EVOLUTIONS AND EXPLANATIONS ABOUT POST-PANDEMIC INFLATION

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Abstract: *The paper aims to (1) review the latest points of view regarding the causes of post-pandemic inflation, (2) analyze the evolution of inflation in some countries and (3) follow the main monetary policy measures taken by the authorities in the field in some states. Concretely, in the last two decades, the money supply link has been secondary or even totally neglected. However, in the last year, a series of theories and models have returned that link the evolutions in terms of inflation to the excess of monetary emission from the pandemic years. The increase in inflation was not quickly accompanied by anti-inflationary measures, the monetary authorities acting late, for fear of continuing the recession or that it would return in countries where economic growth had resumed. The mentioned situations are exemplified with the presentation of developments and analyzes from the Euro Zone, from the United States of America and from some Eastern European states, including Romania.*
Keywords: *inflation, causes, money, aggregate supply.*
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1. Introduction

The economic downturn and subsequent recession following the onset of the Covid-19 pandemic has led to few inflation concerns. The easing of restrictions by mid-2020 and the resumption of some activities in 2021 amid public vaccination campaigns did not change the inflation expectations of governments and particularly monetary authorities, either. It was thought that the sharp fall in labor force participation in the economic process and rising unemployment would cushion the fall in supply, upward pressures on wages and, in principle, price increases.

However, starting in late 2020, but much more visibly in the first part of 2021, inflation was returning, becoming a global phenomenon.

This is because global demand has rapidly rebounded and changed its demand structure, in the sense that as people spend more time at home to avoid the pandemic, they have reduced their demand for services but increased their demand for goods. This increase in demand further exacerbated the pressure on global trade, and as it came against the backdrop of disruptions in pre-pandemic supply chains, it caused bottlenecks as companies were unable to respond quickly to changing demand patterns.

But what were the causes of post-war inflation? In a previous paper (Gust, 2024) I presented at length the views of the monetary authorities, those whose main task/mission by law is to maintain price stability, i.e. low inflation (e.g. in the European Union, a price increase of 2% maximum). In the official views of the monetary authorities, among the causes of inflation are considered to be the effects of the energy crisis, disruptions in supply chains, the effects of the Russian-Ukrainian war, etc. The amount of money put into circulation by central banks is not mentioned in any of the official views. It should be noted that this cause is not mentioned even in the studies analyzing the implementation of inflation targeting policies. So, we should ask ourselves why, if official money, created by the central bank, plays no role in inflation, national legislations have given the monetary authorities the task of maintaining price stability. If post-pandemic inflation is due to commodity prices, caused by bottlenecks in supply chains, strong demand, high wage growth in some sectors, energy crisis, the impact of the war in Ukraine, then monetary authorities/central banks have no role in price stability, and price increases are a matter of the governance of countries or geopolitical situations.

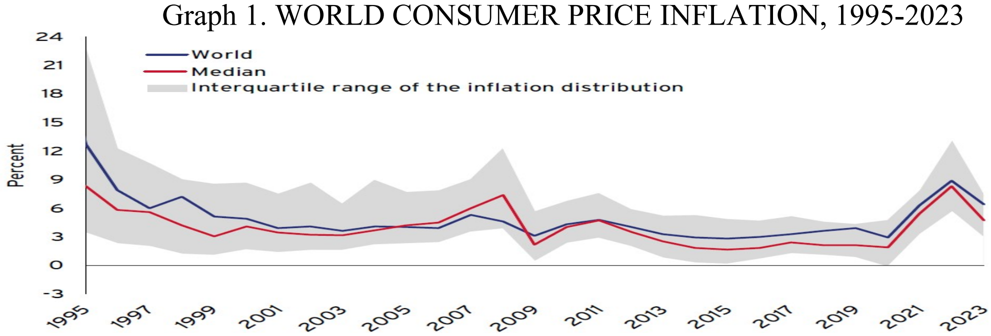
I have analyzed several papers from the period 2022, 2023, 2024 (so, recent) that deal with post-pandemic inflation and I can say that there are two broad categories of opinions. One that goes along with monetary authorities and does not see any link between post-pandemic inflation and money, and another which proposes to take into account the evolution of monetary aggregates in the estimates of inflation developments, even if money is not seen as the source of inflation (although some consider that a causal link between money and inflation is functional). In particular, with regard to the inflation forecast for 2020-2021, the monetary authorities have proved incorrect, sending the wrong signals to the markets.

2. Recent views on post-pandemic inflation

A. Traditional views

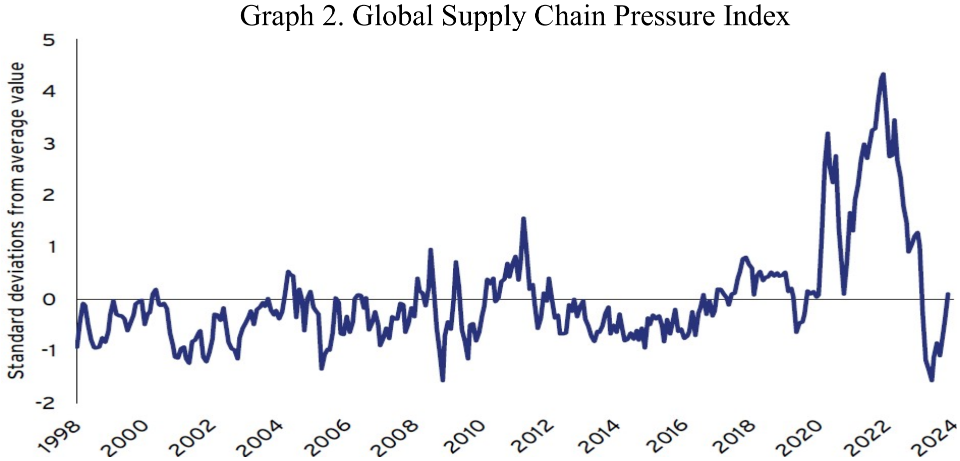
Towards the end of 2021, commodity prices started to rise rapidly as European natural gas prices were driven up as Russian supplies were reduced. And in early 2022, the Russian invasion of Ukraine and the start of the war pushed commodity prices to near historical unprecedented heights, caused in turn by sharp increases in the prices of oil, natural gas, electricity and most food (English, Forbes and Ubide, 2024)

Graph 1. WORLD CONSUMER PRICE INFLATION, 1995-2023



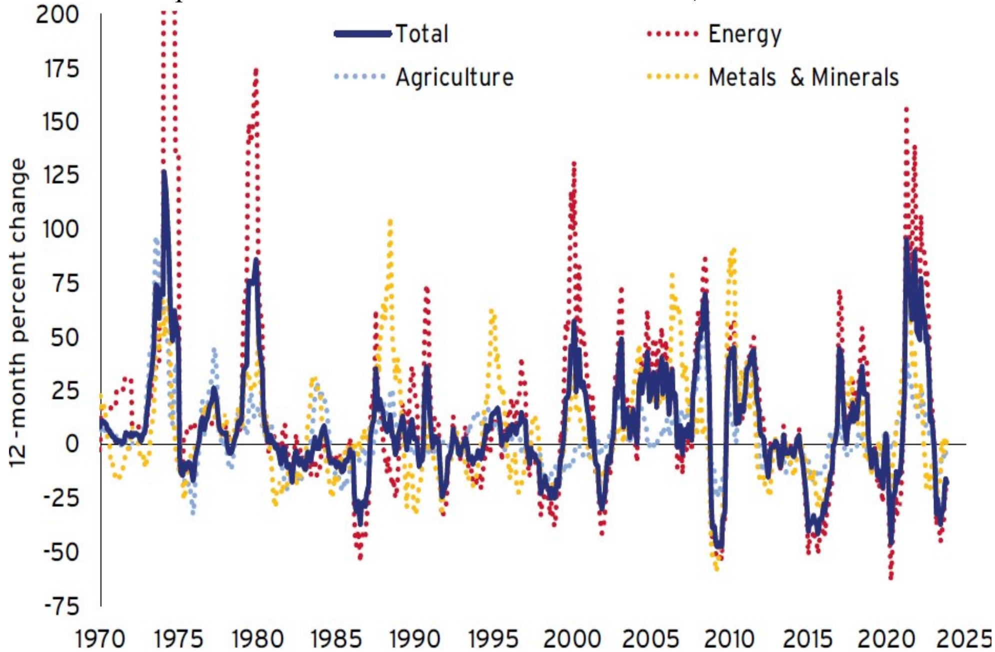
Source: IMF, World Economic Outlook, October 2023 apud English, Forbes and Ubide, 2024.

Graph 2. Global Supply Chain Pressure Index



Source: Federal Reserve Bank of New York, Global Supply Chain Pressure Index, https://www.newyorkfed.org/research/policy/gscpi. apud English, Forbes and Ubide, 2024

Graph 3. COMMODITY PRICE INFLATION, 1970 TO PRESENT



Source: Data from World Bank apud English, Forbes and Ubide, 2024

English, Forbes and Ubide (2024) also mention that the post-pandemic inflationary shock has also led to significant popular discontent and criticism of central banks in Western economies. But these authors note that the dissatisfaction and criticism would be due not to the causes (which were "beyond the control of these institutions") but to their inaccurate inflation forecasts, misleading the public with their predictions that inflation rates would remain low for a long period of time and delaying anti-inflation policies. The same source cites that public dissatisfaction has prompted either reports critical of central banks or revisions to some of the procedures central banks apply in forecasting monetary policy during periods of uncertainty or even lawsuits.

Another study (Ha, et al., 2023), finds that headline inflation from 2001-22 was caused by oil price and aggregate demand shocks, which accounted for 65% of the variance of inflation, aggregate supply shocks, only 13%, and interest rate shocks in boosting headline inflation ranged from 19% to 22%.

On the same note, another analysis (Visco, 2023), I find that the inflation factors were:

- first, fiscal policies that were expansionary in all states during the acute phase of the pandemic;

- second, household disposable income dynamics (in the US, demand in the services sector was restrained by pandemic-related factors, while in the goods sector there were signs of overheating, as personal consumption expenditure in the durable goods sector was already more than 30 percent above pre-crisis levels, and the rapid recovery in demand led to increased bottlenecks in global value chains, but also to higher prices for intermediate goods. In the euro area, demand for both goods and services remained below pre-crisis trends until the end of 2021);

- thirdly, the labor market (in the US, the annual nominal wage change has exceeded 4% since the third quarter of 2021 and is close to 6% in 2022, in the euro area, around 3%, above the 2% inflation target);

- fourth, the energy shock, which played a very different role on both sides of the Atlantic (oil prices in the second half of 2020 gradually rose in both the United States and the euro area, natural gas prices in the United States rose much more sharply, rising from around 10 USD per megawatt-hour before the pandemic to a peak of over 30 USD in 2022, while in Europe the increase went from just over 10 EUR per megawatt-hour in early 2020 to 180 EUR before the Russian aggression in Ukraine, peaking at 350 EUR in the summer of 2022, and then stabilizing at around 60 EUR in 2023).

Meanwhile, Ignazio Visco, governor of the Bank of Italy for 12 years until 2023, says Milton Friedman's famous statement should be seen as "a causal relationship between money supply and the price level that can be maintained, albeit with variable lags, over horizons that are not necessarily long." "Some say that [...] the persistence of the inflationary consequences of the energy shock could have been found [...] in the abundant liquidity created before and after the pandemic."

The same author also says "monetary tightening in the euro area needs to continue to ensure that a temporary increase in inflation caused by a supply shock does not become a more persistent demand-led phenomenon".

Afrouzi, et al., (2024) analyze how exogenous economic and policy factors generate central bank pressures that can affect long-run inflation and the transitions between them to steady states and argue that enhanced central bank independence or a more credible public debt policy is dependent on, and should offset the global economic pressures that push up average inflation in the long run now if inflation is to remain low and stable in the future. More specifically, they argue that an optimal central bank policy centered on achieving the commitment/target will push inflation towards zero in the long run, independent of economic parameters.

Economic pressures/shocks may result in higher average inflation, but these are more likely to be in the form of occasional bursts of inflation, such as after pandemics, than inflation that continuously overshoots the target. High inflation is also caused by aggregate distortions (monopolies) as well as price distortions in the economy.

As causes of the post-pandemic inflationary shock the study indicates:

- The reversal of globalization (declining international trade as a share of global GDP which stopped growing after peaking at 61% in 2008 and has since fallen to 57% in 2021, foreign direct investment as a share of global GDP, which peaked at 5.3% in 2007, has since fallen to 2.2% in 2021, international flows that have become more fragmented - exemplified by Brexit in 2016, the start of the US-China trade war in 2018, the rise in the number of international trade restrictions, the expansion of security-related screening mechanisms for foreign direct investment, and generally the application of protectionist trade policies around the world after the 2007 global financial crisis and accelerated after the 2020 pandemic (what I call the transition from "hyperglobalization" before the global financial crisis to "slowbalization", which occurred largely due to the political backlash against free trade) and the rise of international geopolitical tensions (exemplified by trade and capital flows that have segmented along geopolitical lines, following the invasion of Ukraine by Russia in 2022 and which became particularly costly for Europe, the Israel-Gaza war in 2023, and the widening conflict in the region, which led to attacks on merchant ships in the Red Sea. All this has led to new disruptions in global trade, less global competition and a monopoly of powerful firms and pressure on the central bank to create inflation;

- increasing fiscal pressures (higher government debt in the 2020s than in the 2010s for all groups of countries, excess debts made in the pandemic era as a result of high government spending combined with high interest rates, rising primary budget deficits, fiscal pressures for advanced economies from accelerated population ageing and the resulting expansion of social spending, etc., and all these increased fiscal pressures result in a stimulus to monetary growth, with the central bank using inflation to devalue debt and stimulate the economy to reduce the real interest rate and the cost of issuing new securities;
- higher long-term real interest rates, which result in higher nominal interest rates (keeping expected inflation constant), but higher inflation and price dispersion.

B. Views that list the quantity of currency in circulation among the causes

McCallum and Nelson (2009) find that economic theory and economic and monetary policies over the last two decades have greatly reduced the role of monetary aggregates/money supply. Today, most monetary authorities/central banks' policies are mainly aimed at so-called "inflation targeting", which mainly involves the use of period-to-period adjustments of a short-term interest rate, rather than the pursuit of any monetary aggregate. In addition, the model of the behavior of the economy is to be written by monetary authorities/central banks in a way that does not include any reference to any monetary aggregate, although the economy uses a medium of exchange. Thus, explanatory models of inflation behavior, describing movements in aggregate demand and the policy interest rate, ignore the relationship between money and inflation.

Old monetary theories focus on the idea that there will be a long-run relationship between price increases, on the one hand, and exogenous increases in the money stock, on the other (McCallum and Nelson, 2009). Problems with the measurement of money in the economy has led to the abandonment of analyzing monetary aggregates and taking them into account in "inflation targeting" policies.

Studies, in recent high-inflation years, have focused on the idea that money played a minor, auxiliary role because the increase in inflation was purely exogenous, and the expansion of inflation to most goods and services merely reflected the pass-through of the increase in input costs to final consumer prices that would have happened with or without the increase in money (Schnabel, 2023).

Isabel Schnabel, a member of the European Central Bank's Executive Board, believes that the analysis of the post-pandemic inflationary wave misses the question of why the transmission of supply-side shocks to final consumer prices has been so strong. Prices are always the sum of costs and profit margins, and in the past, margins have often been a key damper on price increases. In a recession, unit labor costs typically rise because output falls faster than employment, and because reduced demand limits the scope for price increases, unit profits will normally fall. "*But in recent years, unit profits have also risen strongly, despite large increases in firms' input costs. Such results are atypical for purely exogenous cost-push shocks*." In contrast, they [the authors of the explanatory analysis of the post-pandemic inflationary wave] suggest that "*inflation was the result of endogenous supply and demand interactions, with consumers both willing and able to absorb significant price increases*."

Trying to answer the question of whether money growth has played any role in this post-pandemic inflationary wave, she argues with the evolution of real household disposable income. "*After the sovereign debt crisis, it took more than four years for real disposable income to return to pre-crisis levels [...]. At the height of the pandemic, it took just three months. And today [2023], real disposable income is higher than a year ago*."

The author believes that these developments are largely

"the result of significant money creation fueled by the fiscal response to the crisis. Public transfers compensated households for the loss of income during the pandemic bottlenecks, and later for the loss of purchasing power due to the energy shock. And by stabilizing aggregate demand, these transfers paved the way for nominal wage growth and employment growth, which increasingly drove income growth. The money that was created was used in different ways by households. Some of it has been used to finance the surge in nominal consumption expenditure, which has allowed households to maintain their real consumption close to the level observed before the pandemic."

The author concludes that the increase in money would have been the element that produced and maintained inflation, demand would have been more resilient than in a typical recession, households would have been less sensitive to price increases, thus facilitating the pass-through of costs to final consumer prices.

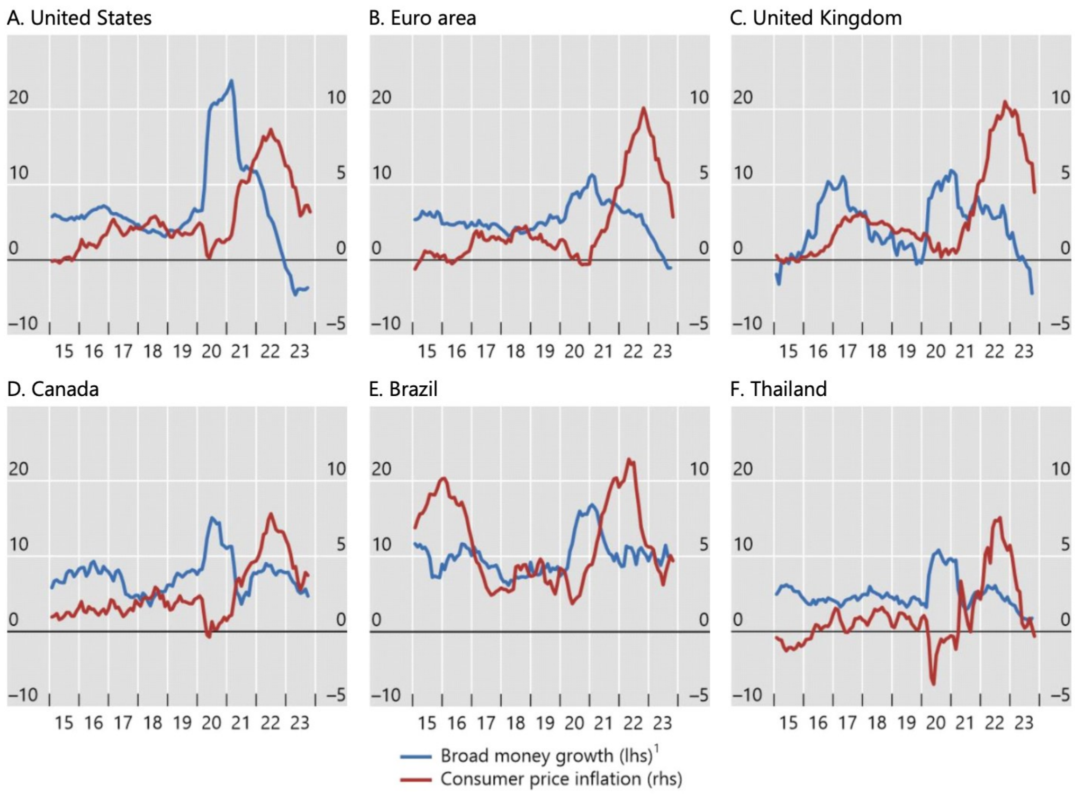
The author also notes,

"*The bottlenecks meant that a significant share of the money created was saved, boosting household balance sheets, with households accumulating excess savings (exemplified by the approximately €860 billion, or about 10.6% of disposable income per year, at the Eurozone level). Some of these savings were held in liquid assets. In 2020 alone, households' overnight bank deposits increased by €570 billion. However, over time, most of the excess savings were invested in stocks and bonds or used to repay outstanding loans. As a result, households accumulated more wealth and also made significant gains as asset prices, especially house prices, rose considerably during the pandemic. So overall, households emerged essentially unscathed from three years of crisis."*

And that, additionally "*the resilience of household incomes and balance sheets, in turn, is likely to have contributed to the significant demand for credit from firms, which further fueled broad money growth and sustained aggregate demand."* The author's argument in explaining money-based inflation is supported by three elements:

- first, a decomposition of inflation into supply and demand factors, which suggests that demand has played a significant role in generating price increases;
- second, the share of price changes between goods and services that can be explained by a common factor is about twice as large as before the pandemic;
- third, the velocity of money gradually recovered after the pandemic. This is a sign that spending has not been held back by higher prices, helping firms to pass through higher input costs.

Graph 4. Corelații inflație – creșterea masei monetare în unele țări occidentale



Source: Borio, Hofmann and Zakrajšek (2024)

Berger, Karlsson and Österholm (2023) note that the dynamic relationship between money growth and inflation "weakened" after the 1980s and then returns after 2020. The same authors note that there is evidence that this time variation may be related to the pace of inflation (inflation growth) and that this confirms previous findings, which reported that the link between money growth and inflation is stronger among high-inflation countries.

Borio, Hofmann and Zakrajšek (2024) examine the link between money growth and inflation and find that the strength of the link depends on the size of inflation. That is, it is "one-to-one" when inflation is high and is nonexistent when inflation is low.

Figure 4 illustrates the co-movement of money growth and inflation for a number of countries. The statistical observations in the previous charts show that in all cases there was a surge in money growth during 2020, and it was followed by a "burst" of inflation in 2021-2022. After money issuance slowed down significantly from 2021 onwards, the process was followed by a fall in inflation from mid-2022.

Using annual data from 1951 to 2021, Claudio Borio, Boris Hofmann, Egon Zakrajšek show that in the long run there is a direct relationship between inflation and "excess money growth" (the difference between money growth and real GDP growth) in a large sample of advanced and emerging market economies. Also, if we split the observations by high inflation regime countries and low inflation regime countries using 10-year periods, we see that this relationship only exists when the inflation threshold moves out of the low inflation regime region and, moreover, as expected, the difference shrinks considerably as the inflation threshold rises further.

In other words, money growth is closely linked to common inflation, to "true inflation", i.e. a generalized increase in prices. Conversely when inflation is low, the importance of money in explaining price changes tends to be low.

However, Borio, Hofmann and Zakrajšek (2023) say that the prior relation is not about causality, only that the link helps in forecasting inflation and ask whether the neglect of monetary aggregates has gone too far?

Dinu and Adina Țiței (2022) find that Romania has seen a significant increase in overall money as a percentage of GDP, implying that the money supply has grown faster than value added, with the highest values of the indicator recorded for 2020 and 2021, and their study showed that inflation is both cause and effect, and that the inflation rate is positively correlated with the inflation rate in the previous year and broad money as a percentage of GDP in the previous year, but also that the variable broad money as a percentage of GDP is positively correlated with the inflation rate in year t-1, the inflation rate in year t-2, broad money as a percentage of GDP in year t-1 and broad money as a percentage of GDP in year t-2. The authors also note that inflation is 60% explained by inflation in previous years and by money that the economy was fed in previous years.

3. In case of Romania

In Romania, the monetary authorities consider that post-pandemic inflation originates from domestic structural imbalances, labor market imbalances, energy prices and other imported goods, etc. Also, in line with the axioms of inflation targeting theory, the various monetary aggregates, which measure currency in circulation, are not taken into account in the analysis of inflation.

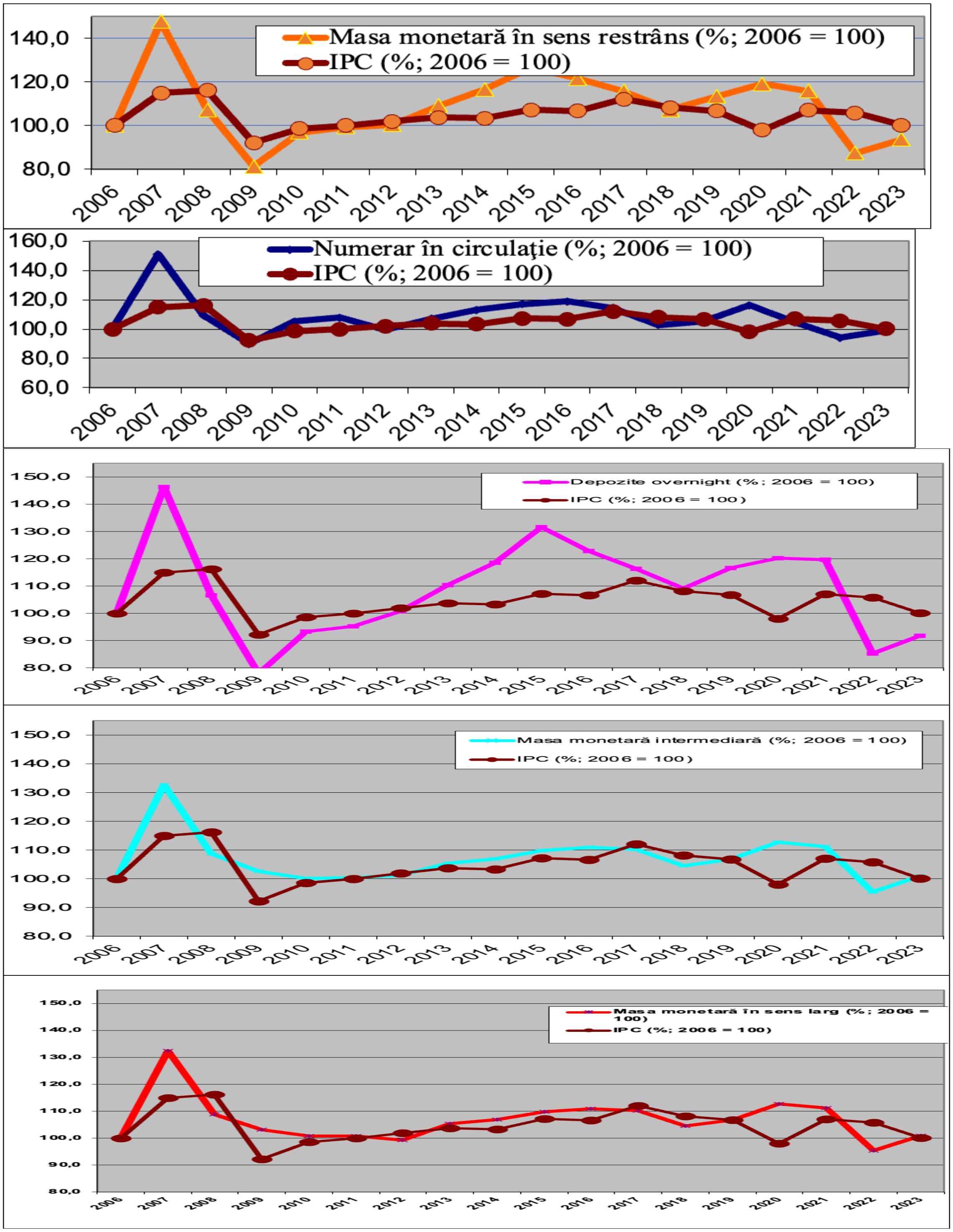
However, the link between the dynamics of inflation and the different expressions of the money supply (expressed in real terms) points to a major connection. Interestingly, the correlation is valid for most monetary aggregates and not only for the post-pandemic period, as it appears in the United States, the Euro Area, etc., but also for the previous period.

Thus, if we exclude 2020 because of the lockdown during the pandemic period, when inflation is very low and the money supply is very high, any increase in money in circulation is reflected in price increases.

Also, there is a somewhat contradictory evolution between inflation and money supply between 2013 and 2017, with prices having lower dynamics than money in circulation in the first three years, only to reverse the trend amid a deflationary episode of a fiscal nature, followed by an inflationary wave that absorbs the additional money.

In addition, we can also observe a lag of about one year in the changes in inflation relative to changes in the money supply.

Graph 5. Correlations between inflation and money supply growth in Romania



Source: author's calculations

4. Conclusions

The collapse of the economy and the ensuing recession after the onset of the Covid-19 pandemic has led to few inflation concerns. The easing of restrictions by mid-2020 and the resumption of some activities in 2021 amid public vaccination campaigns did not change the inflation expectations of governments and particularly monetary authorities, either. It was thought that the sharp fall in labor force participation in the economic process and rising unemployment would cushion the fall in supply, upward pressures on wages and, in principle, price increases. However, starting in late 2020, but much more visibly in the first part of 2021, inflation was returning and becoming a global phenomenon.

Two broad categories of opinion emerge from the recent papers reviewed, which deal with post-pandemic inflation. One that goes along with monetary authorities and sees no link between post-pandemic inflation and money, and another which proposes to take into account the evolution of monetary aggregates in the estimates of inflation trends, even if they do not see money as the source of inflation (although some consider that a causal link between money and inflation is functional). In particular, with regard to the inflation forecast for 2020-2021, the monetary authorities have proved incorrect, sending the wrong signals to the markets.

In Romania, the combination of the inflation dynamics with the different money supply expressions (expressed in real terms) indicates a major link. Interestingly, the correlation is valid for most monetary aggregates and not only for the post-pandemic period, as it occurs in the United States, the Euro Area, etc., but also for the period before, except for 2020 when, due to the lockdown during the pandemic period, inflation falls and money supply increases.

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