2. Inflation in Europe: Assessment, Risks, and Policy Implications

Inflation in Europe has soared to multidecade highs. This chapter examines the drivers of inflation and the prospects and risks around its likely path. While soaring commodity prices account for much of the surge in inflation, empirical analysis finds that a sizable share of the recent uptick cannot be explained by conventional inflation drivers and points to the role of pandemic- and war-related forces, such as rising shortages in input markets. The prospective stabilization of commodity prices and the projected slowdown in growth should gradually bring inflation down, but the process will likely be slower than previously expected and highly uncertain. Inflation risks are on the upside. Central banks should thus keep raising policy rates in most European countries while remaining nimble and data-dependent, with fiscal policies focused on weathering the energy price shock without adding to inflation pressures.

The marked and persistent rise in inflation has defied forecasts and taken center stage in policy discussions in Europe and beyond. With inflation soaring to multidecade highs and price pressures broadening beyond select commodities and durable goods affected by the pandemic- and war-related supply shocks, policymakers are confronted with several challenges: diagnosing the drivers of the surge in inflation, forecasting its likely path and risks around it, and calibrating macroeconomic policies accordingly. An incorrect diagnosis and course of action could be particularly costly at this time. A failure to bring inflation back to target soon risks unmooring inflation expectations, undermining central banks' credibility, and requiring an even larger tightening down the road, with damaging effects on growth and employment. However, a sharper-than-needed tightening could plunge European economies—already battered by the ongoing war in Ukraine, lingering pandemic, and slowing global growth—into recession. The downturn such tightening might trigger could be particularly severe if inflation is largely driven by negative supply shocks, and a very restrictive policy stance is needed to align demand with supply, given the subdued responsiveness of inflation to economic activity observed in the prepandemic period.[1] In this context, the chapter provides an in-depth overview of recent inflation dynamics in Europe, explores its drivers (including their contribution to wide cross-country differences in inflation), analyzes inflation prospects and risks, and discusses their implications for monetary policy and the broader macroeconomic policy mix.

The following takeaways are revealed by the analysis in this chapter. First, some of the recent surge in inflation in Europe cannot be explained by conventional inflation drivers. Soaring commodity prices, along with other traditional factors, can account for just up to two-thirds of the 2022 inflation surge according to the chapter's empirical analysis. Second, some of the unexplained inflation correlates with indicators of tightness, triggered by the pandemic and intensified by the war, such as rising shortages in input markets; thus, there might be less slack across Europe than suggested by traditional measures, such as output and unemployment gaps. Third, under the October 2022 *World Economic Outlook* projections for commodity prices and economic growth, inflation is expected to fall steadily, but the decline could be slower than previously expected and highly uncertain. Inflation risks are very high and primarily on the upside. If some of these risks materialize, model simulations suggest that central banks may need to

This chapter was prepared by Chikako Baba (co-lead), Philipp Engler, Ting Lan, Svitlana Maslova (co-lead), Jorge Salas, and Magnus Saxegaard under the supervision of Jörg Decressin, Romain Duval, and Petia Topalova. Chun Jin, Claire Li, Sabiha Mohona, and Ben Park provided outstanding research assistance. Agnesa Zalezakova provided administrative support.

[1]See, for example, Celasun and others (2022) for the effect of supply bottlenecks on inflation, and Chapter 1 of this *Regional Economic Outlook* for the war's effect on commodity prices.

tighten monetary policies substantially more than currently projected.

Taken together, the evidence presented in this chapter reinforces the case for continued policy tightening, with central banks standing ready to respond to emerging risks in both directions.

Recent Developments

Inflation has surged across Europe during the past 18 months.[2] Inflation exceeded 5 percent in almost all European economies by late summer 2022, but the size and timing of the acceleration in prices varied widely: headline inflation reached between 20–25 percent in the Baltic countries, triple or quadruple the rate in the lowest-inflation countries in the euro area (Figure 2.1). Much of the rise in inflation can be traced back to soaring energy and food prices and, to a lesser extent, supply bottlenecks. On average, commodity prices contributed about two-thirds of the rise in headline inflation.

The considerable cross-country heterogeneity reflects differences in both food and fuels' weights in consumer price indexes and consumers' exposure to global fuel prices because of cross-country differences in the energy mix, price regulations and policy measures, and exchange rate developments. For instance, the steeper rise in food and energy inflation in emerging Europe and advanced central, eastern, and southeastern Europe economies reflects the larger weight of food in these economies' consumer price index baskets, heavier reliance on oil and gas, and fewer recent measures to suppress energy prices' pass-through to domestic inflation (Box 2.1 discusses inflation drivers in the Western Balkans). Durable goods inflation has also contributed significantly, reflecting supply-demand imbalances, as households channeled much of the pandemic-era demand stimulus toward consumer durables, while supply-side disruptions were exacerbated during the pandemic.

Commodity prices have played an outsize role in the inflation surge in Europe, but inflation pressures have become more broad-based. Domestic services inflation, which is less directly exposed to global commodity prices or exchange rate changes, has also soared. The number of items with price increases exceeding central banks' inflation targets has grown precipitously, accounting for 70–90 percent of the core consumer price index basket across broad country groups by late summer 2022.

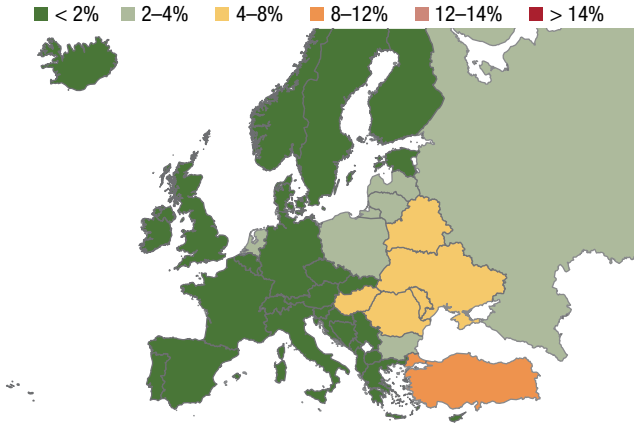
Is the increasingly broad-based nature of inflation indicative of rapidly diminishing slack, growing wage pressures, and rising inflation expectations? In other words, is inflation becoming increasingly entrenched? Recent developments do not provide clear-cut evidence, but risks are mounting. First, domestic slack has decreased rapidly from the pandemic-induced highs, though signals are somewhat mixed across countries. Output-based measures indicate closing gaps across much of Europe, although residual slack persists in some large advanced economies.[3] Likewise, labor markets have become tight in many countries, with unemployment rates below prepandemic lows in two-thirds of economies, job vacancies per unemployed exceeding prepandemic highs in three-quarters of economies, and hours worked almost back to pre-COVID-19 levels by mid-2022. Second and relatedly, wage growth has started to pick up in a number of countries (see also Chapter 2 of the October 2022 *World Economic Outlook*). Negotiated wage increases in the euro area—an indicator based on collectively agreed wages—have generally remained contained but are starting to inch up (Figure 2.2). Finally, medium-term inflation expectations have risen to or above inflation targets, especially among emerging European economies and among households.

[2]The emerging Europe aggregates presented in this chapter typically exclude Russia, Türkiye, and Ukraine, reflecting the much higher inflation rates and more idiosyncratic developments in these economies. The chapter sometimes distinguishes between advanced economies in central, eastern, and southeastern Europe (these include the Czech Republic, Estonia, Latvia, Lithuania, the Slovak Republic, and Slovenia) and the remaining advanced economies to better capture the disparate inflation developments in these two sets of countries.

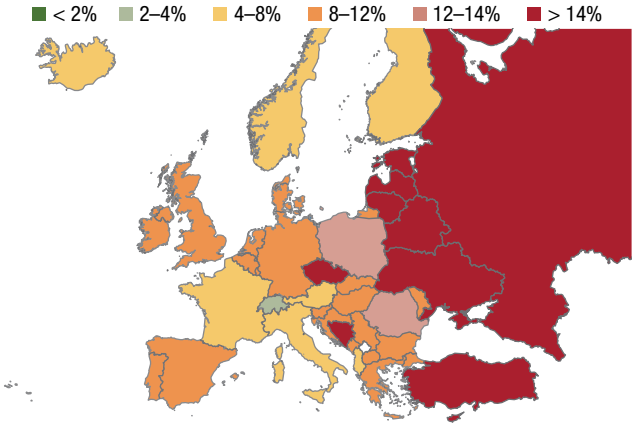
[3]Based on the October 2022 *World Economic Outlook*, two-thirds of advanced and four-fifths of emerging European economies are projected to have positive output gaps in 2022.

Figure 2.1. Inflation Developments

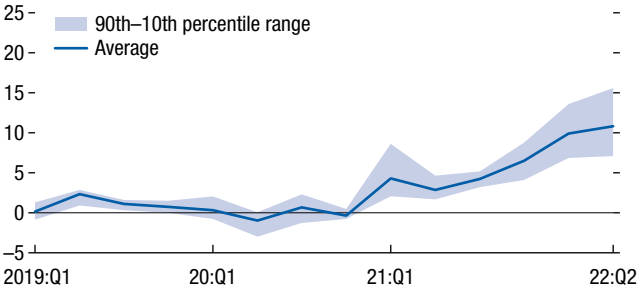
1. Inflation, December 2019
(Percent change, year-over-year)



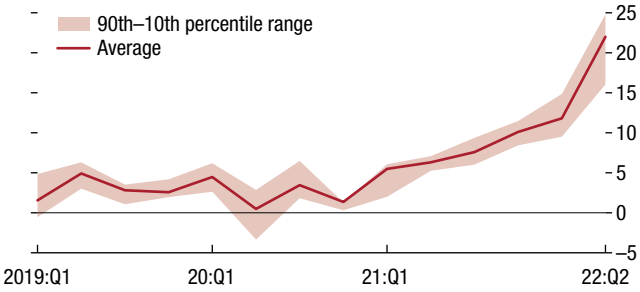
2. Inflation, August 2022
(Percent change, year-over-year)



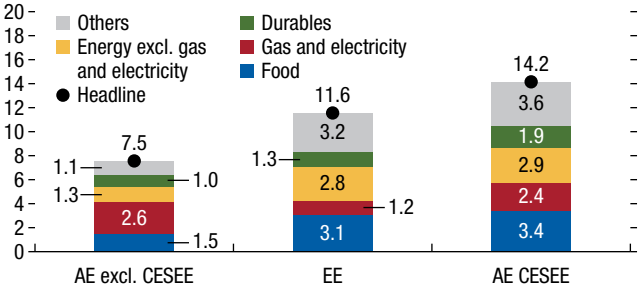
3. Headline Inflation: Advanced Europe
(Percent change, quarter-over-quarter annualized)



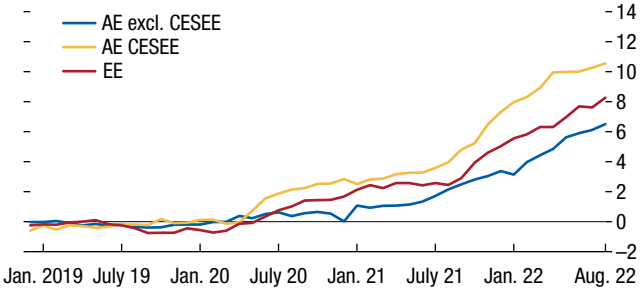
4. Headline Inflation: Emerging Europe
(Percent change, quarter-over-quarter annualized)



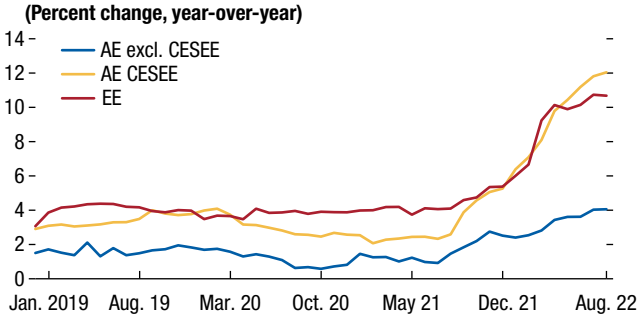
5. Change in Decomposition of Inflation
(Percentage points; December 2019–August 2022)



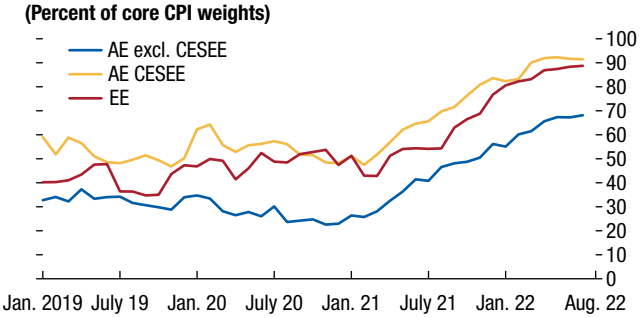
6. Durable Goods Inflation
(Percent change, year-over-year)



7. Services Inflation
(Percent change, year-over-year)

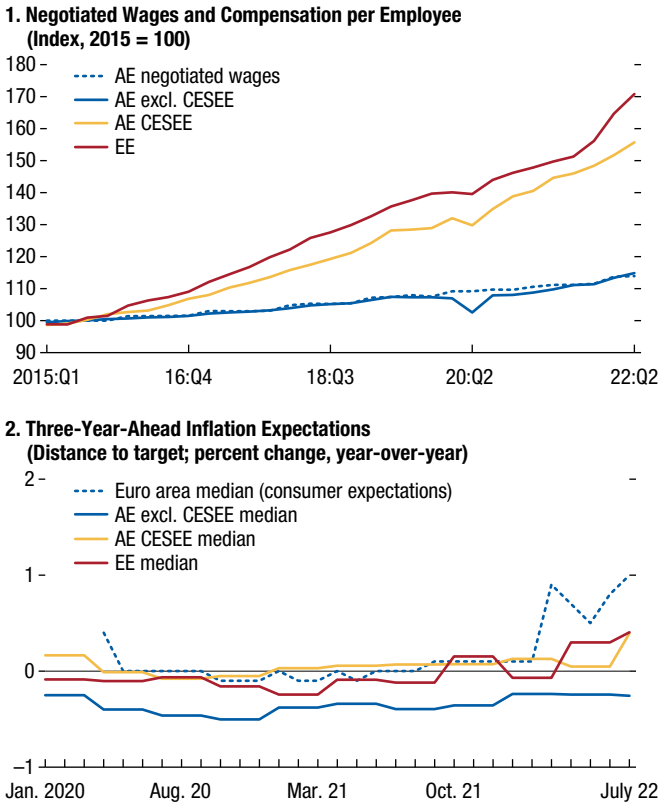


8. Share of Core CPI Basket Items above Inflation Target
(Percent of core CPI weights)



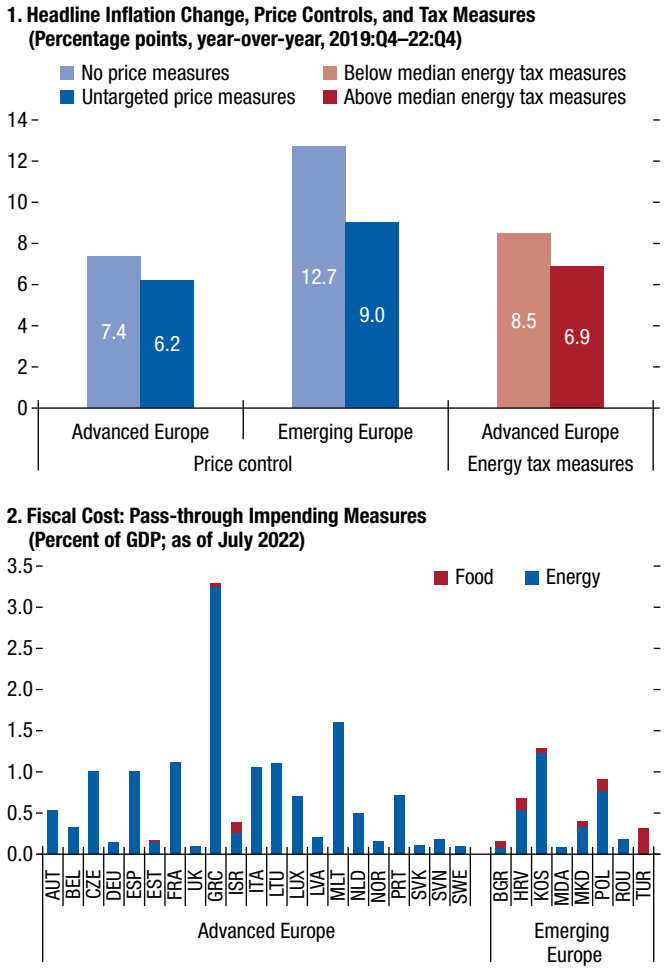
Sources: Eurostat; Haver Analytics; and IMF staff calculations.
Note: Data are weighted by purchasing-power-parity GDP to aggregate across country groups. In panel 8, core CPI baskets exclude all food items and fuels under housing and transport from total CPI baskets. AE = advanced Europe; CESEE = central, eastern, and southeastern Europe; CPI = consumer price index; EE = emerging Europe.

Figure 2.2. Labor Market Pressures and Inflation Expectations



Sources: Consensus Economics; European Central Bank; Haver Analytics; and IMF staff calculations.
Note: AE = advanced Europe; CESEE = central, eastern, and southeastern Europe; EE = emerging Europe.

Figure 2.3. Inflation and Policy Measures



Sources: Haver Analytics; IMF, European Department Desk Survey; and IMF staff calculations.
Note: In panel 1, countries are classified based on whether they have implemented pass-through-suppressing price measures for both households and firms. The impact of energy tax measures is computed following European Central Bank (2021a); countries are classified depending on whether the computed impact in the second quarter of 2022 is above or below the sample median. Country abbreviations are International Organization for Standardization country codes. UK = United Kingdom.

Regulatory, fiscal, and monetary policies also influenced inflation developments. In general, countries where more prices are administered may experience slower changes in inflation if dynamics in administered prices are more muted than the rest of the basket.[4] Furthermore, this time around, specific tax and regulatory measures (such as price caps or freezes) adopted to mitigate rising commodity prices limited the rise in inflation in some countries (such as, for example, France, Malta, and Spain), compared with others where pass-through was larger and quicker, though at sizable fiscal cost (Figure 2.3).

In addition to the factors described above, monetary policy and exchange rate developments also contributed to inflation in several emerging European economies. In Türkiye, for example, the depreciation of the lira amplified the inflationary impact of higher commodity prices and boosted other imported goods and services' inflation.

Inflation Drivers

Looking beyond simple decompositions, a more in-depth understanding of the drivers of the recent inflation surge can be achieved by

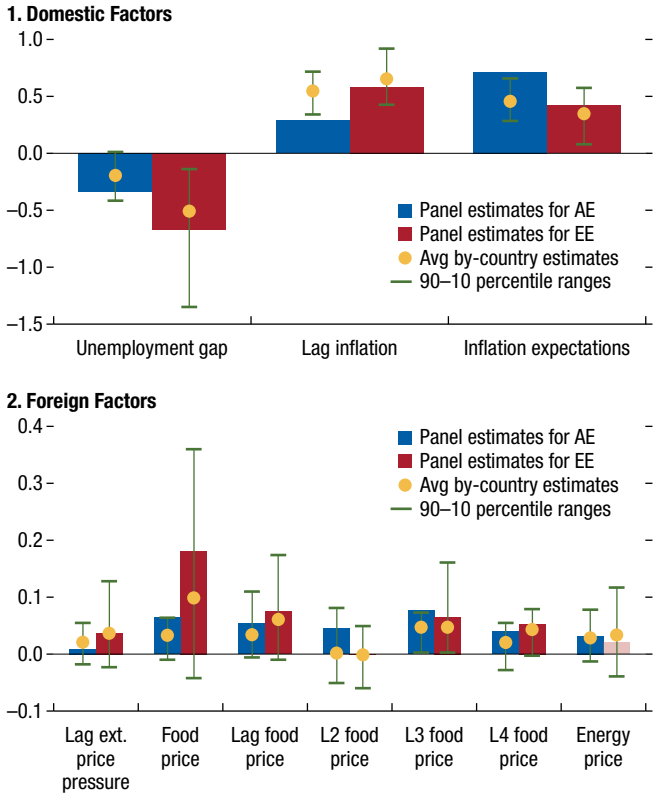
[4]Switzerland is an example of where the large share of administered energy prices has contributed to maintaining one of the lowest inflation rates in 2022.

analyzing the Phillips curve—the workhorse inflation model in the literature, which relates inflation to its past and expected future values, economic slack, and foreign price developments.[5] A Phillips curve is estimated for each of the 24 advanced and 7 emerging European economies with comprehensive available data over 2000:Q1–22:Q2. The resulting estimates are then used to establish (1) how the recent surge in inflation compares with model-predicted values and (2) the contribution of various drivers of the surge—both conventional ones featured in Phillips curves and others that might be more specific to the current inflation episode.

The analysis confirms that both headline and core inflation rates are strongly associated with lower economic slack and higher past and expected future price developments, with noteworthy differences between advanced and emerging European economies (Figure 2.4). In the latter, inflation increases more sharply when labor markets tighten (when unemployment declines), and price setting appears to be less forward looking—consistent with weaker anchoring of inflation expectations historically. Inflation also responds more strongly to foreign price developments (especially global food prices) in emerging European economies than in advanced European economies.[6]

The standard model of inflation, however, can at most account for 60 percent of the recent surge in inflation (Figure 2.5). Using dynamic simulations of the estimated country-specific Phillips curves to compute the contribution of each driver to inflation,[7] the analysis confirms the key role played by foreign (especially commodity) price developments in Europe's inflation surge since 2021. However, the model cannot explain 40 to 50 percent of the rise in inflation in advanced and emerging European economies, as evidenced by the sizable positive residuals—inflation exceeding its model-predicted value—in the second quarter of 2022 (see McGregor and Toscani, forthcoming, for a similar finding for the euro area).[8]

Figure 2.4. Phillips Curve Coefficients for Core Inflation



Sources: Consensus Economics; Haver Analytics; IMF, World Economic Outlook database; and IMF staff calculations.
Note: The bars in the panels display panel regression coefficient estimates. The green line denotes the 90–10 percentile, and the yellow dot is the average of country-level estimates. Panel coefficient estimates, statistically significant at the 10 percent level, are in solid color. AE = advanced Europe; EE = emerging Europe.

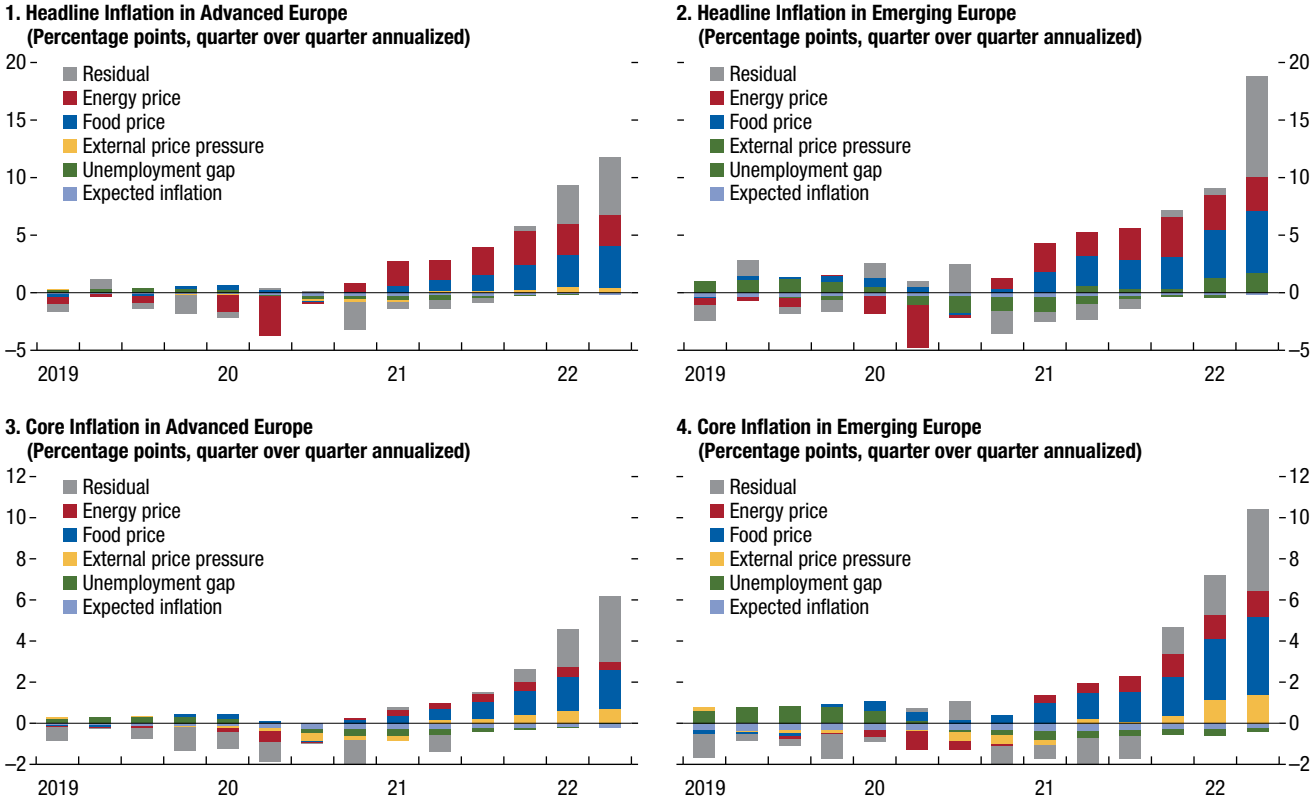
[5]In line with past studies (see, among others, Chapter 2 of the October 2021 *World Economic Outlook*), the model specification includes unemployment gap as measure of economic slack, lagged inflation, three-year-ahead inflation expectations of professional forecasters, a lagged proxy of external price pressures embedding foreign producer price indices and exchange rates, and global energy and food prices (in domestic currency) interacted with the shares of these items in domestic consumer price index baskets. For further details, see the Online Annex.

[6]While producer prices embedded in external price pressures are likely affected by commodity prices, food and energy prices by themselves are also found to be statistically significant drivers of inflation. This may reflect indirect impacts of commodity prices on core inflation through higher domestic production costs.

[7]For the few countries without inflation targets, the analysis assumes a 3 percent target. The findings are robust to alternative assumptions, such as using moving averages of 10-year-ahead inflation expectations.

[8]The unexplained residuals in 2022 are also larger when using Phillips curves estimated only on pre-COVID-19 data, rather than on the full available sample period. This is suggestive of changes in the relationship between inflation and some of its drivers during the post-COVID-19 period.

Figure 2.5. Implied Contributions of Domestic and Global Factors to Inflation Dynamics



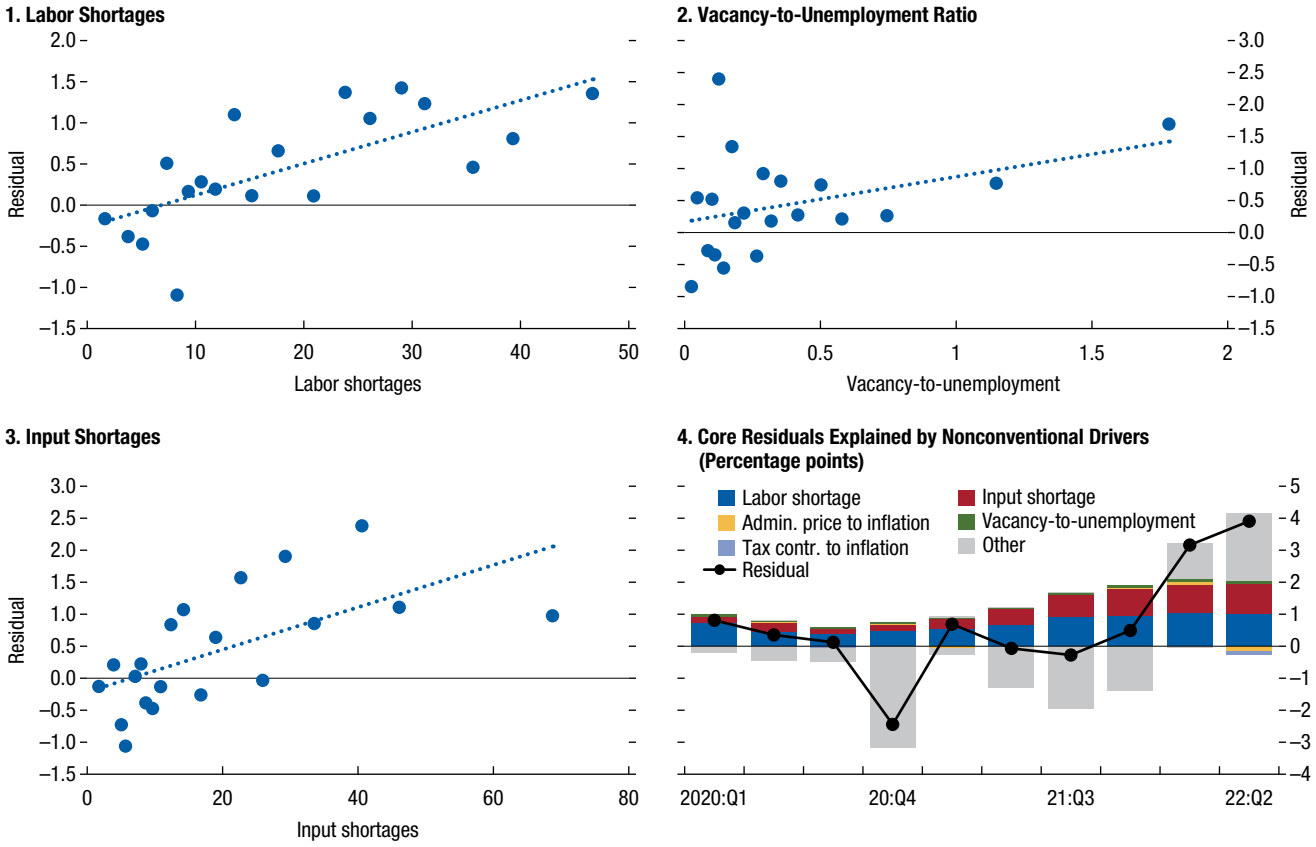
Sources: Consensus Economics; Haver Analytics; IMF, World Economic Outlook database; and IMF staff calculations.
Note: The bars in the panels represent the simple average contribution of each factor across advanced and emerging market economies in Europe. Contributions are calculated based on the dynamic simulations of country-by-country Phillips curve regressions.

Several factors may account for the rise in unexplained inflation. First, Europe has been hit by two tail-risk events: the pandemic and Russia's war in Ukraine. These shocks may have altered the structural relationships underpinning the inflation process, which the analysis estimates using historical data (Gopinath 2022).

For example, there is suggestive evidence from this chapter's analysis that core inflation has become more backward-looking, and the pass-through of global commodity prices to domestic inflation has increased postpandemic (see the Online Annex; Amiti and others 2022; Bank for International Settlements 2022).[9] Second, even without structural shifts, commonly used indicators may fail to capture inflation's drivers properly. Unemployment gaps may be poor proxies for economic slack since the pandemic because of the widespread use of short-term work programs in Europe and structural labor market changes (for example, shifts in workers' preferences and declines in labor supply because of the pandemic, and demographic headwinds; Duval and others 2022; McGregor and Toscani, forthcoming). High vacancy-to-unemployment ratios—that partly reflect large numbers of unfilled job vacancies—suggest that European labor markets may be tighter than unemployment alone suggests. Beyond labor shortages, unprecedented supply bottlenecks that are also captured poorly in the conventional Phillips curve model—and reflect a host of factors, including the reallocation of demand away from services toward goods during COVID-19 and the speed of the global recovery driven in part by the exceptional policy support—have contributed greatly to recent price pressures (Celasun and others 2022; Gopinath 2022).

[9]The increased pass-through from commodity prices to domestic inflation could reflect the very large and persistent energy price shocks, which firms may be unable to absorb through lower profits.

Figure 2.6. Phillips Curve Residuals for Core Inflation and Nonconventional Drivers



Sources: Eurostat; Haver Analytics; and IMF staff calculations.
Note: Panels 1–3 display the binned scatter plots between the Phillips curve residuals for core inflation and nonconventional factors. Input and labor shortages are measured as the shares of firms reporting shortages of intermediate inputs and labor, respectively, as a factor limiting production. The bars in panel 4 decompose the Phillips curve residuals into contributions of nonconventional factors, based on the correlation between the latter and the residuals.

Other relevant factors for which the estimated model does not account include discretionary policies, such as temporary tax changes (for instance, Germany's value-added tax cut that reduced inflation in the second half of 2020) and price-suppressing measures in response to higher global food and energy prices (Ari and others 2022), although these have tended to contain the inflation rise instead of amplifying it. All countries in Europe were affected by these factors in some way, as reflected in the consistently positive Phillips curve residuals in the last few quarters, but the extent varied across countries, accounting for some of the cross-country heterogeneity in unexplained inflation.

Suggestive analysis indicates that rising input shortages explain in part the large Phillips curve residuals, indicating that there may be less economic slack across Europe than thought previously.[10] Regressing the residuals on variables outside of the Phillips curve model uncovers strong correlations with (1) alternative measures of labor market tightness, such as the vacancy-to-unemployment ratio or the share of firms reporting labor shortages as a factor limiting production[11]; and (2) supply bottlenecks, measured by the share of firms reporting shortages of intermediate inputs as a factor limiting production (Figure 2.6).

[10]These variables could not be included in the regressions because of lack of comprehensive cross-country time series coverage.

[11]See also Duval and others (2022) for the United Kingdom and the United States. Ball, Leigh, and Mishra (2022) present evidence on the role of unemployment-to-vacancy ratios in explaining post-pandemic inflation in the United States.

Input shortages appear to account for a sizable portion of the unexplained inflation in 2022. As a purely illustrative exercise, the estimated correlations are used to decompose the Phillips curve residuals in recent quarters into the contributions of each factor. This analysis suggests that input and, to a smaller extent, labor shortages have exerted significant upward pressure on prices in the post-COVID-19 period.

Specifically, the widespread reported input and labor shortages and high vacancy-to-unemployment ratios in the first half of 2022 might have raised core inflation by about 1.5 percent on average in Europe, or about three-fourths of the 2 percent estimated residual.

These suggestive findings imply that beyond the predominant role of commodity prices, the recent surge in inflation in Europe is also at least partly driven by labor market tightness, while supply shortages have played an even larger role than captured by foreign price and commodity price variables included in the Phillips curves.

Future Path and Risks

How is inflation likely to evolve over the coming year, and what are the key risks around its likely path? Under the October 2022 *World Economic Outlook* forecasts for global commodity prices, growth, and unemployment, and assuming stable inflation expectations, the empirical model would predict average inflation to decline gradually to 3–6 percent (headline) and 3–7 percent (core) in both advanced and emerging European economies by the end of 2023 (Figure 2.7).

In emerging European economies, despite starting from higher levels and being generally more persistent, inflation would fall more rapidly than in advanced economies because commodity price stabilization would entail larger disinflation gains. Such gains will be more muted, all else equal, in countries where measures that dampened commodity pass-through are gradually phased out. These Phillips curve–based forecasts assume that the model's large underestimation of recent inflation vanishes quickly.

A more conservative approach, which assumes a slower reduction in recent inflation forecast errors, predicts a slower return to lower inflation rates.[12] Overall, this analysis suggests that risks around IMF *World Economic Outlook* inflation forecasts—which embed a lower degree of persistence of inflation than implied by the Phillips curves of this chapter—are tilted to the upside.

Uncertainty around inflation forecasts is unusually large. Recent supply shocks could persist if bottlenecks and commodity prices ease more slowly than projected, especially as the war in Ukraine drags on. Alternatively, commodity prices could slide if the global economy slows further. Another source of uncertainty relates to domestic slack—tight labor markets suggest that it may have been overestimated, but a sharper growth slowdown and, in some (central, eastern, and southeastern European) economies, the successful labor market integration of Ukrainian refugees would increase it. Finally, continued inflation surprises may de-anchor inflation expectations or prompt workers to demand and obtain compensation for high inflation in the form of higher wages (or both), potentially triggering wage-price feedback loops and thereby making the overall inflation process more backward-looking.

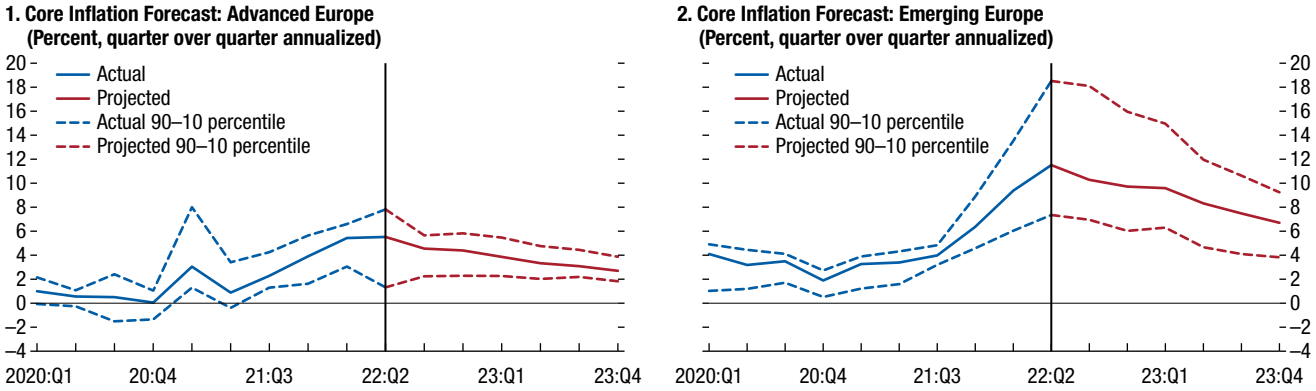
Several simple scenarios are simulated to illustrate these risks (Table 2.1),[13] confirming the wide range of possible inflation paths and the predominance of upside risks (Figure 2.8). Renewed commodity price shocks and smaller-than-estimated slack could easily delay the return of inflation to target—more so in emerging European economies, reflecting higher spending on commodities, greater pass-through of global price shocks to domestic inflation, and steeper Phillips curves than in advanced economies. A de-anchoring of inflation expectations would also feed into higher inflation.

[12]The conservative approach assumes that the average of the estimated 2022 residuals declines gradually using a first-order autoregressive process with autocorrelation coefficient of 0.6.

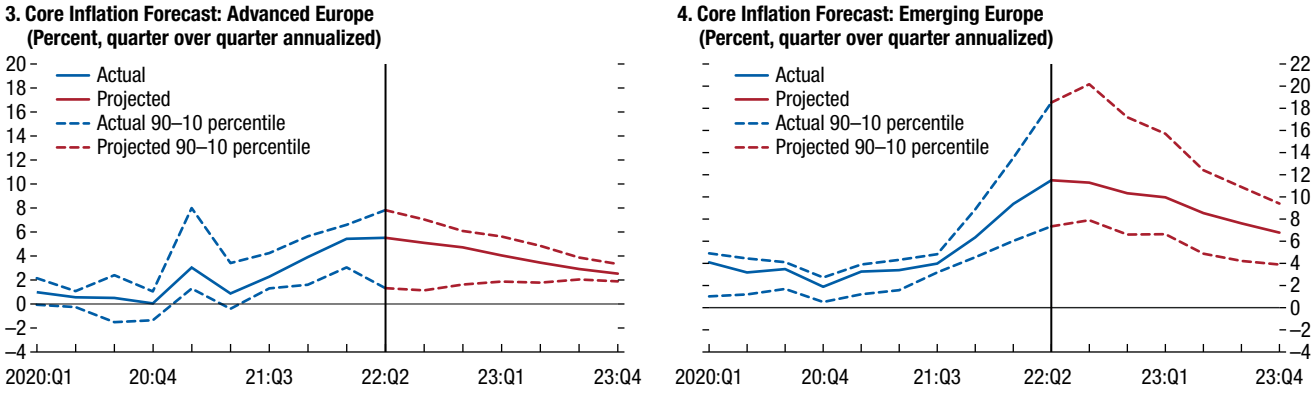
[13]The shocks discussed in the scenarios should be viewed as purely illustrative. Quantifying the probability distribution of these shocks and therefore their relative importance for the inflation outlook and risks is beyond the scope of the chapter.

Figure 2.7. Phillips Curve–Based Inflation Forecasts

Optimistic Forecast: Assume No Forecast Errors Starting in 2022:Q3



Conservative Forecast: Gradually Decaying Residuals Starting in 2022:Q3



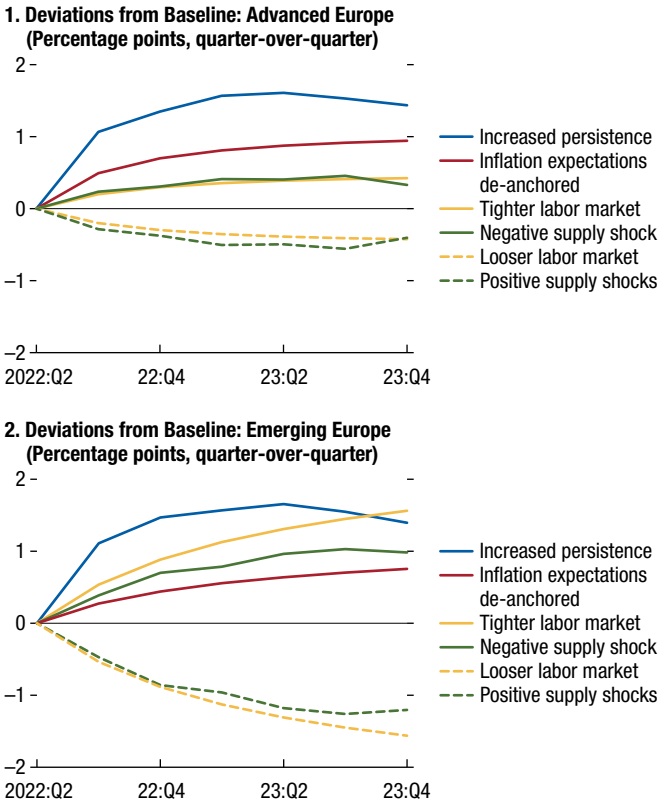
Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: The solid blue (red) lines denote the purchasing-power-parity GDP-weighted average of observed (forecast) core inflation across 21 advanced and 5 emerging market economies in Europe. The dashed lines denote the observed (forecast) of the 10th and 90th percentiles of core inflation in each country income group. Emerging market economies include Bulgaria, Croatia, Hungary, Poland, and Romania.

Table 2.1. Illustrative Inflation Risk Scenarios

	Shocks	Phillips Curve Simulations	DSGE Model Simulations
0	Baseline (*World Economic Outlook*)	October *World Economic Outlook* assumptions (energy inflation 79.6 percent in 2022, 2.9 percent in 2023; food inflation 14.2 percent in 2022, –5.8 percent in 2023)	Cost shock raises inflation to *World Economic Outlook* baseline in the second quarter of 2022
1	Negative Supply Shocks	20 percent rise in energy and food prices	Additional inflationary cost shock matching initial shock in Phillips curve simulation
2	Positive Supply Shocks	20 percent fall in energy and food prices	Additional deflationary cost shock matching initial shock in Phillips curve simulation
3	Less Slack than Estimated	2 percentage points lower unemployment gap	2 percentage points lower output gap than assumed by the central bank in its monetary policy rule
4	More Slack than Estimated	2 percentage points higher unemployment gap	2 percentage points higher output gap than assumed by the central bank in its monetary policy rule
5	De-anchoring	1 percentage point higher expected inflation	Sudden rise in expectations increases inflation in the first period by 1 percentage point
6	More Backward-Looking Price Formation Process	Rise in the coefficient on lagged inflation to 0.8 (about its pre-1990s value)	Rise in the coefficient on lagged inflation to 0.8

Sources: IMF World Economic Outlook database; and IMF staff.
Note: DSGE = dynamic stochastic general equilibrium. All shocks persist throughout the simulation periods of six quarters in the Phillips curve simulation exercise.

Figure 2.8. Phillips Curve Simulations: Core Inflation



Sources: Consensus Economics; IMF, World Economic Outlook database; and IMF staff calculations.
Note: The lines show the purchasing-power-parity GDP-weighted average of core inflation paths (in deviation from baseline) under alternative scenarios as described in Table 2.1.

Finally, core inflation could be significantly higher than the baseline forecast if price setting becomes as backward-looking as it was before the 1990s, as may happen, for example, if workers bargain over wages considering recent rather than expected future inflation, and firms pass on higher input costs (including wage bills) to their prices.

The simulations suggest that the most challenging scenario, especially in advanced economies, would be a more backward-looking price formation process, which could be triggered by a wage-price spiral. Some pick-up in wage growth is to be expected; to keep the labor income share stable, for example, wages should grow in line with the sum of the GDP deflator and trend labor productivity growth rates. However, a much steeper acceleration in wages could trigger adverse wage-price feedback loops that would lead to monetary policy tightening and higher unemployment. Such risk could materialize if commodity-driven changes in prices seep into wages, and higher wages then feed back into inflation. Two complementary empirical exercises shed light on factors that have affected the likelihood of this risk in the past. First, the chapter examines the transmission of exogenous price changes onto wages, and then it examines the propagation of wages to prices (Figure 2.9).

The first exercise, based on Baba and Lee (2022), analyzes the response of wages to inflation triggered by oil prices shocks.[14] Two main factors are found to increase the pass-through from price shocks to wages: high prevailing inflation and weak central bank independence, which is linked to weak monetary policy credibility more broadly. When prevailing inflation is already high—as it is right now—an oil-induced increase in prices leads to a larger and more long-lasting increase in wages. Likewise, the wage response to price shocks is much larger and more persistent when monetary policy lacks credibility and thereby the ability to keep inflation expectations anchored.

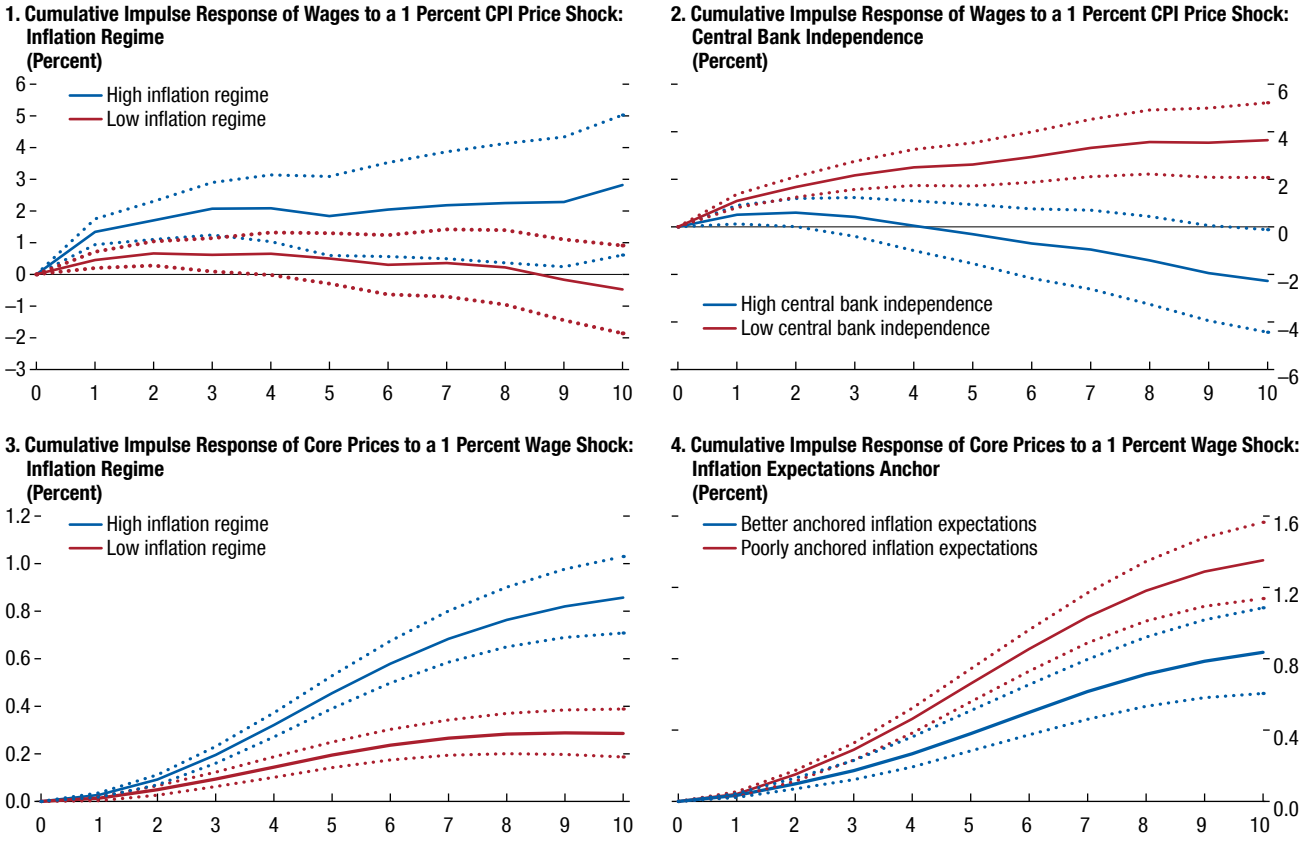
The second exercise, based on IMF estimates in the November 2019 *Regional Economic Outlook: Europe*, examines the response of prices to wages.[15] That pass-through is also found to be larger when prevailing inflation is high—it is three times larger in a high-inflation environment than in a low-inflation one. The pass-through from wages to prices is also stronger when inflation expectations are not well anchored, again underscoring that monetary policy credibility has a role to play in containing wage-price spiral risks.

Together, these findings suggest that the risks of a wage-price spiral are more pronounced when inflation is already high and where monetary policy is not deemed credible. High inflation

[14]The pass-through of price shocks to wages is estimated using the local projection method, with global oil price changes as an instrument for consumer price changes in a sample of European economies over the first quarter of 2000 through the fourth quarter of 2019. See Baba and Lee (2022) for details.

[15]The pass-through of wages to prices is estimated using an interacted panel vector autoregression model in a sample of European economies over the period from the first quarter of 1995 through the first quarter of 2019. See Boranova and others (2021) for details.

Figure 2.9. Wage Price Spiral Risks
(Percent)



Sources: Baba and Lee 2022; Boranova and others 2021; and IMF staff estimates.
Note: Panels 1 and 2 reflect estimates for a sample of 39 European countries over 2000:Q1–19:Q4, obtained from the approach in Baba and Lee (2022). Panels 3 and 4 reflect estimates for a sample of 27 European countries over 1995:Q1–2019:Q1, obtained from the approach in Boranova and others (2021). CPI = consumer price index.

could be conducive to second-round effects on wages, which subsequently would increase inflation persistence and reduce the role of medium-term inflation expectations in price formation.

What do these findings mean for the inflation outlook? The evidence presented indicates that the multidecade high levels of inflation recorded in much of Europe in the past 18 months clearly increase the risk of inflation becoming entrenched. Moreover, there are tentative signs that inflation has become more backward-looking in the post-COVID-19 period.

However, the prevalence of formal wage indexation to past inflation has fallen across Europe in recent decades, lowering risks of wage-price spirals. Wage growth has been relatively contained in most advanced European economies so far, and there was limited evidence of acceleration in negotiated wages until late summer.[16]

According to recent European Central Bank analyses, more than half of private sector employees in the euro area do not take inflation into account when setting wages and, where inflation plays a formal role in wage negotiations,

[16]Notwithstanding, close monitoring of wage developments is warranted given early signs of building pressures from ongoing wage negotiations, minimum and public sector wage increases, and the reintroduction of inflation-indexation clauses in some wage agreements (such as in Spain). In some emerging European countries, the large recent increases in public sector wages might spill over to private wage negotiations.

forward-looking inflation measures are used predominantly (European Central Bank 2021b, p. 63, Box 7). Likewise, in the public sector, only about one-fifth of the euro area public wage bill has full or partial price indexation (European Central Bank 2022, p. 68, Box 8). Overall, while risks of wage-price spirals have increased and would rise further if high inflation were to persist, they remain contained so far, at least in advanced European economies, as also discussed in Chapter 2 of the October 2022 *World Economic Outlook*.

Policies

Given these inflation prospects and risks, how should policies be set, and what would be their implications for inflation and growth? This section uses a small dynamic stochastic general equilibrium model to examine monetary policy responses and implied inflation and GDP growth paths under the risk scenarios discussed, distinguishing between advanced and emerging European economies. It then discusses the role that fiscal and other policies may also play in containing inflation pressures.

Monetary Policy

A dynamic stochastic general equilibrium model, calibrated to an average advanced and an emerging European economy, respectively (including average Phillips curve characteristics within each country income group), illustrates the wide range of possible policy rate paths over the coming quarters, given very high uncertainty. The baseline scenario replicates inflation and output dynamics observed in the first half of 2022 using a "cost-push shock" related to commodity price inflation.[17] Risk scenarios that are analogous to those considered in the previous section (Table 2.1) are then simulated over and above the baseline cost-push shock.

Simulations suggest that if some of the upside inflation risks materialized, monetary policies could easily need to be tightened by more than 200 basis points more than under the baseline, reducing GDP growth in the year ahead by up to 2 percentage points in some cases (Figure 2.10). These broad conclusions would apply differently across advanced and emerging European economies, depending on the nature of the shock. They would also differ across individual countries within each income group, depending on cyclical and structural specifics not captured in simulations run for an average country, such as the starting level of inflation, its persistence, its responsiveness to slack, and the degree of anchoring of inflation expectations, among others.

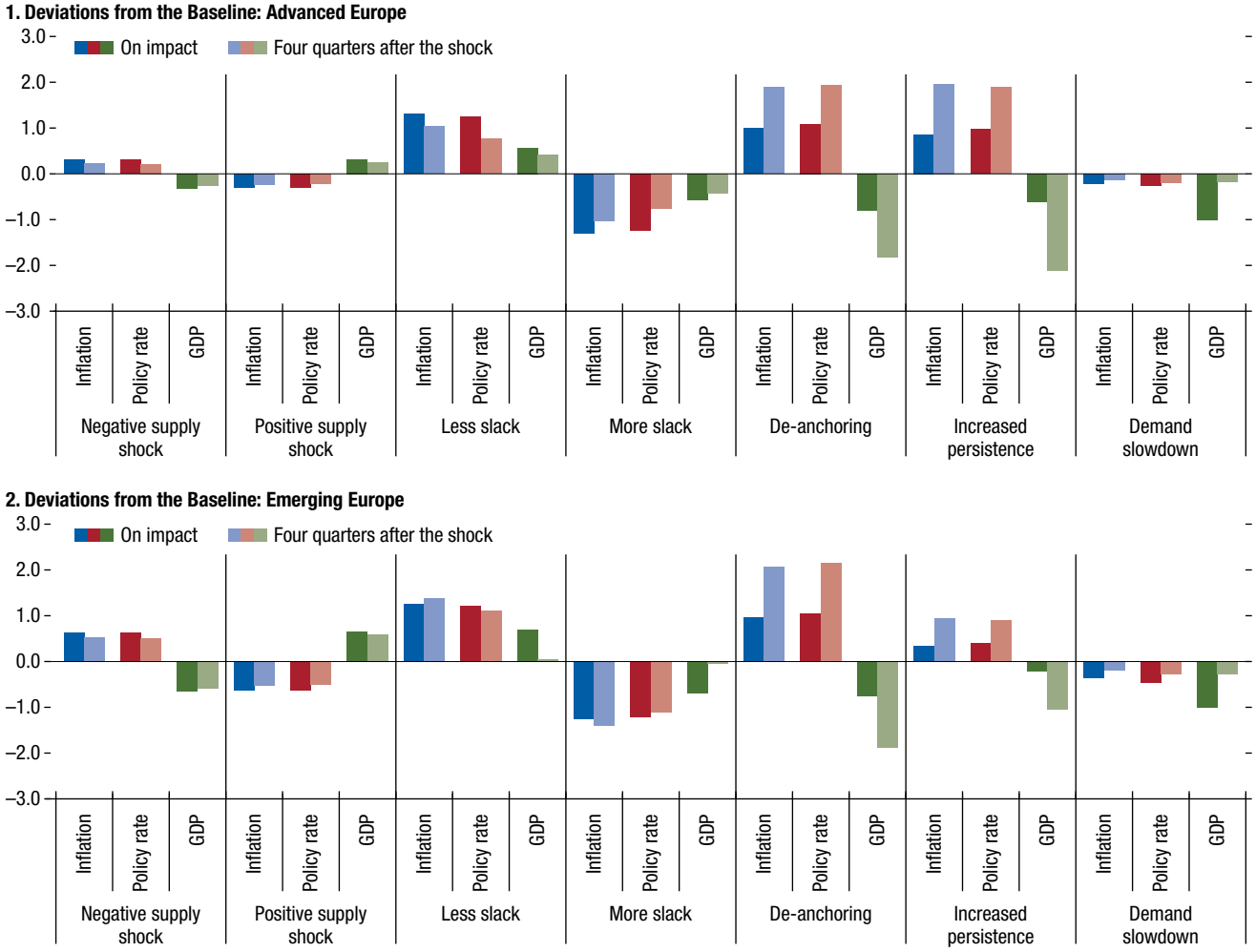
A further commodity-driven cost shock would lead to another round of higher inflation, tighter monetary policy, and lower output everywhere but particularly in emerging Europe because of its larger share of food and energy in consumption baskets and the larger role of past inflation in inflation expectation formation. The deeper economic downturn in emerging European economies would reflect the sharper required monetary policy tightening, despite steeper Phillips curves than in advanced economies.

A de-anchoring of inflation expectations would have even larger effects because it is typically difficult to reverse, exerting upward inflation pressure for a long time. Emerging European economies would be hit particularly hard because the persistent shock to forward-looking inflation expectations would be continuously reinforced by the stronger backward-looking component of price setting, causing a larger and more persistent increase in inflation than in advanced economies.[18] Such a scenario would be more likely to materialize if inflation rates exceeded targets for a prolonged period, as this could erode central

[17]The framework is based on Galí and Monacelli's (2005) model of small open economies. See the Online Annex for the baseline calibration and more details of the simulations. The calibration reflects the parameters estimated in the previous sections: a steeper Phillips curve, more backward-looking inflation, and a bigger cost-push (because of the larger share of commodities in consumer price index baskets and larger pass-through) in emerging Europe compared with advanced Europe.

[18]The stronger persistence of a de-anchoring scenario in emerging European economies becomes pronounced in later periods that are not shown in Figure 2.10.

Figure 2.10. Model Simulation Results under Alternative Illustrative Scenarios
(Percentage points)



Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: The dark blue bars display deviations from baseline of core inflation right after the shocks, and light blue bars display deviations four quarters after the shocks for a typical advanced economy (panel 1) and emerging economy (panel 2). The dark and light red (green) bars show deviations from baseline of the policy rate (GDP) right after the shocks and four quarters after the shock, respectively.

banks' credibility and raise inflation expectations and inflation toward persistently elevated levels. Central banks would then be forced to tighten their stance and depress economic activity for as long as inflation expectations remain elevated.

The realization by central banks that there is less (or more) economic slack than previously anticipated would also require adjusting policy rates (upward or downward) compared to their expected paths.[19] Until central banks correct their stance, monetary policy would be undesirably expansionary (contractionary) causing considerably more (less) inflation than desirable from their perspective. This holds especially for emerging European economies, as steeper Phillips curves and more backward-looking price setting exacerbate the inflationary impact of monetary policy mistakes.

An increase in the extent to which price formation is backward-looking—as a result of a wage-price

[19]In this scenario, central banks overestimate (underestimate) the size of the output gap for six quarters by 2 percentage points, reflecting a misjudgment of aggregate demand.

spiral, for example—would drive up inflation similar to a cost shock but much more strongly and in a more long-lasting manner because of its broad-based nature. Persistently elevated inflation would depress real wages and could trigger higher wage demands. Rising real wages would subsequently increase firms' costs and could induce higher inflation. Inflation expectations that turn more backward-looking allow past inflation hikes to exert continuing inflation pressure, even after the original shock has faded. Advanced economies may be at greater risk of such an increase in the "backward-lookingness" of price formation because their inflation expectations are currently more forward-looking than those in emerging European economies, leaving more scope for deterioration—in other words, their central banks have more hard-won credibility to lose.[20] Similar to the cost-push shock scenario, central banks would need to tighten monetary policy to contain inflation, but more and more persistent tightening would be needed to cope with a more persistent rise in inflation.

Finally, a contraction in aggregate demand would exacerbate the decline in output but ease inflation pressures. Emerging European economies would see inflation drop by more than advanced economies because of their steeper Phillips curves.[21]

These illustrative scenarios suggest that central banks should keep raising policy rates under most scenarios while remaining nimble and ready to respond to emerging risks in both directions, with greater chances that policy rate paths may ultimately need to be steeper instead of flatter than expected. In any case, maintaining central bank independence, effective communication, and transparency will be key to preserving hard-won credibility and prevent the unmooring of inflation expectations. The scenarios also show that the desirable strength and persistence of the monetary policy reaction depend on the risk and vary across economies. For example, emerging European economies would need to react more strongly to a de-anchoring of inflation expectations.

Fiscal and Other Policies

Although monetary policy is the main tool to lower inflation, fiscal policy should not complicate its action. As discussed in Chapter 1 of this *Regional Economic Outlook*, fiscal consolidation should proceed under the baseline IMF projections—even if its pace may be temporarily slowed—to avoid boosting aggregate demand and making it harder for monetary policy to tame inflation.

The more temporary and targeted the relief measures for energy (and food) price shocks are, the less they will conflict with the monetary policy stance. So far, Europe's policymakers have responded to the commodity crisis with a wide range of mostly broad-based, price-suppressing measures, including subsidies (for example, the Czech Republic, France, Greece, Lithuania, Poland, and Romania), tax cuts (most countries), and price controls.[22] Some of these measures are intended to contain current inflationary pressures, with the hope of moderating wage claims and preventing price-wage feedback loops. The fiscal cost of these measures, however, especially those targeting energy prices, has been sizable. It is estimated to reach about 0.6 and 0.5 percent of GDP on average in advanced and emerging European economies, respectively, by mid-2022, exceeding 1.5 percent of GDP in countries such as Greece and Malta. The extraordinary magnitude and partly temporary nature of the energy price increase caution against a full immediate pass-

[20]The simulation assumes that advanced and emerging European economies converge to the same level of backward-looking inflation expectations.

[21]For the demand slowdown scenario, the inflation reaction is shown for the quarter after the shock rather than on impact. With flexible exchange rates, a contractionary demand shock triggers a depreciation of the exchange rate on impact, which offsets its direct deflationary effect. The following appreciation allows consumer prices to decline.

[22]When it comes to food, emerging European economies have been much more likely than advanced ones to resort to such measures, given the larger weight of food in their consumption baskets. About 70 percent of emerging European economies used such measures for food, including tax cuts for food items (for example, Bulgaria, Croatia, North Macedonia, Poland, and Türkiye) and subsidies to farmers (for example, Kosovo and North Macedonia), compared with 12 percent of advanced economies.

through to end users. However, support measures should remain as temporary and targeted as possible and be designed in the most efficient way possible, with the goal of preserving price signals and encouraging energy savings.

Other policies could also be useful. Where collective bargaining agreements have a wage indexation clause, the authorities could intervene to moderate negotiated wages in the medium term in exchange for one-time wage bonuses rather than outright wage increases. Structural reforms that enhance productivity and investments that expand economic capacity and relieve supply constraints, notably in energy and labor markets, could also support monetary policy in the fight against inflation.

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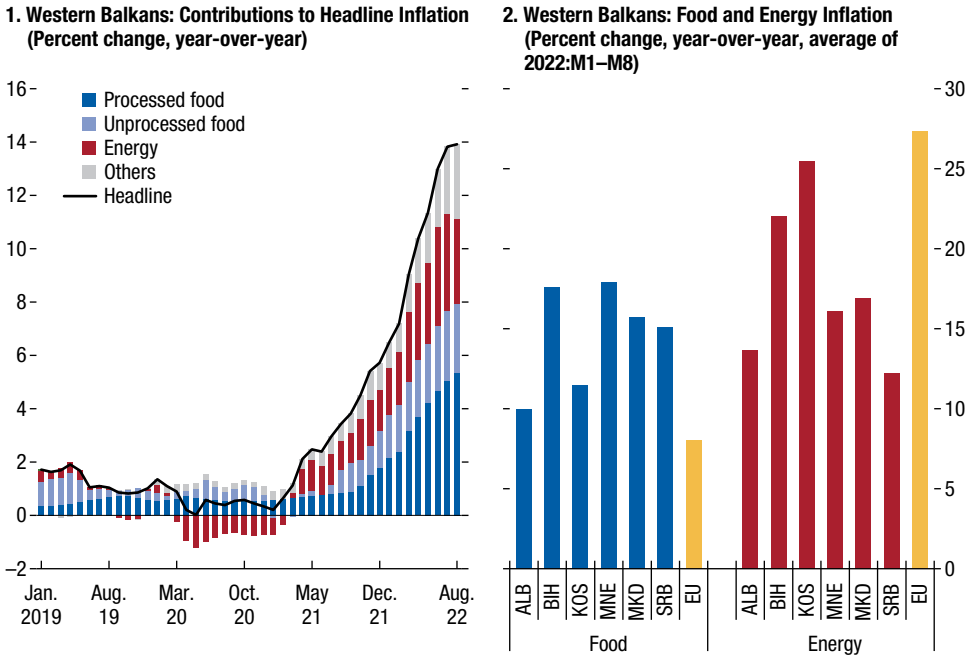
Box 2.1. Inflation Dynamics in the Western Balkans

Inflation was in double digits in the summer of 2022 in all Western Balkan countries except for Albania, where it was at a two-decade high. Food has been the dominant driver for two reasons (Box Figure 2.1.1): Domestic food prices have increased more in the Western Balkans than in the European Union (EU) because of a high pass-through from global food prices, and food makes about 40 percent of the average consumption basket in the Western Balkans—twice the EU average. By contrast, energy price inflation has been below the EU average, helped by domestic electricity generation (Albania, Bosnia and Herzegovina, Montenegro) and policies that dampened energy price increases at the consumer level. More recently, inflation has become more broad-based, with a rapid rise in core inflation, a build-up of wage pressures (triggered in some cases by minimum wage increases), and growing inflation expectations in some countries.

Box Figure 2.1.1.



Sources: Eurostat; Haver Analytics; national authorities; and IMF staff calculations.
Note: Country abbreviations in panel 2 use International Organization for Standardization (ISO) country codes.

Adapting the Phillips curve model detailed in the chapter to the data availability and country specificities of the Western Balkans uncovers the importance of international factors in domestic price determination (Minasyan and others, forthcoming). International food prices are a strong determinant of headline inflation in the Western Balkans through their impact on domestic unprocessed and processed food prices but also on nonfood inflation. The (nominal effective) exchange rate is found to be another key driver of headline inflation, in line with a large exchange rate pass-through. Furthermore, the analysis confirms the strong persistence of both headline and core inflation, while inflation expectations are also found to be an important determinant of inflation. The latter findings suggest that it could take time for inflation to fall back to its presurge levels, underscore the importance of well-anchored inflation expectations, and support the decision of all Western Balkans central banks with autonomous monetary policy (Albania, North Macedonia, Serbia)

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Box 2.1. Inflation Dynamics in the Western Balkans *(continued)*

to increase key policy rates several times since March. By contrast, measures of slack such as unemployment or output gaps are not found to be statistically significant, likely reflecting data limitations in the presence of high informality.

Rising inflation has prompted governments in the region to take action to dampen its impact on households and firms. Albania, Bosnia and Herzegovina, Kosovo, and Serbia implemented one-off assistance packages, most of which are targeted at vulnerable groups. Albania and Bosnia and Herzegovina also introduced sizable public wage and pension increases. Household electricity tariffs are regulated and have remained unchanged so far in most Western Balkans countries (except for Kosovo and North Macedonia), helping to contain the rise of inflation but at high fiscal costs. Price caps and profit margin limits for critical staple food and fuel items have been introduced in all Western Balkans countries, with limited effectiveness. Some countries have also introduced export bans (North Macedonia, Serbia), which only make the global situations worse, and value-added tax and excise tax cuts (Montenegro, Serbia) on products such as flour, wheat, and sunflower oil, which are not well targeted either and may be difficult to exit in the future.