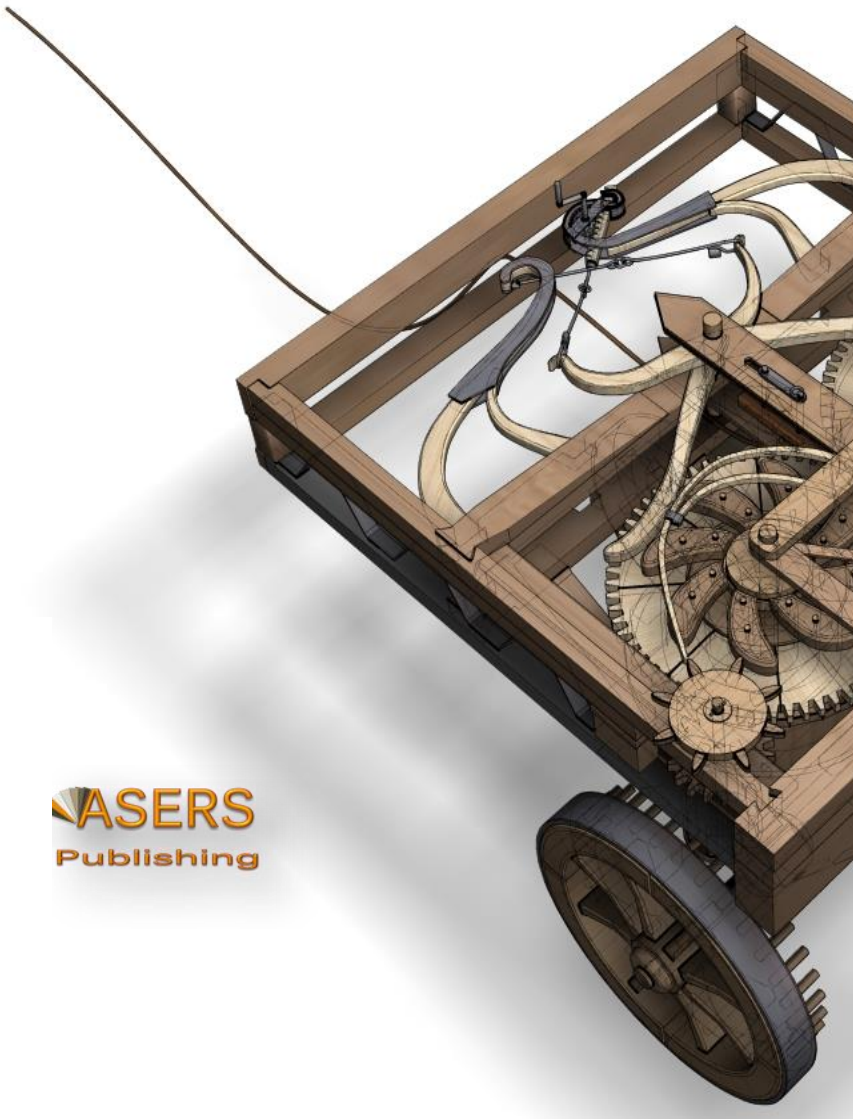
Theoretical and Practical Research in Economic Fields



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Inflation Persistence and Implications for the Euro Area

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Abstract: *The deceleration of consolidation trends subsequent to the previous financial crisis has had a mitigating effect on price dynamics. Furthermore, the expansionary fiscal and monetary measures implemented to stimulate the recuperation of crisis-affected economies did not yield substantial inflationary consequences. The disruptions in supply chains caused by the pandemic, the increased use of expansionary fiscal and monetary policies in response to the outbreak, and the influence of geopolitical factors such as energy prices have recently rekindled the capacity of price level dynamics to react. When the underlying economic factors deteriorate, it leads to an increase in vulnerability and a decrease in the ability of the euro area to withstand adverse events. During periods of economic prosperity, the monetary policy implemented by the European Central Bank (ECB) has the tendency to enhance the convergence of countries within the euro area and bolster its resilience against adverse economic disturbances. The findings of the article provide support for arguments emphasizing the need to adjust the institutional framework of the euro area, hence reinforcing the rationale for the concept of a two-speed euro area.*

Keywords: inflation persistence; price stability; deflation; disinflation; Euro Area; pandemic period; Ukraine.

JEL Classification: E31; O52; O57; J11.

Introduction

The existing body of empirical research lacks sufficient theoretical and empirical understanding of the progression of price level dynamics, its underlying characteristics, its relationship with broader macroeconomic trends, and the resulting causal effects on monetary policy. The forecasts presented are grounded in empirical evidence, which highlights the significant impact of endogenous and external shocks, as well as the actions undertaken by monetary and fiscal authorities, on the overall growth of advanced Western economies.

Following the current financial and following economic and debt crises, there has been a notable impact on price developments due to considerable consolidation patterns. On the other hand, the implementation of expansive fiscal and monetary measures, notwithstanding deflationary and disinflationary conditions, has played a supportive role in facilitating the recovery of economies afflicted by the crisis. In recent times, however, there has been a restoration of the capacity for price adjustments to respond. The observed phenomenon can be attributed to the intensification of expansionist components within fiscal and monetary policies following the onset of the COVID-19 pandemic, with the interruptions seen in production chains due to the epidemic. Additionally, the influence of geopolitical issues, particularly energy prices, has contributed to this outcome.

There exists substantial theoretical and empirical backing for the examination of inflation characteristics, including the duration of inflationary periods. This assertion holds particular validity within the framework of the New Keynesian Model (NCP), which serves as a robust and comprehensive approach for integrating macroeconomic and microeconomic underpinnings within the realm of economic modeling. At the microeconomic level, the estimation of price adjustment costs in monopolistic market structures serves to elucidate the attributes of inflation. Conversely, at the macroeconomic level, the analysis of inflation characteristics is predominantly

driven by approaches that examine the efficacy of transmission mechanisms, the bias between rules and discretion, inertia, trends in inflation as opposed to cyclical macroeconomic fluctuations, and other related factors.

The formation of inflation expectations is influenced by the response of inflation to various macroeconomic, microeconomic, and monetary policy factors. The effectiveness and efficacy of the transmission mechanism for monetary policy have experienced significant decline within an environment characterized by persistently low interest rates approaching zero (often referred to as the near-zero lower bound), notwithstanding the utilization of unconventional measures in the implementation of monetary policy. Consequently, the price level dynamics were influenced by microeconomic factors, as opposed to being solely determined by monetary macroeconomic fundamentals. The efficacy of the monetary policy transmission mechanism in terms of retail segment cash accessibility may have diminished. However, it can be argued that quantitative easing is beneficial in this regard, as its fundamental objective is to guarantee the availability of liquidity to economic entities, including commercial banks. In contrast to the conventional macroeconomic environment characterized by predictable macroeconomic fundamentals, the expansion of the monetary base by central banks, driven by fiscal stimulus measures in response to the pandemic, has exhibited an accelerated trajectory. Initially, this acceleration took place covertly through the increase in financial asset prices, such as stock markets, and the growth of house prices. However, more recently, it has become overt, manifesting in the dynamics of price levels and the associated characteristics of inflation.

The ECB faces challenges in managing the effects of external shocks on the euro area's diverse Member States. While there is some alignment in economic cycles, differences in macroeconomic and microeconomic factors, as well as price levels, contribute to asymmetric economic outcomes. These disparities also impact real interest rates. Empirical evidence serves to bolster the proposition of a viable two-speed euro area concept and lends credence to the arguments emphasizing the imperative need for modifications in the institutional framework of the euro area. During periods of economic prosperity, the single monetary policy implemented by the ECB has the tendency to enhance economic convergence, leading to a convergence in price levels. Additionally, it serves to reinforce the symmetry of economic cycles and enhance the euro area's resilience to both internal and external shocks. The adoption of a common monetary policy benefits countries in favorable economic conditions. Nevertheless, when confronted with deteriorating macroeconomic fundamentals, it becomes apparent that the euro area's ability to withstand challenges is underscored, while simultaneously exposing some vulnerabilities stemming from enduring structural and performance disparities among its constituent nations. This, in turn, leads to observable disparities in real interest rates.

The main objective of the article is to provide a comprehensive understanding of the theoretical and empirical basis for examining and explaining the characteristics of inflation, as well as the macroeconomic consequences that influence central banks' decision-making regarding monetary policy. This paper aims to provide a comprehensive overview of the evolutionary trajectory of inflation and its associated characteristics during the past two decades. Special attention will be given to the transformative developments observed in recent years, particularly those influenced by the global pandemic and energy crises. This study aims to elucidate the implications of empirical experience for economic policy.

1. Literature Review on Persistence in Inflation

The phenomenon of inflation gradually returning to its equilibrium level after a shock, such as one caused by monetary policy, is referred to as inflation persistence. This concept is being utilized more frequently as a measure of the effectiveness of monetary policy (Meller and Nautz 2012). According to Willis (2003) and Marques (2004), the persistence of inflation is influenced by the magnitude of its response to a shock. When the rate of inflation's response is low, inflation tends to be more persistent. Conversely, when the rate of response is high, inflation exhibits lower levels of persistence. According to Roache (2014), the effectiveness of monetary policy in addressing temporary price shocks is diminished when inflation exhibits a high level of persistence. Conversely, the efficacy of monetary policy implementation by the central bank is enhanced as inflation persistence diminishes. In Milani's (2005) seminal work, a theoretical framework was put forth to explain the phenomenon of inflation persistence. This model posits that economic actors adjust their expectations of future inflation based on previous economic performance. According to his research findings, inertia, sometimes referred to as "learning behavior," emerges as the predominant factor contributing to the persistence of inflation. In addition, Cogley and Sbordone (2008) propose in their study that modifications in monetary policy play a predominant role in driving alterations in the long-term inflation trend component, hence contributing to the persistence of inflation.

Empirical research utilizes a variety of methodologies to measure the degree of inflation persistence. Two empirical studies have been conducted to estimate autoregressive models with a time-varying parameter. These

studies are Pivetta and Reis (2007) and Benati (2002). In their study, Levin and Piger (2004) employed autoregressive models that incorporated the possibility of a structural break occurring at any given point. They utilized both traditional and Bayesian econometric methodologies to carry out their analysis. Cuestas and Harrison (2010) conducted a study in which they employed unit root tests that account for nonlinearity to examine the stationarity of inflation in a majority of the Central and Eastern European (CEE) countries. Davig and Doh (2014) conducted an estimation of the mark-switching New Keynesian model for the United States, employing Bayesian approaches to account for potential fluctuations in the coefficients that capture monetary policy reactions. Wolters and Tillmann (2015) conducted a study to examine the impact of structural fracture on the persistence rate of inflation using quantile autoregressive models. Canarella and Miller (2017) conducted an empirical investigation to examine the global durability of inflation by employing cointegration methodologies.

Amisano and Tristani (2010) contend that the inclusion of structural breaks in the model results in a notable reduction in the degree of persistence observed in inflation. Moreover, it is argued that econometric assessments validating substantial levels of inflation persistence are typically observed in research that solely examine average inflation. Amisano and Tristani (2010) have documented a considerable body of research that has consistently revealed the existence of structural cracks and their consequential effect on the reduction of inflation persistence. Levin and Piger (2004), Bilke (2005), and Corvoisier and Mojon (2005) have together identified structural breaks in inflation in France across a significant number of OECD countries. In their study on the persistence of inflation, Ewing and Malik (2010) incorporated structural breaks into the GARCH model and found that oil shocks exerted a significant initial effect which diminished rapidly over time.

The study conducted by Meller and Nautz (2012) examined the degree of inflation persistence prior to and after to the establishment of the Economic and Monetary Union (EMU). The panel data model employed in their study demonstrated that, notwithstanding variations in inflation dynamics among member nations, there has been a notable decline and convergence in the level of inflation persistence since 1999. Canarella and Miller (2017) conducted a study on the persistence of inflation in a sample of industrialized and emerging economies who implemented inflation targeting. The results indicate that inflation exhibits co-integration, stationarity, and persistence in Germany, the United States, as well as three developed economies, namely Sweden, Canada, and the United Kingdom. Nevertheless, there is a lack of convergence between the three emerging economies (Mexico, Israel, and Chile) and Germany or the United States in terms of inflation persistence. Additionally, Canarella and Miller (2017) observe that there is a decreasing trend in inflation persistence among industrial economies on a worldwide scale. Kanellopoulos and Koutroulis (2016) employed non-linear panel data models to investigate the existence of heterogeneity and analyze the persistence of inflation across 11 member states within the euro area. The results of the study indicate a positive correlation between higher inflation rates and increased inflation persistence. This relationship has important implications for the implementation of monetary policy across different contexts. According to the study conducted by Franta, Saxa, and Šmídková (2010), there were notable disparities in the level of inflation persistence between the member nations of the euro area and those that were not part of it. Rodriguez-Fuentes, Olivera-Herrera, and Padrón-Marrero (2004) highlight a consistent decline in inflation rates across EU member states over an extended period. However, they argue that the ECB's singular monetary policy, designed to target inflation for the entire euro area, may exacerbate the persistence of inflation in countries with divergent business cycles. This is due to the ECB's uniform interest rate policy, which may not adequately account for the specific needs of individual nations. Additionally, the authors suggest that nations aspiring to join the euro area may also experience an increase in inflation persistence as they strive to align with the core member states of the euro region.

2. Inflationary Trends

The COVID-19 epidemic has had a profound influence on the political and economic functionality of the global economy. In numerous European countries, governmental authorities have implemented restrictions on commercial operations, while individuals have voluntarily restricted their mobility due to apprehensions around the transmission of diseases. Private consumption experienced a significant decline as a consequence. Countries that saw a more pronounced impact from the crisis subsequently witnessed higher rates of economic growth due to the diverse nature of economic activity and development. The recession exhibited distinctive characteristics in terms of its magnitude and attributes, wherein several sectors experienced significantly more adverse effects compared to others, particularly those reliant on face-to-face interactions such as travel, entertainment, dining, and accommodation.

The conflict in Ukraine has had a profound effect on the global economy, particularly in relation to the food and energy sectors. There has been a significant decrease in supply and a remarkable increase in prices. The

euro area has a higher degree of vulnerability to the economic ramifications arising from Russia's invasion of Ukraine compared to other economic zones. The predominant factor contributing to this phenomenon is the substantial dependence of the euro area on energy imports, which constituted over 50% of the region's energy consumption in the year 2020. Moreover, it is worth noting that Russia held a prominent position as a major energy provider to the euro area prior to the onset of the conflict. Before the commencement of armed conflict in Ukraine, both Russia and Ukraine had significant roles as importers of food and fertilizer inside the euro area. The euro area is widely recognized as an economically integrated region that is particularly vulnerable to disruptions in global manufacturing chains and global markets.

The ongoing conflict in Ukraine has exacerbated the pre-existing inflationary pressures that were already on the increase across the euro area during the period of economic recovery following the epidemic. Consequently, there has been a significant increase in consumer costs, namely in the sectors of food and energy. The primary factor behind the heightened inflation in 2022 was the escalation of energy costs. However, since the commencement of 2023, the predominant driver of inflation has been the surge in food prices. The escalation in food prices can be attributed, in part, to the indirect and delayed consequences of elevated energy prices, as food production necessitates a substantial amount of energy. The energy policy mechanism of the European Union (EU) has exerted a notable influence on the escalation of energy prices, specifically in connection to electricity and its cost relative to gas prices. The prices of food commodities, such as oilseeds and wheat, which were significantly dependent on imports from Russia and Ukraine before the onset of the war, had a considerably higher rate of growth compared to the overall average rise in food costs. The economies of the member nations of the euro area are currently experiencing significant adverse effects from elevated levels of inflation, mostly driven by escalating energy and food costs. This phenomenon is particularly evident in homes with limited financial resources, as a significant proportion of their total consumption is allocated towards energy and food expenses.

The substantial rise in imported energy costs leads to a considerable and unavoidable decline in actual revenue as a consequence of the deterioration of trade circumstances and genuine demands to enhance competitiveness. The reason for this is that the euro area has a limited level of energy source diversity and, consequently, relies heavily on energy imports, predominantly from Russia prior to the commencement of the conflict in Ukraine. In light of these conditions, enterprises are incentivized to mitigate their share of the burden by transferring the escalation in input costs to their clientele through price increases for their products. Moreover, employees are motivated to mitigate their share of the workload by engaging in salary negotiations with employers in order to completely compensate for the decrease in purchasing power resulting from rising inflation. The interplay between higher profit margins, increasing nominal incomes, and rising prices mutually reinforce one another, hence intensifying the likelihood of an inflationary cycle and elevating inflation expectations. Consequently, this dynamic has the potential to solidify persistently high levels of inflation. Therefore, in line with the mandate of the ECB, the Governing Council of the ECB initiated the process of normalizing monetary policy in December 2021 and made a commitment to swiftly restore inflation to the medium-term target of 2%.

Based on the projected sequence of events, there are discernible signs in the initial and subsequent quarters of 2023 that suggest a diminishing influence of the Ukrainian conflict on global energy and food market dynamics. This phenomenon is expected to result in a gradual and moderate decrease in inflation rates, both within the euro area as a whole and within its constituent member nations. The expenditure associated with energy holds significant importance within this particular setting. In the year 2022, the EU experienced a notable reduction of over 20% in its consumption of natural gas. This decline played a significant role in enabling the EU to manage the consequences of decreased imports of Russian gas, which can be attributed, in part, to the imposition of sanctions by the EU. The precipitous decrease in natural gas prices observed subsequent to the peak levels reached in autumn 2022 can be ascribed to endeavors aimed at curbing energy use and fostering energy source variety. Moreover, the present market forward prices suggest a downward trend in gas prices, so leading to a potential decrease in energy expenses for consumers.

The primary determinant of consumer inflation inside the euro area currently pertains to the fluctuating nature of escalating food expenses. Nevertheless, starting from mid-2022, several significant indicators, such as farm-gate prices and food commodity prices within the euro area, have experienced a substantial decline. This observation substantiates the forecast that there will be a deceleration in the increase of food costs in the forthcoming months. Despite these promising advancements, it is crucial to underscore that there is a significant potential for the conflict in Ukraine to exert adverse effects on economic expansion, potentially leading to general price increases, notably in the realms of food and energy.

The euro area economy is projected to see moderate yet positive short-term growth, as a result of fiscal measures aimed at mitigating the effects of high inflation on real earnings, with a particular focus on low-income populations. Additionally, the decrease in energy expenses contributes to this economic prognosis. The labor markets within the member nations of the euro area continue to exhibit positive developmental trends. The strong performance of the labor market indicates significant potential for future growth in the economy of the euro area. Additionally, it might potentially encourage the emergence of novel employment prospects, thereby efficiently integrating a substantial number of Ukrainian refugees into the labor markets of member nations within the euro area.

3. Is Inflation a Threat for the Euro Area?

Following the occurrence of the global financial and economic crisis, as well as the ensuing debt crisis commonly referred to as the euro crisis, a period of economic recuperation ensued. Over the past decade or longer, the ECB has consistently underestimated its inflation target. However, it is noteworthy that inflation rates constantly maintained below the threshold of 2% throughout this period. In response to these occurrences, the ECB has opted to enact monetary stimulus measures at unprecedented magnitudes, commonly referred to as "quantitative easing," with the aim of elevating inflation levels in alignment with its desired target. The ECB introduced the pandemic emergency purchase program (PEPP) as a supplementary measure to its monetary policy framework in response to the onset of the global pandemic. This decision was motivated by the ECB's apprehension regarding the potential exacerbation of deflationary pressures resulting from the implementation of pandemic-related restrictions on economic activity. The aforementioned action clearly indicated the organization's commitment to maintaining an accommodating monetary policy throughout the duration of the pandemic, as seen by the wider population.

However, the conclusion of the pandemic and the energy crisis associated with the conflict in Ukraine have raised significant considerations on the potential need for the ECB to adjust its monetary policy earlier than originally projected. The reopening of sectors of the economy that experienced prolonged closures in 2020 can be attributed to the effective management of the epidemic by advanced economies. Furthermore, the global recovery in 2021 exhibited a relatively robust pace. Furthermore, some anomalous occurrences resulting from the epidemic facilitated a swifter-than-expected restoration of inflation in the year 2021. Furthermore, alongside the recuperation of energy prices, there have been price escalations observed in several other commodities as a result of disruptions in supply and alterations in demand patterns.

In 2021, the ECB conducted a review of its monetary policy strategy. Following the completion of this assessment, the ECB may have made the decision to allow inflation to surpass its designated target, even if only for a limited period, considering the substantial cumulative underestimation of its inflation objective in the years leading up to the global health crisis. Given the ECB's decision to refrain from adopting an average inflation target policy, it becomes imperative for the ECB to take prompt measures in response to any sustained inflation exceeding the 2% threshold in the long run. The ECB would have significant challenges if it were to abruptly transition to a more conservative monetary policy. Such a shift might potentially result in a likely recession or pose concerns regarding financial stability. Given the prevailing macroeconomic and monetary policy trends in the second half of 2021, the ECB had little reason to be apprehensive about the possibility of inflation persistently exceeding its target level and so requiring a substantial modification to its monetary policy. During the latter part of 2021, the ECB, the FED, and other central banks in advanced market countries acknowledged the temporary nature of heightened inflation following the initial phase of the pandemic, as pandemic restrictions were being eased. The relevance of considering the potential alleviation of inflationary pressures observed in 2021 for the year 2022 seemed significant, despite the presence of several distinctive factors and attributes inherent to post-pandemic countries, which further complicated the process of economic forecasting during that period.

The conflict in Ukraine has exacerbated the inflationary pressures that were already on the increase across the euro area amid the post-pandemic economic recovery of individual nations. Consequently, there has been a significant increase in consumer prices, namely in relation to food and energy. The large increase in headline inflation in 2022 may be attributed to the upward trend in the prices of food and energy, which accounted for more than two-thirds of this surge. The primary factor behind the heightened inflation in 2022 was the escalation of energy costs, whilst the predominant contributor since the commencement of 2023 has been the upward trajectory of food prices. In May 2023, there was a notable surge of 10.5% in food costs compared to the corresponding month in the previous year. It is worth mentioning that this increase follows a larger annual rise of 15.3%, which reached its peak in March 2023. The escalation in food prices can be attributed, in part, to the indirect and delayed consequences of elevated energy prices, as food production necessitates a substantial

amount of energy. The energy policy mechanism of the EU has exerted a notable influence on the escalation of energy prices, specifically in the context of electricity and its cost relative to gas prices. The prices of food commodities, such as oilseeds and wheat, which were significantly dependent on imports from Russia and Ukraine prior to the war, had a considerably higher rate of growth compared to the average escalation observed in food costs. The economies of the member nations of the euro area are experiencing significant adverse effects from elevated levels of inflation, mostly driven by escalating energy and food costs. This phenomenon is particularly true for households with low income, as a significant proportion of their total consumption is allocated to expenses related to energy and food.

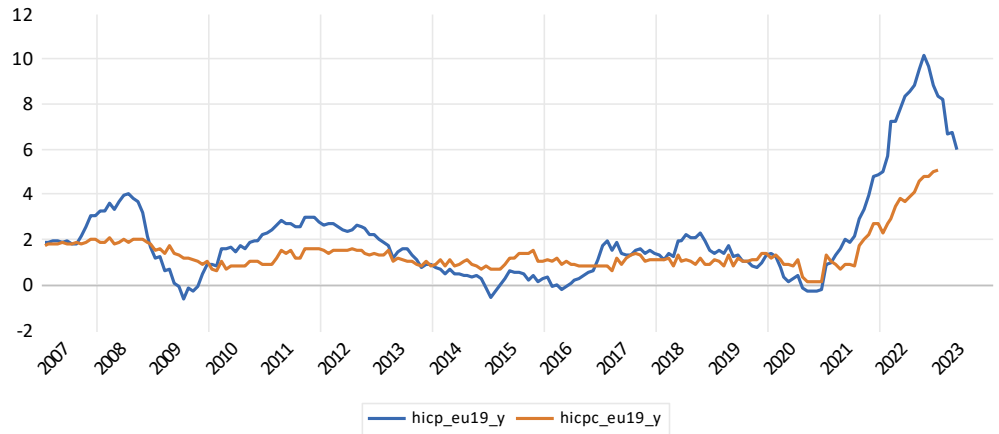
The substantial rise in imported energy costs leads to a considerable and unavoidable decline in actual revenue as a consequence of the deterioration of trade circumstances and genuine demands to enhance competitiveness. The reason for this is that the euro area has a limited level of energy source diversity and, consequently, relies heavily on energy imports, predominantly from Russia prior to the commencement of the conflict in Ukraine. Considering these conditions, enterprises are incentivized to mitigate their share of the burden by transferring the escalation in input expenses to their clientele through price increases on their products. Moreover, employees are motivated to reduce their share of the workload by engaging in negotiations with employers to get compensation modifications that completely counterbalance the decrease in real income resulting from heightened inflation. The interplay between higher profit margins, increasing nominal incomes, and rising prices contributes to the potential emergence of an inflationary cycle, subsequently elevating inflation expectations and potentially solidifying a persistent state of high inflation. Therefore, in line with the ECB's prescribed objectives, the Governing Council of the ECB initiated the course of action to restore monetary policy to its standard state in December 2021. Additionally, they made a commitment to expeditiously bring inflation back to the desired medium-term target of 2%.

3.1 The Euro Area's Inflation and Inflationary Pressures

Before the implementation of pandemic-related restrictions, the Harmonized Index of Consumer Prices (HICP) reflected an estimated inflation rate of approximately 1%. The pandemic-induced restrictions imposed in 2020 had a negative impact on pricing dynamics, particularly during the latter half of the year. However, a reversal in this trend occurred in early 2021, leading to a subsequent increase in the inflation rate.

As can be seen from Figure 1, the main drivers of the rise in HICP inflation in 2021 and 2022 were non-core inflation components. Core inflation can be said to fluctuate over a much narrower range than headline HICP inflation, broadly since the inception of the euro area.

Figure 1. Harmonized Index of Consumer Prices (HICP and core HICP in the euro area) (2007-2023) (in percent)

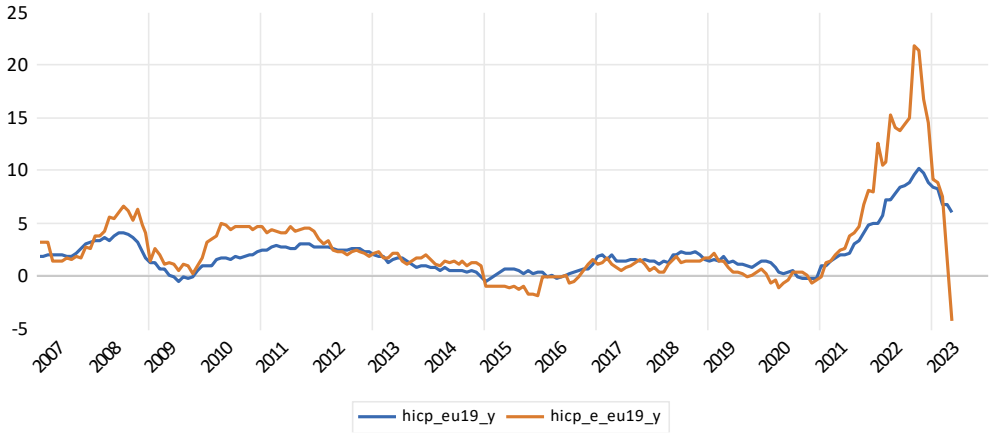


Source: The author's calculations using data from Eurostat

What implications does this have for the monetary policy of the ECB? The ECB frequently exhibits a preference for a broader range of "fundamental" indicators of price fluctuations, which may not be directly tied to the only monitoring of core HICP inflation. However, while analyzing the projected trajectory of inflation, it is prudent to focus on the concept of core inflation, as depicted in the graph. In contrast, core inflation has a greater degree of stability, especially during periods that are perceived as economically fortunate. Furthermore, it is evident from both plots that the euro area exhibits more pronounced disparities between core and basal inflation when compared to the United States.

The disparity between core and basal inflation in the euro region can be predominantly attributed to the notable escalation in energy prices. Figure 2 illustrates a notable decrease in energy prices during the initial phase of the epidemic era, followed by a significant rebound towards the conclusion of 2022. The swift transformation might be attributed to apprehensions of the possibility of an economic downturn resulting from the impact of increasing key interest rates implemented by the ECB on the euro area's economy.

Figure 2. HICP and HICP energy price index (2007-2023) (in percent)



Source: The author's calculations using data from Eurostat

An in-depth analysis of macroeconomic indicators suggests that the current persistence of inflation, as measured by the HICP and targeted by the ECB, is likely to be temporary in character. It is not feasible to anticipate a continued upward trajectory of core HICP inflation in the forthcoming months. However, several additional factors are considered in addition to the immediate term.

Furthermore, it is of utmost importance to ascertain the extent to which heightened inflationary pressures translate into increased inflation expectations and subsequently contribute to elevated wage demands. This critical information aids in assessing the transitory nature of a reported inflationary upsurge. Currently, it does not seem that continually increased inflation rates have a detrimental effect on the upward trajectory of inflation expectations. Based on available statistics, it can be observed that the economy saw a resurgence subsequent to the removal of pandemic-related limitations. Consequently, this led to a gradual upturn in the HICP inflation over the course of 2021. The onset of the energy crisis in the EU in early 2022, accompanied by early indications, and the following eruption of the conflict in Ukraine, led to a significant surge in the HICP inflation. This upward trajectory reached its highest point prior to the conclusion of 2022.

The recent surge in inflation poses a potential threat to the medium-term economic growth of the euro area. Despite the observed peak towards the close of the preceding year, the probability of a forthcoming reduction in interest rates may be significantly reduced due to the prolonged persistence of inflation rates over the ECB's inflation objective. Countries that have been impacted by the pandemic and oil crisis may have challenges in their efforts to expedite economic growth if they continue to face elevated interest rates. Higher interest rates on debt payments might hinder the efforts of governments, firms, and individuals to consolidate their financial obligations.

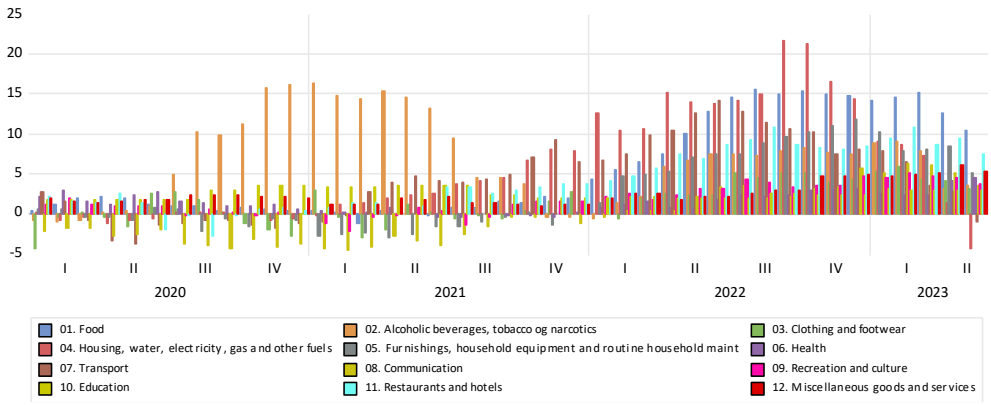
Orphanides and Wilcox (1997) advocated that central banks could capitalize on short-term supply shocks that yield favorable effects on inflation as a means to mitigate inflationary pressures. These shocks are expected to enable central banks to maintain low inflation rates without the need to raise unemployment rates, hence avoiding hindrances to the nation's economic advancement. The reputation of central banks, such as the ECB, has been adversely affected due to their inability to attain the required levels of inflation in recent years, despite their implementation of a policy involving the utilization of cheap money, quantitative easing, and the maintenance of key interest rates at near-zero levels. If the current upward trend in inflation has any impact on inflation expectations, it could perhaps help to uphold the ECB's target rate as the primary reference point for inflation expectations. Furthermore, the potential of "opportunistic higher inflation" extends beyond aiding the ECB in achieving its inflation target. It might also potentially support a systematic and organized exit strategy from the ECB's ongoing unorthodox monetary policies.

4. Causes behind the Current Rise in Inflation

Throughout the year 2020, the period of the pandemic exerted a significant influence on worldwide economic patterns. The sudden decrease in aggregate demand resulted in a substantial decrease in the pricing of several commodities and services. Following the commencement of economic recovery, it became evident and anticipated that a substantial increase in prices would occur as a result of these transformations. The variation in the trajectory of this process across different nations and industries was to be expected, and it had a significant impact on the pricing of particular goods and services.

Budianto *et al.* (2021) express concerns on the potential conclusion of the recent phase of low inflation, attributing it to the enhancement in headline output growth and the persistent limitations imposed on specific sectors. The primary factors contributing to the surge in inflation are the underlying consequences of the pandemic, the escalation in prices for specific items impacted by the pandemic, and the rise in energy expenses. All these reasons share a common characteristic: they had a temporary impact on inflation. In order to achieve a sustained rise in inflation, it would be imperative to witness a significant surge in labor expenses alongside a decrease in inflation expectations. Nevertheless, in the aftermath of the pandemic, there was limited evidence of inflation expectations from forecasters and financial markets effectively stabilizing in the medium term. Additionally, while wage growth is subdued, it is worth noting that it is quite elevated. Therefore, these modifications appeared to align with a medium-term inflation projection that was approaching the targets established by central banks.

Figure 4. Dynamics of the HICP main components in the euro area (2020-2023) (in percent)



Source: The author's calculations using data from Eurostat

The preceding section discussed the significant impact of base effects on oil and other energy prices. The aforementioned observation aligns with the historical precedent of significant volatility, pronounced seasonal variations, and heightened vulnerability to sudden external disturbances in the context of food and energy prices (see Figure 4). Due to this rationale, analysts and central bankers primarily direct their attention towards core inflation as a means to gauge underlying inflation patterns and forecast inflation in order to establish the essential frameworks for guiding monetary policy. Core inflation, in this context, excludes the influence of food and energy prices when computing the consumer price index (CPI) and assessing inflation levels.

The euro area has experienced significant input cost pressure, notably starting from the latter half of 2021. This may be attributed to the escalation of commodity prices, substantial increases in transportation costs, as well as shortages in certain raw materials and intermediary products. Within the manufacturing and distribution chain, there exists a phenomenon of pricing pressure originating from external factors, leading to a rise in the costs associated with inputs. However, it was not until a subsequent phase in the production and distribution process that the effects of pricing pressures were evident. In contrast to intermediate products, the escalation in prices of domestic non-food consumer items remained rather moderate across the specified timeframe, despite the fact that prices within this category were already much higher than their historical mean. Moreover, the alterations in import prices were disadvantageous, particularly for non-food consumer goods, predominantly due to the appreciation of the euro compared to its value one year ago.

The escalation of consumer costs, namely for food and energy, has been observed as a consequence of the energy crisis resulting from the conflict in Ukraine. Consequently, by October 2022, the median annual inflation rate in the euro region as a collective entity surged to an unprecedented level of 10.16%. As of the commencement of 2021, the inflation rate inside the euro area remained below 1%. The predictability of the euro

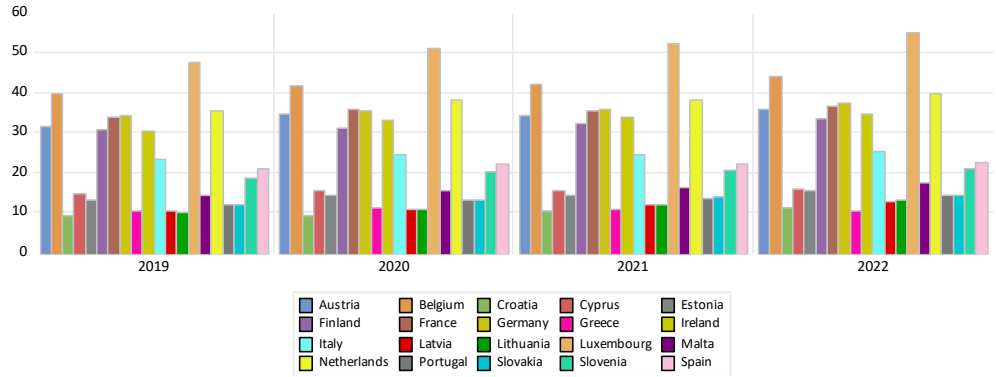
area economy's recovery, the labor market conditions in each member state, and the possible risks linked to a potential escalation of the crisis in Ukraine causing further increases in food and energy prices are all highly uncertain. If there is a persistent increase in food and energy prices, the ECB might delay the reduction of key interest rates, relaxation of monetary policy guidelines, and the cessation or reduction of the current quantitative tightening. This would be done to align inflation in the euro area with its desired target.

4.1 Should We Anticipate a Steadier Increase in Inflation?

As the current situation stands, there is a possibility of prolonged high inflation if the inflationary shocks experienced in 2021 (stemming from the global economy rebounding after the relaxation of pandemic restrictions) and 2022 (due to the energy crisis resulting from the conflict in Ukraine) trigger a series of subsequent events that give rise to a price-wage inflationary spiral. Consequently, this could lead to sustained wage growth surpassing labor productivity growth, specifically in terms of continuous increases in unit labor costs. Additionally, there is a risk of ecological contamination.

According to Lane (2021), robust labor markets are generally associated with enduring inflation. Numerous economies have successfully navigated the pandemic period, seeing few adverse impacts on the labor market and unemployment trends, primarily due to substantial budgetary assistance. Consequently, numerous countries are projected to experience unemployment rates post-2021 that are similar to the historically low levels observed in the preceding decades. It is worth mentioning that the compensation per employee (CPE) in several euro area nations has not yet returned to the levels observed prior to the pandemic, a trend that persists into 2021 and even extends into 2022 (as indicated in Figure 5).

Figure 5. Increasing trend in labor compensation per employee (2000-2022) (in EUR per hour)



Note: Compensation of employees per hour worked in EUR
Source: The author's calculations using data from Eurostat

In the context of the euro area, it is apparent that the utilization of fiscal stimulus to sustain employment throughout the pandemic period has implications for many indicators that monitor the progression of the labor market. The CPE growth remained below 2% until the conclusion of 2021 due to a confluence of factors, including a deceleration in the rate of pay per employee per hour and an upsurge in working hours attributable to a decline in the utilization of short-term employment programs. This level of growth aligns with the long-term average observed since 1999. However, it is noteworthy that during the entirety of 2022, the increase of CPI exceeded the long-term average of 2% by a little margin. This observation suggests the potential emergence of a price-wage spiral, which has inherent risks. This offers another rationale for the ECB's implementation of a more restrictive monetary policy approach, which entails gradually increasing key interest rates and implementing measures to reduce the quantity of money in circulation.

Nevertheless, it can be postulated that workers whose actual wages were affected during the pandemic, characterized by a decrease or lack of growth in nominal wages alongside a decline in the purchasing power of their real incomes due to rising inflation, may endeavor to address this predicament by advocating for increased wages from their employers or by pursuing opportunities in alternative industries that offer greater potential for wage advancement. Current labor market concerns, such as skill mismatches among workers in various industries, considerable regional disparities in income and employment prospects, and limited territorial mobility of employees within the EU, have the potential to undermine and exacerbate the fragility of local labor markets. The demand for proficient personnel in rapidly recovering industries and regional economies may be increasing, perhaps resulting in heightened competition within labor markets. The convergence of inflationary forces resulting from the economic recovery following the pandemic and the escalating costs associated with the EU's energy

challenge may potentially lead to a situation of stagflation in specific countries inside the eurozone, should this scenario materialize.

Based on the prevailing conditions in the euro area, it is plausible to posit that the phenomenon of stagflation will not solely impact a limited subset of states characterized by pronounced challenges but will progressively extend its detrimental effects to encompass a substantial proportion of the region's economies. To mitigate the risk of a debt crisis, central banks possess the capacity to engage in the monetization of substantial fiscal deficits. This is attributable to the notable escalation of private and governmental debt within the global economy throughout the pandemic era, as well as persistent structural patterns (Roubini 2021). Economic actors find themselves ensnared in a cycle of indebtedness as a consequence of the simultaneous escalation of both public and private debt. In the forthcoming years, central banks will be confronted with the challenge of addressing the escalation of inflation. There is a potential for initiating a significant debt crisis and profound economic downturn if policymakers opt to gradually transition away from implementing unconventional measures and maintain higher interest rates over extended durations within nations, with the aim of addressing inflationary pressures. Nevertheless, there is a potential danger of seeing double-digit inflation and severe stagflation if the authorities decide to prematurely relax monetary policy once again.

4.2 How Did We Get There?

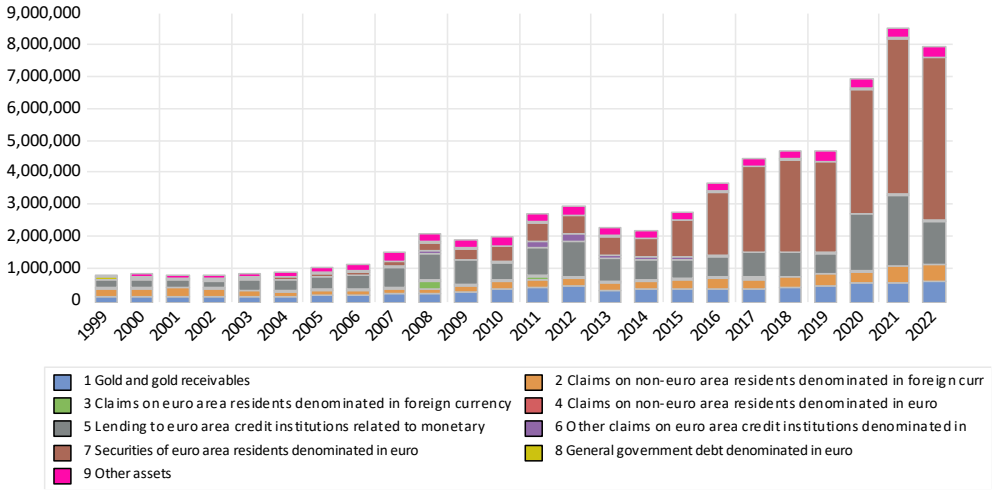
The implementation of quantitative easing by the ECB over a period of more than ten years resulted in a substantial increase in its balance sheet, as depicted in Figure 6. The initial catalyst for the events may be traced back to shifts in the macroeconomic landscape, encompassing both market fundamentals and sentiment. These changes were then compounded by the consequences of the sovereign debt crisis within the euro region. Given that the main policy rate had already been reduced to negative levels in 2014 and was nearing the effective lower bound, the ECB initiated the implementation of "unconventional" monetary policy measures.

Shortly after the onset of the COVID-19 epidemic, there was a notable increase in the balance sheet of the ECB. The introduction of an additional government bond purchase program has further augmented the balance sheet of the ECB with the objective of averting financial crises and economic downturns. During its peak in 2022, the balance sheet of the ECB accounted for over 50% of the GDP of the euro area.

Simultaneously, it is noteworthy that a substantial augmentation in the ECB's balance did not exhibit any discernible indications of potential inflationary pressures. Throughout the majority of the post-economic and financial crisis era, commencing in 2008, the euro region saw a notable presence of disinflationary forces that posed a significant risk to its delicate economic expansion.

The ECB observed the initial indications of inflationary pressures shortly after the onset of the COVID-19 pandemic problem. This was a consequence of the significant distortions it caused in the economies of not only the euro area, which became evident towards the end of 2021. The gradual reduction of asset purchasing programs, coupled with the implementation of quantitative tightening in March 2023, played a role in the gradual decline of the ECB's balance sheet.

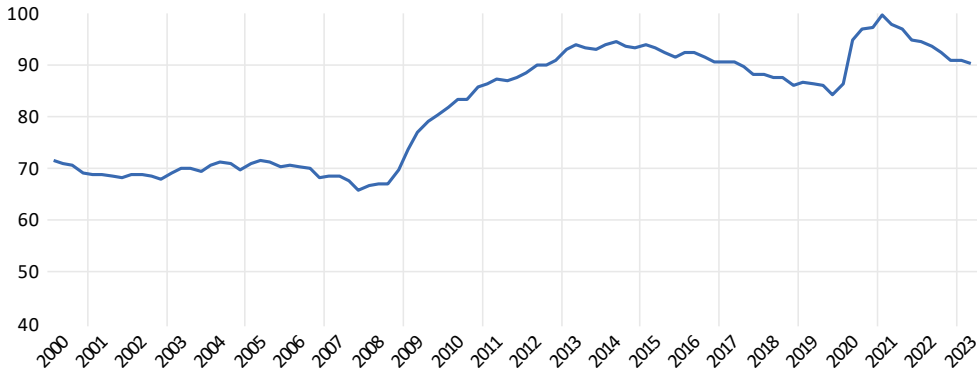
Figure 6. Consolidated balance sheet (assets) of the ECB (1999-2022)



Source: The author's calculations using data from Eurostat

The process of reducing the size of the ECB's balance sheet appears to be progressing slowly but is of great significance in mitigating inflationary pressures within the euro area. This reduction aims to lessen the excessive amount of money in circulation, so contributing to the overall objective of price stability. Nevertheless, it is evident that the implementation of the new monetary policy strategy by the ECB has shown certain constraints within a span of less than a year. The ECB's swift escalation of key interest rates, coupled with a corresponding decline in government bond prices, has resulted in challenging liquidity limitations for the government budgets of euro area member countries. This situation is further exacerbated by a substantial accumulation of sovereign debt within the region (as depicted in Figure 7), leading to a notable surge in interest payments on government debt.

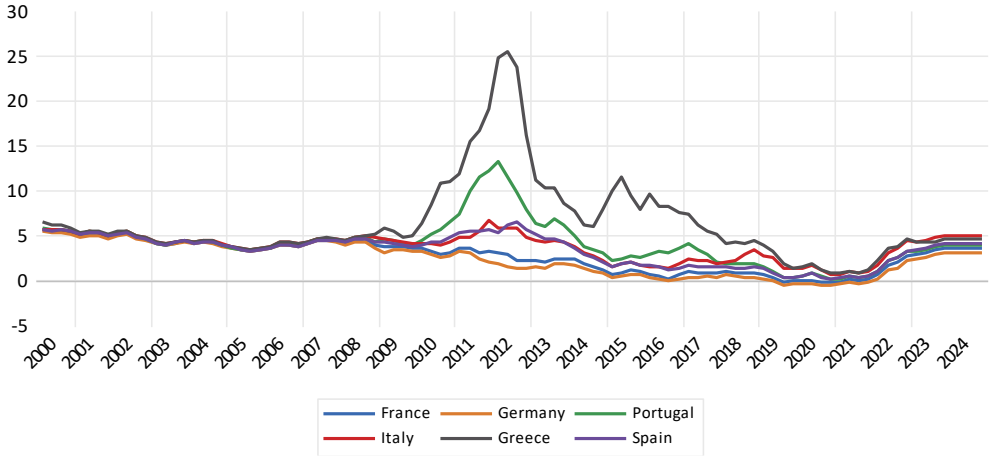
Figure 7. Government debt (consolidated) (as % of GDP)



Source: The author's calculations using data from Eurostat

One notable consequence arising from heightened uncertainty during the post-economic and financial crisis period, which began in 2008, is a substantial rise in the spread of 10-year government bonds among individual member nations of the euro area (as depicted in Figure 8). The presence of heterogeneity across member countries in the euro area is often seen as a favorable characteristic of the shared currency region. This heterogeneity enhances the advantages derived from diversity, leading to increased intertemporal cross-country trade and capital allocation. Nevertheless, the fundamental foundations of the euro region, particularly the shared framework for monetary policy, paradoxically exacerbate this divergence despite efforts to mitigate it. Consequently, the distorting impacts of the prevailing monetary policy exacerbate pre-existing disparities among member nations of the euro area and contribute to the overall decline in its competitiveness.

Figure 8. 10-Year Government Bond Yields (in % p.a.)



Source: The author's calculations using data from Eurostat

4.3 Inflation and Policy Challenges for ECB

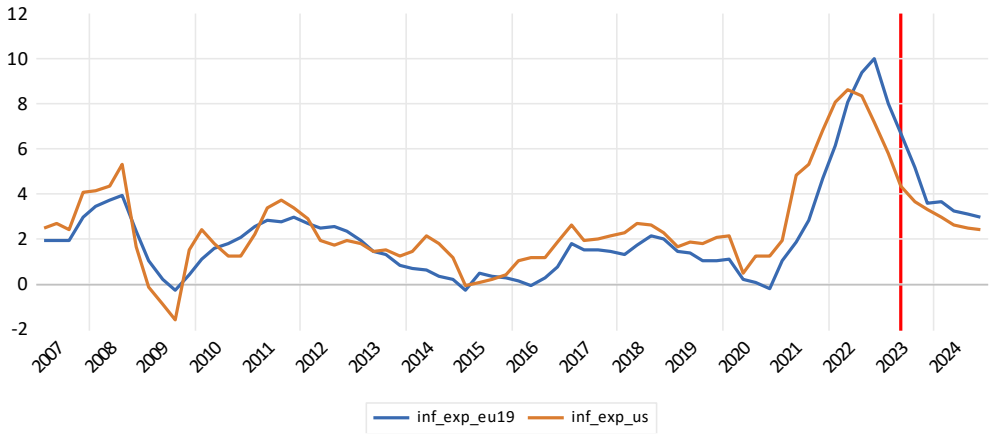
The stance towards the ECB is relatively more complex as compared to that of the FED. During the initial decade, growth shocks emerged as the predominant determinant affecting inflation dynamics inside the euro area. Over the course of the previous decade, there has been a notable transition towards disinflationary shocks in the aftermath of the global financial crisis. In a scenario where a significant minimum threshold indicates that

disinflationary shocks cannot be easily counteracted through interest rate measures, various cyclical elements, notably the disinflationary consequences of both the 2009 twin recessions (economic and financial crisis) and the 2012 debt crisis, interact with persistent structural patterns such as globalization, digitalization, and demographic factors. The diminished anticipation of inflation (as depicted in Figure 9) could be attributed to the ECB's inflation objective being less firmly established, possibly due to the prolonged presence of low inflation (ECB, 2021).

The utilization of unconventional monetary policy measures has played a significant role in addressing disinflationary pressures, alleviating apprehensions regarding deflation, and averting a more pronounced decline in inflationary expectations, particularly starting from 2014. This analysis critically examined the unconventional monetary instruments employed by the ECB and reached the determination that each of these tools effectively contributes to the enhancement of economic output, employment levels, and inflation rates. The aforementioned tools encompass longer-term refinancing operations, asset purchases, negative interest rates, and forward guidance. The Governing Council deemed these actions justifiable considering their potential spillover consequences, such as impacts on socioeconomic inequalities and the banking sector. The close proximity of interest rates to the effective lower bound, along with the limited understanding of the effectiveness and potential adverse consequences of alternative tools, contributed to the maintenance of inflation rates below the targeted level. Additionally, these variables-imposed constraints on the extent and swiftness with which monetary policy could address disinflationary events. The potential lack of adequate anchoring of inflation expectations slightly below, yet proximate to, the 2% threshold within the ECB's dual-objective framework may have engendered ambiguity over the precise level of the inflation target. Moreover, the perception of differential treatment in relation to the target's applicability for various stakeholders could have contributed to the prolonged persistence of low inflation. In light of concerns over the sustainability of debt, fiscal policies impeded both economic growth and inflation subsequent to the financial crisis (ECB, 2021).

The primary objective of the ECB's strategy review in July 2021 was to ensure the credibility of its inflation target. The objective behind the recalibration of forward-looking interest rate guidance and the transition from a "below, but close to, 2% inflation target" to a symmetrical inflation target of 2% was twofold: firstly, to avoid premature monetary tightening, a mistake that the ECB has made previously, and secondly, to establish a more distinct reference point for longer-term inflation expectations.

Figure 9. Market-based inflation expectations in the euro area and USA (2007-2024) (in percent)



Note: The vertical line indicates the start of the projection horizon.
Source: The author's calculations using data from FRED Economic Data, Federal Reserve Bank of St. Louis.

The ECB faces a notable credibility challenge in the event that demand, and supply shocks continue to be influenced by structural factors that affect the economies of the euro area, even after the conclusion of the pandemic and energy crises. This scenario could result in a sustained and substantial increase in medium-term inflation within the euro area, surpassing the ECB's inflation target of 2%. In contrast to the FED, which possesses a greater degree of autonomy in adjusting its monetary policy tool without significant concerns of disturbance within its authority, the ECB is expected to encounter more challenges under comparable conditions. Within the context of the euro area comprising sovereign nations, certain member states face the potential of a sovereign debt crisis. Consequently, the central bank's choices regarding the timing, magnitude, and necessity of reducing government bond acquisitions, as well as increasing interest rates to mitigate inflationary pressures, are bound to generate controversy and carry significant political implications. In the context of inflationary pressures, it becomes challenging for the ECB to strike a harmonious equilibrium between varying national interests and

divergent views towards inflation, particularly in a situation where nations burdened with substantial public debt experience slower economic growth compared to those with lower public debt levels.

Concluding Remarks

In the aftermath of the recent financial and following economic and debt crises, there has been a discernible deceleration in price fluctuations as a result of the prevailing inclination towards consolidation. Nevertheless, the emergence of expansionist components in fiscal and monetary measures following the onset of the COVID-19 pandemic, coupled with the disruptions in production chains caused by the same, alongside the influence of geopolitical dynamics such as energy prices, have recently reinstated the capacity for price fluctuations. The presence of deflationary and disinflationary trends did not amplify the inflationary impacts of loose fiscal and monetary policies aimed at stimulating the recovery of crisis-affected economies.

From a certain perspective, quantitative easing can be regarded as advantageous as its primary objective is to guarantee the availability of liquid assets for economic entities, such as commercial banks. This is true even though the effectiveness of the monetary policy transmission mechanism, specifically in terms of retail segment access to liquidity, may be compromised. In the context of the economic effects of pandemic measures, the expansion of central banks' monetary base has been observed. This expansion has been driven by fiscal stimulus measures aimed at mitigating the impact of the pandemic. Initially, this expansion occurred in a covert manner, leading to increases in financial asset prices such as stock markets and growth in house prices. However, more recently, this expansion has become more overt, affecting price levels, and altering the dynamics of inflation. These developments deviate from the typical macroeconomic environment characterized by predictable macroeconomic fundamentals, highlighting the potential risks associated with such measures.

Conclusion

The macroeconomic features of euro area Member States exhibit heterogeneity, even though there is a growing similarity in cyclical trends in economic developments. This heterogeneity reinforces divergent tendencies and asymmetric economic manifestations. These differences are observed not only in macroeconomic and microeconomic fundamentals but also in price level dynamics. As a result, there are divergent distorting effects on real interest rate developments. These disparities arise in response to idiosyncratic and exogenous structural shocks, within the framework of the common monetary policy implemented by the ECB. The empirical findings provide support for the arguments emphasizing the necessity of making modifications to the institutional structure of the euro area. Additionally, these results lend credibility to the arguments advocating for the implementation of a feasible idea of a two-speed euro region. The single monetary policy implemented by the ECB has the potential to enhance economic convergence among countries, promote synchronization of economic cycles, and improve the euro area's ability to withstand internal and external shocks during favorable economic conditions. However, in the presence of declining macroeconomic fundamentals, certain vulnerabilities and reduced resilience within the euro area become more pronounced. This is primarily due to persistent structural and performance disparities among member countries, which consequently lead to divergences in real interest rates.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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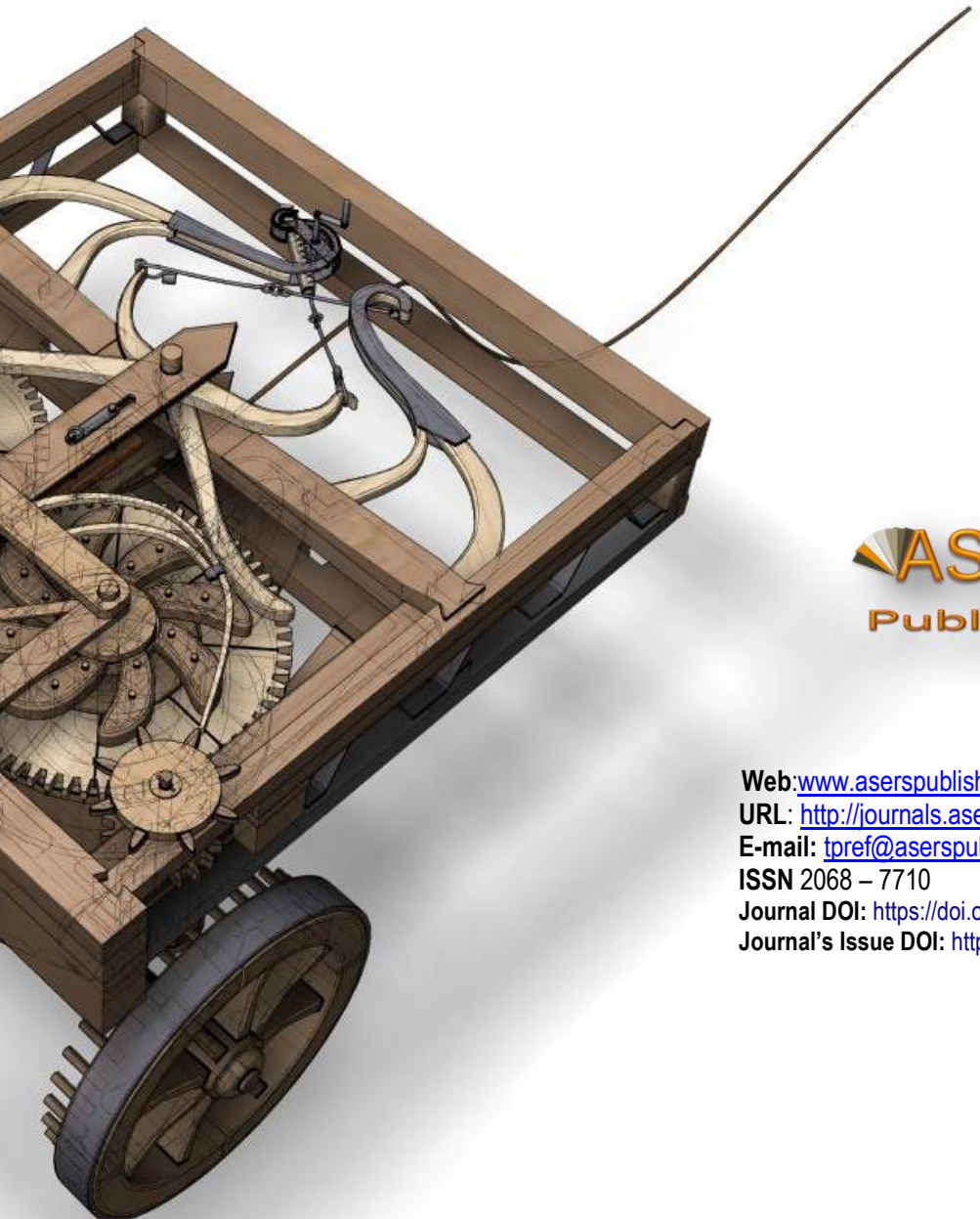

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