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Factors of global inflation in 2021–2022☆

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Abstract

The paper examines the factors of global inflation acceleration in 2021–2022. We consider primarily the developed economies, where rates of inflation over the last two years have exceeded multi-year highs and have significantly exceeded target levels. We find that the cause of accelerating inflation was an imbalance between aggregate demand, which started to increase rapidly in the second half of 2020 as economies began to adapt to the circumstances of the pandemic, and aggregate supply, which encountered persistent constraints associated with interruptions in global supply chains. Significant support for demand was provided by fiscal stimulus that was unprecedented in scale and was accompanied by policy interest rates reaching extremely low levels, and by active injections of liquidity by central banks. The willingness of governments to implement ultra-expansionary monetary and fiscal policies can to a considerable degree be attributed to the fact that during the previous decade large budget deficits, zero interest rates, and programs of quantitative easing had not resulted in macroeconomic destabilization. We examine the view of many central banks that the inflationary wave would not be long-lasting, which was a crucial reason for delaying the interest rates increase. We consider the conditions in which the leading economies might fall into the stagflation trap.

Keywords: inflation, monetary policy, fiscal policy, inflation targeting, commodity markets, inflation expectations, stagflation.
JEL classification: E31, E42, E51, E52, E58, E61, E62, E65.

1. Introduction

One of the principal economic problems of the last two years has been the acceleration of inflationary processes that began in 2021 and affected the major-

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ity of countries. In 2021 and 2022, the growth rate of consumer prices in G7 countries was 7.4% and 5.6% respectively, whereas the average rate of inflation in these countries during 2010–2018 was 1.5%. In the USA the rates were 7.0% and 6.5% in 2021 and 2022 compared with 1.8% in 2010–2019, and in the euro area—5.0% and 9.2% compared with 1.3%. At its peak, inflation in the USA approached 10% and in the euro area it was even higher. Whereas for emerging markets relatively high inflation is fairly normal, such an increase in prices in developed countries is unusual and has not been experienced since the 1980s.

Abnormally high inflation brings multiple risks to the world economy and confronts monetary authorities throughout the world with a complex dilemma. Maintaining loose monetary conditions supports the recovery of economic growth but has side effects. There are risks of losing control over prices, de-anchoring of inflation expectations, and falling into the stagflation trap, escape from which is always painful. The stagflation scenario can be avoided if inflation is stabilized by increasing interest rates, but the attendant risk is a destabilization of budgets and of financial systems that during the past decades have become accustomed to low rates of interest. Moreover, tightening monetary policy will result in a slowing down of economic growth, and growth rates in the past decade have not been high.

During the last ten years, central banks of developed countries have striven to increase inflation to a target level, and steadily enter the zone of positive policy rates; but, despite this, the inflation rates have remained at low levels. Consequently, when in 2021 inflation began to accelerate, regulators were taken by surprise and were slow to normalize monetary policy; they did not curtail policies of quantitative easing and held interest rates close to the lower bound, even when the unprecedented scale of the inflationary shock became evident.

Given the observed dynamics of macroeconomic conditions, a number of questions arise. What were the causes of the inflationary shock of 2021–2022 and why was it so unexpected? Was the delay of monetary authorities in increasing interest rates a policy mistake, or was it an optimal decision, given the information that was available at the time? How great is the risk that the leading economies will enter an extended period of stagflation, and under what conditions will this occur? Will this inflationary shock result in an increase in consumer prices that is close to targeted rates, and in a normalization of monetary policy? Or, during the next few years, will inflation begin to decline and the world economy return to its longstanding condition before the pandemic? In this paper, we shall attempt to answer these questions, focussing on discussion of the causes of the inflationary shock, and on why it came as such a surprise to the leading central banks and analytical centres.

2. The decade 2010–2019: Low inflation and soft monetary policy

The years 2010–2019 were quite remarkable in developed countries which witnessed a combination of policies of economic stimulus and a relatively restrained dynamic of major macro-economic variables. During the 2010s, the policy rates of central banks of the leading economies did not exceed 1.25%, with the exception of the USA and Canada, where interest rates during some brief periods were in the range 2.0%–2.5%. At the same time, central banks implemented asset purchase programs and provided banks with refinancing within the framework of programs aimed at stimulating economic activity. Immediately after the world economic crisis of 2008–2009, public budget deficits significantly increased and the public debt began to rapidly grow. Towards the middle of the decade, the parameters of fiscal policy started to return to normal, but governments did not seek to achieve fiscal surpluses to reduce debt to pre-crisis level.

Despite the fact that governments and monetary authorities in developed countries adopted very stimulating macroeconomic policies, this did not lead to destabilization or over-heating. Only a few countries in the euro area experienced a budget crisis. Inflation, interest rates and economic growth rates remained at low levels (see World Bank, 2019, Box 1.1). At the same time, in developed countries, inflation was markedly lower than target levels (Fig. 1). Inflation was low even in those countries where unemployment rate fell below the pre-world economic crisis level. A remarkable feature of that decade was the weak link between inflation and such indicators of economic activity as unemployment, the output gap and growth rates of GDP.

From the point of view of economic policy, the situation we have described marked a fundamental change of agenda when compared with the one that had been dominant for decades before the economic crisis of 2008–2009. In 2009, output in developed countries was 4% lower than potential GDP, after which it slowly recovered and returned to trend only in 2018 (see World Bank, 2018, Box 1.1). There were heightened anxieties that developed economies would follow the Japanese scenario, whereby low economic growth rates and price dynamics, teetering on the brink of deflation, would persist for over ten years, whilst the opportunities for governments to stimulate economic growth would be limited by the zero lower bound of nominal interest rates (Fukao et al., 2015). In the expert community, the view became widespread that the development of the leading economies would slow down owing to structural factors (Gordon,

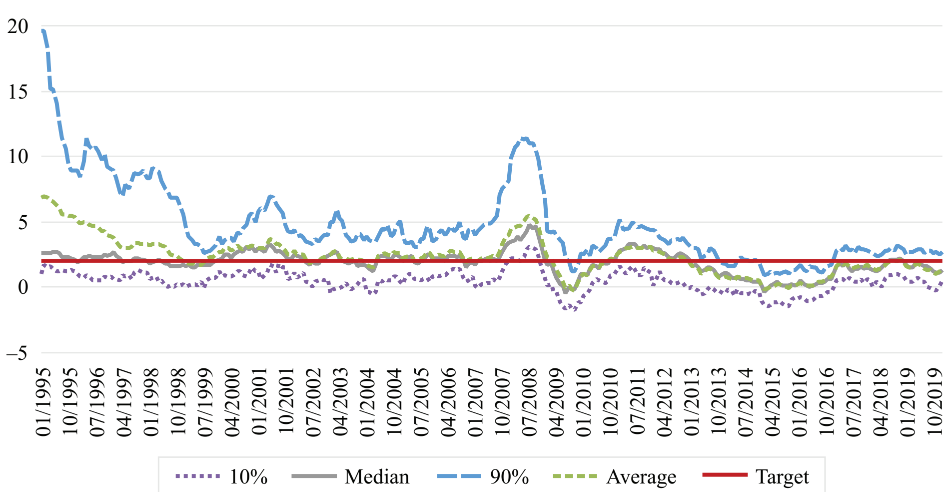

Fig. 1. Quantiles and average level of inflation in a group of developed countries, 1995–2019 compared with target level for inflation (%, YoY).

Note: We have chosen 2% as the target level of inflation, since this corresponds to the level of inflation targeted by the majority of developed countries.
Source: IMF.

2015; Eggertsson et al., 2019; Acemoglu and Restrepo, 2017; Summers, 2016; Drobyshevsky et al., 2018).

In conditions of secular stagnation, the risks of deflation significantly exceed the risks of accelerated inflation, which means that economic policy should be targeted on growth. The goals of curbing inflation and ensuring strict control over budget deficits lost their former relevance, and the objective of returning inflation to target levels and preventing the economy from sliding towards zero interest rates and deflation came to the fore. So it was that in the 2010s the understanding of macroeconomic risk by economic authorities of developed countries and by analysts in research institutes changed. In the expert community the idea of a "new normal" became widespread, by which the combination of low inflation, nominal interest rates that were close to zero, accompanied by an active use of so-called non-conventional monetary tools, high levels of employment, and moderate economic growth rates was meant (Williams, 2017; Lombardi et al., 2018; ECB, 2014).

Before the global crisis of 2008–2009 the consensus was that the priorities of economic authorities should be the smoothing out of cyclical fluctuations in the economic activity, avoiding excessive acceleration of inflation and supporting fiscal sustainability (Goodfriend, 2007; Arestis and Sawyer, 2004). Based on these considerations, a system of macroeconomic regulation was constructed. Under this framework of economic regulation, the major concern of economic policy was to keep high budgetary and monetary discipline, based on transparent decision-making and rule-based policy (Clarida et al., 1999; Bernanke et al., 2000; Taylor, 2000; Wyplosz, 2005).

However, the post-crisis decade showed that even a significant fiscal and monetary stimulus had not resulted in an acceleration of inflation or destabilization of the budget (Summers, 2019)[1]. Multifold increases in debt burdens did not lead to a growth in the cost of borrowing to support budgets, and an active provision of liquidity to financial markets did not have inflationary consequences. Experience has shown that it is difficult to get out of a predicament involving weak demand and inflation that is close to zero. Whilst the measures to be taken to suppress aggregate demand are well known, and the difficulties of their implementation are more of a political than technical matter, it transpires that in conditions of weak demand there is a lack of effective instruments; in these circumstances the usual measures frequently fail to work (Goryunov et al., 2021).

In other words, over the decade 2010–2019 economic authorities and experts revised their views with regard to the risks arising from the implementation of an expansionary macroeconomic policy and concluded that in conditions of weak demand, intensive stimulus would not entail any significant destabilizing consequences.[2] Given that economic growth rates during 2010–2019 were lower than desired, the readiness of authorities to switch to ultra-expansionary monetary and fiscal policies in the event

[1] During the 2010s only those countries that belonged to the Euro area experienced a budget crisis and a high cost of borrowing; that is, they were prevented from adopting comfortable interest rates by the policy of the European Central Bank (ECB).

[2] It is highly symptomatic that it was precisely at the end of the 2010s that so-called "modern monetary theory" (MMT) became popular. One of its key principles was the absence of budget constraints upon government, and its basic recommendation in respect to monetary policy was support for low nominal interest rates (Wray, 2015; Grishchenko et al., 2021). In this framework, the observation of fiscal and monetary discipline receded into the background.

of recession increased significantly. It was precisely in this way that developed countries governments reacted, when in 2020 they confronted the economic crisis that arose out of the global pandemic.

3. The pandemic and the start of the inflationary wave

The first case of infection by the SARS-Cov-2 virus was detected in December 2019 in the Chinese city of Wuhan, and by early spring of 2020 the global pandemic had generated a world economic crisis. Although the dynamics of GDP varied significantly from country to country, statistics for 2020 indicate that global output had fallen by 3.3%. On average during 2020 OECD countries and emerging markets lost around 4.5% of GDP, but in each group there were countries in which output fell drastically and others that did not experience any decline in GDP. There was a significant fall in output in 2020 in European countries: on average throughout the European Union (EU) GDP fell by over 6%, whereas in the USA there was a fall of only 3.4% and in Japan of 4.5%. There were large losses of output in Latin America — on average GDP in the countries of this region fell by 6.7%. According to statistics for 2020 the Chinese economy managed to avoid any decline, registering a growth in GDP of 2,4%; Turkey recorded a growth of 1.8%.

The leading economies displayed a similar dynamics of output: GDP began to decline rapidly in the first quarter of 2020 and at the end of the first half-year it reached its lowest point. In the third quarter output began to recover, such that in the second half-year of 2020 a significant part of the preceding decline had been made good. China got past the lowest point of decline in the first quarter of 2020. Thereafter, rates of recovery in all countries slowed down, but according to statistics for 2021, these rates on average remained high enough to enable the majority of countries to attain pre-crisis levels of production (Fig. 2).

In the first half of 2020, while the pandemic was spreading throughout the world and uncertainty was at its height, economic activity sharply declined, and inflation slowed down. The slow-down in inflation was more marked in developed countries (Fig. 3), but was apparent also in emerging markets. Meanwhile, central

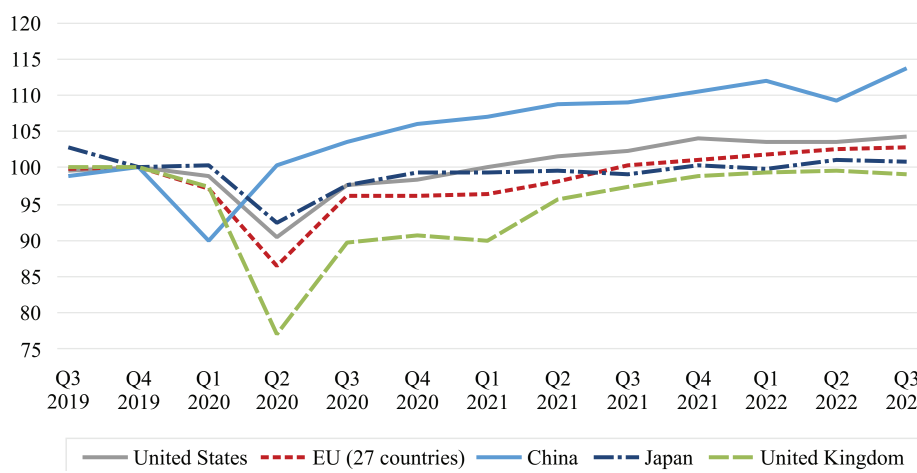

Fig. 2. Dynamics of real GDP of the largest economies (index, Q4 2019 = 100).

Source: OECD.

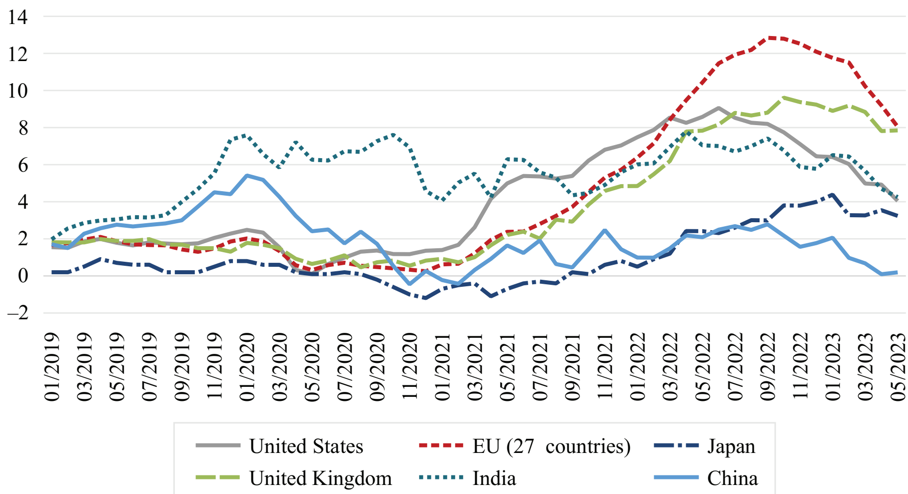

Fig. 3. Inflation in the leading economies (%, YoY).

Source: IMF.

banks everywhere lowered their interest rates in an attempt to support economic activity, avoid a liquidity crisis in financial markets, and provide stability to the banking sector. The Bank of Canada, the Bank of England, the US Federal Reserve, the Reserve Bank of Australia, and the Norges Bank all lowered their key interest rates almost to zero. In the euro area, Japan, Sweden and Switzerland interest rates at the beginning of 2020 were already at zero or even negative, and with the onset of the crisis they remained at their previous level. In addition to lowering interest rates, monetary authorities renewed their asset purchasing programs, and now no limits were set on the volume of purchases (BIS, 2020).

It is worth noting that during the acute phase of the crisis, central banks of emerging markets also lowered their interest rates, that is to say, they implemented a counter-cyclical monetary policy. Interest rates fell despite a record level of outflow of capital, and a sharp fall in the value of national currencies (IIF, 2020). Moreover, in Chile, South Korea, India, Mexico, Turkey, South Africa and a number of other countries central banks introduced their own government bond purchasing programs. This included, in a number of cases, purchasing in primary markets, with a view to reducing volatility in debt markets and supporting their liquidity, and in order to facilitate the funding of budget deficits (Arslan et al., 2020; World Bank, 2021a).

A persistent wave of inflation began to spread globally in 2021, and only in the second half of 2022 did signs start to appear that inflation was beginning to abate (see Fig. 3). In 2023 inflation rates started to decline and in a number of countries they stabilized at higher than normal levels. It is worth noting that in developed countries inflationary processes followed a common pattern and that, whilst there was a significant divergence in levels of inflation, the tendency for consumer prices to increase affected all developed countries to a greater or lesser degree. In emerging markets there was much greater diversity. In a number of countries (Mexico, United Arab Republic, Colombia, and Chile) prices followed the same trend as in developed economies. Argentina and Turkey fall into a separate group: in these countries inflation rates had been measured in tens of percent for several years. In 2021 in

Table 1
Peak rates of inflation (%, YoY), and months when they were recorded, for three episodes of inflation: 2021–2022, the first half of the 1970s, and the beginning of the 1980s.

Country	2021–2022		Mid-1970s		Beginning 1980s	
	inflation	month, year	inflation	month, year	inflation	month, year
Japan	3.8	10/2022	24.8	02/1974	8.7	09/1980
France	6.2	10/2022	15.2	12/1974	14.3	11/1981
Canada	8.1	06/2022	12.0	02/1975	12.9	01/1981
USA	9.1	06/2022	12.3	12/1974	14.8	03/1980
Great Britain	9.6	10/2022	26.9	08/1975	21.9	05/1980
Germany	10.4	10/2022	7.9	12/1973	7.4	10/1981
Italy	11.8	10/2022	25.2	11/1974	22.0	11/1980

Source: IMF.

these countries inflationary processes also accelerated. By contrast, in such huge economies as India and China the years 2021–2022 do not stand out in respect of price dynamics; in other words, the wave of inflation passed these countries by.

The inflationary wave of 2021–2022 constituted the most powerful inflationary shock since the time of the so-called “Great Inflation,” when the consumer prices growth rates in developed countries rose to double-digit levels. During that period, which began at the end of the 1960s and ended in the mid-1980s, there were two peaks of inflation: the first was reached in the first half of the 1970s; and the second at the beginning of the 1980s. Although the levels of inflation recorded in developed countries for 2021–2022 were noticeably higher than average levels for the preceding decade, and higher than targeted levels, they were nevertheless lower than the peak levels of inflation that were reached during the1970s and 1980s (Table 1).

It is important to emphasise that the surge in inflation was anomalous in developed countries, whereas in the case of emerging markets such shocks are more typical, given that in these countries the average level of inflation is higher, and price stability generally has not yet been achieved. There are significant exceptions, such as Chile and Colombia, where the monetary authorities adopted inflationary targeting some time ago and established controls over inflationary processes; but even these countries were unable to counteract the global shock of 2021–2022 and keep inflation below 10%.

The slowdown of world inflation that has been observed in 2023 provides grounds for the idea that developed countries will in a few years return to price stability. Even so, we cannot unequivocally claim that the inflationary episode has come to an end, given that not all of the largest economies have managed to sustainably reduce inflation, and that in the countries where this has been achieved inflation still remains significantly higher than targeted levels.

4. Factors contributing to global inflation

The growth of inflation in 2021–2022 was the result of an imbalance between aggregate demand and aggregate supply that developed on a world scale. The first half of 2020 marked the peak of quarantine measures introduced by governments and these served as a significant external factor constraining aggregate demand. Alongside measures of quarantine, governments introduced programs of budget-funded support that were unprecedented in scale and had a wide range

Table 2
The extent of total discretionary fiscal support during the world financial crisis (2009–2011) and during the COVID-19 pandemic (2020–2021).

Country	World financial crisis (% of GDP 2009)	COVID-19 pandemic (% of GDP 2020)
G20 developed countries		
Australia	5.8	17.4
Canada	3.4	13.1
France	2.9	8.1
Germany	5.8	13.4
Italy	0.0	9.7
Japan	6.1	14.7
South Korea	4.8	5.7
Spain	…	6.7
United Kingdom	1.6	14.2
USA	6.6	22.2
G20 emerging markets		
Argentina	6.2	4.1
Brazil	1.3	7.7
China	7.3	4.6
India	0.8	3.6
Indonesia	1.6	7.2
Mexico	2.6	0.2
Russia	15.2	4.2
Saudi Arabia	11.7	0.6
UAR	5.2	4.4
Turkey	1.7	3.1

Note: In measuring the fiscal support of 2020, expenditure on health services is not included.
Source: IMF (for data on the extent of fiscal stimulus programs see IMF, 2010, 2011a, 2011b); authors' calculations.

of objectives, including support for private consumption, supplementary funding for health services, subsidies for the debt servicing of enterprises that were most vulnerable under conditions of the lock-down, tax abatements, and benefits for individuals who had become unemployed.[3] The total value of fiscal stimulus delivered in the G20 largest economies (supplementary expenditures on health services and state funded loan guarantees not included) exceeded $8.4 trillion, or over 10% of the world GDP of 2020. In some countries, the budget support exceeded 14% of GDP (Table 2). For comparison, following the world financial crisis, the scale of discretionary fiscal stimulus[4] (that is, the greater part of active budgetary support) delivered in the G20 countries over the three years — 2009 to 2011, amounted to around 4% of the world GDP of 2009.

Fiscal stimulus was supported by monetary authorities. They significantly increased their asset purchases that made an important contribution to growth of money supply in nominal terms. Over a two-year period during which the federal funds rate remained at its lowest level (from March 2020 through February 2022), money supply in the USA increased by 40% and during the same period the Fed balance more than doubled. In the euro area the situation was similar:

[3] For more detailed information on the measures of budget support applied in various countries see IMF, 2011a.
[4] These are measures aimed to support aggregate demand. Decisions on these measures are taken by special legislative acts that take into account the special circumstances of the crisis. They are not to be confused with the so-called "automatic stabilizers," for example, unemployment benefits.

from the beginning of the crisis to the time when the ECB increased its interest rate (February 2020 through July 2022), money supply increased by 20% and the ECB balance by 87%. It is worth noting that the growth in money supply in the USA and in the euro area over the period 2020–2022 was significantly greater than it had been during the years 2008–2010, when the ECB and the Federal Reserve had introduced programs of quantitative easing, and support measures had been applied by the budgetary authorities (Figs. 4–5).

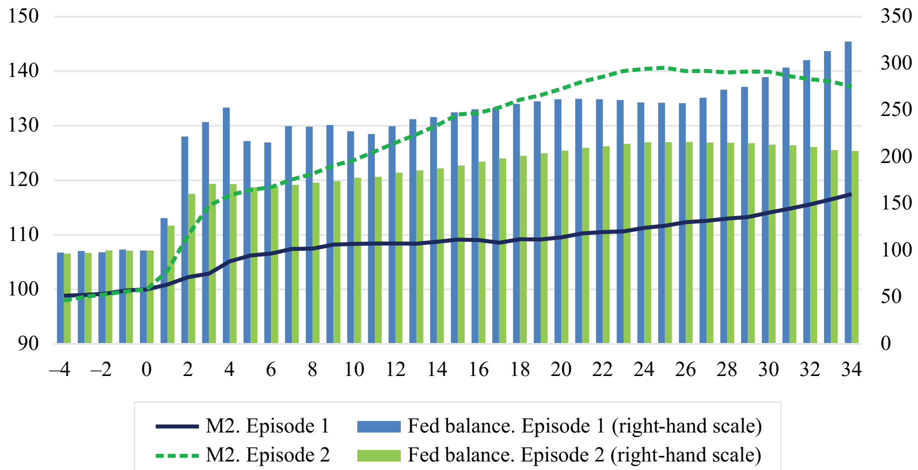

Fig. 4. Balance of the Fed and money supply (M2) in the USA during the world financial crisis (Episode 1) and the COVID-19 pandemic (Episode 2).

Note: The values along the horizontal axis correspond to the number of months that had elapsed since the date of commencement of the episode. The starting date of Episode 1 was August 2008; the starting date of Episode 2 was February 2020. The values along the vertical axis are normalized: the starting date of the episode is set at 100. *Source:* Federal Reserve Bank of St. Louis.

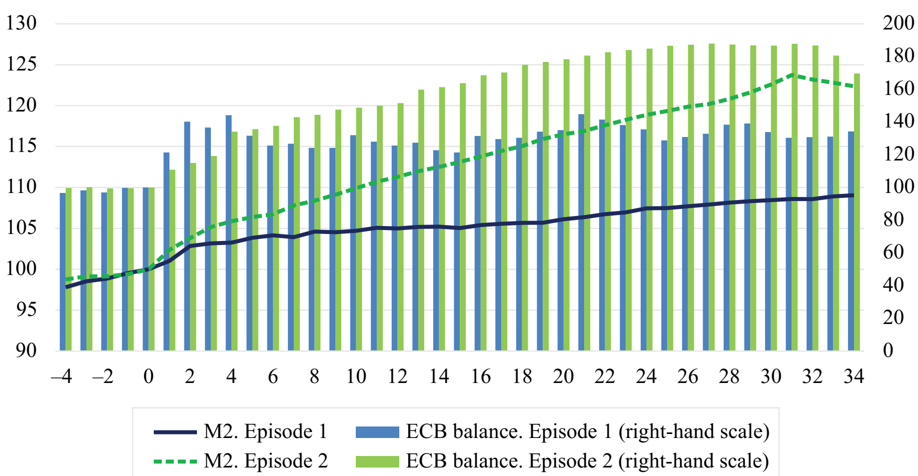

Fig. 5. Balance of the ECB and money supply (M2) in the euro area during the world financial crisis (Episode 1) and the COVID-19 pandemic (Episode 2).

Note. The values along the horizontal axis correspond to the number of months that had elapsed since the date of commencement of the episode. The starting date of Episode 1 was August 2008; the starting date of Episode 2 was February 2020. The values along the vertical axis are normalized: the starting date of the episode is set at 100. *Source:* ECB.

The combined effect of administrative measures for limiting consumption and of massive financial support for households was as follows: in 2020 savings significantly increased (IMF, 2021c). Growing uncertainty was an additional factor driving precautionary household savings.

Towards the beginning of 2021 the acute phase of the economic crisis came to an end as governments, enterprises and households adapted to conditions of the pandemic involving social distancing, the mass use of personal protective equipment (PPE), and the introduction of vaccination programs. Aggregate demand, fuelled by measures of fiscal support, began to return to previous levels as the lock-down was lifted. However, the production capacity of the world economy could not cope with the sudden growth in demand.

In the modern world the production of goods is organized internationally and on a global scale: final goods contain a multitude of component parts that have their origin in different countries. In order to reduce their costs, enterprises strive to minimize their stocks of components, relying on the smoothness and efficiency of international logistics. This system of production is particularly sensitive to any interruption of supplies. Quarantine measures disrupted the system, and logistical pressure built up in the supply chains. The Global Supply Chain Pressure Index measured by the FRB of New York recorded a rapid increase in the first half of 2020 (Fig. 6). Interruptions of global supply chains had a serious negative impact on aggregate supply, but in 2020 they did not have any visible inflationary consequences, mainly because demand remained at a low level.

The dynamics of the average value of the PMI Index for industry in the G20 countries indicate that in the first half of 2020 there was a sharp fall in demand, but by the summer of that year the index rose above 50. It continued to rise rapidly, indicating that the slump had been overcome and a transition to sustainable growth was underway. The Business Confidence Index calculated by the OECD for the G20 economies reflected similar dynamics of demand. In the autumn of

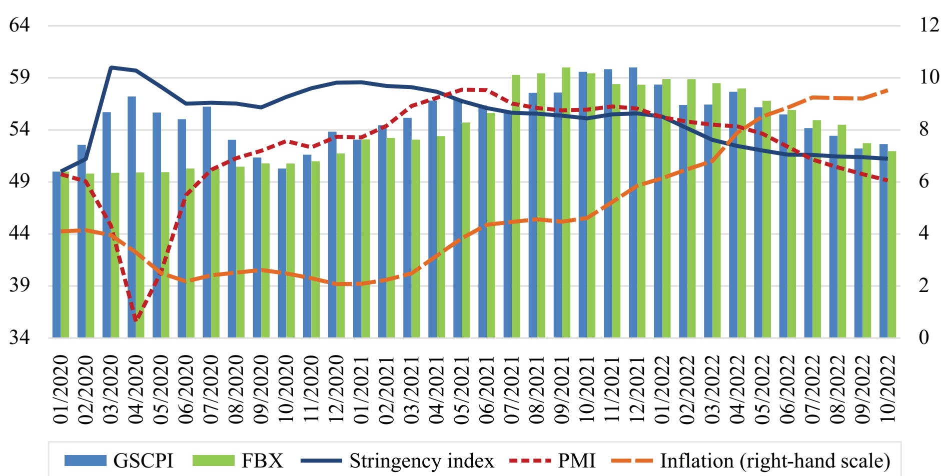

Fig. 6. The Global Supply Chain Index (GSCPI); the Freightos Baltic Index (FBX); The Stringency Index; Average inflation and the PMI Index in the G20 countries.

Note: For convenience of graphic representation, the GSCPI, FBX and Stringency Indices are presented in normalized form. The initial value (January 2020) is set at 50 and the maximum value — at 60.
Sources: IMF; Standard & Poor's; FRB of New York; Oxford University; freightos.com

2020 indicators had reached levels of neutrality, but in the beginning of 2021 they steadily entered a zone that indicated sustainable expansion of demand.

In 2021 the imbalance between the demand and supply sides became more acute. As of January 2021 freight charges began to increase and pressure in supply chains increased once again (see Fig. 6). As a consequence of dislocations in the international transport network, in the up-stream industries, and in a number of industries specializing in components (semiconductors, microprocessors) widely used in the production of a variety of modern consumer goods, bottlenecks began to appear (Rees and Rungcharoenkitkul, 2021). Difficulties in these sectors resulted in an increase in the cost of production that was passed on to consumers of these products. These difficulties spread throughout production chains and this, in turn, led to a contraction of production of a wide range of goods. The growing imbalance between demand and supply became a key factor contributing to the subsequent global inflationary shock.

Increases in the cost of food and fuel in world markets made a significant contribution to the inflation surge. In OECD countries in 2020 and 2021 food and energy accounted for around a third of the increase in the consumer price index (CPI). In developing countries, the share of food in the consumer basket was higher, which meant that in these countries the contribution of food to the increase of CPI was even greater. We can distinguish two waves of growth in commodity prices. The first predominantly affected food prices. It began in the second half of 2020 and was linked to the recovery of economic activity following a pause in the first half of 2020. Particularly marked was the increase in prices of cereals and vegetable oil: between June 2020 and July 2021 the prices of products in this group grew by almost 50%. World energy prices also increased in this period, but unlike food prices they fell significantly during the first months of the pandemic (Fig. 7). For this reason, the increase started from a relatively low base and the inflationary effect of energy prices was limited.

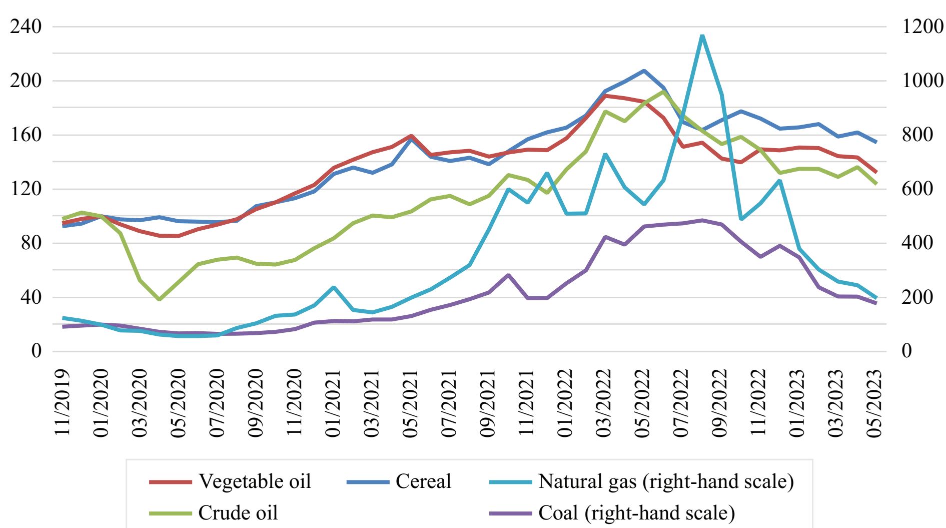

Fig. 7. Indices of world cereal prices, vegetable oil, crude oil, coal and natural gas (January 2020 = 100).

Source: IMF.

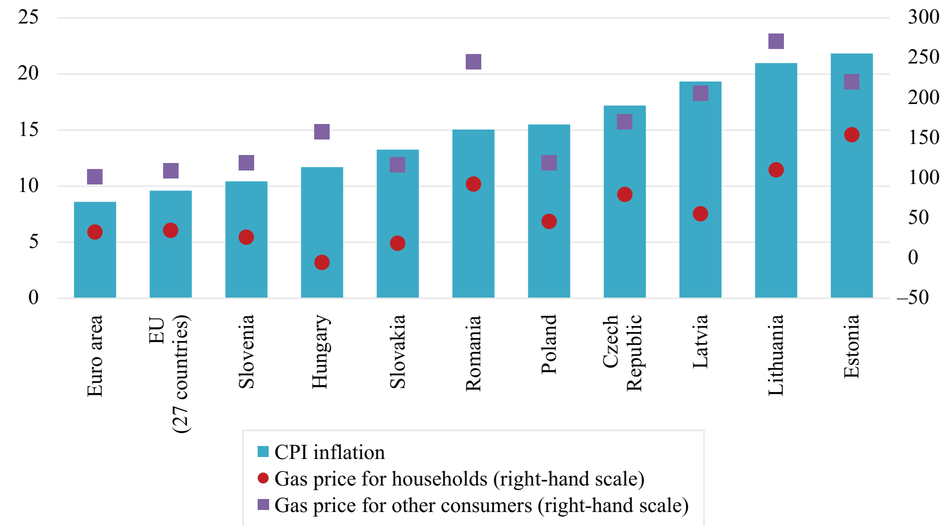

Fig. 8. Increase in consumer prices and in prices for natural gas for households and other consumers in the countries of CEE for the period of July 2021 through June 2022 compared with corresponding indicators for the EU and the euro area (%).

Source: Eurostat, OECD.

The second wave of growth in commodity prices was associated with the rise in geopolitical tension and deterioration in international relations at the beginning of 2022. These led to large-scale changes in the energy markets, diminishing supply of gas from Russia to Europe, a sanctions war, and an interruption in the supply of some food products from Russia and Ukraine to world markets. By the middle of 2022 commodity prices had reached their peak; then they began to fall. There was a particularly steep rise in world prices for natural gas and coal: the average price of coal in 2022 was four times higher than in January 2020 and the average price of gas was almost seven times higher.[5]

The increase in the price of natural gas had the greatest impact on consumer prices in the countries of Central and Eastern Europe (CEE), where inflation was significantly higher than in the rest of Europe (Fig. 8). During the second half of 2021 and the first half of 2022, that is, during the period when the growth rates of prices for gas were at their peak, the increase in consumer prices in the EU and the euro area reached 9.6% and 8.6% respectively. Over the same period consumer prices in the Czech Republic increased by 17.2%, in Latvia—by 19.3%, in Lithuania—by 21.0% and in Estonia—by 21.8%. Additionally, natural gas prices in these countries increased much more steeply than in other European countries. In Latvia, Lithuania and Estonia over the considered period the price of gas to households increased by 55%, 110% and 154% respectively, whereas on average throughout the EU and the euro area gas prices to households increased by one third. In other CEE countries there was a similar scenario to the one in the Baltic States.

The increase in the rate of global inflation can to a significant degree be attributed to a change in the pattern of consumer demand, namely a reduction in the demand for services and an increase in demand for goods. This shift in the pattern of

[5] The price dynamics of gas and coal are derived from the indices of the prices of these commodities (Natural gas and Coal) published by the IMF as part of its "Primary commodity price database."

demand occurred in many economies, both developed and developing. In the first six months of 2020 there was a synchronous decline in the consumption of goods and services, but thereafter, during the phase of economic recovery, demand for services increased much more slowly than demand for goods. In the G7 countries the consumption of durable goods, following the decline in the first half of 2020, by the third quarter of 2020 had returned to the level of the end of 2019. The consumption of other goods suffered almost no decline at the start of the pandemic. However, the consumption of services fell by 20% after which it slowly returned to its former level, reaching pre-crisis values only in the second half of 2022 (Fig. 9). Such a kind of dynamics of consumption pattern was documented in many countries. Along with that there was a similar shift in favor of goods in international trade (World Bank, 2021b). In 2020, after the start of the pandemic, the import of goods in OECD and BRICS countries fell sharply, but by the end of the year imports had returned to their pre-crisis level. However, the import of services in both groups of countries reached previous levels much later (Fig. 10).

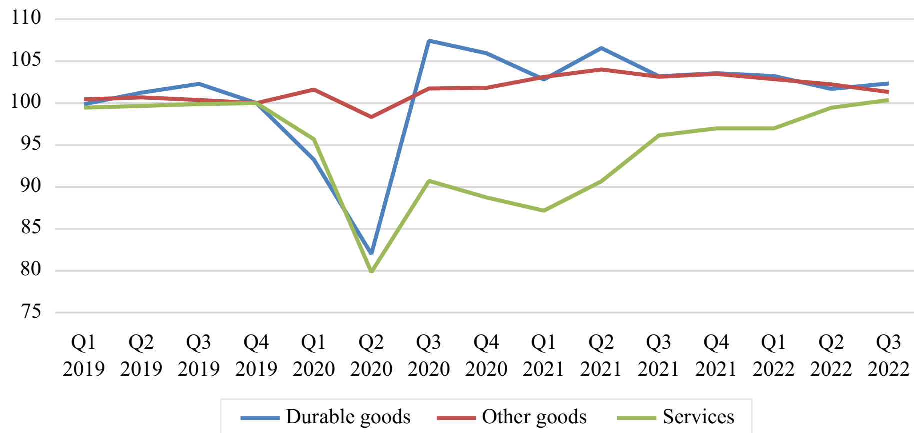

Fig. 9. Consumption of services, durable goods and other goods in G7 countries (index, Q4 2019 = 100).

Source: OECD.

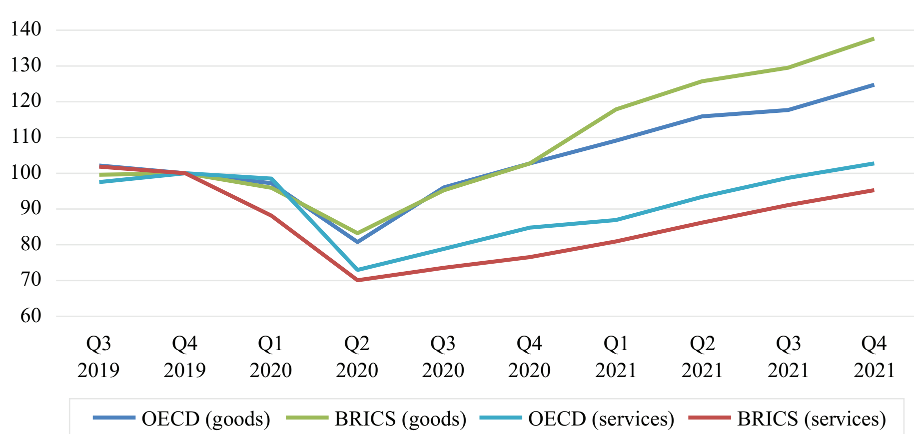

Fig. 10. Import of goods and services in OECD and BRICS countries in U.S. dollars (seasonally adjusted, index, Q4 2019 = 100).

Source: OECD.

According to economic theory, a change in the structure of demand should not result in a change in the level of prices. When an increase in demand for one category of goods is accompanied by a fall in demand for another category, then goods of the first category should increase in price, and goods of the second category should become cheaper. Hence despite relative prices' change there should be no inflation or deflation, since the growth in prices of some goods is compensated by a reduction in the prices of other goods. As a result, the general price index, which is the weighted sum of the prices of goods of both categories, remains the same. However, this logic applies in cases where prices are flexible.

In cases where there are nominal rigidities and different categories of goods display different degrees of price rigidity, a change in the structure of demand might result in inflation. It is well known that the prices of goods, on average, display a greater degree of flexibility than the prices of services: this asymmetry is universal and can be observed in many economies (Bills and Klenow, 2004; Dhyne et al., 2006). In a scenario involving an increase in demand for goods and a fall in demand for services, the prices of goods will increase rapidly whereas the prices of services will fall slowly, and the outcome will be an increase in the general level of prices. Just such an effect was observed in 2021–2022 when an upturn in demand pushed up the prices of goods, albeit there was no fall in the prices of services: the outcome was an increase in the general level of consumer prices. It would therefore appear that the increase in inflation during 2021–2022 derived primarily from the satisfaction of pent-up demand in conditions of constrained supply. In the first half of 2020 disinflationary tendencies were dominant, and were the consequence of a fall in demand in conditions of a rapidly unfolding global pandemic and rising uncertainty. Then, as of 2021, the balance rapidly tilted towards pro-inflationary tendencies, since a significant disproportion had developed between, on the one hand, a powerful recovery of demand, and, on the other hand, the reduced productive capacities of the global economy.

We should emphasise that the changes in demand and the negative supply shocks described were of a non-economic origin, to the extent that they had been shaped by the introduction and subsequent relaxation of administrative restrictions. The recovery of demand would not have been so rapid if it had fallen owing to an endogenous economic shock. Given that demand had been artificially restrained for some time, it was to be expected that there would be a rise in the rate of inflation once barriers were removed, as economic agents increased their expenditure and strove to compensate for the previous contraction of consumption. However, the effect of this pro-inflationary mechanism was greatly amplified by three sets of circumstances: an uneven recovery of demand in various sectors; difficulties that arose in production and supply; and an active stimulus policy.

5. Why monetary tightening was delayed: Arguments of monetary authorities

The inflationary shock came as a surprise to monetary authorities of developed countries, international organizations and experts, amongst whom the prevailing opinion was that the impact of pro-inflationary factors would be limited and temporary, and that no significant tightening of fiscal policy would be needed. The IMF economists repeatedly revised upwards their forecasts for inflation in

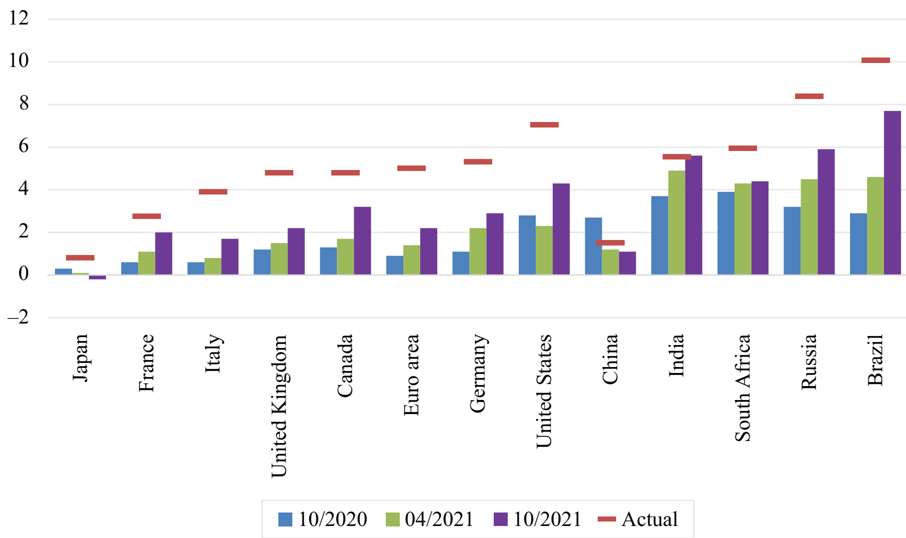

Fig. 11. Forecast of inflation in 2021 in various issues of World Economic Outlook and the actual level of inflation in 2021.

Source: IMF, 2020, 2021a, 2021b.

2021, even when it had become absolutely clear that inflation was accelerating (Fig. 11). The very last estimate of inflation in 2021 published in October of that year by the most distinguished economists of the USA, German, Italy and Great Britain, and of the countries of the euro area, deviated from actual inflation by over 2%. Forecasts for 2022 were far more precise. The economists of the OECD, taking into account the results of 2021, had estimated, that any growth in consumer prices in European countries would barely reach 2%; they had also been unable to predict the anomalous increase in inflation (OECD, 2021abc). In mid-2021, the World Bank advised governments of developed countries to keep expansionary policy, so as not to harm an accelerating growth of output (World Bank, 2021b).

The absence of any signal from the regulators that they were willing to move towards tightening and suppress demand was in itself an additional factor stimulating inflation. It was only at the end of 2021 that monetary authorities began to curtail asset purchasing programs and increase interest rates; and it was only in 2022 that decisive steps were taken for monetary tightening. The Fed policy rate remained at a level of 12.5 basis points from March 2020 and was increased to 37.5 basis points only in March 2022, when the rate of inflation had reached 8%. The ECB first increased its interest rate from zero to 0.5% in July 2022, when inflation was running at 8.6%. Central banks of other developed countries were also slow to increase their interest rates. By the end of 2022, the regulators of all developed countries, with the exception of the Bank of Japan, had significantly increased their interest rates. In emerging markets, the cycle of tightening had begun earlier. The first to adopt measures of monetary tightening were the monetary authorities of Latin America (Brazil, Chile, Mexico, Colombia, and Peru) who began increasing interest rates from the third quarter of 2021. Then in the fourth quarter of that year the countries of CEE began to increase their key interest rates (Poland, Czech Republic, Hungary and Romania). The countries of the Pacific Region and South-East Asia changed the course of their monetary policy in the second to third quarter of 2022 (Thailand, Philippines, Malaysia, India, Indonesia).

Of course, the postponement of monetary tightening by central banks, and their inability to foresee the wave of inflation, were interconnected. Interest rates should be increased when prices are influenced by factors that are likely to cause inflation to deviate from its target level. Owing to the fact that central banks did not detect the impact of such factors, monetary authorities were unprepared for the wave of inflation. The acceleration of inflation was ignored for so long because it was considered to be temporary. Let us examine the reasons why the regulators were unable to predict the surge in inflation, and why they considered an increase in interest rates to be inappropriate.

Firstly, the rapid return of demand to pre-crisis levels, which became the principal factor driving global inflation, was difficult to predict. From the vantage point of 2023 it might seem obvious that demand would quickly return to pre-crisis levels. However, generally speaking, such dynamics of demand is highly atypical; usually, the recovery of demand following a crisis takes longer, especially in circumstances in which a crisis arises as the consequence of a negative demand shock. The economic crisis of 2022 was unique in that it was determined by non-economic factors and originated in a supply shock. That is why demand, having experienced a brief slump during the acute phase of the crisis, quickly picked up again. Given substantial budget stimulus, it is entirely understandable why markets rapidly became overheated. However, it is important to remember that right up to the end of 2021 there was a great deal of uncertainty as to whether progress was being made in the struggle with the pandemic. Even today we cannot exclude the possibility of new, vaccine-resistant variants of the virus appearing, and of quarantine measures being reintroduced. As the example of China shows — an economy that was not affected by the global wave of inflation and which, right up to the end of 2022, was enforcing a policy of "zero tolerance" in combating COVID-19 and applied a great many measures of quarantine, lockdown can have a powerful deflationary impact. This means that high probability of reintroducing quarantine also serves as a brake on inflation. Finally, it was difficult to forecast such a drastic switch from the consumption of services to the consumption of goods and the effect that this would have on price dynamics.

The second reason why an increase in interest rates was delayed derived from the fact that monetary authorities relied on indicators of core inflation that are based on the consumption basket with goods with most volatile prices excluded. The dynamics of core inflation was more stable than the headline inflation, owing to the fact that the latter was affected by steeply increasing food and energy prices. Central banks are reluctant to bear down on price shocks provoked by a rise in commodity prices, since the pro-inflationary effect of these increases is of relatively short duration. Given that there is a time lag in the effect upon inflation of any change in interest rates, counteracting such shocks makes little sense (Bernanke, 2010; Mehra and Sawhney, 2010). For this reason, monetary authorities mostly rely on a forecast dynamics of inflation that is calculated with the help of modelling and empirical data and not to a lesser extent on actual current inflation. In other words, in the opinion of the economists of leading central banks, the observed acceleration of inflation was driven predominantly by short-term factors; there would be a natural decline in the rate of inflation, and there was no need to increase interest rates.

The third reason why interest rates were not increased was that inflation expectations remained stable. The yields on long-term securities, future inflation estimates, made by professional forecasters, and other indicators used in evaluating inflation expectations, indicated that economic agents believed that a prolonged period of high inflation was unlikely. The understanding of regulators that any inflationary shock would be temporary reinforced this view.

The fourth reason is connected with the absence of visible signs of overheating in the economy, and above all the fact that from the start of the crisis employment had declined and returned to its former level only by the beginning of 2022. Relatively high unemployment rates pointed to the existence of unutilized labor resources, which implied the absence of pressure on prices from the rising cost of labor. However, in many developed countries in 2021 there were already shortages in the labor market, owing to structural changes brought by the pandemic. The pandemic impacted different segments of the labor market in many different ways (IMF, 2022a; Causa et al., 2021). As a result, the labor market, which is in any case highly segmented and differentiated, became even more fragmented. The changes that took place, as revealed by aggregate labor market indicators, have been correctly interpreted as an increase in the natural rate of unemployment (Blanchard et al., 2022). This means that by 2021 there had been a one-time increase in actual unemployment and of its natural level; but since the increase in the natural level was invisible to the monetary authorities they failed to take into account the fact that, in reality, the deviation of unemployment from the natural level was significantly less, and mistakenly concluded that there were no significant tensions in the labor market.[6]

The fifth argument in favor of retaining low interest rates was based on perceptions that, since 2010, in developed countries the price level had remained extremely stable and its response to changes in aggregate demand had been weak. The experience of the last decade had shown that despite massive fiscal stimulus, inflation had remained low. In other words, the correlation between inflation and economic cycle had weakened, an effect that had begun to appear in the 1990s.[7] In economic literature, this phenomenon is interpreted as a flattening of the Phillips curve, which is understood as the generalized dependence of actual inflation on a particular indicator of the economic cycle (an output gap, a deviation in unemployment from the natural level, the load on productive capacities and so on), adjusted for inflation expectations. The weaker the dependence, the lower the slope of the Phillips curve. By the end of the 2010s, an understanding had been formed in the expert community that the weakening of the link between inflation and real economic activity was indicative of a new economic reality with which central banks would have to come to terms.

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[6] A more complex picture of the processes at work in the labor market is provided by the frequently used indicator of the relationship between the number of vacancies and the number of unemployed (Domash and Summers, 2022). This indicator highlights any overheating of the labor market attributable to an increase in demand for labor, that is an increase in the number of vacancies.

[7] See Beaudry and Doyle, 2000; Roberts, 2006; Iakova, 2007; Kuttner and Robinson, 2010; Blanchard et al., 2015; Forbes et al., 2020.

In our opinion, the following considerations also played some part. Firstly, monetary authorities could not ignore the condition of the budget, which had borne the main burden in the battle with the crisis. In 2020, the overall budget deficits of general government of developed countries exceeded 10% of GDP, and although in 2021 these deficits were lower, there had been no return to relatively safe levels of deficit (Fig. 12). Given that over the previous 20 years the cost of servicing government debt, expressed as a share of GDP, had been declining (Fig. 13), it could naturally be assumed that an increase in interest rates would

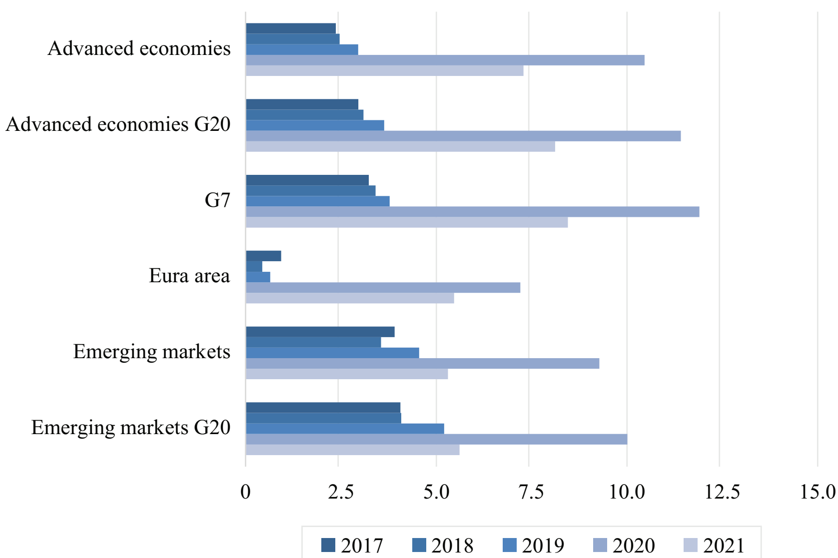

Fig. 12. The overall budget deficit of general government in countries of various categories (% of GDP).

Source: IMF, 2022b.

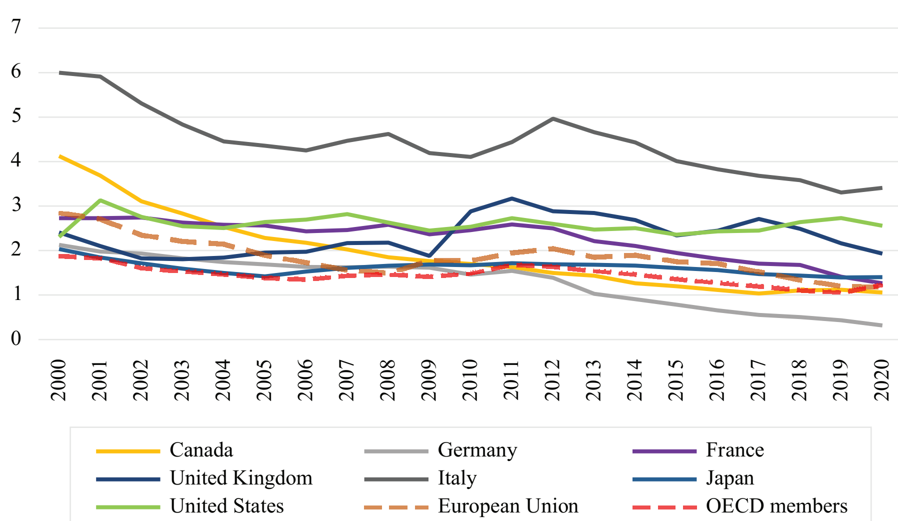

Fig. 13. Interest payments on government debt (% of GDP).

Source: World Bank.

inflict a significant negative shock on the budget. In an ambivalent situation, in which there are arguments in favor both of increasing interest rates and of retaining loose conditions in the money market, the risk of destabilizing the budget militates in favor of low interest rates. And taking into account the fact that in preceding years not only budgetary authorities but also financial markets and institutions had become accustomed to a surplus of liquidity, an increase in interest rates would have destabilized not only the budget but also the financial sector.

It would be a mistake to think that we are now living under a régime of "fiscal dominance" in monetary policy, whereby monetary authorities engage in monetary expansion in order to create favorable credit conditions for the budget, at the cost of price stability. Albeit with some delay, central banks have begun to tighten their policy, and inflationary processes are now tending in the direction of stabilization and even contraction. Even so, we can confidently state that one of the motives of regulators in keeping interest rates at a low level was bolstering the stability of government finances.

Secondly, in our opinion, central banks of developed countries had become accustomed to an increased level of inflation partly because for an entire decade during the 2010s they had had to deal with the problem of abnormally low inflation. When the economy is passing through a period of moderate and not prolonged inflation it would be a mistake abruptly to change the direction of monetary policy, especially since this would certainly impact negatively on the recovery of the economy from a severe crisis. On the contrary, a brief, steep rise in inflation would partly compensate for the low inflation of preceding years. This approach was officially adopted by the US regulator in 2020, when it was decided to go over to average inflation targeting. Under this approach, the aim of the central bank is to keep inflation rate averaged over several years close to a target level. If, after several years, inflation turns out to be lower than the target, the regulator should allow higher inflation in the following years, so that the resulting average inflation is close to the target level. A sharp change of policy and of rhetoric would also result in a loss of confidence in the signals issued by central banks as part of their forward guidance. In 2020 monetary policy was ultra-expansionary, and, being concerned to avoid a reduction in demand and the deflation trap, central banks gave every possible signal to the markets that interest rates would remain at zero levels for a considerable time to come. A rapid transition to a cycle of tightening would have greatly devalued the information signals of the regulators.

6. The risks of stagflation and medium-term scenarios

At the present time, the principal factor of uncertainty relates to whether monetary authorities of developed countries will succeed in the medium-term in stabilizing inflation around target levels, and whether this effort will be accompanied by a severe recession. Possible scenarios include a relatively quick suppression of the inflation shock, the continuation of high inflation, and a lapse into a prolonged period of stagflation. The first outcome seems most probable given that, in the first place, central banks have become aware of the risks of inflation and have everywhere begun to increase interest rates in order to regain price stability. Secondly, developed economies are hovering on the brink of recession, that is, the pressure of demand is decreasing, commodity prices have stabilized and the impact of pro-inflationary factors is weakening. Thirdly, inflation expectations remain low and have become anchored. In our opinion, the principal reason why stagflation seems unlikely is that, by comparison with the 1970s, today's monetary authorities have a very different understanding of their ability to combat inflation; they appreciate the need to secure price stability, and are aware of their responsibility for supporting this.[8] Even so, one cannot completely rule out the possibility of a period of prolonged high inflation, so we must ask in what circumstances this might materialize.

Amongst the factors that might lead to a period of prolonged high inflation, two must be singled out: firstly, inflation expectations de-anchoring, a shift in inflation expectations from the current to a higher level, and a consolidation of this shift. Secondly, an unleashing of the so-called "wage–price spiral," whereby an increase in consumer prices compels workers to demand higher wages, and this in turn forces consumer prices upwards through the effect of wage increases on costs. Of course, these two circumstances are directly linked, given that the initiation of a "wage–price spiral" is only possible if inflation expectations have significantly increased, since it is precisely in this circumstance that not only indexation with reference to past inflation, but also expectations that consumer prices will continue to increase, will become embedded in nominal wages.[9] However, expectations of increased inflation take some time to develop, and the principal circumstance impelling any change is the perception by economic actors of an increase in actual inflation (De Fiore et al., 2022). In other words, inflation expectations are to a considerable extent adaptive: when economic agents see that the growth rates of consumer prices have increased, they conclude after a period of time that these increased rates are normal and adjust their expectations accordingly.

Current economic literature on the de-anchoring of inflation expectations concentrates on the emergence of inflation expectations which are too low but not too high. This is because central banks of developed countries during the last decade were engaged in a battle with low inflation that was complicated by a reduction in inflation expectations.

In circumstances in which the monetary authorities demonstrated their inability to raise inflation to the target level, economic actors began to take this into account, and gradually lowered their inflation expectations; this made the task of stimulation, at a time of zero levels of nominal interest rates, even more complicated.[10] Empirical research has shown that in developed countries the degree of anchoring of inflation expectations varies significantly from country to country, and also over time (Buono and Formai, 2018; Strohsal et al., 2016; Grishchenko et al., 2019). In present circumstances the discussed mechanism might operate but only in the opposite direction, when an inability (or unwillingness) of a central bank to steer inflation towards a target becomes a factor in the anchoring of infla-

[8] Lengthy inflation in developed countries during the 1970s persisted largely because during these years central bank heads assumed that an inflationary shock was non-monetary in its nature and so could not be suppressed by a tightening of fiscal policy (Romer and Romer, 2002, 2013; Meltzer, 2005).

[9] The idea that expectations play a significant role in price formation, and that, therefore, a shift in inflation expectations will provoke an acceleration of inflation, is widely accepted in economic theory (Muth, 1961; Freidman, 1968; Lucas and Rapping, 1969; Sims, 2009) and has been substantiated empirically (see, for example, Reis, 2021).

[10] The problem of de-anchoring as a consequence of unduly low inflation has been examined in Gobbi et al. (2019) and Busetti et al. (2017).

tion expectations, which would make the task of lowering inflation even more difficult to achieve.

In a scenario in which a "wage–price spiral" is unleashed, a dual knock-on effect acquires great importance: firstly, there is the impact of an increase in prices on the growth of wages; secondly, there is the impact of the increased cost of wages on prices. In the World Economic Outlook (IMF, 2022c) the IMF reported on the results of empirical research into historical trends in wages and prices and provided the analysis of episodes in which the effect of the "wage–price spiral" could be identified. The authors conclude that periods in which the "wage–price spiral" has any effect are relatively short in duration; that is, the process of self-generating inflation is soon exhausted, and, usually, the period of increased inflation is not followed by a corresponding increase in nominal wages. Instead, what follows is a decline in inflation accompanied by a moderate increase in wages. In other words, empirical research casts doubt on the possibility of an inflationary scenario resulting from the "wage–price spiral." Economists of the Bank for International Settlements are more sceptical (BIS, 2022; Boissay et al., 2022), and argue that despite the absence of any increase in wages across the board, the risks of a "wage–price spiral" having effect in developed countries are quite real, particularly in those countries where the labor market is most overheated.

In addition to the factors dealt with above, the readiness of monetary authorities to adhere to a strict policy for suppressing inflation, even in conditions of declining economic activity and rising unemployment, will be of great importance. Usually central banks of developed countries take action in response to demand shocks in which economic activity and inflation keep in step, and so no contradiction arises between the methods for supporting price stability and those for smoothing the dynamics of output. However, in present conditions of unstable economic growth, and with inflation still significantly above target, monetary authorities could face a difficult choice, given that combating inflation requires the raising of interest rates, whereas stimulating growth requires that they be lowered. In these circumstances there is a risk that central banks, in their anxiety to forestall a decline in production, will hasten to relax control, with the consequence that inflation will remain high.

One of the causes of the stagflation of the 1970s was a lack of consistency, in that the cycle of monetary tightening was ended prematurely, that is, before inflation had returned to moderate levels (Romer and Romer, 1989; King, 2005; Goodfriend, 2007). In other words, in response to rising inflation, the monetary authorities raised interest rates in an attempt to curtail the spiral of inflation; but since this strict monetary policy resulted in a decline in rates of economic growth, the central bank then prematurely cut policy rates without waiting for a steady decline in inflation, assuming that the forces driving inflation were already exhausted, and that it would fall to moderate levels without additional measures on their part. A repetition of this scenario in the nearest future cannot be ruled out.

Whether central banks of developed countries will encounter such problems in a more distant future will depend upon how, in response to structural changes, potential output and the neutral interest rate might change. For monetary authorities, the greatest difficulties arise in circumstances when there are low growth rates of potential output and a neutral interest rate that is close to zero, since in this scenario inflation and the nominal interest rate fall to levels close to zero.

This drastically undermines the effectiveness of monetary policy (Goryunov et al., 2021). If, once the inflationary shock has been overcome, there is a recurrence of such macroeconomic conditions in developed countries, it is likely that there will once again be recourse to the use of non-conventional measures of monetary policy with policy rates close to the effective lower bound. A continuing and accelerated transition to renewable energy resources, brought about by a growing number of risks on the geopolitical side and the impact of these risks on world energy markets, could also contribute significantly to this scenario. If events were to unfold in this direction, it is likely that the idea of an upward shift of the targeted level of inflation would acquire considerable support within the expert community. Although at the present time this idea has no appeal for central bank heads, a significant number of economists are of the opinion that an increase in the target level of inflation in developed countries to between 2.5–4.0% is desirable (Abmrocio et al., 2022; Reifschneider and Wilcox, 2021), in that it would create more space for a reduction of interest rates in the event of recession, and thereby enhance the effectiveness of monetary policy.

Meanwhile, an increase in neutral interest rates in response to structural changes cannot be ruled out.[11] In this case, the task of obtaining price stability would be simpler, since nominal interest rates would increase, and central banks would acquire greater space for manoeuvre in the event of a fall in demand. However, higher interest rates would require an intensification of measures of quantitative tightening, which would put financial institutions under stress, given that they have operated for many years in conditions of excess liquidity. There would also be a negative impact on fiscal sustainability. Meanwhile, there is ambiguity as regards the direction of change in the growth of potential output. Firstly, in recent years there has been a noticeable slowing down of the process of globalization; in some respects, one can even speak of the beginning of de-globalization. Segmentation of the world market and tightening of capital controls will impact negatively on the growth rates of potential output and will exert an upward pressure on neutral interest rates. Secondly, given the growth of geopolitical tension it is likely that there will be a significant increase in government expenditure on defense and on the military-industrial complex; this will result in an increase in the growth rates of potential GDP and of the neutral interest rate. There remains, therefore, a significant degree of uncertainty with regard not only to the dynamics of consumer prices, but also to structural macroeconomic trends and the monetary policy agenda over the next few years.

7. Conclusion

The onset of the pandemic in 2020 ushered in a period of development of the global economy that was abnormal in many respects, and the inflationary shock of 2021–2022 was an inherent part of that development. The rapid surge in aggregate demand that occurred in the second half of 2020 and which gathered pace as conditions of quarantine were relaxed, and while supply chains were still disrupted and restrictions on aggregate supply remained in power, produced imbalances that

[11] For an extensive review of the factors determining the long-term and medium-term dynamics of the neutral real interest rate, see Drobyshevsky et al. (2021).

resulted in a level of inflation that had not been seen in many years. Although the release of deferred demand would almost inevitably have led to an increase in prices, the increase would not have been so great if a policy of fiscal and monetary stimulus that was unprecedented in scale had not been introduced. Governments were unable to foresee the extent of this inflationary shock as they were unable to quantify the increase in costs that derived from the lock-down, or anticipate the dysfunctional behavior of particular markets. They also underestimated the pro-inflationary impact of support measures. The first failure is explained by the abnormality of the impact of the pandemic, the nature of which was not fully understood, and the effects of which on the economy could not have been predicted. The second failure derived from the reliance of governments on the experience of the decade that preceded the crisis, during which time an ultra-expansionary monetary policy and significant fiscal stimulus did not have any markedly inflationary consequences. One can therefore talk of policy mistakes that were the result, on the one hand, of a concatenation of circumstances, and, on the other hand, of the decision of governments during the crisis to abandon strict monetary discipline.

The present inflationary episode is not yet over, given that the growth rates of consumer prices have not yet returned to targetable levels, though there are some indications that inflation is on a downward trend. The principal efforts of monetary authorities as they liaise with governments in the immediate future will be directed towards returning inflation to a targeted level. This policy is fraught with significant risks, given that during the last decade budgetary authorities and financial institutions became accustomed to extensively eased monetary conditions. It also possible that what lies ahead is a prolonged period of high inflation.

References

Acemoglu, D., & Restrepo, P. (2017). Secular stagnation? The effect of aging on economic growth in the age of automation. *American Economic Review*, *107*(5), 174–179. https://doi.org/10.1257/aer.p20171101

Ambrocio, G., Ferrero, A., Jokivuolle, E., & Ristolainen, K. (2022). What should the inflation target be? Views from 600 economists. *Bank of Finland Research Discussion Paper*, No. 7/2022. https://doi.org/10.2139/ssrn.4104977

Arestis, P., & Sawyer, M. (2004). *Re-examining monetary and fiscal policy for the 21st century*. Cheltenham: Edward Elgar. https://doi.org/10.4337/9781845423339

Arslan, Y., Drehmann, M., & Hofmann, B. (2020). Central bank bond purchases in emerging market economies. *BIS Bulletin*, No. 20.

BIS (2020). *Annual economic report.* Bank for International Settlements.

BIS (2022). *Annual economic report*. Bank for International Settlements.

Beaudry, P., & Doyle, M. (2000). What happened to the Phillips curve in the 1990s in Canada? In: *Proceedings of the Conference on price stability and the long-run target for monetary policy* (pp. 51–82). Ottawa: Bank of Canada.

Bernanke, B. (2010). *Monetary policy and the housing bubble*. Speech at the Annual Meeting of the American Economic Association, Atlanta, Georgia, January 3.

Bernanke, B. S., Laubach, T., Mishkin, F. S., & Posen, A. S. (2000). *Inflation targeting: Lessons from the international experience*. Princeton, NJ: Princeton University Press.

Bils, M., & Klenow, P. (2004). Some evidence on the importance of sticky prices. *Journal of Political Economy, 112*(5), 947–985. https://doi.org/10.1086/422559

Blanchard, O., Cerutti, E., & Summers, L. (2015). Inflation and activity — two explorations and their monetary policy implications. *NBER Working Paper*, No. w21726. https://doi.org/10.3386/w21726

Blanchard, O., Domash, A., & Summers, L. H. (2022). Bad news for the Fed from the Beveridge space. *Peterson Institute for International Economics Policy Brief*, No. 22-7. https://doi.org/10.2139/ssrn.4174601

Boissay, F., De Fiore, F., Igan, D., Tejada, A. P., & Rees, D. (2022). Are major advanced economies on the verge of a wage-price spiral? *Bank for International Settlements Bulletin*, No. 53.

Buono, I., & Formai, S. (2018). New evidence on the evolution of the anchoring of inflation expectations. *Journal of Macroeconomics*, *57*, 39–54. https://doi.org/10.1016/j.jmacro.2018.04.003

Busetti, F., Delle Monache, D., Gerali, A., & Locarno, A. (2017). Trust, but verify. De-anchoring of inflation expectations under learning and heterogeneity. *ECB Working Paper*, No. 1994. https://doi.org/10.2866/755076

Causa, O., Luu, N., & Abendschein, M. (2021). Labour market transitions across OECD countries: Stylised facts. *OECD Economics Department Working Papers*, No. 1692. https://doi.org/10.1787/18151973

Clarida, R., Gali, J., & Gertler, M. (1999). The science of monetary policy: A new Keynesian perspective. *Journal of Economic Literature, 37*(4), 1661–1707. https://doi.org/10.1257/jel.37.4.1661

De Fiore, F., Goel, T., Igan, D., & Moessner, R. (2022). Rising household inflation expectations: What are the communication challenges for central banks? *BIS Bulletin*, No. 55.

Dhyne, E., Alvarez, L., Le Bihan, H., Veronese, G., Dias, D., Hoffmann, J., Jonker, N., Lunnemann, P., Rumler, F., & Vilmunen, J. (2006). Price changes in the euro area and the United States: Some facts from individual consumer price data. *Journal of Economic Perspectives*, *20*(2), 171–192. https://doi.org/10.1257/jep.20.2.171

Domash, A., & Summers, L. H. (2022). A labor market view on the risks of a US hard landing. *NBER Working Paper*, No. w29910. https://doi.org/10.3386/w29910

Drobyshevsky, S. M., Trunin, P. V., & Bozhechkova, A. V. (2018). Secular stagnation in the modern world. *Voprosy Ekonomiki*, 11,125–141 (in Russian). https://doi.org/10.32609/0042-8736-2018-11-125-141

Drobyshevsky, S. M., Trunin, P. V., Sinelnikova-Muryleva, E. V., Makeeva, N. V., & Grebenkina, A. M. (2021). Estimating a neutral real interest rate in Russia during inflation targeting. *Voprosy Ekonomiki*, 9, 5–23 (in Russian). https://doi.org/10.32609/0042-8736-2021-9-5-23

ECB (2014). *Monetary policy in a changing financial landscape*. ECB Forum on Central Banking, Conference Proceedings. https://doi.org/10.2866/913542

Eggertsson, G. B., Lancastre, M., & Summers, L. H. (2019). Aging, output per capita, and secular stagnation. *American Economic Review: Insights*, *1*(3), 325–342. https://doi.org/10.1257/aeri.20180383

Forbes, K., Gagnon, J., & Collins, C. (2020). Low inflation bends the Phillips curve around the world. *Peterson Institute for International Economics Working Paper*, No. 20-6. https://doi.org/10.2139/ssrn.3577993

Friedman, M. (1968). The role of monetary policy. *American Economic Review*, *58*(1), 1–17.

Fukao, K., Ikeuchi, K., Kwon, H. U., Makino, T., Younggak, K., & Takizawa, M. (2015). Lessons from Japan's secular stagnation. *RIETI Discussion Paper Series*, No. 15-E-124.

Gobbi, L., Mazzocchi, R., & Tamborini, R. (2019). Monetary policy, de-anchoring of inflation expectations, and the "new normal." *Journal of Macroeconomics*, *61*(C), 103070. https://doi.org/10.1016/j.jmacro.2018.10.006

Goodfriend, M. (2007). How the world achieved consensus on monetary policy. *Journal of Economic Perspectives*, *21*(4), 47–68. https://doi.org/10.1257/jep.21.4.47

Gordon, R. (2015). Secular stagnation: A supply-side view. *American Economic Review*, *105*(5), 54–59. https://doi.org/10.1257/aer.p20151102

Goryunov, E. L., Drobyshevsky, S. M., Mau, V. A., & Trunin, P. V. (2021). What do we (not) know about the effectiveness of the monetary policy tools in the modern world? *Voprosy Ekonomiki, 2*, 5–34 (in Russian). https://doi.org/10.32609/0042-8736-2021-2-5-34

Grishchenko, O., Mouabbi, S., & Renne, J. P. (2019). Measuring inflation anchoring and uncertainty: A US and euro area comparison. *Journal of Money, Credit and Banking*, *51*(5), 1053–1096. https://doi.org/10.1111/jmcb.12622

Grishchenko, V., Ostapenko, V., Tkachev, V., & Tunyov, V. (2021). Modern monetary theory (MMT): New paradigm or a set of recommendations for macroeconomic policy? *Ekonomicheskaya Politika*, *16*(3), 8–43 (in Russian). https://doi.org/10.18288/1994-5124-2021-3-8-43

Iakova, D. (2007). Flattening of the Phillips curve: Implications for monetary policy. *IMF Working Papers*, No. 07/76. https://doi.org/10.5089/9781451866407.001

IIF (2020). *Capital flows report: Sudden stop in emerging markets*, April 9. Institute of International Finance. Available at: https://www.iif.com/Portals/0/Files/content/2_IIF2020_April_CFR.pdf

IMF (2010). *Fiscal monitor*, November. Washington, DC: International Monetary Fund.

IMF (2011a). *Fiscal monitor: Database of country fiscal measures in response to the COVID-19 pandemic*. Available at https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19

IMF (2011b). *Fiscal monitor*, November. Washington, DC: International Monetary Fund.

IMF (2020). *World economic outlook*, October. Washington, DC: International Monetary Fund.

IMF (2021a). *World economic outlook*, April. Washington, DC: International Monetary Fund.

IMF (2021b). *World economic outlook*, October. Washington, DC: International Monetary Fund.

IMF (2021c). *Fiscal monitor*, April. Washington, DC: International Monetary Fund.

IMF (2022a). *World economic outlook*, April. Washington, DC: International Monetary Fund.

IMF (2022b). *Fiscal monitor*, April. Washington, DC: International Monetary Fund.

IMF (2022c). *World economic outlook*, October. Washington, DC: International Monetary Fund.

King, M. (2005.) What has inflation targeting achieved? In B. S. Bernanke, M. Woodford (eds.). *The inflation-targeting debate* (pp. 11–16). Chicago, IL: University of Chicago Press. https://doi.org/10.7208/chicago/9780226044736.003.0002

Kuttner, K., & Robinson, T. (2010). Understanding the flattening Phillips curve. *North American Journal of Economics and Finance*, *21*(2), 110–125. https://doi.org/10.1016/j.najef.2008.10.003

Lombardi, D., Siklos, P., & Amand, S. (2018). A survey of the international evidence and lessons learned about unconventional monetary policies: Is a "new normal" in our future? *Journal of Economic Surveys*, *32*(5), 1229–1256. https://doi.org/10.1111/joes.12293

Lucas, R. E., & Rapping, L. A. (1969). Price expectations and the Phillips curve. *American Economic Review*, *59*(3), 342–350.

Mehra, Y., & Sawhney, B. (2010). Inflation measure, Taylor rules, and the Greenspan–Bernanke years. *FRB Richmond Economic Quarterly*, *96*(2), 123–151.

Meltzer, A. H. (2005). Origins of the Great Inflation. *Federal Reserve Bank of St. Louis Review*, *87*(2), 145–176. https://doi.org/10.20955/r.87.145-176

Muth, J. F. (1961). Rational expectations and the theory of price movements. *Econometrica: Journal of the Econometric Society*, *29*(3), 315–335. https://doi.org/10.2307/1909635

OECD (2021a). *OECD economic surveys: European Union*. Paris: OECD Publishing. https://doi.org/10.1787/a77ab220-en

OECD (2021b). *OECD economic surveys: France*. Paris: OECD Publishing. https://doi.org/10.1787/289a0a17-en

OECD (2021c). *OECD economic surveys: Euro area 2021*. Paris: OECD Publishing. https://doi.org/10.1787/214e9f0a-en

Rees, D., & Rungcharoenkitkul, P. (2021). Bottlenecks: Causes and macroeconomic implications. *BIS Bulletin*, No. 48.

Reifschneider, D., & Wilcox, D. (2021). Another reason to raise the Fed's inflation target: An employment and output boom. *Peterson Institute for International Economics Policy Briefs*, No. 21-19.

Reis, R. (2021). Losing the inflation anchor. *Brookings Papers on Economic Activity, 2021*(2), 307–361. https://doi.org/10.1353/eca.2022.0004

Roberts, J. (2006). Monetary policy and inflation dynamics. *International Journal of Central Banking*, *2*(3), 193–230. https://doi.org/10.2139/ssrn.633222

Romer, C., & Romer, D. (1989). Does monetary policy matter? A new test in the spirit of Friedman and Schwartz. *NBER Macroeconomics Annual*, *4*, 121–170.

Romer, C., & Romer, D. (2002). The evolution of economic understanding and postwar stabilization policy. *NBER Working Paper*, No. w9274. https://doi.org/10.3386/w9274

Romer, C., & Romer, D. (2013). The most dangerous idea in Federal Reserve history: Monetary policy doesn't matter. *American Economic Review*, *103*(3), 55–60. https://doi.org/10.1257/aer.103.3.55

Sims, C. (2009). Inflation expectations, uncertainty and monetary policy. *BIS Working Papers*, No. 275. https://doi.org/10.2139/ssrn.1440243

Strohsal, T., Melnick, R., & Nautz, D. (2016). The time-varying degree of inflation expectations anchoring. *Journal of Macroeconomics*, *48*, 62–71. https://doi.org/10.1016/j.jmacro.2016.02.002

Summers, L. (2016). The age of secular stagnation: What it is and what to do about it. *Foreign Affairs*, *95*(2), 2–9.

Summers, L. (2019). *Secular stagnation and the future of global macroeconomic policy*. Speech at Peterson Institute for International Economics, April 15.

Taylor, J. B. (2000). Reassessing discretionary fiscal policy. *Journal of Economic Perspectives*, *14*(3), 21–36. https://doi.org/10.1257/jep.14.3.21

Williams, J. C. (2017). Interest rates and the "new normal." *FRBSF Economic Letter*, No. 2017-29.

World Bank (2018). *Global economic perspectives*, January. https://doi.org/10.1596/978-1-4648-1163-0

World Bank (2019). *Global economic perspectives*, January. https://doi.org/10.1596/978-1-4648-1343-6

World Bank (2021a). *Global economic prospects*, January. https://doi.org/10.1596/978-1-4648-1612-3

World Bank (2021b). *Global economic prospects*, June. https://doi.org/10.1596/978-1-4648-1665-9

Wray, L. (2015). *Modern money theory: A primer on macroeconomics for sovereign monetary systems*. New York: Palgrave Macmillan. https://doi.org/10.1057/9781137539922

Wyplosz, C. (2005). Fiscal policy: Institutions versus rules. *National Institute Economic Review, 191*, 64–78. https://doi.org/10.1177/0027950105052661