European Economics Analyst

Euro Area Inflation — A Bumpy Ride Up a Shallow Path (Schnittker)

- Euro area core inflation has fallen by almost a percentage point since the start of the year to an all-time low of 0.2%yoy in September. The data suggest that three-quarters of this decline can be explained by just three subcomponents: travel, hospitality, and clothing/footwear. Slicing the data differently, we find that about a third of the overall decline in core inflation since January can be attributed to Covid restrictions, with a further third owing to the temporary German VAT cut.
- To get a clearer read of the likely path of inflation rates over the next year, we build simple statistical models for each of the 16 high-level subcomponents of Euro area core inflation. Our framework suggests that monthly core inflation will remain subdued for the rest of the year, before picking up in 2021 as the Covid distortions unwind. The inflation path, however, will be bumpy over the next couple of years, as tax changes and base effects will have large effects on the year-over-year inflation rates. We project core inflation to peak at 1.4% in September next year, before falling back to around 1.0% in mid-2022.
- Looking further ahead, we expect inflationary pressures to be driven by three key factors: the amount of slack in the economy, the evolution of inflation expectations, and energy prices. We investigate the sensitivity of inflation to each of these drivers and find a wide range of plausible three-year-ahead core inflation rates from 0.9% to 1.6%. Against this backdrop, we maintain our baseline view that core inflation will reach 1.3% at the end of 2023. We will continue to monitor the evolution of labour market slack as the post-lockdown recovery unfolds, as well as the ECB's Strategy Review given its potential implications for underlying inflation expectations.

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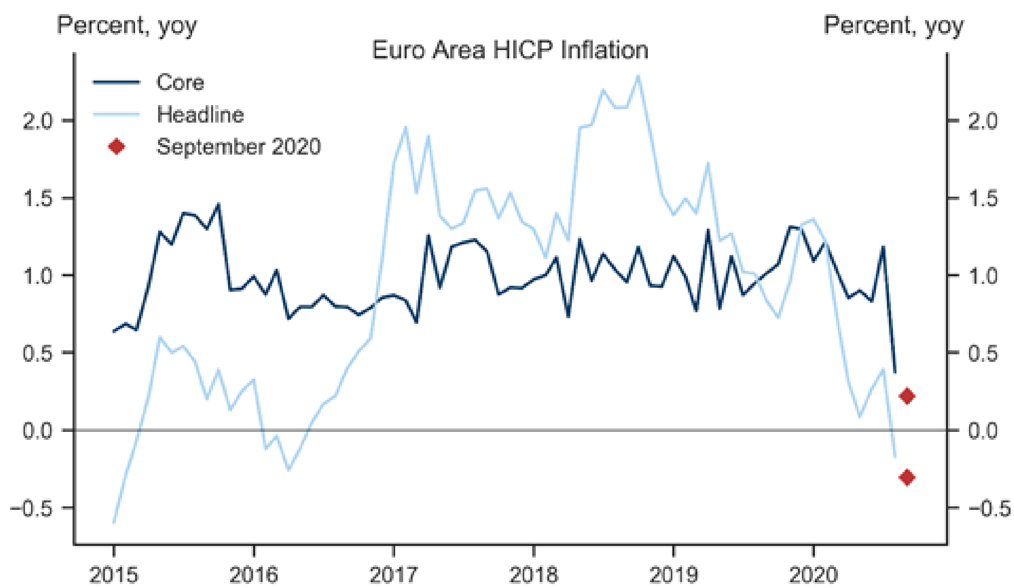
Euro Area Inflation — A Bumpy Ride Up a Shallow Path

Euro area inflation significantly surprised to the downside in September, with Euro area core inflation falling to an all-time low of 0.22% (Exhibit 1).[1] The HICP component breakdown revealed continued sequential weakness, particularly in the hospitality and clothing subcomponents. The key question is whether such low inflation rates are the new normal, or a temporary phenomenon. Given the uncertain outlook for near-term sequential inflation and with multiple tax changes lined up in 2021, in today's *Analyst* we reassess the outlook for Euro area inflation, both in the short term, and in the long term.

Exhibit 1: Core Inflation Reached an All-Time Low in September



Source: Goldman Sachs Global Investment Research, Haver Analytics

The Short-Term Outlook

Euro area year-on-year core inflation has fallen by a full percentage point since the Covid crisis began in February. We start our analysis by dissecting this decline in two ways.

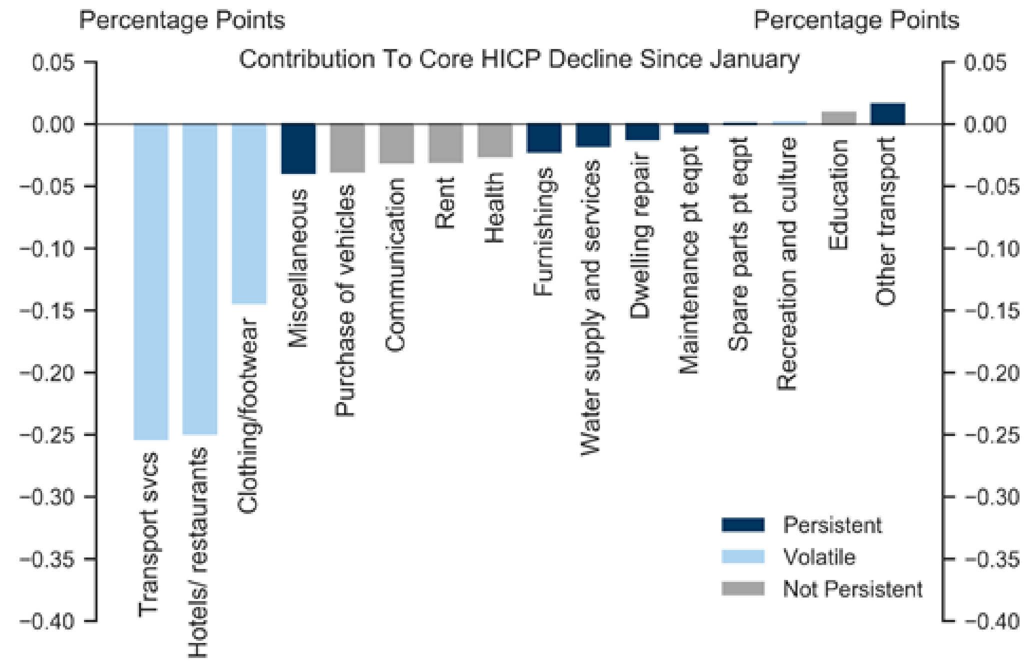
First, about three-quarters of this decline can be explained by just three subcomponents: transport services, hospitality, and clothing and footwear (Exhibit 2). It seems natural to expect the weakness in these subcomponents to continue in the near term, as we are observing a second wave of coronavirus infections, and more stringent containment measures across the Euro area. Looking further ahead into next year, however, the currently subdued inflation rates in these components look to be short-lived: a simple statistical model suggests that sequential inflation rates of these subcomponents are highly volatile and not persistent.[2] Conditional on our forecast of a continued recovery throughout 2021, we therefore expect sequential inflation rates of

[1] Our preferred measure of core inflation is headline inflation excluding energy, food, alcohol and tobacco.

[2] For each subcomponent, we regress month-on-month seasonally adjusted inflation on up to three lags. We only keep lags that are statistically significant at the 5% significance level, and classify a component as persistent (volatile) if the sum of autoregressive terms is greater (less) than zero.

these components to start to pick up in 2021.[3]

Exhibit 2: Much of the Decline Should Unwind As The Economy Recovers



"High Persistence" refers to a cumulative autoregressive coefficient greater than 0, "Not Persistent" to a coefficient equal to 0, while "Volatile" is the remaining categories.

Source: Goldman Sachs Global Investment Research, Haver Analytics

Second, we use our previous estimates to decompose the reduction in core inflation since January into three different buckets (Exhibit 3).[4] Our estimates suggest that about 30bp of the 90bp decline are attributable to components which are particularly sensitive to lockdown measures, such as air travel, and some consumer goods. As we see the likelihood of a future full nationwide lockdown across Euro area economies as relatively low at this point, there should be limited further weakness in these categories beyond the end of 2020. The same is true for the drag caused by the temporary German VAT cut, which came into force in July and will mostly unwind in January 2021.[5] We estimate that this temporary VAT reduction can account for around 30bp of the inflation reduction since January. The remainder of about 30bp can therefore be thought of as weakening of the underlying inflation trend, for which the outlook is more uncertain.

Exhibit 3: Decomposing The Fall Since January

Source: Goldman Sachs Global Investment Research, Haver Analytics

[3] We find that only very few components, e.g., hospitality, are sensitive to the output gap at a monthly frequency. While "output gap sensitivity" is likely a better gauge for a future rebound than purely statistical persistence, we resort to the latter here given the statistical constraints.

[4] This is an indicative decomposition only. While we stripped out the effect of the German VAT cut prior to estimating the impact of "Lockdown Sensitive Components", there is some risk of overlap left if our assumption of a one-third pass-through of the German VAT cut is too low (high). The residual of the decomposition is therefore likely a lower (upper) bound.

[5] In addition to the general temporary VAT cut from 19% to 16% (or 7% to 5% for the reduced rate), Germany cut the VAT rate on restaurant and catering services between 1 July 2020 and 30 June 2021. The rate dropped from the standard VAT rate to the 7% reduced rate (5% for the last six months of 2020 based on the above cut). This temporary cut will continue to the end of June 2021.

To get a clearer read of the likely path of sequential inflation rates over the next year, we build simple statistical models for each of the 16 high-level subcomponents of Euro area core inflation. We regress each of the subcomponents on up to three lags of itself, the current and lagged values of the unemployment gap, and the trade-weighted exchange rate, and retain covariates only if they are statistically significant.[6]

We then use this model to project forward inflation in these subcomponents. In line with the more qualitative evidence presented earlier, the model forecasts further muted sequential growth rates in clothing and footwear, transport services, and the hospitality industry, before a gradual improvement in 2021 (Exhibit 4). This gradual recovery is driven by a mix of "catch-up" inflation in lockdown-sensitive components, mainly services, as well as a rebound in activity in those components that the model identifies as "unemployment gap" sensitive.[7] We also see a re-acceleration in goods inflation, but expect this to be somewhat smaller as the catch-up inflation in services is likely to be more pronounced.

Exhibit 4: Our Component Level Forecast

GS Core HICP Component Forecasts (SA)	Sep 2020	End 2020		Sep 2021	
	YoY	YoY	Contribution to Change	YoY	Contribution to Change
Core HICP	**0.26**	**0.20**	**-0.05**	**1.38**	**1.13**
Core Goods	**-0.22**	**-0.07**	**0.04**	**0.97**	**0.28**
Clothing and footwear	-1.38	-0.03	0.11	2.46	0.32
Furnishings	0.19	-0.36	-0.05	-0.44	-0.05
Purchase of vehicles	0.73	0.33	-0.02	1.14	0.02
Spare parts and accessories for personal transport eqpt	0.54	-0.27	-0.01	-0.36	-0.01
Core Services	**0.15**	**0.04**	**-0.07**	**1.52**	**0.86**
Rent	1.21	1.24	0.00	1.40	0.02
Dwelling repair and maintenance	1.51	1.06	-0.01	0.70	-0.01
Water supply and services	0.84	0.74	0.00	1.61	0.03
Health	0.29	0.34	0.00	1.41	0.08
Maintenance and repair of personal transport eqpt	2.49	2.58	0.00	1.86	-0.02
Other personal transport eqpt services	1.73	1.77	0.00	1.94	0.00
Transport services	-4.39	-4.28	0.00	2.55	0.27
Communication	-2.18	-2.26	0.00	-1.37	0.03
Recreation and culture	0.00	-0.46	-0.06	0.79	0.10
Education	1.14	0.77	-0.01	1.66	0.01
Hotels and restaurants	0.21	0.17	-0.01	2.76	0.36
Other					
Miscellaneous goods and services	1.33	1.16	-0.02	1.22	-0.01

Core Services and Core Goods are not fully comparable to the Eurostat's Goods and Services series, as the granularity of our forecasts does not allow for the same composition. Seasonal adjustment errors mean that there might be small differences in the current year-on-year rate compared with the NSA yoy rate.

Source: Goldman Sachs Global Investment Research, Haver Analytics

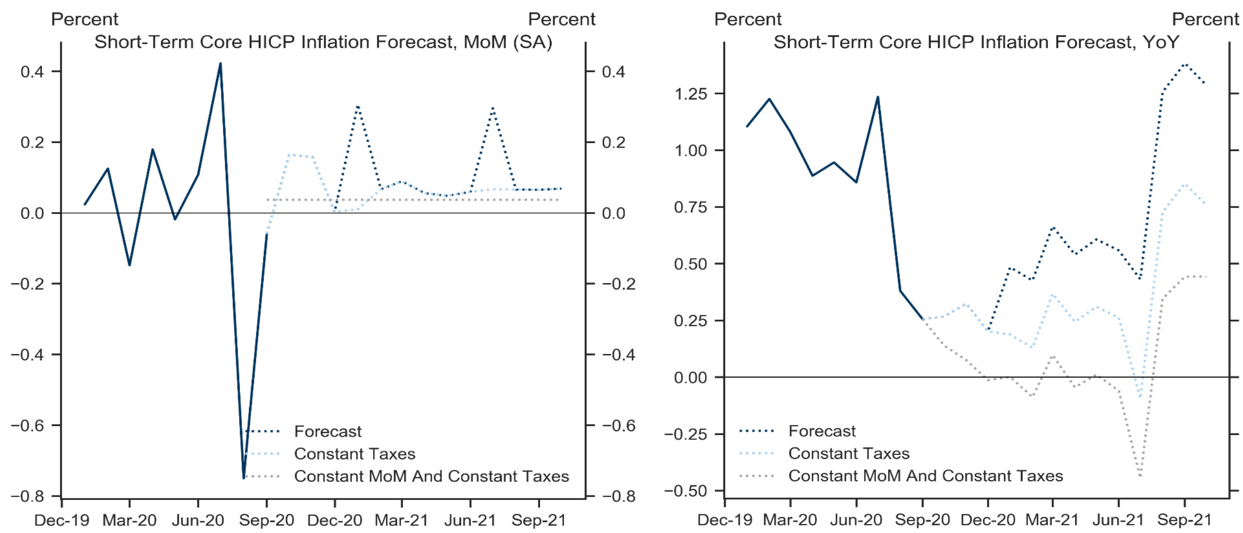
In the final step of our near-term forecast, we use the model projections and overlay our expectations of upcoming tax changes. Exhibit 5 illustrates this process. The grey line

6 The lag structure is determined by statistical significance of the lags (5% significance). The unemployment gap and exchange rate (or lags thereof) are only included if they are a) statistically significant and b) have a positive sign. The models are estimated over the period from January 2007 September 2020.

7 Much of the rebound in this model is driven by mean reversion, which may be a concern. However, our longer-term "Phillips Curve" models show a similar rebound in sequential inflation based on the closing of the output gap, which should alleviate at least some of this concern.

assumes (for simplicity) constant, modestly positive month-on-month growth in inflation going forward, with taxes at their present values. The light blue lines retains the latter assumption, but uses our near-term model projections and thus incorporates a sequential pick-up in core inflation (left panel). Finally, the dark blue line takes this forecast as the baseline and adds one-off changes in sequential growth rates due to tax adjustments. All in all, we expect sequentially higher core inflation together with tax changes to boost Euro area core inflation to around 1.4% in a year's time (right panel).

Exhibit 5: We Expect A Gradual Re-acceleration of Sequential Core Inflation Rates



Source: Goldman Sachs Global Investment Research, Haver Analytics

Taking a Longer View

Next we turn to the medium-term inflation outlook. Here we employ our "Phillips curve" framework to relate core inflation back to economic fundamentals. We regress the quarter-on-quarter annualised core inflation rate on a lag of itself, our estimate of the output gap, inflation expectations as measured by the seven-quarter-ahead Survey of Professional Forecasters, and the difference between energy and core inflation to account for any pass-through from energy prices into core inflation. While our previous work has found that this model performs well in-sample, today we zoom in on each of the three drivers to assess both model and forecast uncertainty.[8]

Slack

Starting with the measure of slack in the economy, we use our standard Phillips curve framework but vary the measure of the output gap to gauge the uncertainty around our forecast. We construct three different forecasts: first, our baseline, which uses our own measure of the output gap. We use our own GDP forecasts and our estimated trend growth rate to project the output gap forward. Second, a forecast based on our own output gap measure, but assuming a permanent supply hit to the level of potential

[8] For more information on this model see for example Christian Schnittker, "Euro Area Inflation – Looking Softer," *European Economics Analyst*, 21 June 2020.

output from the coronacrisis.[9] Third, we use the underemployment gap as a proxy for labour market slack, which we have found works well as a proxy for inflationary pressure.[10] To project the underemployment gap forward, we base the path on estimates from our previous work.

We find that, in our baseline projection, inflation reaches 1.3% at the end of 2023, with a plausible range of around 1.0-1.5% (Exhibit 6, left panel). While the uncertainty around our forecast for underemployment is high, this exercise raises two important points: first, we should monitor labour market developments closely to see if underemployment remains elevated throughout 2021 and thereby poses a downside risk to our forecast. Second, we should monitor the extent of the likely supply damage of the coronacrisis: our earlier work has found a number of potential channels through which this could materialise, although it is too early at this stage to quantify the precise impact. Significant, and persistent, supply damage to the economy poses an upside risk to our inflation forecast.

Inflation Expectations

Next we turn to inflation expectations. Market expectations of long-term inflation are notably below those of economists. In our baseline forecast we assume inflation expectations, measured by the seven-quarter-ahead Survey of Professional Forecasters, rise gradually from around 1.3% currently to 1.5% by the end of 2023. To cross-check the sensitivity of our forecast to this assumption, we run two alternative scenarios, one in which we replace our measure of inflation expectations with market expectations (which remain particularly subdued), and one in which inflation expectations rise more quickly.

We find that these scenarios imply a range of end-2023 core inflation rates of between 0.9% and 1.6% (Exhibit 6, right panel). Persistently low inflation expectations could therefore become a self-fulfilling prophecy, and we will monitor the upcoming survey releases closely (the 2020Q4 Survey of Professional Forecasters will be released on 30 October). A faster-than-expected rebound in inflation expectations, for example caused by the outcome of the ECB's Strategy Review, poses an upside risk to our forecast.[11]

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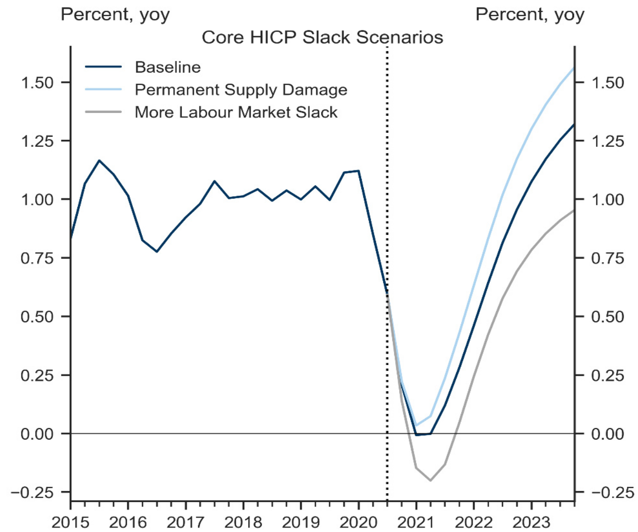
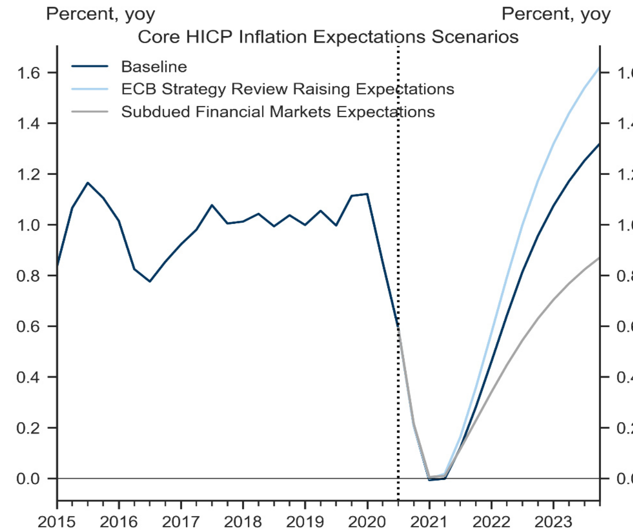
9 Specifically, for illustration purposes, we assume that 10% of the output loss in 2020 Q1 and Q2 is permanent.

10 In a horserace between the underemployment gap and our own measure of the output gap, we find that a Phillips curve with the underemployment gap as the measure of slack has slightly better (in-sample) forecast performance.

11 We expect the Governing Council to adopt a symmetric 2% inflation aim but think ECB officials will include "soft" elements of AIT in its new strategy by placing some weight on persistent inflation misses when adjusting the policy stance. This could lead to higher inflation expectations. For more information, see Nikola Dacic and Jari Stehn, "A Symmetric 2% Aim with Some Memory," *European Economist Analyst*, 11 October 2020.

Exhibit 6: There Is Considerable Uncertainty Around Our Long-Term Forecast





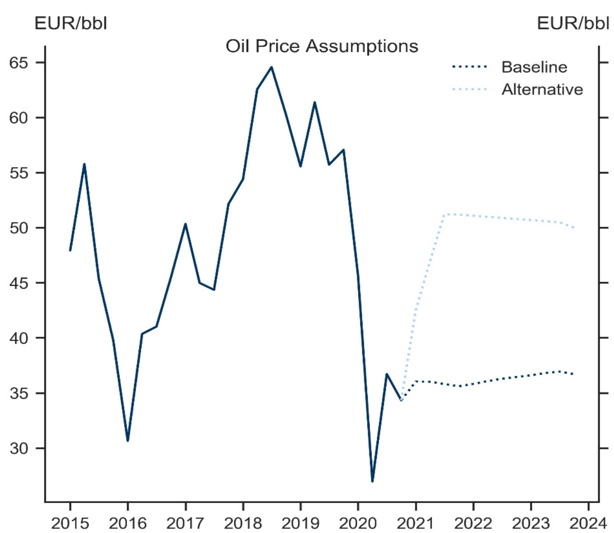
Source: Goldman Sachs Global Investment Research, Haver Analytics

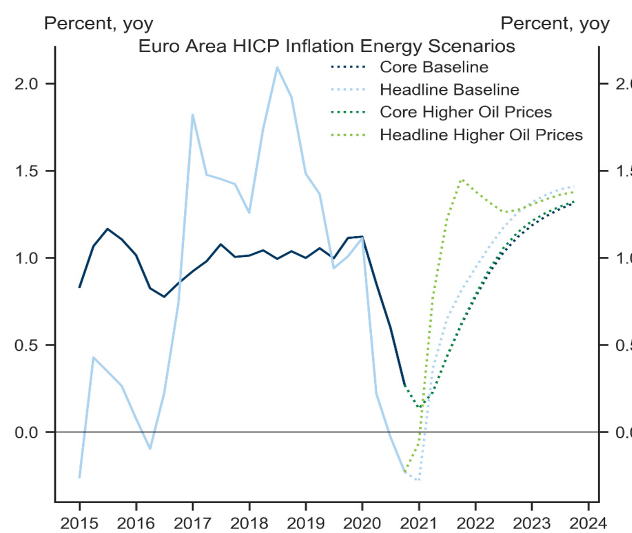
Energy Prices

Last we turn to energy prices. In our baseline model we use oil futures as the input for our energy inflation forecast. On this baseline, the Euro price of a barrel of oil rises gradually over the forecast horizon. However, there is a risk of significantly higher oil prices, as highlighted by our commodities team (Exhibit 7, left panel).

We simulate the model under both cases and find that the impact of higher oil prices on headline inflation in the near term is sizeable, while the impact on core inflation is limited. It is, however, possible, that our model underestimates the pass-through from energy prices to core inflation with such a large shock. We therefore see a sharp rise in oil prices as a risk to both our headline and core inflation forecasts.

Exhibit 7: Higher Oil Prices Mainly Affect Headline Inflation





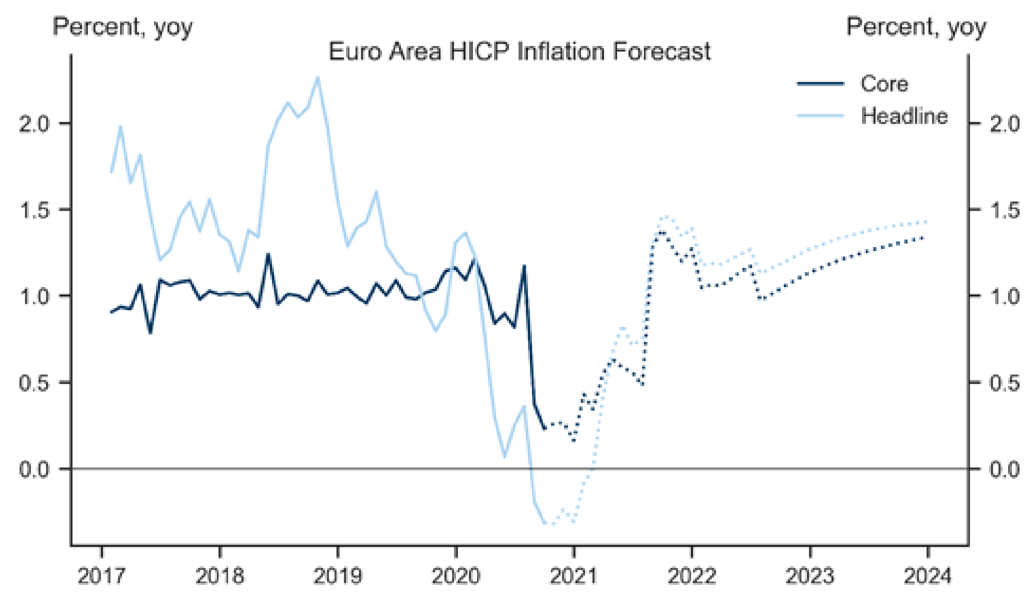
Source: Goldman Sachs Global Investment Research, Haver Analytics

Our Updated Inflation Projections

In the final step, we pull together both our short- and long-term model to produce EMU-4 and Euro area forecasts. Combining the models allows us to easily apply granular judgments to subcomponents in the short run, while more closely linking our inflation forecast back to economic fundamentals in the medium to long run.[12]

We expect Euro area inflation to be volatile over the next couple of years, as tax changes and base effects make the underlying rate of inflation hard to read. We project core inflation to peak at 1.4% in September next year, before falling back to around 1.0% in mid-2022. From there on core inflation should give a cleaner read of underlying inflationary pressures, and we expect a gradual increase in inflation over 2022H2 and 2023 to 1.3% at the end of 2023. We expect headline inflation to run about a tenth above this throughout the forecast.

Exhibit 8: We Expect Inflation To Be Volatile In the Near Term ...



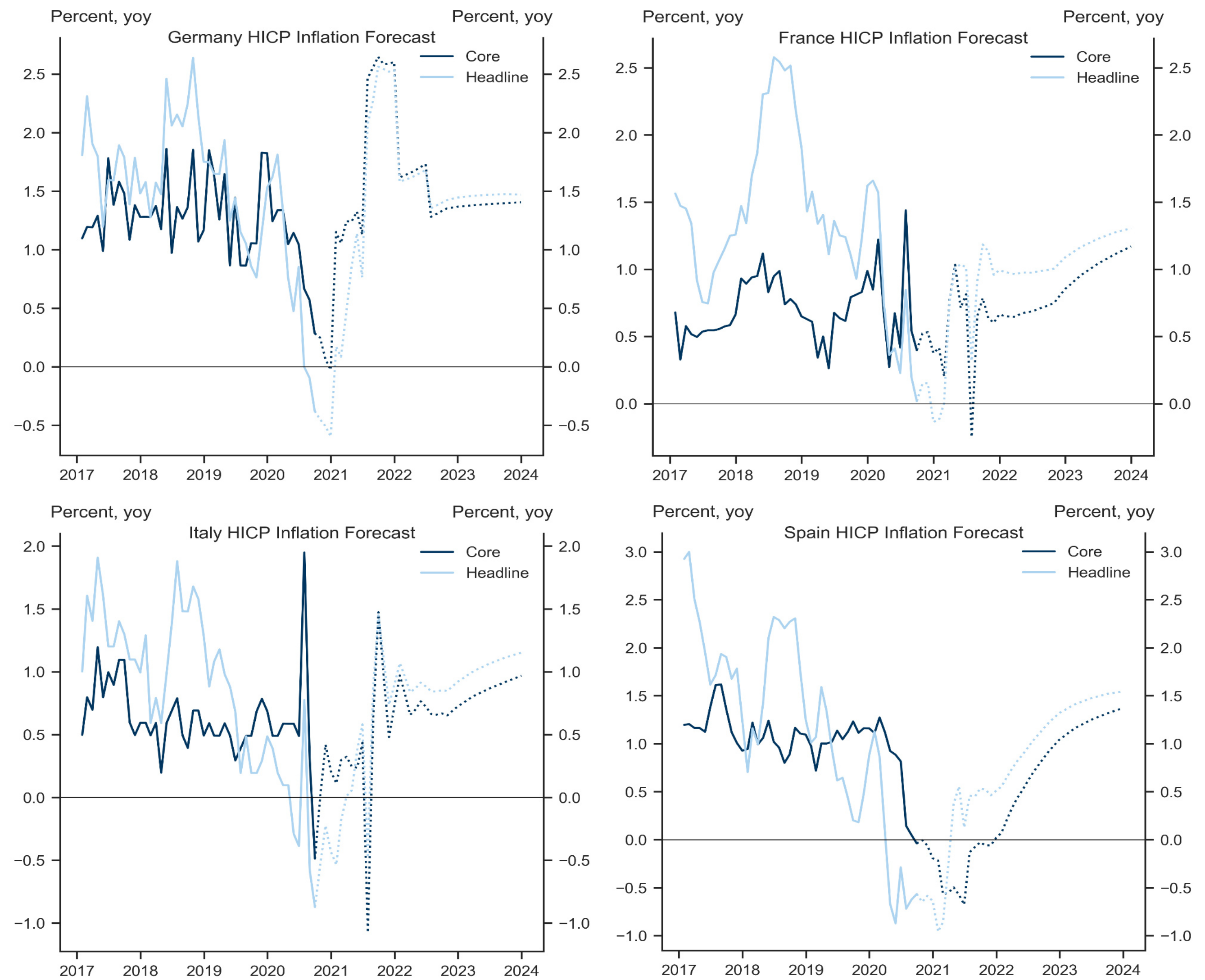
Source: Goldman Sachs Global Investment Research, Haver Analytics

At the EMU-4 level, we expect tax changes and seasonal factors to lead to a distorted picture until late 2022. In Germany, we expect temporary spikes in inflation in both January and July 2021 as the temporary VAT cut is unwound, and a further boost to headline inflation in January 2021 as the German carbon tax adds about 7 cents per litre to the price of fuel (Exhibit 9, top left). In France, we see base effects related to this year's delayed summer sales leading to significant volatility in the year-on-year inflation rate in the middle of next year. We also expect a slight boost to headline inflation in November of this year on account of an increase in the tobacco tax (Exhibit 9, top right). The seasonal volatility is also visible in Italy in 2021, and we expect a sequential pick-up in inflation to leave Italian core inflation at 1.0% at the of 2023 (Exhibit 9, bottom left). Our Spanish inflation forecast is notably below that of the Bank of Spain, as we expect tourism prices to recover at a slower rate (Exhibit 9, bottom right). In terms of non-EMU-4 forecasts, we expect the reversal of the Irish VAT cut in March 2021 to

12 We switch from our short- to medium-term model after one year.

boost Euro area inflation slightly.

Exhibit 9: … With Even More Volatility At The EMU-4 Level



Source: Goldman Sachs Global Investment Research, Haver Analytics

Overall we therefore expect highly volatile inflation rates over the next couple of years, followed by a gradual increase of core inflation to 1.3%. The uncertainty around the medium-term baseline forecast is high, however, and we will continue to monitor the evolution of labour market slack and the development of inflation expectations as cross-checks for our modal forecast.

Christian Schnittker

Disclosure Appendix

Reg AC

We, Sven Jari Stehn, Alain Durre, Adrian Paul, Soeren Radde, Filippo Taddei, Christian Schnittker and Nikola Dacic, hereby certify that all of the views expressed in this report accurately reflect our personal views, which have not been influenced by considerations of the firm's business or client relationships.

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