 | 1,55 | 1,93 | 1,69 | -0,28 | 2,05 | 9,32 | 7,22 |
| Bulgaria | | 18,67 | 2,57 | 10,32 | 7,36 | 5,82 | 2,34 | 6,15 | 6,04 | 7,40 | 7,58 | 11,95 | 2,47 | 3,04 | 3,39 | 2,39 | 0,38 | -1,60 | -1,07 | -1,32 | 1,19 | 2,63 | 2,45 | 1,22 | 2,85 | 13,01 | 8,61 |
| Romania | 155,08 | 59,11 | 45,79 | 45,66 | 34,45 | 22,52 | 15,26 | 11,90 | 9,06 | 6,61 | 4,90 | 7,92 | 5,58 | 6,08 | 5,82 | 3,38 | 3,19 | 1,38 | -0,41 | -1,07 | 1,08 | 4,08 | 3,91 | 2,33 | 4,10 | 12,02 | 9,75 |
| Croatia | | | 3,75 | 4,44 | 4,27 | 2,53 | 2,39 | 2,15 | 2,99 | 3,29 | 2,66 | 5,80 | 2,23 | 1,08 | 2,20 | 3,35 | 2,33 | 0,22 | -0,26 | -0,63 | 1,31 | 1,55 | 0,79 | 0,02 | 2,68 | 10,67 | 8,39 |
| Switzerland | | | | | | | | | | 1,00 | 0,78 | 2,36 | -0,73 | 0,62 | 0,10 | -0,72 | 0,07 | 0,01 | -0,83 | -0,53 | 0,64 | 0,92 | 0,38 | -0,84 | 0,48 | 2,67 | 2,27 |
| Serbia | | | | | | | | | | | 5,81 | 11,84 | 8,13 | 6,24 | 11,21 | 7,32 | 7,72 | 2,28 | 1,52 | 1,30 | 3,36 | 2,01 | 1,87 | 1,75 | 4,07 | 11,72 | 12,04 |
| Türkiye | 85,99 | 82,19 | 61,28 | 53,15 | 56,77 | 46,99 | 25,30 | 10,07 | 8,12 | 9,28 | 8,76 | 10,45 | 6,24 | 8,58 | 6,46 | 8,96 | 7,45 | 8,91 | 7,75 | 7,66 | 11,12 | 16,33 | 15,18 | 12,28 | 19,59 | 72,28 | 53,97 |
| United Kingdom | 1,89 | 1,57 | 1,26 | 0,83 | 1,24 | 1,22 | 1,34 | 1,32 | 2,09 | 2,30 | 2,38 | 3,55 | 2,24 | 3,23 | 4,47 | 2,89 | 2,50 | 1,52 | 0,00 | 0,70 | 2,68 | 2,42 | 1,79 | | | | |
| United States | | | | | | | 2,27 | 2,72 | 3,69 | 3,17 | 2,63 | 4,37 | -0,83 | 2,43 | 3,82 | 2,11 | 1,25 | 1,31 | -0,75 | 0,57 | 1,76 | 2,16 | 1,38 | 0,76 | 5,34 | 8,68 | 3,00 |

Source: Eurostat, HICP - annual data (average index and rate of change)

We have divided the inflation rate values into four groups:

- values of 2% (as the benchmark for the term "stability") or just above, not exceeding 3% (the cells for these values have a white background);
- values from 3 to 10%, above the stability level and corresponding to a visible level (through negative effects) in both personal and corporate budgets (the cells for these values have a yellow background);
- values from 10 to 20%, which are accelerating the erosion of the purchasing power of the population and are determining the balances of enterprises (the cells corresponding to these values have an orange background);
- values above 20%, which are close to inflationary crisis zones (cells with red background).

Table 1 shows the following for the countries analysed:

a. a difference between the countries of Western Europe and the USA on the one hand and the countries of Central and Eastern Europe on the other, in the sense that in the former, the level of inflation is much lower, the figures are much closer to the range characteristic of stability, while in the latter group, the figures consistently exceed this range;

b. over 27 years, there have been three inflationary spikes, two small ones in 2008, in the wake of the financial crisis, then in 2011 and 2012, as the crisis was being overcome, and the third, which was persistent, began in 2021 and continued into 2022 and 2023;

c. in the middle of the second decade, 2014, 2015, 2016, many European countries, as well as the USA, experienced a more or less prolonged deflationary peak or were close to such a phase, and without generalising, some European countries repeated the experience in the pandemic year, due to the closure of their economies;

d. the countries with the most disappointing inflation performance are Turkey and Romania;

e. in Romania's case, out of the 27 years analysed, it had an inflation of over 20% for 6 years, then another 3, the inflation rate was over 3% for 12 years, it experienced deflation (denied by the NBR and motivated by fiscal effects) for 2, and the statistics recorded inflation values at the level of financial stability for only 3 years. It should also be noted that this counter-performance of our country is unique in the European Union.

**2. Causes of the inflationary crisis according to central banks**

2021 marked increases in inflationary phenomena in many countries, the phenomenon has accelerated in 2022 and has begun to fade in 2023. Here are some case studies:

a. In the summer of 2021, the European Central Bank (ECB) expected inflation to pick up in the autumn of that year and forecast a reduction in 2022. The ECB saw the inflationary surge as stemming from "*the sharp rise in oil prices starting around halfway through last year, the reversal of the temporary reduction in the VAT rate in Germany, the delay of summer promotional sales in 2020, and the manifestation of cost pressures from temporary shortages of materials and equipment*" (ECB, 2021). ECB forecasts for 2022 did not come true. Thus, in June 2022, the ECB Economic Bulletin, considered that "*inflation picked up [...] to 8.1% in May", the reasons being global energy prices, food prices "partly reflecting the importance of Ukraine and Russia among the world's leading producers of agricultural goods*", "*re-intensification of supply bottlenecks, recovery of domestic demand, particularly in services, amid the reopening of the euro area economy*" (ECB, 2022). After an uncertain 2023 for inflation, in early 2024, the ECB reckoned that "*core inflation eased further in January as the impact of past supply shocks continued to fade and tight monetary policy*

*dampened demand", but "domestic inflationary pressures are still elevated, partly as a result of robust wage dynamics and falling labour productivity*". (ECB, 2024a).

b. In the United States, the Federal Reserve System's (FED) Monetary Policy Report, analyzing the price situation in 2021, found in early 2022 that the price index for personal consumption expenditures had risen 5.8 percent in the 12 months ending December 2021, and the index excluding food and energy had risen 4.9 percent, these were "*the highest values for both measures in about 40 years*", and inflation pressures were due to "*commodity prices, which are facing both supply chain bottlenecks and strong demand, such as for cars and furniture, high wage growth in some service sectors and a significant increase in housing rents*". (FED, 2022). One year later, in 2023, looking at price developments in 2022, the EDF found that the consumer price index was falling, yet it was still higher than in the pre-pandemic years (Consumer price inflation as measured by the 12-month change in the index for personal consumption goods prices, was 5.4% in January, down from its peak of 7% in June last year but still well above the FOMC's 2% target, and prices of goods included in core inflation, which excludes volatile commodity prices such as food and energy, dropping to 4.7%. The causes for the inflationary wave to continue into 2022 were supply chain bottlenecks, commodity price increases, basic services prices such as housing/rent services, labour market slack "*in tight areas*" (FED, 2023). The moderation of the inflationary wave in 2023 is explained by oil prices being below 2022 levels (although the redirection of shipping away from the Red Sea "*had put some upward pressure on oil prices*"), falling natural gas prices due to high production, slowing food prices due to lower agricultural and livestock commodity prices, moderating supply bottlenecks, lower import prices, decelerating rent growth, easing labour demand and improving labour supply, as evidenced in the March 2024 Federal Reserve System (FED) Monetary Policy Report notes. (FED, 2024)

c. A more detailed analysis of the inflationary wave affecting the global economy between 2021 and 2023 can be found in the annual reports of the International Monetary Fund (IMF), World Economic Outlook. Thus, in its October 2021 World Economic Outlook, subtitled Recovery During A Pandemic, the IMF, considered the inflationary crisis to begin in 2021 as a result of (1) rising global food prices, but also local shortages in some countries in sub-Saharan Africa and the Middle East and Central Asia, (2) pandemic-induced supply-demand mismatches and commodity price increases, (3) developments related to some national policies (such as "*the expiry of the temporary value-added tax rebate in Germany, rents in the US, the expiry of mortgage moratoria in some jurisdictions*"), (4) exchange rate depreciation, which contributed to higher prices of imported goods, (5) "*supply bottlenecks, caused by the sharp contraction in demand in 2020, which led many companies to reduce orders of intermediate inputs, and the recovery in 2021 that made some manufacturers unable to rapidly increase supply flows (e.g., microchip production), and, in addition, the global distribution of shipping containers became highly distorted during the pandemic or blocking their usual routes, which increased delays in delivery times (the closure of the Suez Canal, port restrictions in China following the COVID-19 outbreaks, congestion at ports in Los Angeles and Long Beach)*" [later, the series of these factors, were expanded in the 2022 IMF report, adding factory closures due to outbreaks, congested shipping lanes, worker shortages due to caretakers or dependent care responsibilities, etc.], (6) rising oil prices (in 2021, nearly 60% above 2020 baseline), (7) rising non-oil commodity prices (increasing nearly 30% above 2020 levels) (IMF, 2021).

A year later, the IMF, in its World Economic Outlook, entitled War Sets Back The Global Recovery, published in April 2022, estimated that global inflation would rise above the 2021 forecast due to the impact of the war in Ukraine and the extension of price

pressures. Thus, the IMF sees the conflict in Eastern Europe having a prolonged impact on commodity prices, affecting oil and gas prices more severely in 2022 and food prices by 2023 (due to the delayed impact of the 2022 harvest). The war in Ukraine and sanctions against Russia and Belarus have led to disruption of both food supplies and agricultural inputs such as potash fertiliser, futures markets indicate that oil and gas prices will rise rapidly in 2022 (by 55 and 147% respectively) and added uncertainty to the forecast, making commodity prices volatile in the 2022-2023 outlook. Also in the same paper, the IMF notes that "*core inflation, which excludes food and energy prices, has exceeded pre-pandemic rates in most economies, increasing most where recoveries have been strongest. It also notes that during 2022 "demand is expected to weaken, consistent with the moderate recovery and the withdrawal of extraordinary policy support overall, and that [... ] supply bottlenecks will ease as production responds to higher prices*", but that "*recurrent bottlenecks in China as a result of the zero-COVID strategy, the war in Ukraine, sanctions against Russia could prolong disruptions in some sectors until 2023*", hence price increases, and that these will add "*to the lack not only of energy supply but also of key production inputs such as rare metals and gas*". The 2022 IMF report, noting, referring to prices in 2021, that the services market has been severely disrupted by pandemic restrictions on people and people's spending has shifted to goods and that this change has overlapped with supply bottlenecks, leading to strong pressures on commodity prices (IMF, 2022).

In the April 2023 World Economic Outlook, subtitled A Rocky Recovery, the IMF, analysing the global inflation situation during 2022, considered that inflation had declined, owing to falling fuel and energy commodity prices, particularly in the United States, the Eurozone and Latin America, the fact that, to curb demand and price increases, most central banks around the world have been raising interest rates rapidly at a faster pace, both overall and core inflation rates (excluding volatile prices) remain at roughly double pre-2021 levels and well above target in almost all inflation-targeting countries (IMF, 2023).

d. In Romania, the National Bank (NBR), in its 2021 Annual Report, considered that the annual inflation rate in 2021, at 8.19% (compared to 2.06% in 2020), was "80%" explained by the increase in natural gas, electricity and fuel prices and stated that "*with the gradual easing of restrictions imposed in the context of the pandemic, global demand for energy goods has recovered, and on the European gas market this has been superimposed on a lower level of stocks*", as the quantities imported from the main supplier could not be replenished. The effects spilled over to the electricity market, all the more so as thermal power plants using this type of fuel played an important role in the energy mix in 2021, filling in for deficient production from hydro and wind sources, as well as the closure of some coal-fired power plants amid the accelerating transition to a green economy. The latter has amplified the cost of fossil fuel energy production, significantly increasing the prices of carbon emission allowances; compared to the end of 2020, prices on European wholesale markets reached up to four and seven times higher for electricity and natural gas in 2021. In the case of fuels, the Brent price advanced, supported by global demand and relatively low OPEC+ production, but at a slower rate than in 2020. In the non-fuel segment, the increase in prices reflected the gradual reduction in domestic wood supply in recent years, as well as the manifestation of effects associated with demand for alternative energy sources. (NBR, 2021).

In its 2022 Annual Report, the NBR, considered that the annual inflation rate in 2022, at 16.37% (compared to 8.19% in 2021), was explained by "*a series of supply shocks - associated with the impact of the war in Ukraine on commodity prices and the unfavourable agricultural year - with the transmission of pressures into consumer prices facilitated by the aggregate demand surplus in the economy*" (NBR, 2022).

In the February 2024 Inflation Report, the NBR notes that the annual rate of consumer price inflation "*accelerated its downward trajectory in the last quarter of 2023, reaching 6.61% in December*", almost 10% lower than in December 2022) and that the disinflation was the result of "*a combination of factors: keeping commodity prices on a downward slope, abundant domestic and international harvests, the extension and expansion of the list of key food products covered by the trade surplus cap measure. In turn, energy commodity prices have continued to fall in annual terms [...]"* (NBR, 2024a).

**3. Money and inflation**

There is no doubt that the energy crisis, disruptions in supply chains and the effects of the Russian-Ukrainian war have had the effect of increasing prices, but I believe that one of the main causes of the increase in inflation was and still is the issue of too much money in relation to the volume of goods and services on the market.

The accumulation of a large quantity of money in circulation, in relation to the needs of national economies, with the quantity of goods and services offered on the markets began immediately after the financial crisis of 2007-2008. In order to limit the effects of the crisis and to avoid it spreading to businesses in the real economy, most central banks have been practising so-called quantitative easing policies, whereby they buy financial assets from banks or directly from economic agents with liquidity problems and, in return, supply the economy with large amounts of money. In the United States, the Federal Reserve System (Fed) bought around $600 billion worth of assets in each of the first three years after the crisis, and since 2012, they have set a monthly target of $40 billion with asset purchases against dollar issuance, with the target rising to $85 billion per month the following year. Purchases were halted on 29 October 2014, after the FED had accumulated $4.5 trillion in assets (Wikipedia, 2024).

Similarly, in the Eurozone, the European Central Bank embarked on large-scale purchases of covered bonds in May 2009 and purchased around €250 billion worth of sovereign bonds from the Member States concerned in 2010 and 2011 (although, until 2015, the ECB refused to openly admit that it was doing quantitative easing). Starting in 2015, the ECB, announced an "extended asset purchase programme" of €60 billion per month from European governments, agencies and institutions, which was planned to last until September 2016 at the earliest, with a total of at least €1.1 trillion, and since 2016, the ECB has increased its monthly bond purchases to €80 billion and included corporate bonds in the assets purchased. The programme continued in subsequent years, so in November 2019, the ECB resumed buying eurozone government bonds at a rate of €20 billion in an effort to encourage governments to borrow more and spend on domestic investment projects (Wikipedia, 2024).

Most central banks have run similar programmes, the main reason being to avoid deflation, which would have plunged national economies into a recession on the scale of 1929-1933. However, the effects of the money issuance of 2008-2016 (even, 2019, in the eurozone) remained, unspent money was accumulating in the accounts of businesses, banks, in the pockets of the population.

2020 and 2021 were the years of the pandemic crisis, when national economies were shut down, the GDP of most countries marked greater or lesser setbacks, but central banks continued to issue currency above needs. For example, in March 2020, to help the economy absorb the shock of the COVID-19 crisis, the ECB announced a €750 billion Emergency Pandemic Purchase Program (EPPP). Across the ocean in the US, the FED announced, on the 15th of March 2020, further quantitative easing of around $700 billion through asset

purchases to support US liquidity in response to the COVID-19 pandemic, and, as of mid-summer 2020, this resulted in an additional $2 trillion in assets on its balance sheets (Wikipedia, 2024).

These measures have been replicated in most economies, with central banks implementing similar monetary issuance programmes, which have further crowded the monetary circuits already congested by the excess money issuance generated by the post-2007 anti-crisis policies and the deflation avoidance policies of the middle of the second decade of the millennium.

Of course these money-issuing policies during the COVID-19 pandemic, as well as those applied after 2017 and the deflation-avoidance policies of 2013-2016 have their justifications, but it made sense that sooner or later economies would have to find a new equilibrium, as long as central banks that had issued impressive amounts of money did little to neutralize the potential effects or sterilize the excess.

So this excess money supply began to show its effects on inflation, starting in late 2021, and the continuing crises that had plagued the economy until then turned into an inflationary crisis that exacerbated its effects in 2022, continued at slightly more modest levels in 2023, and looking set to continue into 2024.

Monetary issuance as a cause of inflation has been found in economic studies and theories for over 200 years. At the beginning of the 20th century, Irving Fisher put it into a simple equation, which shows that any additional quantity of money leads to price increases (as the reciprocal is valid) (Faugere, J.P., 2000). 50 years later, Milton Friedman, Nobel Prize winner in economics, postulates that "*inflation is always and everywhere a monetary phenomenon, for which state policy is responsible*" [Bezbakh, P., Inflation, disinflation, deflation, Ed. Humanitas, Bucharest, 1992, p. 43] and that "*inflation occurs when the quantity of money increases visibly faster than output, and the faster the increase in the quantity of money per unit of output, the higher the inflation rate*" (Wheelen, C., 2016). The same Friedman, also proposes a rule of monetary growth "*monetary policy might be better directed by a rule - namely that money grows at a constant rate - rather than in a discretionary manner.*" (Dornbusch., R, Fischer, S., Startz, R., 2007).

**4. Money dynamics**

Statistics containing information on the money supply measure the size of the money supply by indicators called monetary aggregates. Although there are differences between central banks in the calculation of monetary aggregates, they are, however, generalized (Dardac, N., Barbu, T., 2009):

- M1 monetary aggregate (money supply in the narrow sense), which includes currency in circulation and overnight deposits (current accounts and sight deposits);
- M2 (intermediate money supply), which includes M1 (narrow money supply) and time deposits;
- monetary aggregate M3 (broad money supply), which includes M2 (narrow money supply) and other financial instruments (such as money market fund units, debt securities, etc.).

**Romania's case**. From the outset it should be noted that the NBR calculates the following monetary aggregates (NBR, 2024b):

- M1, money supply in the narrow sense, contains currency in circulation and overnight deposits;
- M2, intermediate money supply, contains M1 and deposits with an original maturity of up to and including two years (deposits redeemable at notice up to and including three months are also included);

- M3, broad money, consists of M2 and other financial instruments (repo loans, money market fund shares/units, debt securities issued with a maturity of up to and including two years).

From the statistical data in the interactive database on the NBR website, it is possible to see a very high dynamic of the money supply circulating in Romania. Thus:

**Table 2. Money dynamics in Romania**

| Date | billions *lei* | | | | | | Increase from previous year - *%* | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Currency (NC) | Depozite overnight (DO) | M1 | M2 | M3 | PIB | NC | DO | M1 | M2 | M3 | PIB |
| Jan. 2007 | 13,5 | 38,1 | 51,6 | 106,3 | 106,6 | 347,0 | - | - | - | - | - | - |
| Dec. 2007 | 21,4 | 58,5 | 79,9 | 148,0 | 148,1 | 418,3 | 58,9 | 53,3 | 54,8 | 39,3 | 38,9 | 20,5 |
| Dec. 2008 | 25,3 | 67,3 | 92,5 | 173,6 | 174,0 | 524,4 | 17,9 | 15,0 | 15,8 | 17,3 | 17,5 | 25,4 |
| Dec. 2009 | 24,0 | 55,4 | 79,4 | 188,0 | 189,6 | 510,5 | -5,2 | -17,6 | -14,2 | 8,3 | 9,0 | -2,6 |
| Dec. 2010 | 26,8 | 54,8 | 81,6 | 199,6 | 202,8 | 533,9 | 11,8 | -1,1 | 2,8 | 6,1 | 6,9 | 4,6 |
| Dec. 2011 | 30,6 | 55,2 | 85,8 | 212,1 | 216,2 | 565,1 | 14,2 | 0,8 | 5,2 | 6,3 | 6,6 | 5,8 |
| Dec. 2012 | 31,5 | 57,5 | 89,0 | 221,8 | 222,0 | 595,4 | 2,8 | 4,2 | 3,7 | 4,6 | 2,7 | 5,4 |
| Dec. 2013 | 34,8 | 65,5 | 100,3 | 241,3 | 241,5 | 637,5 | 10,5 | 13,9 | 12,7 | 8,8 | 8,8 | 7,1 |
| Dec. 2014 | 39,9 | 78,7 | 118,6 | 261,6 | 261,8 | 667,6 | 14,7 | 20,1 | 18,2 | 8,4 | 8,4 | 4,7 |
| Dec. 2015 | 46,5 | 103,1 | 149,6 | 286,1 | 286,3 | 712,8 | 16,5 | 31,0 | 26,1 | 9,4 | 9,3 | 6,8 |
| Dec. 2016 | 54,7 | 125,3 | 180,0 | 314,0 | 314,1 | 752,1 | 17,6 | 21,6 | 20,3 | 9,8 | 9,7 | 5,5 |
| Dec. 2017 | 63,3 | 147,4 | 210,6 | 350,0 | 350,1 | 851,6 | 15,7 | 17,6 | 17,0 | 11,5 | 11,5 | 13,2 |
| Dec. 2018 | 67,7 | 167,4 | 235,1 | 381,1 | 381,1 | 959,1 | 7,0 | 13,6 | 11,6 | 8,9 | 8,8 | 12,6 |
| Dec. 2019 | 74,1 | 202,8 | 276,9 | 422,6 | 422,6 | 1.063,8 | 9,5 | 21,1 | 17,8 | 10,9 | 10,9 | 10,9 |
| Dec. 2020 | 88,2 | 249,4 | 337,6 | 487,3 | 487,3 | 1.066,8 | 19,0 | 23,0 | 21,9 | 15,3 | 15,3 | 0,3 |
| Dec. 2021 | 96,1 | 310,7 | 406,8 | 564,4 | 564,4 | 1.189,1 | 9,0 | 24,6 | 20,5 | 15,8 | 15,8 | 11,5 |
| Dec. 2022 | 101,3 | 296,8 | 398,1 | 603,0 | 603,0 | 1.409,8 | 5,4 | -4,5 | -2,1 | 6,8 | 6,8 | 18,6 |
| Dec. 2023 | 110,2 | 299,1 | 409,4 | 667,8 | 667,8 | 1.549,9 | 8,8 | 0,8 | 2,8 | 10,7 | 10,7 | 9,9 |

Source: www.bnr.ro, Data sets, Money supply and author's calculations

- cash in circulation, sight deposits and current account balances, in the 18 years analysed (2016-2023), increase eight times, the M2 aggregate, which includes, in addition to the items mentioned above, term deposits, increases more than 6 times, while Romania's GDP increases about 4.5 times;

- of the 17 years for which increases can be calculated, the relative increases of all aggregates measuring money supply grow faster than GDP measured in current prices in 6, at least one monetary aggregate grew faster than GDP in another 8, and GDP grows faster than money supply in only 3 years, 2008, 2012 and 2022;

**Table 3. Romania: Correlations of money with GDP**

| Date | The ratio between the monetary aggregate growth index and the GDP growth index | | | | | The ratio of GDP to the monetary aggregate (the number of rotations of a monetary unit) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | NC | DO | M1 | M2 | M3 | NC | DO | M1 | M2 | M3 |
| Jan. 2007 | - | - | - | - | - | 25,7 | 9,1 | 6,7 | 3,3 | 3,3 |
| Dec. 2007 | 1,32 | 1,27 | 1,28 | 1,16 | 1,15 | 19,5 | 7,2 | 5,2 | 2,8 | 2,8 |
| Dec. 2008 | 0,94 | 0,92 | 0,92 | 0,94 | 0,94 | 20,7 | 7,8 | 5,7 | 3,0 | 3,0 |
| Dec. 2009 | 0,97 | 0,85 | 0,88 | 1,11 | 1,12 | 21,3 | 9,2 | 6,4 | 2,7 | 2,7 |
| Dec. 2010 | 1,07 | 0,95 | 0,98 | 1,02 | 1,02 | 19,9 | 9,7 | 6,5 | 2,7 | 2,6 |
| Dec. 2011 | 1,08 | 0,95 | 0,99 | 1,00 | 1,01 | 18,5 | 10,2 | 6,6 | 2,7 | 2,6 |
| Dec. 2012 | 0,98 | 0,99 | 0,98 | 0,99 | 0,97 | 18,9 | 10,3 | 6,7 | 2,7 | 2,7 |
| Dec. 2013 | 1,03 | 1,06 | 1,05 | 1,02 | 1,02 | 18,3 | 9,7 | 6,4 | 2,6 | 2,6 |
| Dec. 2014 | 1,10 | 1,15 | 1,13 | 1,04 | 1,04 | 16,7 | 8,5 | 5,6 | 2,6 | 2,5 |
| Dec. 2015 | 1,09 | 1,23 | 1,18 | 1,02 | 1,02 | 15,3 | 6,9 | 4,8 | 2,5 | 2,5 |
| Dec. 2016 | 1,11 | 1,15 | 1,14 | 1,04 | 1,04 | 13,8 | 6,0 | 4,2 | 2,4 | 2,4 |
| Dec. 2017 | 1,02 | 1,04 | 1,03 | 0,98 | 0,98 | 13,5 | 5,8 | 4,0 | 2,4 | 2,4 |
| Dec. 2018 | 0,95 | 1,01 | 0,99 | 0,97 | 0,97 | 14,2 | 5,7 | 4,1 | 2,5 | 2,5 |
| Dec. 2019 | 0,99 | 1,09 | 1,06 | 1,00 | 1,00 | 14,4 | 5,2 | 3,8 | 2,5 | 2,5 |
| Dec. 2020 | 1,19 | 1,23 | 1,22 | 1,15 | 1,15 | 12,1 | 4,3 | 3,2 | 2,2 | 2,2 |
| Dec. 2021 | 0,98 | 1,12 | 1,08 | 1,04 | 1,04 | 12,4 | 3,8 | 2,9 | 2,1 | 2,1 |
| Dec. 2022 | 0,89 | 0,81 | 0,83 | 0,90 | 0,90 | 13,9 | 4,8 | 3,5 | 2,3 | 2,3 |
| Dec. 2023 | 0,99 | 0,92 | 0,94 | 1,01 | 1,01 | 14,1 | 5,2 | 3,8 | 2,3 | 2,3 |

Source: author's calculations using data from www.bnr.ro, Datasets, Money supply

- if we subjectively consider that there can be a deviation of 5% between the indices of GDP and a monetary aggregate respectively, then we can see that in 2007 and 2020, the amount of money in circulation had grown well above the growth of GDP, in two others, 2008 and 2022, money contracts strongly relative to GDP, and in two others, 2012 and 2017, GDP and monetary aggregates evolved in tandem but with minor differences;

- the number of rotations of a monetary unit in a year is decreasing, reaching lows in the pandemic year, but the growth that follows is slow and far from the values of the first year of the interval analysed. For example, the cash in circulation had a velocity of 25.7 (one unit of cash, averaged transactions of 25.7 lei), because the minimum in 2020 assumed that one monetary unit generated transactions of 12.1 lei. That is, less than half. Subsequently, the indicator reverses its trend, but progress is absolutely marginal (for 2023, we record a ratio of one currency unit to transactions of 14.1 lei).

**The case of the Eurozone**. The European Central Bank calculates the following monetary aggregates: M1, which comprises currency in circulation and overnight deposits, M2, which comprises M1 plus deposits with an agreed maturity of up to two years and deposits redeemable at notice of up to three months, and M3, which comprises M2 plus repurchase agreements, money market fund shares and units, and debt securities with a maturity of up to two years (ECB, 2024b).

As was the case in Romania, the money supply is growing in the Eurozone, but the dynamics are much more modest. Thus:

- cash and overnight deposits increase by 2.5 times, and the M2 aggregate (which includes time deposits) by almost 2 times;

- although developments are more modest than in our country, nevertheless in 7 years (2012, 2014, 2015, 2016, 2018, 2019, 2020), monetary aggregates grow much faster than GDP dynamics, at least one aggregate grows faster than GDP in another 8, and only in 2 (2022 and 2023) does GDP have higher dynamics than monetary aggregates;

- however, if we subjectively consider that there may be deviations between the monetary aggregates and GDP indices of, say, 5%, in most cases they evolve in tandem and with close

values, only in 3 years are divergent developments with large deviations observed: in 2020, the pandemic year, and partly in 2009, when the money supply grows well above GDP, and in 2023, when the money supply contracts quite a lot in relation to GDP;

**Table 4. Money dynamics in the Eurozone**

| Date | Money - billions euro | | | | | PIB (billions euro) | Increase from previous year - % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Currency (N) | Overnight deposits (DV) | M1 | M2 | M3 | | N | DV | M1 | M2 | M3 | PIB |
| 2006 | 582,13 | 3.114,42 | 3.696,55 | 6.705,28 | 7.838,83 | 8.893,19 | | | | | | |
| 2007 | 625,82 | 3.213,69 | 3.839,51 | 7.356,07 | 8.647,96 | 9.386,83 | 7,5 | 3,2 | 3,9 | 9,7 | 10,3 | 5,6 |
| 2008 | 710,87 | 3.281,82 | 3.992,69 | 8.041,92 | 9.402,54 | 9.620,16 | 13,6 | 2,1 | 4,0 | 9,3 | 8,7 | 2,5 |
| 2009 | 757,03 | 3.742,83 | 4.499,86 | 8.208,18 | 9.349,66 | 9.272,33 | 6,5 | 14,0 | 12,7 | 2,1 | -0,6 | -3,6 |
| 2010 | 795,29 | 3.915,52 | 4.710,80 | 8.423,43 | 9.298,96 | 9.533,54 | 5,1 | 4,6 | 4,7 | 2,6 | -0,5 | 2,8 |
| 2011 | 844,80 | 3.958,29 | 4.803,08 | 8.606,63 | 9.497,90 | 9.797,74 | 6,2 | 1,1 | 2,0 | 2,2 | 2,1 | 2,8 |
| 2012 | 864,48 | 4.239,20 | 5.103,68 | 8.999,57 | 9.786,33 | 9.837,02 | 2,3 | 7,1 | 6,3 | 4,6 | 3,0 | 0,4 |
| 2013 | 910,07 | 4.475,95 | 5.386,02 | 9.211,92 | 9.832,59 | 9.935,97 | 5,3 | 5,6 | 5,5 | 2,4 | 0,5 | 1,0 |
| 2014 | 970,35 | 4.971,06 | 5.941,41 | 9.675,44 | 10.326,08 | 10.169,84 | 6,6 | 11,1 | 10,3 | 5,0 | 5,0 | 2,4 |
| 2015 | 1.037,86 | 5.574,82 | 6.612,68 | 10.217,57 | 10.842,91 | 10.523,62 | 7,0 | 12,1 | 11,3 | 5,6 | 5,0 | 3,5 |
| 2016 | 1.076,64 | 6.080,99 | 7.157,63 | 10.709,55 | 11.382,09 | 10.816,81 | 3,7 | 9,1 | 8,2 | 4,8 | 5,0 | 2,8 |
| 2017 | 1.113,00 | 6.637,24 | 7.750,23 | 11.209,46 | 11.860,29 | 11.224,92 | 3,4 | 9,1 | 8,3 | 4,7 | 4,2 | 3,8 |
| 2018 | 1.166,13 | 7.118,27 | 8.284,40 | 11.710,32 | 12.371,40 | 11.600,16 | 4,8 | 7,2 | 6,9 | 4,5 | 4,3 | 3,3 |
| 2019 | 1.224,49 | 7.724,36 | 8.948,85 | 12.380,67 | 12.987,39 | 11.987,12 | 5,0 | 8,5 | 8,0 | 5,7 | 5,0 | 3,3 |
| 2020 | 1.364,00 | 8.905,46 | 10.269,46 | 13.747,13 | 14.483,23 | 11.466,66 | 11,4 | 15,3 | 14,8 | 11,0 | 11,5 | -4,3 |
| 2021 | 1.470,38 | 9.822,56 | 11.292,94 | 14.716,65 | 15.504,80 | 12.415,98 | 7,8 | 10,3 | 10,0 | 7,1 | 7,1 | 8,3 |
| 2022 | 1.539,54 | 9.763,04 | 11.302,58 | 15.248,66 | 16.068,42 | 13.439,08 | 4,7 | -0,6 | 0,1 | 3,6 | 3,6 | 8,2 |
| 2023 | 1.536,53 | 8.834,34 | 10.370,86 | 15.139,16 | 16.137,06 | 14.296,61 | -0,2 | -9,5 | -8,2 | -0,7 | 0,4 | 6,4 |

Source: www.ecb.eu, Statistics, ECB Data Portal, Monetary aggregate

- the number of rotations of a monetary unit also falls in the Eurozone, but they are much smaller, by about a third for cash, by almost half for overnight deposits and by about a quarter for the M2 aggregate.

**Table 5. The Eurozone: Correlations of money with GDP**

| Date | The ratio between the monetary aggregate growth index and the GDP growth index | | | | | The ratio of GDP to the monetary aggregate (the number of rotations of a monetary unit) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | DV | M1 | M2 | M3 | N | DV | M1 | M2 | M3 |
| 2006 | - | - | - | - | - | 15,3 | 2,9 | 2,4 | 1,3 | 1,1 |
| 2007 | 1,02 | 0,98 | 0,98 | 1,04 | 1,05 | 15,0 | 2,9 | 2,4 | 1,3 | 1,1 |
| 2008 | 1,11 | 1,00 | 1,01 | 1,07 | 1,06 | 13,5 | 2,9 | 2,4 | 1,2 | 1,0 |
| 2009 | 1,10 | 1,18 | 1,17 | 1,06 | 1,03 | 12,2 | 2,5 | 2,1 | 1,1 | 1,0 |
| 2010 | 1,02 | 1,02 | 1,02 | 1,00 | 0,97 | 12,0 | 2,4 | 2,0 | 1,1 | 1,0 |
| 2011 | 1,03 | 0,98 | 0,99 | 0,99 | 0,99 | 11,6 | 2,5 | 2,0 | 1,1 | 1,0 |
| 2012 | 1,02 | 1,07 | 1,06 | 1,04 | 1,03 | 11,4 | 2,3 | 1,9 | 1,1 | 1,0 |
| 2013 | 1,04 | 1,05 | 1,04 | 1,01 | 0,99 | 10,9 | 2,2 | 1,8 | 1,1 | 1,0 |
| 2014 | 1,04 | 1,09 | 1,08 | 1,03 | 1,03 | 10,5 | 2,0 | 1,7 | 1,1 | 1,0 |
| 2015 | 1,03 | 1,08 | 1,08 | 1,02 | 1,01 | 10,1 | 1,9 | 1,6 | 1,0 | 1,0 |
| 2016 | 1,01 | 1,06 | 1,05 | 1,02 | 1,02 | 10,0 | 1,8 | 1,5 | 1,0 | 1,0 |
| 2017 | 1,00 | 1,05 | 1,04 | 1,01 | 1,00 | 10,1 | 1,7 | 1,4 | 1,0 | 0,9 |
| 2018 | 1,01 | 1,04 | 1,03 | 1,01 | 1,01 | 9,9 | 1,6 | 1,4 | 1,0 | 0,9 |
| 2019 | 1,02 | 1,05 | 1,05 | 1,02 | 1,02 | 9,8 | 1,6 | 1,3 | 1,0 | 0,9 |
| 2020 | 1,16 | 1,21 | 1,20 | 1,16 | 1,17 | 8,4 | 1,3 | 1,1 | 0,8 | 0,8 |
| 2021 | 1,00 | 1,02 | 1,02 | 0,99 | 0,99 | 8,4 | 1,3 | 1,1 | 0,8 | 0,8 |
| 2022 | 0,97 | 0,92 | 0,92 | 0,96 | 0,96 | 8,7 | 1,4 | 1,2 | 0,9 | 0,8 |
| 2023 | 0,94 | 0,85 | 0,86 | 0,93 | 0,94 | 9,3 | 1,6 | 1,4 | 0,9 | 0,9 |

Source: author's calculations using data from www.ecb.eu, Statistics, ECB Data Portal, Monetary aggregate

**The US case**. In the US (FED, 2021), the Federal Reserve System calculates the following monetary aggregates:

- Ml, which is made up of funds that are readily available for spending. M1 consists of (1) currency outside the U.S. Treasury, Federal Reserve Banks, and depository institution vaults; (2) traveler's checks of nonbank issuers; (3) demand deposits; and (4) other deposits, such as balances in negotiable demand draft accounts at depository institutions, credit union share accounts, and demand deposits at savings institutions.

- M2 is composed of a broader set of financial assets held mainly by households. M2 consists of M1 plus (1) savings deposits, (2) small-value time deposits (time deposits in amounts less than USD 100,000) and (3) money market mutual fund accounts.

**Table 6. Money dynamics in the United States**

| Date | Money - billions usd | | | | | PIB – billions usd | Increase from previous year - % | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Currency in circulation (N) | reserve balances (R) | Monetary base (BM) | M1 | M2 | | N | R | BM | M1 | M2 | PIB |
| 2006 | 811 | 16 | 827 | 1.367 | 7.072 | 13.815,58 | | | | | | |
| 2007 | 822 | 15 | 837 | 1.373 | 7.472 | 14.474,23 | 1,4 | -4,5 | 1,3 | 0,5 | 5,7 | 4,8 |
| 2008 | 878 | 788 | 1.666 | 1.602 | 8.192 | 14.769,86 | 6,8 | 5188,6 | 99,0 | 16,6 | 9,6 | 2,0 |
| 2009 | 924 | 1.102 | 2.026 | 1.693 | 8.496 | 14.478,07 | 5,2 | 39,8 | 21,6 | 5,7 | 3,7 | -2,0 |
| 2010 | 980 | 1.037 | 2.017 | 1.837 | 8.802 | 15.048,97 | 6,0 | -5,9 | -0,5 | 8,5 | 3,6 | 3,9 |
| 2011 | 1.067 | 1.553 | 2.620 | 2.166 | 9.660 | 15.599,73 | 8,9 | 49,7 | 29,9 | 17,9 | 9,8 | 3,7 |
| 2012 | 1.159 | 1.517 | 2.676 | 2.461 | 10.460 | 16.253,97 | 8,6 | -2,3 | 2,1 | 13,6 | 8,3 | 4,2 |
| 2013 | 1.232 | 2.485 | 3.718 | 2.674 | 11.035 | 16.880,68 | 6,4 | 63,8 | 38,9 | 8,7 | 5,5 | 3,9 |
| 2014 | 1.328 | 2.607 | 3.935 | 2.956 | 11.692 | 17.608,14 | 7,8 | 4,9 | 5,8 | 10,5 | 6,0 | 4,3 |
| 2015 | 1.416 | 2.420 | 3.836 | 3.104 | 12.351 | 18.295,02 | 6,6 | -7,2 | -2,5 | 5,0 | 5,6 | 3,9 |
| 2016 | 1.501 | 2.031 | 3.532 | 3.345 | 13.213 | 18.804,91 | 6,0 | -16,1 | -7,9 | 7,8 | 7,0 | 2,8 |
| 2017 | 1.607 | 2.244 | 3.851 | 3.613 | 13.853 | 19.612,10 | 7,1 | 10,5 | 9,0 | 8,0 | 4,8 | 4,3 |
| 2018 | 1.709 | 1.691 | 3.401 | 3.764 | 14.355 | 20.656,52 | 6,4 | -24,6 | -11,7 | 4,2 | 3,6 | 5,3 |
| 2019 | 1.796 | 1.630 | 3.427 | 4.008 | 15.314 | 21.521,40 | 5,1 | -3,6 | 0,8 | 6,5 | 6,7 | 4,2 |
| 2020 | 2.072 | 3.135 | 5.207 | 17.813 | 19.107 | 21.322,95 | 15,3 | 92,3 | 51,9 | 344,4 | 24,8 | -0,9 |
| 2021 | 2.225 | 4.188 | 6.413 | 20.434 | 21.495 | 23.594,03 | 7,4 | 33,6 | 23,2 | 14,7 | 12,5 | 10,7 |
| 2022 | 2.299 | 3.107 | 5.406 | 19.756 | 21.294 | 25.744,11 | 3,3 | -25,8 | -15,7 | -3,3 | -0,9 | 9,1 |
| 2023 | 2.335 | 3.492 | 5.827 | 18.022 | 20.786 | 27.356,39 | 1,6 | 12,4 | 7,8 | -8,8 | -2,4 | 6,3 |

Source: www.imf.org, International Financial Statistics (IFS), United States

Deposits at depository institutions held by the U.S. government, U.S. and foreign depository institutions, and foreign official institutions are excluded from the calculation of monetary aggregates because monetary aggregates measure money in the hands of the nonbank public in the United States.

As with the Eurozone, money supply is growing, but the dynamics appear to be larger. Thus:

- cash almost triples, the M1 aggregate increases 13-fold, especially in the pandemic year, and M2 triples;

- the annual growth rates of the money supply are constantly outpacing GDP growth, with GDP growing faster than the money supply in only 3 years, 2007, 2022 and 2023;

- however, if we consider, subjectively, that there can be deviations between the monetary aggregates and GDP indices of, say, 5%, in most cases they evolve in tandem and with values that do not exceed 5%, only in 3 years are antagonistic developments observed: in 2009 and 2020, the pandemic year, when the money supply increases above GDP (in 2020 even exponentially) and in 2022, when the money supply contracts quite a lot in relation to GDP;

- the number of revolutions of a monetary unit also falls in the US, by about a third in the case of cash and six times in the case of the M2 aggregate.

**Table 7. United States: Correlations of money with GDP**

| Date | The ratio between the monetary aggregate growth index and the GDP growth index | | | | | The ratio between GDP and currency | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | R | BM | M1 | M2 | N | R | BM | M1 | M2 |
| 2006 | - | - | - | - | - | 17,0 | 885,6 | 16,7 | 10,1 | 2,0 |
| 2007 | 0,97 | 0,91 | 0,97 | 0,96 | 1,01 | 17,6 | 971,4 | 17,3 | 10,5 | 1,9 |
| 2008 | 1,05 | 51,83 | 1,95 | 1,14 | 1,07 | 16,8 | 18,7 | 8,9 | 9,2 | 1,8 |
| 2009 | 1,07 | 1,43 | 1,24 | 1,08 | 1,06 | 15,7 | 13,1 | 7,1 | 8,6 | 1,7 |
| 2010 | 1,02 | 0,91 | 0,96 | 1,04 | 1,00 | 15,4 | 14,5 | 7,5 | 8,2 | 1,7 |
| 2011 | 1,05 | 1,44 | 1,25 | 1,14 | 1,06 | 14,6 | 10,0 | 6,0 | 7,2 | 1,6 |
| 2012 | 1,04 | 0,94 | 0,98 | 1,09 | 1,04 | 14,0 | 10,7 | 6,1 | 6,6 | 1,6 |
| 2013 | 1,02 | 1,58 | 1,34 | 1,05 | 1,02 | 13,7 | 6,8 | 4,5 | 6,3 | 1,5 |
| 2014 | 1,03 | 1,01 | 1,01 | 1,06 | 1,02 | 13,3 | 6,8 | 4,5 | 6,0 | 1,5 |
| 2015 | 1,03 | 0,89 | 0,94 | 1,01 | 1,02 | 12,9 | 7,6 | 4,8 | 5,9 | 1,5 |
| 2016 | 1,03 | 0,82 | 0,90 | 1,05 | 1,04 | 12,5 | 9,3 | 5,3 | 5,6 | 1,4 |
| 2017 | 1,03 | 1,06 | 1,05 | 1,04 | 1,01 | 12,2 | 8,7 | 5,1 | 5,4 | 1,4 |
| 2018 | 1,01 | 0,72 | 0,84 | 0,99 | 0,98 | 12,1 | 12,2 | 6,1 | 5,5 | 1,4 |
| 2019 | 1,01 | 0,93 | 0,97 | 1,02 | 1,02 | 12,0 | 13,2 | 6,3 | 5,4 | 1,4 |
| 2020 | 1,16 | 1,94 | 1,53 | 4,49 | 1,26 | 10,3 | 6,8 | 4,1 | 1,2 | 1,1 |
| 2021 | 0,97 | 1,21 | 1,11 | 1,04 | 1,02 | 10,6 | 5,6 | 3,7 | 1,2 | 1,1 |
| 2022 | 0,95 | 0,68 | 0,77 | 0,89 | 0,91 | 11,2 | 8,3 | 4,8 | 1,3 | 1,2 |
| 2023 | 0,96 | 1,06 | 1,01 | 0,86 | 0,92 | 11,7 | 7,8 | 4,7 | 1,5 | 1,3 |

Source: author's calculations based on data from www.imf.org, International Financial Statistics (IFS), United States

**The case of Poland**. The monetary aggregates calculated by the Central Bank of Poland (Narodowy Bank Polski) are (NBP, 2024):

- M0, consisting of currency in circulation, current accounts and reserve requirement accounts of banks that do not hold current accounts with the NBP;
- M1, consisting of the amount of currency in circulation and overnight deposits of resident sectors other than monetary financial institutions and central government.
- M2, consisting of M1 and the amount of deposits (zloty and foreign exchange) up to two years' maturity of resident sectors other than monetary financial institutions and central government;
- M3, consisting of M2 and the sum of repurchase agreements, debt securities with an agreed maturity of up to two years issued by resident monetary financial institutions and shares/units issued by resident monetary financial institutions held by residents.

The evolution of monetary aggregates in Poland is quite close to Romania. Thus:

- cash increases almost 5 times, M1 aggregate 6 times, M2 and M3 5 times;
- in 7 years the annual growth rates of money supply continuously exceed GDP growth and only in 2 years, 2022 and 2023, does GDP grow faster than money supply;

**Table 8. Money dynamics in Poland**

| Data | Money (PLN mil.) | | | | GDP | Increase from previous year - % | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M0 | M1 | M2 | M3 | (PLN mil.) | M0 | M1 | M2 | M3 | PIB |
| Jan.07 | 88.649,5 | 277.433,8 | 488.060,8 | 503.574,8 | 1.069.431 | - | - | - | - | - |
| Dec.07 | 102.669,4 | 335.266,2 | 549.344,3 | 561.623,8 | 1.187.508 | 15,8 | 20,8 | 12,6 | 11,5 | 11,0 |
| Dec.08 | 126.350,2 | 349.943,1 | 660.239,9 | 666.231,3 | 1.285.571 | 23,1 | 4,4 | 20,2 | 18,6 | 8,3 |
| Dec.09 | 137.506,6 | 388.344,9 | 714.757,8 | 720.232,5 | 1.372.025 | 8,8 | 11,0 | 8,3 | 8,1 | 6,7 |
| Dec.10 | 139.726,8 | 449.192,0 | 774.657,9 | 783.648,5 | 1.434.368 | 1,6 | 15,7 | 8,4 | 8,8 | 4,5 |
| Dec.11 | 138.129,2 | 468.052,6 | 863.745,5 | 881.496,3 | 1.553.641 | -1,1 | 4,2 | 11,5 | 12,5 | 8,3 |
| Dec.12 | 167.205,2 | 484.813,0 | 900.336,7 | 921.412,5 | 1.612.739 | 21,0 | 3,6 | 4,2 | 4,5 | 3,8 |
| Dec.13 | 164.009,5 | 555.835,3 | 960.344,9 | 978.908,2 | 1.630.126 | -1,9 | 14,6 | 6,7 | 6,2 | 1,1 |
| Dec.14 | 191.619,6 | 606.282,7 | 1.044.552,9 | 1.059.015,3 | 1.700.552 | 16,8 | 9,1 | 8,8 | 8,2 | 4,3 |
| Dec.15 | 212.176,9 | 692.124,4 | 1.145.258,8 | 1.154.992,6 | 1.798.471 | 10,7 | 14,2 | 9,6 | 9,1 | 5,8 |
| Dec.16 | 220.490,6 | 815.304,0 | 1.256.211,9 | 1.265.661,7 | 1.853.205 | 3,9 | 17,8 | 9,7 | 9,6 | 3,0 |
| Dec.17 | 231.964,3 | 906.374,6 | 1.312.847,3 | 1.324.368,6 | 1.982.794 | 5,2 | 11,2 | 4,5 | 4,6 | 7,0 |
| Dec.18 | 292.144,7 | 1.012.353,1 | 1.428.233,2 | 1.446.092,6 | 2.126.506 | 25,9 | 11,7 | 8,8 | 9,2 | 7,2 |
| Dec.19 | 303.891,5 | 1.154.871,6 | 1.552.647,9 | 1.565.574,7 | 2.288.492 | 4,0 | 14,1 | 8,7 | 8,3 | 7,6 |
| Dec.20 | 384.125,6 | 1.531.713,7 | 1.814.748,9 | 1.822.727,7 | 2.337.672 | 26,4 | 32,6 | 16,9 | 16,4 | 2,1 |
| Dec.21 | 451.768,2 | 1.724.786,8 | 1.974.496,8 | 1.984.816,2 | 2.631.302 | 17,6 | 12,6 | 8,8 | 8,9 | 12,6 |
| Dec.22 | 422.908,8 | 1.584.901,0 | 2.078.248,4 | 2.091.255,5 | 3.067.495 | -6,4 | -8,1 | 5,3 | 5,4 | 16,6 |
| Dec.23 | 451.139,4 | 1.685.259,9 | 2.259.343,5 | 2.268.269,3 | 3.396.269 | 6,7 | 6,3 | 8,7 | 8,5 | 10,7 |

Source: www.imf.org, International Financial Statistics (IFS), Poland

- as in the other cases, if we consider, subjectively, that there may be deviations between the indices of monetary aggregates and GDP of, say, 5%, there are fewer cases of developments outside the range, in most cases they evolve in tandem and with values not exceeding 5%, only in 3 years are antagonistic developments observed: in 2009 and 2020, the pandemic year, when the money supply grows above GDP (in 2020 even exponentially) and in 2022, when the money supply contracts quite a lot in relation to GDP;

- the number of revolutions of a monetary unit is also falling in Poland, by about a third in the case of M0, M2 and M3 and almost halving in the case of M1.

**Table 9. Poland: Correlation of money with GDP**

| Date | The ratio between the monetary aggregate growth index and the GDP growth index | | | | The ratio between GDP and currency | | | |
|---|---|---|---|---|---|---|---|---|
| | M0 | M1 | M2 | M3 | M0 | M1 | M2 | M3 |
| Jan.07 | - | - | - | - | 12,1 | 3,9 | 2,2 | 2,1 |
| Dec.07 | 1,04 | 1,09 | 1,01 | 1,00 | 11,6 | 3,5 | 2,2 | 2,1 |
| Dec.08 | 1,14 | 0,96 | 1,11 | 1,10 | 10,2 | 3,7 | 1,9 | 1,9 |
| Dec.09 | 1,02 | 1,04 | 1,01 | 1,01 | 10,0 | 3,5 | 1,9 | 1,9 |
| Dec.10 | 0,97 | 1,11 | 1,04 | 1,04 | 10,3 | 3,2 | 1,9 | 1,8 |
| Dec.11 | 0,91 | 0,96 | 1,03 | 1,04 | 11,2 | 3,3 | 1,8 | 1,8 |
| Dec.12 | 1,17 | 1,00 | 1,00 | 1,01 | 9,6 | 3,3 | 1,8 | 1,8 |
| Dec.13 | 0,97 | 1,13 | 1,06 | 1,05 | 9,9 | 2,9 | 1,7 | 1,7 |
| Dec.14 | 1,12 | 1,05 | 1,04 | 1,04 | 8,9 | 2,8 | 1,6 | 1,6 |
| Dec.15 | 1,05 | 1,08 | 1,04 | 1,03 | 8,5 | 2,6 | 1,6 | 1,6 |
| Dec.16 | 1,01 | 1,14 | 1,06 | 1,06 | 8,4 | 2,3 | 1,5 | 1,5 |
| Dec.17 | 0,98 | 1,04 | 0,98 | 0,98 | 8,5 | 2,2 | 1,5 | 1,5 |
| Dec.18 | 1,17 | 1,04 | 1,01 | 1,02 | 7,3 | 2,1 | 1,5 | 1,5 |
| Dec.19 | 0,97 | 1,06 | 1,01 | 1,01 | 7,5 | 2,0 | 1,5 | 1,5 |
| Dec.20 | 1,24 | 1,30 | 1,14 | 1,14 | 6,1 | 1,5 | 1,3 | 1,3 |
| Dec.21 | 1,04 | 1,00 | 0,97 | 0,97 | 5,8 | 1,5 | 1,3 | 1,3 |
| Dec.22 | 0,80 | 0,79 | 0,90 | 0,90 | 7,3 | 1,9 | 1,5 | 1,5 |
| Dec.23 | 0,96 | 0,96 | 0,98 | 0,98 | 7,5 | 2,0 | 1,5 | 1,5 |

Source: author's calculations based on data from www.imf.org, International Financial Statistics (IFS), Poland

In Table 10 we have an exercise on what it would mean if the monetary issue in Romania were made in correlation with the evolution of our country's GDP and what the difference would be compared to the currency in circulation. The conclusion is that permanently, and in the case of all monetary aggregates and their components (with the exception of overnight deposits between 2009 and 2013), there has been an excess of money supply that has continuously increased, in the years of the pandemic, 2020 and 2021, coming to represent more than double the money supply required by Romania's GDP, in the case of cash, overnight deposits and the M1 aggregate, which cumulates the two elements.

**Table 10. Romania: estimates of excess money**

| Date | Recalculated money (billion lei), (monetary aggregate*%GDP | | | | | Excess money (billion lei) | | | | | % share of excess currency in the effective money | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | NC | DO | M1 | M2 | M3 | NC | DO | M1 | M2 | M3 | NC | DO | M1 | M2 | M3 |
| Dec. 2007 | 16,3 | 46,0 | 62,2 | 128,1 | 128,5 | 5,2 | 12,5 | 17,7 | 20,0 | 19,6 | 31,9 | 27,2 | 28,4 | 15,6 | 15,2 |
| Dec. 2008 | 20,4 | 57,6 | 78,0 | 160,6 | 161,1 | 4,9 | 9,6 | 14,5 | 13,1 | 12,9 | 24,0 | 16,7 | 18,6 | 8,1 | 8,0 |
| Dec. 2009 | 19,8 | 56,1 | 76,0 | 156,3 | 156,9 | 4,1 | -0,7 | 3,4 | 31,7 | 32,8 | 20,8 | -1,3 | 4,5 | 20,3 | 20,9 |
| Dec. 2010 | 20,8 | 58,7 | 79,4 | 163,5 | 164,1 | 6,0 | -3,9 | 2,1 | 36,1 | 38,7 | 29,1 | -6,6 | 2,7 | 22,1 | 23,6 |
| Dec. 2011 | 22,0 | 62,1 | 84,1 | 173,0 | 173,6 | 8,6 | -6,9 | 1,7 | 39,0 | 42,6 | 39,3 | -11,1 | 2,1 | 22,5 | 24,5 |
| Dec. 2012 | 23,1 | 65,5 | 88,6 | 182,3 | 182,9 | 8,3 | -7,9 | 0,4 | 39,5 | 39,1 | 36,0 | -12,1 | 0,5 | 21,7 | 21,4 |
| Dec. 2013 | 24,8 | 70,1 | 94,9 | 195,2 | 195,9 | 10,0 | -4,6 | 5,4 | 46,1 | 45,7 | 40,4 | -6,5 | 5,7 | 23,6 | 23,3 |
| Dec. 2014 | 26,0 | 73,4 | 99,3 | 204,4 | 205,1 | 13,9 | 5,3 | 19,2 | 57,2 | 56,7 | 53,7 | 7,2 | 19,4 | 28,0 | 27,6 |
| Dec. 2015 | 27,7 | 78,4 | 106,1 | 218,3 | 219,0 | 18,8 | 24,7 | 43,5 | 67,9 | 67,2 | 67,7 | 31,5 | 41,0 | 31,1 | 30,7 |
| Dec. 2016 | 29,2 | 82,7 | 111,9 | 230,3 | 231,1 | 25,4 | 42,6 | 68,1 | 83,7 | 83,0 | 87,0 | 51,6 | 60,8 | 36,4 | 35,9 |
| Dec. 2017 | 33,1 | 93,6 | 126,7 | 260,8 | 261,7 | 30,2 | 53,7 | 83,9 | 89,2 | 88,4 | 91,1 | 57,4 | 66,2 | 34,2 | 33,8 |
| Dec. 2018 | 37,3 | 105,4 | 142,7 | 293,7 | 294,7 | 30,4 | 62,0 | 92,4 | 87,4 | 86,4 | 81,6 | 58,8 | 64,7 | 29,8 | 29,3 |
| Dec. 2019 | 41,4 | 117,0 | 158,3 | 325,7 | 326,9 | 32,8 | 85,9 | 118,6 | 96,9 | 95,7 | 79,2 | 73,4 | 74,9 | 29,7 | 29,3 |
| Dec. 2020 | 41,5 | 117,3 | 158,8 | 326,7 | 327,8 | 46,7 | 132,1 | 178,8 | 160,7 | 159,5 | 112,6 | 112,6 | 112,6 | 49,2 | 48,7 |
| Dec. 2021 | 46,2 | 130,7 | 177,0 | 364,1 | 365,4 | 49,9 | 179,9 | 229,8 | 200,3 | 199,0 | 107,9 | 137,7 | 129,9 | 55,0 | 54,5 |
| Dec. 2022 | 54,8 | 155,0 | 209,8 | 431,7 | 433,2 | 46,5 | 141,8 | 188,3 | 171,3 | 169,8 | 84,8 | 91,5 | 89,7 | 39,7 | 39,2 |
| Dec. 2023 | 60,3 | 170,4 | 230,6 | 474,6 | 476,3 | 50,0 | 128,7 | 178,7 | 193,2 | 191,5 | 82,9 | 75,6 | 77,5 | 40,7 | 40,2 |

Source: author's calculations using data from www.bnr.ro, Data sets, Money supply

## 5. Conclusions

In the last three years, most national economies have experienced high inflation dynamics, beyond the 2% that is considered a benchmark for stability by central banks, which are entrusted by national legislation with the prerogative of ensuring and maintaining price stability. The same central banks, analysing inflation trends from 2021-2023, consider that it is caused by the energy crisis, disruptions in supply chains, the effects of the Russian-Ukrainian war have had the effect of driving up prices, etc. However, although economic theory has for at least two centuries postulated a link between inflation and the quantity of money in circulation, and this link has become a universally recognised fact, as evidenced by the statutes of central banks, which invest them with ensuring price stability, they avoid or evade acknowledging that one of the main causes of the increase in inflation has been, and still is, the issue of too much money in relation to the volume of goods and services on the market.

The accumulation of a large amount of money in circulation, in relation to the needs of national economies, with the quantity of goods and services offered on the markets started immediately after the financial crisis of 2007-2008. In order to limit the effects of the crisis and to avoid it spreading to businesses in the real economy, most central banks have been practising so-called quantitative easing policies, whereby they buy financial assets from banks or directly from cash-strapped economic agents and, in return, supply the economy with large amounts of money. From 2012-16, and in some cases as late as 2019, central banks

continued these policies amid fears that a strong deflation would throw national economies into crisis, Starting in 2020, and then in 2021, the pandemic crisis shut down economies, but central banks continued to issue money. Surpluses of money supply in circulation have accumulated in most economies over the volume of goods and services on offer in the markets. These money supply surpluses began to show their effects on inflation from late 2021 onwards, and the continuing crises that had plagued the economy until then turned into an inflationary crisis that exacerbated its effects in 2022, continued at slightly more modest rates in 2023 and looking set to continue into 2024. This paper analyses money supply developments (through aggregates measuring money supply) in the Eurozone, the US, Romania and Poland. The conclusion is that in all the cases studied, money supply has grown much faster in relation to GDP, and there are many cases where the growth rates of money have been much higher than those of GDP, with the velocity of money even halving. Subsequently from 2022 onwards, the application of anti-inflationary policies began to absorb some of the excess money supply and the velocity of money began to increase, but still in the cases studied there are large volumes of money that will strain inflation for some time.

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