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Where is the Euro Area headed? Restoration of price stability

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Abstract

After the two recent global shocks of the COVID-19 Pandemic of 2019–2021 and the Russian invasion of Ukraine in February 2022, the 2023–24 economic priority for the Euro Area is the fight against inflation in the midst of global economic and financial uncertainties. We focus on Euro Area inflation, analyze its diagnostics, examine inflation expectations, review theories of inflation and evaluate monetary and fiscal policies prompted because of COVID-19. Then we explore policies of the European Central Bank to fight inflation and conclude that restoration of price stability in the Euro Area will remain its central focus during 2023 and 2024.

JEL classifications: E31; E43; E44; E52; E58

Keywords: European Economic Growth; Inflation; Monetary Policy; Global Shocks; Price Stability

This paper addresses the question: Where is the Euro Area (EA) headed during 2023–24? An examination of past developments during the 65 years of unprecedented progression towards European economic integration suggests that its leading goal has been the pursuit of rapid economic growth. This fundamental quest to advance economic growth for a united Europe as a

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common goal in the face of traditional nationalism has taken a variety of forms and has been confronted by several major crises. From the Treaty of Rome in 1957, economic growth was pursued through free trade among its initial 6 European member counties; then it expanded to a common agricultural policy, to be followed by exchange rate stability. Eventually, the Single European Market was established in late 1992 to promote economic growth with free movement of goods, services, and factors of production to be succeeded boldly by adopting one common currency and establishing one central bank in 1999.

There were also many crises along the way. The 1970 s were years of economic recession and inflation. The European Monetary System experienced imbalances among its increasing number of 12 member countries at that time because of the dominant role of the German Central Bank. After the euro's introduction in 1999, the first major shock was the Global Financial Crisis of 2007–09 followed by the European Sovereign Debt Crisis. More recently, the COVID-19 pandemic of 2019–2021, the inflation of 2021–22 and the Russian invasion of Ukraine in February 2022, have diverted attention from long-run economic growth to medium term management of inflation amid economic uncertainty and potential financial instability.

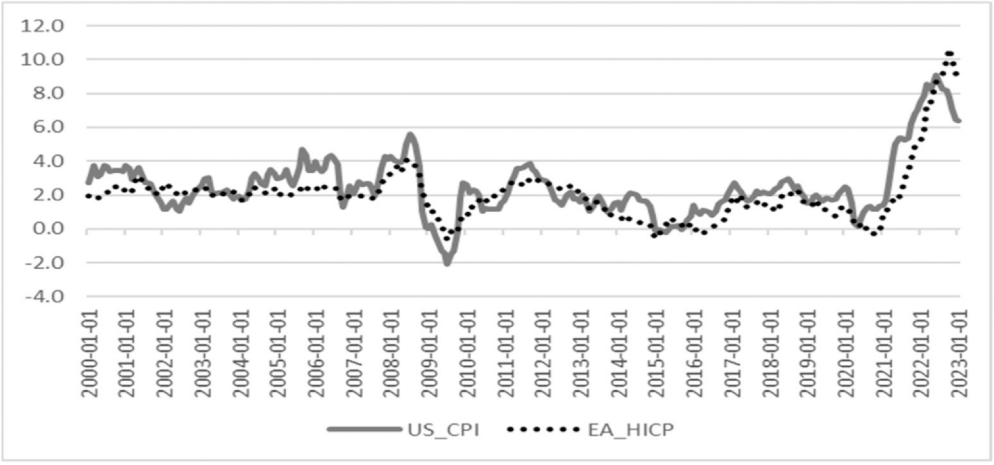
Our answer to where the EA is headed in the medium term is restoration of price stability. In section 1, we briefly discuss price stability that prevailed in the EA during 2000–2020. Then, in section 2, we present data to show the surprising inflationary developments during 2021–2022. By mid-2021, inflation started rising faster, and after the Russian invasion of Ukraine in late February 2022, it accelerated further. By the end of 2022, inflation for that year had registered levels not seen during the euro's existence. We analyze the diagnostics of the EA inflation in some detail in this section by discussing both the broad measure of inflation and its components. In section 3, we relate actual price inflation to expected inflation and wage inflation, and in section 4, we review theories of inflation to help us understand its causes and guide us towards strategies to combat it. Section 5 focuses on monetary and fiscal policies during COVID-19. These policies have played a significant role in reviving inflation as did the Russian invasion of Ukraine. Section 6 centers on attaining price stability pursued by the European Central Bank (ECB) and our conclusions are summarized in the last section.

The answer that says the EA during 2022 experienced inflation and major uncertainty because of the Russian invasion of Ukraine, and needs to achieve price stability during 2023–24, may be characterized as a medium-term direction. However, price stability has become a universal goal for modern economies as a precondition for stable long-run economic growth. Thus, the EA is headed towards price stability in the next couple of years to pursue its longer-term goal for real economic growth.

1. Price stability in the Euro Area during 2000–2020

Graph 1 shows the rate of inflation in the EA since the introduction of the euro. The graph also includes the rate of inflation in the U.S. Our focus is the EA inflation, but by contrasting it to the US inflation, we obtain useful insights. The measure we use for inflation in the EA is the Harmonized Index of Consumer Prices: All Items for the Euro Area of 19 countries. Croatia was added to the euro area in January 2023, but this will affect future calculations. For similarity of comparisons, we use the Consumer Price Index (CPI) for the US, instead of the Personal Consumption Expenditures Price Index. The EA does not compute inflation using a methodology similar to the one followed by the Personal Consumption Expenditures Price Index.

The Harmonized Index of Consumer Prices (HICP) is a monthly index measuring price changes for consumer goods and services purchased by EA households. "Harmonized" means all



Graph 1. Comparing EA Harmonized Index of Consumer Prices and US Consumer Price Index. Not seasonally adjusted. The authors have prepared this graph from data
Source: FRED series with original sources Eurostat and Bureau of Labor Statistics.

27 countries of the European Union, and in particular, the subset of 19 countries of the EA follows the same methodology to allow for comparisons among member countries. The HICP is compiled by Eurostat and the national institutes of member countries in accordance with state-of-the-art statistical methods related to harmonization among member countries. Recall that HICP inflation data is used by the European Union to assess whether a country is ready to join the EA.

The HICP for the 19 countries of EA is calculated as an average of the national HICPs, weighted by the countries' relative household consumption expenditure shares in the euro area total. These weights are computed from national accounts and updated every year. From 2000–2020, both the EA and the US have experienced price stability. The European Central Bank (ECB) describes price stability as a year-on-year increase in the HICP for the EA of 2%. The actual average inflation rate in the EA for the period of 2000–2020 was about 1.7%, so the ECB was successful in maintaining price stability. In the US, the Fed targets inflation to 2% and the data in Graph 1 yields an inflation measure using the Consumer Price Index for all items of 2.1% in this same period. Thus, EA inflation was lower than the one in the US. In addition, the EA and the US inflation was on average higher before the Global Financial Crisis (GFC) than after. This was due to the slow recovery of both economies after the GFC. Also, recall that the EA experienced a second crisis after the GFC because several of its member countries had major difficulties with their sovereign debt. This is presented in Malliaris and Malliaris (2020). Graph 1 shows that the EA registered some deflation during 2015–16, and again in late 2020 during COVID 19. With such low rates of inflation during this 20-year period, the emergence of inflation by mid-2021 was an unexpected development which was initially dismissed as a transitory phenomenon.

2. Diagnostics of Euro Area inflation 2021–2022

Monthly data for inflation in EA and US are presented in Table 1. This Table gives numerical values for 2021–2022 that are illustrated at the right-hand end part of Graph 1. The HICP in the EA and the CPI in the US compute total consumer inflation, also called "headline

Table 1
A comparison of EA and US consumer price indexes for January 2021 to February 2023; Frequency: Monthly, Values shown as percent change from one year ago. Not Seasonally Adjusted.

Date	EA HICP	US CPI	EA HICP less FEAT	US CPI less FE
1/1/2021	0.9	1.4	1.4	1.4
2/1/2021	0.9	1.7	1.1	1.3
3/1/2021	1.3	2.6	0.9	1.6
4/1/2021	1.6	4.2	0.7	3.0
5/1/2021	2.0	5.0	1.0	3.8
6/1/2021	1.9	5.4	0.9	4.5
7/1/2021	2.2	5.4	0.7	4.3
8/1/2021	3.0	5.3	1.6	4.0
9/1/2021	3.4	5.4	1.9	4.0
10/1/2021	4.1	6.2	2.0	4.6
11/1/2021	4.9	6.8	2.6	4.9
12/1/2021	5.0	7.0	2.6	5.5
1/1/2022	5.1	7.5	2.3	6.0
2/1/2022	5.9	7.9	2.7	6.4
3/1/2022	7.4	8.5	3.0	6.5
4/1/2022	7.4	8.3	3.5	6.2
5/1/2022	8.1	8.6	3.8	6.0
6/1/2022	8.6	9.1	3.7	5.9
7/1/2022	8.9	8.5	4.0	5.9
8/1/2022	9.1	8.3	4.3	6.3
9/1/2022	9.9	8.2	4.8	6.6
10/1/2022	10.6	7.7	5.0	6.3
11/1/2022	10.1	7.1	5.0	6.0
12/1/2022	9.2	6.5	5.2	5.7
1/1/2023	8.6	6.4	5.3	5.6
2/1/2023	8.5	6.0	5.6	5.0

Source: Eurostat, Bureau of Labor Statistics, FRED data

inflation". The HICP and CPI measure living costs for an average consumer, without seasonal price adjustments. They are volatile as presented in Graph 1, because all components of consumer spending are included. Usually, food and energy prices are more volatile than school tuition or a visit to a doctor, which do not change from month to month.

Table 1 shows 3 patterns: from January 2021 through June 2022, the monthly HICP numbers for the EA are below those of the CPI for the US; second, from July 2022 to February 2023, EA inflation is higher than that of the US. Third, for 26 months (about 2 years), EA inflation grows slowly and peaks in October 2022, in contrast to US inflation which reaches its peak in June 2022 and then declines. This simply means that headline inflation in the US was higher than that of the EA from early 2021 to June 2021 and then there was a reversal. EA inflation continued to increase while US inflation began to decline. To explain this reversal, we must decompose the headline inflation.

The decomposition of inflation into its major components is advocated by both monetary theory and policy. Monetary theory distinguishes between an inflation that results from equal percentage increases across all goods and services and inflation that is driven by random shocks to certain groups of goods and services. Inflation with equal percentage increases across all markets does not affect relative prices and is a purely monetary phenomenon that central banks have the tools to correct. However, when shocks impact certain markets exclusively, like oil

prices increasing because OPEC is unwilling to replace Russian oil supply, an analysis is needed in terms of supply and demand dynamics. Monetary policy does not focus on specific markets. Some markets, usually related to energy and food, experience more frequent shocks to their supplies relative to their demands. So, their prices fluctuate more relative to goods such as refrigerators or services such as a ticket to a theater.

It is not appropriate for a central bank to pursue price stability for sectors of the economy that exhibit high price volatility. Volatile prices in certain components of inflation, while other components record very minor price changes, can be tolerated by central banks because such prices are mean reverting in competitive markets and often self-correct. Central bankers know that achieving price stability is essential but also realize their target is core inflation, defined as headline inflation less inflation in food and energy products. Food prices are excluded because they are influenced by weather and seasonal factors. Energy prices are highly correlated to oil price movements and oil prices have a long record of high volatility. Table 1, the third column of data records the HICP Overall Index Less Energy, Food, Alcohol and Tobacco. The analogous measure in the US is presented in the last column and describes the CPI less Food and Energy.

Comparing these 2 less volatile measures of inflation in the EA and US using monthly data for January 2021- February 2023, we draw 3 additional observations: First, by excluding the volatile components of inflation, since October 2021 for the EA and March 2021 for the US, the core or stable part of inflation in both the EA and US is lower, but still remains above the 2% target. Second, core inflation in the EA is mostly lower than in the US. The implication is that the volatile component in the EA is higher than that of the US. This can be explained by the fact that the EA is more dependent on its energy and food from the global economy than the US, which is significantly more self-sufficient in food and energy. When we consider the EA inflation and its acceleration during spring 2022, we can easily attribute it to the Russian invasion of Ukraine that dramatically impacted not only the energy markets but also the global food supply. Thus, by comparing the EA inflation to that of the US, the diagnostics show that US inflation, both headline and core, are mostly higher than the equivalent in the EA, but when the headline EA inflation overtakes that of the US, it happens because of the acceleration of energy and food prices in the EA. A further conclusion may be reached by describing the EA inflation.

as less challenging because it is driven by food and energy, while the US inflation is broader and more complex since the CPI less energy and food remains high.

To add to our diagnostics of inflation in the EA, we also present Table 2 with all the key components of inflation for the 24 months during 2021–22. The HICP inflation has 10 components presented in Table 2 that records small inflation pressure during the first half of 2021 across all sectors and then inflation increasing during the second half of 2021, primarily for food & beverages, housing, electricity, gas, housing equipment and transportation. Inflation for electricity and gas accelerates in 2022 and inflation from components of food, transportation, house equipment and recreation are also added.

3. The role of inflation expectations and wage increases in Euro Area inflation

Thus far, the inflation data presented describe actual values. It is important to recognize that actual inflation in each period influences expectations about future inflation. Households and firms continuously make decisions about consumption, production, savings and investments that involve both current and expected prices. During periods of financial stability, such stability is

Table 2
EA Harmonized Index of Consumer Prices and its Components for 2021–22. Percent Change from 1 Year Ago; Monthly, Not Seasonally Adjusted.

Date	Total	Food & Beverage	Alcohol & Tobacco	Clothing Shoes	Housing Electricity Gas	Household equipment	Health	Transportation	Communication	Recreation	Education
2021–01–01	0.9	1.0	3.3	2.5	0.3	1.2	0.2	-0.8	-0.4	2.7	0.0
2021–02–01	0.9	0.8	3.5	0.7	0.5	0.8	0.2	-0.6	-0.4	1.9	0.1
2021–03–01	1.3	0.7	2.7	-1.3	1.6	0.8	0.2	0.8	-0.9	1.7	0.1
2021–04–01	1.6	-0.1	2.8	-0.2	3.0	0.7	0.0	-2.6	-0.1	0.7	0.1
2021–05–01	2.0	0.0	2.3	0.4	3.5	0.8	0.2	-0.9	-0.3	1.4	0.3
2021–06–01	1.9	0.1	1.9	1.8	3.7	1.0	0.2	-2.0	-0.3	-0.4	0.2
2021–07–01	2.2	1.4	2.2	-3.3	4.7	1.3	0.3	0.3	0.6	-1.4	0.2
2021–08–01	3.0	1.9	2.3	3.6	5.2	2.0	0.4	2.5	0.5	-0.5	0.2
2021–09–01	3.4	1.9	2.3	1.7	5.9	2.1	0.6	4.9	0.5	1.1	-1.8
2021–10–01	4.1	1.8	2.5	0.9	8.0	2.3	0.8	5.6	1.4	1.6	-1.0
2021–11–01	4.9	2.2	2.0	1.4	9.1	2.6	0.9	6.3	0.9	4.0	-1.0
2021–12–01	5.0	3.6	2.2	2.8	9.7	2.8	0.9	5.1	0.9	2.9	-0.9
2022–01–01	5.1	4.0	2.2	-0.2	11.9	2.8	0.8	2.0	-0.2	2.8	-0.9
2022–02–01	5.9	4.8	2.2	2.1	13.4	3.8	0.9	2.2	-0.3	3.1	-0.9
2022–03–01	7.4	5.8	2.3	2.1	17.2	4.2	1.0	2.0	0.1	3.1	-0.9
2022–04–01	7.4	7.7	2.2	2.0	15.9	5.0	1.1	7.9	0.2	3.6	-0.9
2022–05–01	8.1	8.9	2.7	1.7	16.3	5.9	1.3	7.1	-0.3	3.6	-0.9
2022–06–01	8.6	10.7	3.2	0.6	16.9	6.5	1.1	-2.0	-0.2	4.4	-1.0
2022–07–01	8.9	11.8	3.5	0.0	17.7	6.9	1.3	1.6	-0.5	4.4	-0.9
2022–08–01	9.1	12.7	3.8	2.1	19.7	7.4	1.2	1.1	-0.5	4.8	-0.8
2022–09–01	9.9	14.1	4.1	3.2	21.1	7.8	1.4	7.3	-0.6	4.6	3.8
2022–10–01	10.6	15.9	4.2	3.8	23.2	8.5	1.8	7.5	-1.0	4.9	4.1
2022–11–01	10.1	16.4	4.6	3.4	20.6	8.6	1.7	7.4	-0.9	4.7	4.1
2022–12–01	9.2	16.3	5.2	3.7	16.3	9.1	1.8	6.8	-0.9	5.5	4.1

Source: Eurostat

expected to also prevail in the future. However, during periods of inflation, households and firms face a bigger challenge in deciding how future inflation will evolve.

Inflation expectations are beliefs formed, reviewed, evaluated, and revised continuously as households and firms engage in numerous transactions in an inflationary environment. These inflation expectations are important because they can affect current and future inflation. For example, if oil production declines in Saudi Arabia for political reasons and the price of oil increases, firms and households will evaluate the duration of this development. If a rapid return to normality is not expected and further price increases are anticipated, demand may increase so oil can be bought and stored for future use, causing current inflation to go higher.

The importance of inflation expectations in determining actual inflation has guided economists to measure such a relationship. There are various approaches to measuring inflation expectations. Econometrically, Moessner (2022) offers a modelling approach to inflation expectations with the expected price of future inflation computed by 1-period lagged past expected inflation, the actual current inflation for energy and food, the actual core inflation, the output gap and some additional variables. Coibion et al., (2018, 2020) and D'Acunto et al. (2021) present more detailed discussions about the formation of inflation expectations. Another methodology computes expected inflation from surveys, some asking consumers, while others focus on professional economic forecasters. A third inflation expectation source is data obtained from financial markets, particularly Treasury Inflation-Protected Securities.

The ECB Survey of Professional Forecasters for the first quarter of 2023 computes the HICP inflation expectations for 2023 and 2024 at 5.9% and 2.7% respectively. The analysis that follows this survey indicates that participants' expectations primarily reflect assessments of inflation developments excluding energy, food, alcohol, and tobacco, with an emphasis on wage growth that is expected to be around 5%. If wage growth expectations materialize during 2023, the convergence of inflation to 2% by 2025 will be difficult.

4. Theories of inflation

This section discusses analytical explanations of inflation to provide an intellectual transition to monetary policy as a tool for combatting inflation and restoring price stability. We emphasize that there is a large bibliography debating how to measure inflation and how to compute the optimal rate of inflation. Alchian and Klein (1973) argue that consumers spend a certain part of their disposable income on consumer goods and services and, if inflation occurs, their welfare declines. But the actual inflation represents only the current impact on consumer welfare. What also needs to be considered is an assessment of how all future prices are also affected and an appropriate discounting must take place to account for such dynamic future changes. Consumers jointly consider consumption and portfolio decisions, and wealth that is accumulated in consumers' portfolios is impacted by current inflation. Realistically, futures prices do not exist for all goods and services; also, consumers invest their savings and accumulate wealth to finance future consumption. How is wealth, such as housing and asset investments, treated to accurately account for both current and future inflation? Beyond these difficult theoretical issues, what inflation value is optimal? Diercks (2019) surveys 250 studies on optimal inflation and evaluates the benefits and shortcomings of various rates. Brunnermeier and Sannikov (2016) study issues related to the optimal rate of inflation.

In what follows we briefly discuss 5 theories of inflation. First, inflation can occur when aggregate demand for goods and services increases to exceed current aggregate supply. The aggregate demand may increase because consumers spend more, say after a national tax

reduction, or firms make more investments because of advances in technology, or the government sector spends more, say for infrastructure or defense, or finally, because exports increase when the euro declines in value compared to other currencies. With an increase in aggregate demand, the rate of inflation depends on the economy's output gap. This is a measure of the difference between actual output and potential output. If the actual output an economy produces is lower than its potential and there is an increase in aggregate demand, inflation need not rise. However, if an economy is operating at its potential and aggregate demand increases, inflation most likely will increase. Measuring how close an economy is to its potential output is difficult. Potential output depends on productive capacity utilization, the natural level of unemployment and labor productivity influenced by labor participation, average number of hours worked and average hourly earnings.

Beyond these real economic variables, potential output is also impacted by financial conditions, because firms need financing to make investments to increase their productive capacities and hire new workers. Also, the natural level of unemployment is not readily observable and the relationship between unemployment and inflation, the famous Phillips curve, is not stable. What is observable is that for the last 10 years, the rate of unemployment in the EA has averaged 6.7%. This is higher than that of the US that has averaged 5.7%. Thus, an increase in aggregate demand does not routinely produce inflation; the increase in demand must be significant and the economy must be close to its potential output.

Second, inflation also occurs when the aggregate supply decreases. Some shocks to aggregate supply are only limited to certain sectors while others impact larger parts or even the whole economy. After Russia invaded Ukraine in late February 2022, both energy and food supplies declined and prices increased dramatically, particularly in Europe which was dependent on Russian oil and gas. As energy prices increased for oil, gasoline, gas, electricity and food, other sectors using energy, such as transportation and manufacturing production, increased the costs of their output. A hypothesis suggested by Philip Lane (2023) in an interview with Martin Wolf of the Financial Times is that the 2021–23 US inflation may be viewed as an aggregate demand shock, while the EA inflation is the result of an aggregate supply shock. However, the EA and US inflations cannot be fully explained by shocks to aggregate demand and supply. Monetary and Fiscal Policies discussed in section 5 motivate the role of inflation theories discussed next.

Third, monetary economists propose that inflation is a monetary phenomenon. Using the Quantity Theory of Money that is described by the tautological relationship, PQ=MV, where P is the price level, Q is real output, M is money in circulation and V is velocity of money, one can deduce that the price level increases when money supply increases, holding real output and velocity of money constant. Q is constant when the economy is at potential output and cannot produce additional goods and services. V in times of inflation also increases, contributing to additional inflation. Friedman (1987) gives a detailed analysis of the Quantity Theory of Money as a methodology for understanding inflation.

Friedman has also made numerous contributions on issues of monetary policy, beyond this simple Quantity Theory of Money. In Friedman (1968) he argues that monetary policy can prevent money itself from being a major source of economic instabilities. Friedman (1968, p.15) asserts "I believe that a monetary total is the best currently available immediate guide or criterion for monetary policy."

Milton Friedman (1970, p.24) is recognized for having said "Inflation is always and everywhere a monetary phenomenon in the sense that it is and can be produced only by a more rapid increase in the quantity of money than in output". Several recent inflations in Venezuela

and Argentina were fueled by increases in the money supply. However, Mankiw et al. (2018) and Williams (2012) explain in detail that central banks have evolved during the past 20 years and are using interest rates to control inflation instead of monetary aggregates. Williams argues that during the Great Financial Crisis of 2007–09, the Fed increased the money supply without generating inflation because the liquidity supplied by the Fed via Quantitative Easing (QE) ended up in the Fed as bank reserves. Banks chose to hold reserves with the Fed because they received interest that compensated banks that did not find it attractive to make loans in an environment of elevated risk and uncertainty. However, extraordinary QE by the ECB and the Fed during COVID-19, contributed to fueling inflation in the EA and US that materialized with a lag of about 1–1.5 years, first in the US and later in the EA.

Fourth, Sargent and Wallace (1981) explain that fiscal policy matters for inflation. If a government has run deficits for several years and accumulated a large public debt, it may reach a point in time where it cannot raise sufficient revenues from selling bonds to financial markets to finance its current deficit. As the central bank buys government bonds, it contributes to inflation. Monetary policy in such a situation faces a constraint in fighting inflation imposed by the demand for government bonds. If interest rates are increased to fight inflation, they may grow to be larger than the rate of economic growth. Then, monetary policy could not control increases in interest rates and the level of buying government bonds. Such dynamics fuel further inflation. A detailed recent model with fiscal dynamics and inflation is presented in Eusepi and Bruce (2018). The vital role of fiscal policies during COVID-19, addressed in the next section, is critical in explaining the robustness of inflation during 2021–2022, particularly after a 20-year period of low inflation in the US and the EA that also experienced deflation.

Fifth, Cochrane (2022, 2023) shifts the emphasis on factors causing inflation from supply and demand, money, and fiscal policy to government debt and the public's expectations about repayment of public debt. He proposes a fiscal theory of inflation by arguing that prices adjust so that the real value of government debt is equal to the present value of future budget taxes less spending. Present value discounting involves guessing future taxes and spending, changes in discount rates and changes in the price level. A government can run current and future deficits by selling government bonds and issuing new bonds to repay old bonds. But this cannot go on forever. Prices must adjust so that the real value of the total public debt equals the present value of current and future surpluses. Thus the "fiscal theory only predicts inflation when debt is larger than what people think the government will repay" Cochrane (2022, p. 127). This theory also contributes towards a better understanding of inflations because of the public deficits generate in EA and US during the COVID-19 fiscal policies.

5. Monetary and fiscal policies during COVID-19

On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a Pandemic. COVID-19 was a novel respiratory disease caused by the SARS-CoV-2 strain, not previously observed in humans. Following the WHO declaration of a Pandemic, major economic disruptions occurred due to lockdowns, travel restrictions, and many people getting sick. The International Monetary Fund (IMF) has estimated that because of the COVID-19 pandemic the median real global GDP dropped by 3.9% during 2020. This makes COVID-19, the worst economic downturn since the Great Depression. Also, the rapid spread of this contagious new disease resulted in more than 5 million deaths globally by the end of end of 2021.

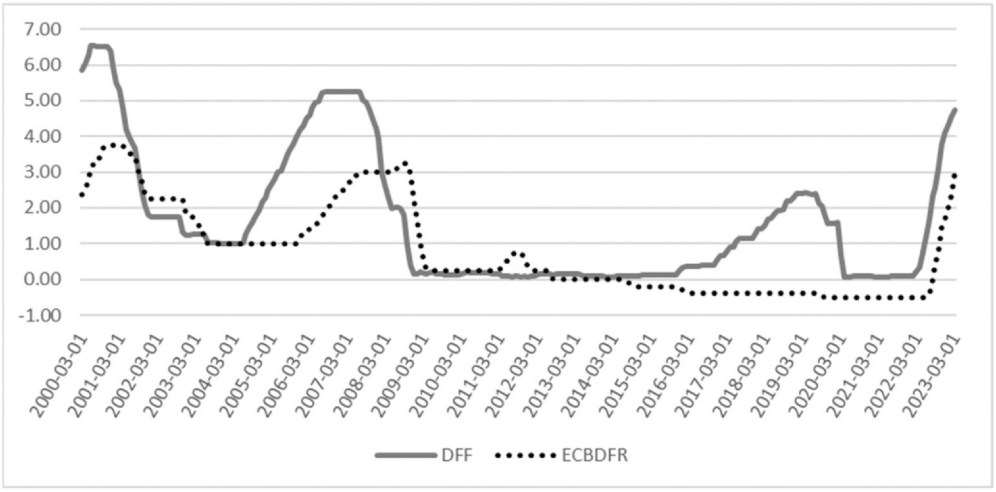
Graph 2 illustrates 3 major facts about COVID-19 in the EA and the US. First, declines in real GDP were larger in both the EA and the US compared to the declines caused by the GFC of

2007–09. A detailed explanation of the impact of the GFC for the EA and the US is presented in Malliaris and Malliaris (2020). Second, for the EA, the COVID-19 declines in real GDP were worse than the declines during the European Sovereign Debt Crisis. Third, the COVID-19 recession was worse for the EA compared to that of the US. Finally, both the EA and the EU experienced short-lived recessions and both economies recovered rapidly and robustly. In what follows, we review the major monetary and fiscal initiatives taken by the EA and the US governments and central banks to neutralize the devastating impact of COVID-19.

By mid-February 2020, global financial markets were assessing the financial and economic consequences of COVID-19. On February 19, 2020, in US, the S&P500 Stock Market Index closed at about 3386 and in the EA, the Stoxx Europe 600 closed at 430. About one month later, after a period of extremely high volatility in financial markets because of the declaration of the pandemic, these indices were both about 31% lower. Such a large decline, in such a brief period of one month exceeded previous bear market declines in both the EA and US. This triggered central banks to take extraordinary measures. Both the Fed and the ECB announced in late March 2020, and during the few turbulent months that followed, numerous initiatives to provide abundant liquidity to stabilize financial markets.

In the US, the Fed Funds Rate during the months of January and February 2020 stood at 1.50%. Then in the March 3 meeting, the FOMC cut the Fed Funds Rate by 50 basis points and then at the March 15 meeting by an additional 100 basis points. So, the Fed Funds Rate was cut to the range of 0–0.25% and remained at zero until April 2022. In the EA, the Deposit Facility Rate was at − 0.5% and remained the same. Graph 3 offers a comparison of these 2 short term interest rates from March 2000 to March 2023, as tools of monetary policy by the ECB and the Fed. It illustrates that for the entire existence of the euro, the Deposit Facility Rate was lower

Graph 2. Real GDP and 2023–24 forecast; Annual growth rate (%), 1999–2024.
Source: OECD (Organization for Economic Cooperation and Development) Economic Outlook: Statistics and Projections.



Graph 3. Federal Funds Effective Rate and ECB Deposit Facility Rate for Euro Area, percent, Not Seasonally Adjusted. Sources: FRED: DFF, and European Central Bank: ECBDF.

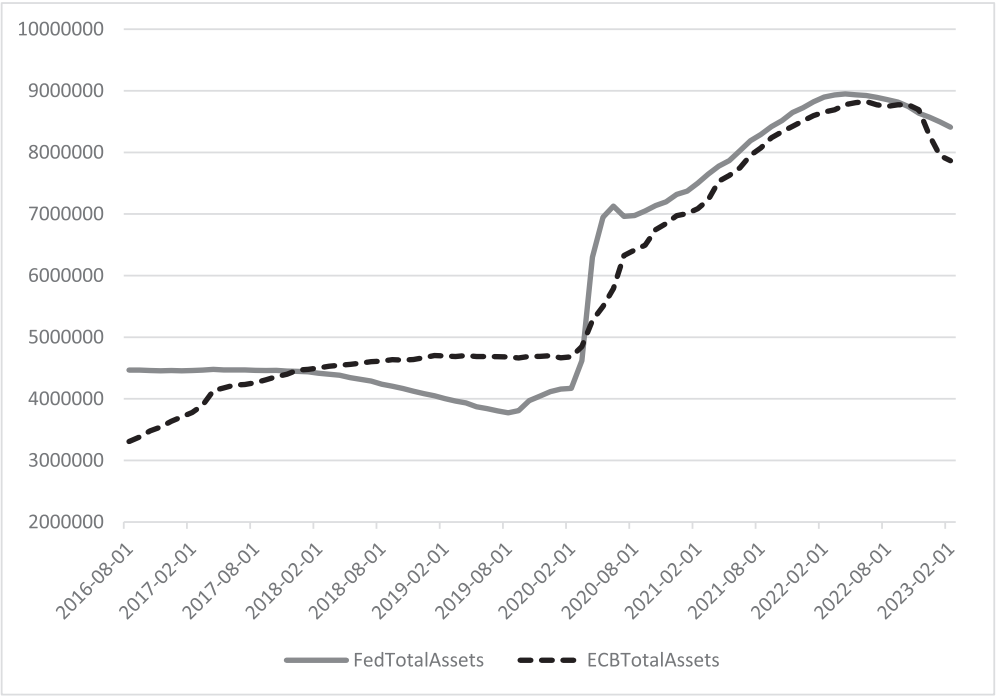
than the Fed Funds Rate except for short periods after the internet recession, the second part of the GFC and the Euro Sovereign Debt Crisis.

Another important initiative that both the Fed and the ECB announced in March 2020 was the expansion of their balance sheets by implementing Quantitative Easing. The Fed signaled it was planning to buy at least $500 billion in Treasury securities and $200 billion in government-guaranteed mortgage-backed securities over several months. By June 2020, the Fed set its rate of purchases to at least $80 billion a month in Treasuries and $40 billion in mortgage-backed securities. By December 2020, the Fed slowed its asset purchasing pace and by November 2021 began tapering its pace. A detailed analysis of these developments is given in Bhar and Malliaris (2021).

The ECB, prior to the COVID-19 Pandemic was buying about €20 billion each month of government bonds, regional and local authorities' bonds, corporate bonds, and asset-backed securities under the Asset Purchase Program. On March 12, the ECB announced the Pandemic Emergency Purchase Program (PEPP) of €750 billion. By June 2020, the ECB increased the.

maximum size of its purchases under PEPP by €600 billion to €1350 billion and extended the horizon to the end of June 2021. Graph 4 illustrates the dramatic increase of asset purchases by the Fed and the ECB. Both central banks doubled their assets during the COVID-19 period. This spectacular increase in central bank assets also caused great increases in the money supply of both the US and EA. Banque de France (2022) reports that the growth rate of the euro area money supply more than doubled to 12% by the end of 2020, compared to 5% in 2019, before falling back to 7% at the end of 2021. The same reports also states that the growth rate of the US money supply increased fivefold to 25% by the end of 2020, compared to 5% on average in 2019, before falling back to 13% at the end of 2021. Lane (2021) gives a detailed record of additional monetary initiatives by the ECB and Clarida et al., (2021) survey related financial initiatives by the Fed.

Fiscal initiatives were equally remarkable. The Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was passed by Congress on March 27th, 2020. This bill allotted $2.2 trillion to provide emergency assistance and health care aid for individuals, families, and



Graph 4. Source FRED with original data from the Board of Governors and the ECB.

businesses affected by the 2020 coronavirus pandemic. On December 21, 2020, Congress passed a $900 billion pandemic relief package to deliver cash to businesses and individuals and resources to vaccinate a nation confronting a frightening surge in COVID-19 cases and deaths. Between these two major Acts, two smaller bills supplied additional funds of about $500 billion. Hodge et al. (2022) estimate that US total fiscal stimulus for 2020 was about 15% of GDP. In addition, during 2021, House Democrats passed a $1.9 trillion coronavirus relief package on March 10. This was signed by President Joe Biden on March 11 and included unemployment aid, direct payments, tax credit expansions, vaccine distribution funds and state and local government relief, among a range of other provisions.

The US increased federal spending, in response to COVID-19, contributed to large budget deficits of $3.1 trillion in Fiscal Year 2020 and of $2.8 trillion in Fiscal year 2021. Both these deficits are the largest and the second largest in history.

The European Union (EU) was equally generous. On 21 July 2020, EU leaders agreed on a €750 billion recovery effort, Next Generation EU, to help the EU tackle the crisis caused by the pandemic. Alongside the recovery package, EU leaders agreed on a €1074.3 billion long-term EU budget for 2021–2027. Together with the €540 billion of funds already in place for the three safety nets (for workers, for businesses and for member states), the overall EU's recovery package amounts to €2364.3 billion. Hodge et al. (2022) estimate that fiscal stimulus in the EU and in the EA was around 13% of GDP. This is truly remarkable because neither the EU nor the EA are fiscally integrated. In general, the EU focused on preventing workers from losing their jobs and assisting the green and digital transitions, while the US supported sending stimulus checks directly to households.

During 2020 and during the first half of 2021, central bankers and treasury officials did not consider the possibility of inflation returning because of such expansionary fiscal and monetary policies to counteract the economic costs of COVID-19 Pandemic. Why? The slow economic growth and low inflation that had prevailed after the Global Financial Crisis had directed economists, such as Summers (2014), to formulate a theory of global economic stagnation with persistent lack of aggregate demand, excess saving, low interest rates, low productivity, aging labor force and potential deflation. In the US, the Fed had kept Fed Funds at zero for most part of 2010–2020, (see Graph 3), and applied Quantitative Easing to reduce long term interest rates and encourage business investments, while the ECB went a little further and brought its Deposit Facility Rate into a negative territory; (see Graph 3). In addition, the general Phillips curve of the form.

Inflation = expected inflation – h (unemployment –natural rate of unemployment) + error term,

where h is a positive coefficient, and anchored expectations could not by construction generate high inflation, unless the error term was big, or the natural rate of unemployment increased substantially. Furman (2022) carefully explains why (almost) no one saw inflation coming in late 2021 and 2022, and Gopinath (2023, p.16) argues that "while high inflation partly reflects unusual developments, some forecast errors likely reflect our misunderstanding of the Phillips curve and the supply side of the economy," and emphasizes that "Running the economy hot may still be desirable in certain circumstances, but policymakers must be more attuned to the potential downsides and be careful with overdoing stimulus."

Hodge et al. (2022) develop a two-country, US and EA, New Keynesian Dynamic Stochastic General Equilibrium macroeconomic model to measure the impact of monetary and fiscal responses during the pandemic, such as the ones just described above. They find that these policies increase both output and inflation in both areas. They initially examine the effect of each policy alone and find that monetary and fiscal policies have similar outcomes on output and inflation. When analyzing the influence of both monetary and fiscal policies at the same time they conclude that these policies are jointly powerful and increase output and inflation but increases in inflation are below the actual increases in core inflation during 2021. These results, in addition to our analysis about the diagnostics of inflation and the theories of inflation show the magnitude of the current inflation puzzle. Integrating all 5 approaches to inflation, the aggressive monetary and fiscal policies to combat COVID-19 and the long-term fiscal theory of inflation may in future research explain the current inflation puzzle.

6. Restoring price stability

Price stability is the principal responsibility of central banks. In general, price stability is necessary for an economy to achieve sustainable and robust labor markets and economic growth. It is a challenging goal because price stability usually means very low-price increases that are stable and predictable.

In the EA, the ECB was created on June 1, 1998, with price stability as its principal objective. In the US, the Federal Reserve was established in 1913 to address banking crises and promote financial stability. Then, in 1977, Congress charged the Fed to effectively promote the goals of maximum employment, stable prices, and moderate long-term interest rates. The attainment of these 3 goals simultaneously proved to be difficult and for the last 30 years the Fed has focused on a "dual mandate" of maximum employment and price stability. Thus, the ECB has one key objective while the Fed has a dual mandate.

There are other differences between the ECB and the Fed because the EA economic and financial conditions differ from the ones in the US. The EA does not have a Eurozone-wide fiscal policy and there are no Eurozone government bonds like the US Treasury T-Bills, T-Notes and T-Bonds. In addition, the Fed supervises approximately 900 state member banks and 5000 bank holding companies in a highly harmonized banking and financial regulatory environment. The ECB supervises 115 major European banks in the EA that account for a substantial share of all banking assets. Beyond banking, capital markets are larger and more robust in the US than in the EA.

Monetary policy instruments employed by the ECB and the Fed are similar. The ECB controls the deposit rate that banks receive for depositing their reserves at the central bank. The Fed uses the Fed funds rate which is the interest rate that depository institutions charge each other for overnight loans. Fed funds rates are coordinated with the interest rates paid by the Fed for bank reserve deposits. There are two other, less important short-term interest rates the ECB uses, the main refinancing operations and the marginal lending facility. In addition, both central banks employ Quantitative Easing or Tightening, and Forward Guidance.

From Table 1 and our discussion of inflation diagnostics, it was the US that first experienced inflation. Beginning in April 2021 and for several months after, annualized inflation remained above 2%. Why did the Fed disregard these above 2% increases? One possibility is Chairman Powell's (2020) presentation at the Jackson Hole Economic Policy Symposium on August 27, 2020, where he proposed a flexible average inflation target (FAIT) of 2%, instead of an inflation target of 2%. FAIT allows inflation to rise and fall to meet an average target over time and when this was proposed during COVID-19, the Fed was challenged to reduce unemployment and willing to tolerate temporary inflation above 2%. Powell (2020) argues how FAIT promotes symmetry around the average 2% inflation target and many past rates below 2% need to be offset by new ones over 2%.

After many deliberations about the emergence of inflation, its causes and whether transitory or persistent, the Fed decided to fight it aggressively. In March 2022 Fed Funds were increased by 25 basis points and then in May by another 50 basis points. These increases were followed by four further increases in June, July, September and November, each worth 75 basis points. The December increase was 50 basis points. Increases in February and March 2023 were 25 basis points each. At this writing in late March 2023, Fed funds stand at 4.75–5:00%, the highest rate since September 2007, as illustrated in Graph 3. The cumulative increase during this period of about one-year monetary tightening to battle inflation is the biggest one compared to similar periods in 1994, 1999, 2004 and 2015.

The ECB delayed, as the Fed did, responding to its inflation in the EA. As Table 1 shows, by December 2021, the EA experienced above 2% inflation for a period of six months. However, the ECB had revised its own inflation target as the Fed had done in August 2020. In July 2021, the ECB's target was revised from "below, but close to 2%" to exactly 2% inflation target for a medium-term period. This target is symmetric, meaning both positive and negative deviations are equally costly. A year later, on July 27, 2022, the ECB increased its interest rates by 50 basis points to be followed by 75 basis points increases in September and November 2022, and 3 additional increases in December 2022, February 2023, and March 2023, each for 50 basis points. By late March 2023, the interest rate on the main refinancing operations was 3.50%, the interest rate on the deposit facility was 3.00% and the interest rate on the marginal lending facility was 3.75%. Both the ECB and the Fed have declared continuous commitment to price stability and have communicated that the fight against inflation will respond to new data and will continue during the rest of 2023, and extended during 2024, even longer until inflation returns to 2%.

What risks do the ECB and the Fed face during their campaign against inflation? Higher interest rates often destabilize financial systems. Public, business, and consumer debts are high and some higher than others. Increases in interest rates, initially short-term, spread through arbitrage to longer-term interest rates and all together make these debts hard to service and increase default risks. Default risks may also increase globally as nations have borrowed in US dollars and Euros and realize that these currencies have appreciated because of higher interest rates. In addition, higher interest rates impact both national and global equities and can cause major repricing affecting wealth and spending. Even the central banks with their significant accumulation of government bonds and mortgage bank securities, may face large losses as interest rates increase and require Treasury support. In such an environment of financial instability it is also hard to manage wages, price expectations, and accomplish a convergence. A detailed presentation of similar concerns is found in Brunnermeier (2023) and Gopinath (2023).

7. Conclusions

We argue that the primary economic goal of the EA in the medium term is the restoration of price stability. We articulate the surprising inflationary developments in the EA during 2021–2022. By mid- 2021, inflation started rising faster and after the Russian invasion of Ukraine in late February 2022, it accelerated further. By the end of 2022, inflation for that year had registered levels not seen during the euro's existence. This inflation became the focus of serious attention by the European Central Bank which has the charge to maintain price stability.

The European Central Bank has responded significantly to the problem of inflation in the second half of 2022 and will continue to do so during 2023 and 2024. So, achieving price stability is where the EA is going. An answer that says the EA, during 2022, experienced inflation and major uncertainty because of the Russian invasion of Ukraine and needs to achieve price stability during 2023–24, may be characterized as a medium-term direction. However, price stability has become a universal goal for modern economies, as a prerequisite for stable long-run economic growth. Thus, the EA is headed towards price stability in the next couple of years to pursue its longer-term goal for real economic growth. Graph 2 illustrates the OECD forecast of expected increasing growth in 2024. We focus on EA inflation, analyze its diagnostics, examine inflation expectations, review theories of inflation and evaluate monetary and fiscal policies prompted because of COVID-19. Then we explore policies of the ECB to fight inflation and conclude that restoration of price stability in the Euro Area will remain its central focus during 2023 and 2024. This goal is challenging because increases in interest rates to combat inflation often produce financial instabilities.

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