



Decomposing AE yields: What Are the Markets-Based Measures Saying?

MONETARY AND CAPITAL MARKETS DEPARTMENT

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The last few months have seen a sharp spike in the nominal bond yields for advanced economies (AEs). Investors focused particularly on US inflation and growth expectations, given the significant systemic implications. The relative importance of the drivers of nominal yields varies between jurisdictions and, importantly, has changed over time. Analysis in the feature reveals that the rise in inflation expectations is the primary driver of the increase in US nominal bond yields over the near term. In contrast, improvement in growth outlook has contributed to the rise in longer-term yields. Considering other major AEs, while inflation expectations have risen across the board, growth expectations appear more pertinent driver for shifts in longer-term yields. The change in the term premia has also played a key role in driving the longer-term inflation breakeven and real yields.

SECTION A: DECOMPOSITION OF ADVANCED ECONOMY NOMINAL YIELDS

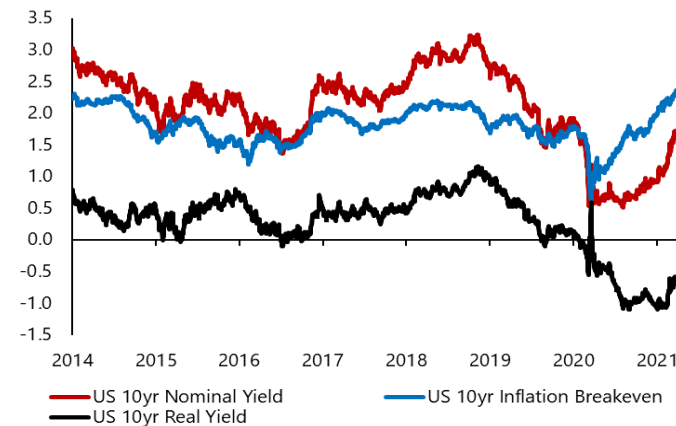
Advanced economy bond yields have risen sharply this year, with a particular investor focus on the United States, reflecting better growth prospects and higher inflation expectations on the back of the US new fiscal stimulus. US 10-year nominal yield has risen by 75 bps / 140 bps this year / in the last six months. Generally speaking, the nominal yield at a particular tenor, can be decomposed into be the sum of two components: (i) inflation breakeven—a common measure of market-implied inflation expectations—and (ii) the real yield—proxying market-implied expectations of growth.

The 10-year inflation breakeven has risen significantly in the last few months, reaching 2.3% is its highest level since early 2013 (also refer GFSR October 2020). Correspondingly, this increase was a major driver of the rise in the US nominal yield since March 2020. Instead, the 10-year real yield, has displayed sharp upward moves only more recently (Chart 1). Importantly, there is a notable difference across segments of the term structure. The 5-year nominal yield—which we consider as reflecting developments over a near-term horizon—has been driven primarily by an increase in the inflation breakeven, while the corresponding real yield has remained relatively unchanged (Chart 2). Indeed, the 5-yr inflation breakeven at 2.6% is almost at the highest level since pre GFC. This lies in a sharp contrast to the 5yr5yr year tenor—which is informative about the longer-term; specifically over years 5 to 10—where the real yield appears to have driven the change in nominal yield, with the inflation breakeven component displaying relatively little variability (Chart 3). The disconnect is also pertinent across the tenors as real yields have an upward sloping term structure, while inflation breakeven has a downward sloping term structure (Chart 4).

Analyzing nominal yield decomposition across other major advanced economies highlights significant heterogeneity in the trends (Chart 5). Like the US, the UK has seen an increase in the real yields as well, especially in the 5yr5yr tenor. This is in a contrast to the EU and Japan, where the change in the real yields remain relatively subdued especially for the 5-year tenor. However, commonalities also exist across the regions: 1) real yields over the 5yr5yr tenor have increased across the board, with the rise notably greater than the 5-year tenor. 2) Inflation breakevens have also risen across regions, with the increase particularly pertinent over the 5-year tenor (as compared to the 5yr5yr tenor).

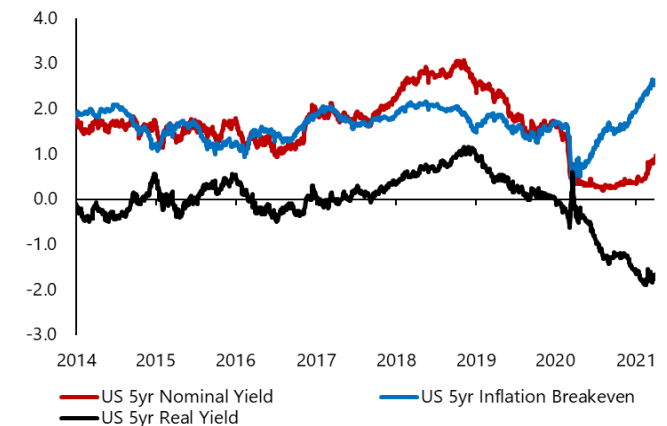
10 year nominal yield in the US has shot up significantly driven by a rise in breakevens and recently real yields.

Chart 1. Breakdown of US 10 Year Nominal Yield (Percent)



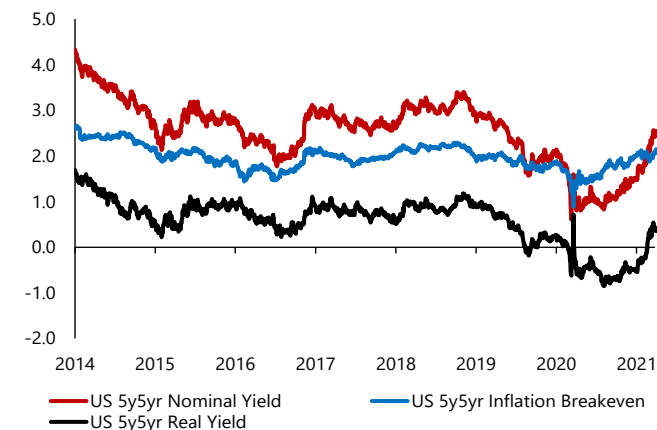
5 year inflation breakevens have also increased sharply but real yields have remained low.

Chart 2. Breakdown of US 5 Year Nominal Yield (Percent)



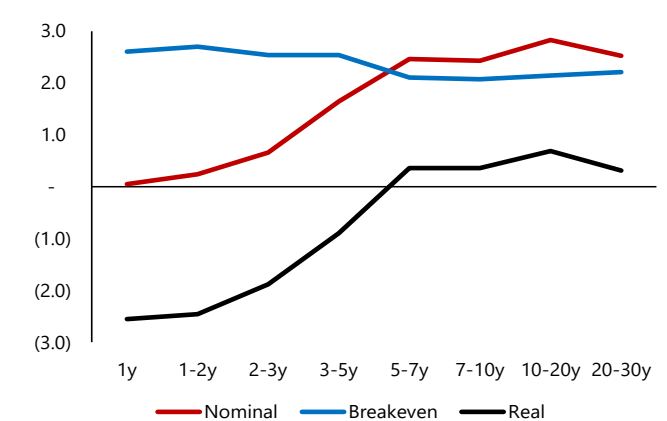
5y5y real yields have increased sharply are now trading above zero.

Chart 3. Breakdown of US 5Y5Y Nominal Yield (Percent)



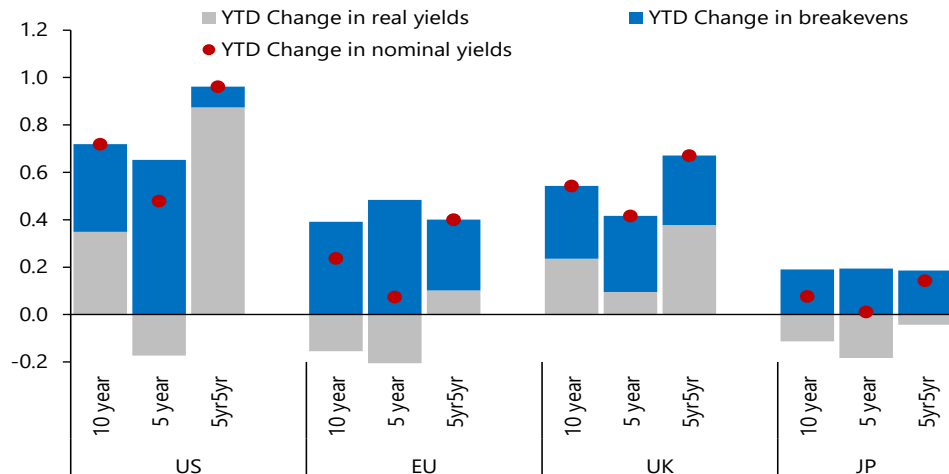
Term structure shows that inflation expectations are front-loaded, while real yield increase is backended.

Chart 4. Forward Rates in the Respective Tenors (Percent, annualized)



Trends vary across different AEs: UK has seen a rise in the real yields as well, especially in the 5-10 yr tenor, while they remain relatively subdued for EU and Japan (especially on the 5 year tenors).

Chart 5. Breakdown of the Change in AE Nominal Yields into Inflation and Real Yield Components (Percentage points)



SECTION B: DECOMPOSITION OF US INFLATION BREAKEVENS

Breakeven inflation, while providing a reliable gauge for market pricing of inflation expectations, may be subject to some potential distortions. Considering the US, Treasury inflation-protected securities (or TIPS, from which the real yield is derived), are generally less liquid than their nominal counterparts, especially in the short run and during periods of market stress. Breakevens also incorporate an inflation risk premium (IRP)—that is, the compensation that investors require for bearing inflation risk. It is therefore pertinent to decompose breakevens into expected inflation and IRP components, adjusting for potential TIPS illiquidity (using both volume and price-based metrics). The analysis suggests that expected inflation over the next 5 years has recovered significantly from the March 2020 trough, even adjusting for the potential distortions and other components. It is currently slightly above pre-pandemic levels—specifically, the average level prevailing over years 2018–2019—and hovering within the 2.0 – 2.5 percent range (Chart 6). On the other hand, expected inflation over the 5yr5yr year segment has also recovered somewhat, albeit at a more sluggish pace compared with the 5-year. It is currently just below pre-pandemic levels (Chart 7). That said, it is expected to remain broadly inline with the target range, both over the near and medium term.

Comparing relative levels, expected inflation over the next 5 years is also now slightly above the corresponding 5yr5yr year segment. This near-term over-shoot in inflation expectations may be viewed as broadly consistent with Fed’s new average inflation targeting framework ([link](#))—and is evident in standard breakevens as well, with the level of the 5-year now exceeding the 10-year breakeven for the first time over the past decade (Chart 8). Notwithstanding the rise in 5-year expectations, given that TIPS are indexed to CPI inflation, of which oil is a major driving factor, near-term moves in expected inflation (and breakevens) will reflect in part the recent sharp spike in oil prices. Considering the period since March 2020, our estimates suggest that attempting to adjust for oil price impact does not meaningfully alter the trajectory followed by the 5-year or 5yr5yr year expectations (Chart 9).

The IRP derived from both 5-year, and 5yr5yr year breakeven decompositions has turned positive and is currently at a multi-year high. This may (tentatively) reflect an increasing perception that inflation risk is becoming more counter-cyclical—i.e., future states of higher inflation, potentially coinciding with low output growth. This stands in contrast to the 2013–2014 period, for instance, which saw comparable levels of the 5-year expectations; however, IRP was (weakly) negative, indicating balance of risks were skewed marginally towards more deflationary/low inflation outcomes. Considering the period end-March 2020 – end-Feb 2021, results suggest that around 45 percent of the increase in (liquidity-adjusted) 5-year breakeven is due to increase in the IRP corresponding to this tenor, and remaining 55 percent due to increase in inflation expectations component. For the 5yr5yr year, close to 10 percent is increase in expected inflation with the 90 percent attributable to increase in risk premia (Chart 10). Comparing with another trough to peak period of June 2016 – June 2017, say, we find that while the relative contributions of IRP and expected inflation to the increase in breakeven were similar the aforementioned period, for the 5-year the bulk of the variation was due to change in expectations, and just around 15 percent attributable to increased IRP.¹

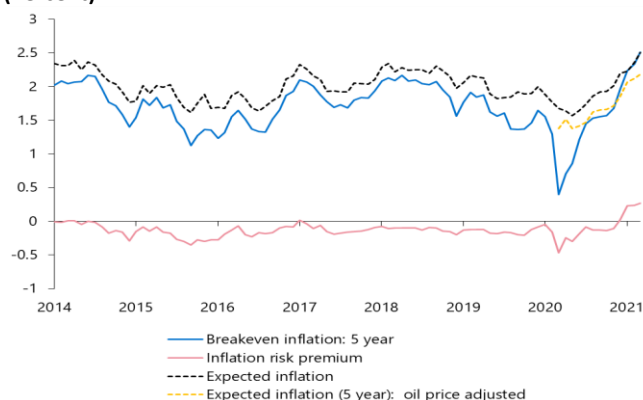
In conjunction with the upward drift in IRP—reflecting increasing risk of higher inflation outcomes—TIPS’ ETFs have also witnessed robust inflows, as market participants actively seek to hedge inflation risk (Chart 11). Flows in these ETFs have amounted to an average 5% of assets under management over the last three

¹ For the period October 8 to Oct 9, 70 percent of change in 5-year breakeven was due to rise in expectations component. For the 5yr5yr year breakeven over this period, around 40 percent of the variability was due to change in expectations.

months, which compares with just 1.5% over the last five years. Evidence from inflation options also reveals an increasing probability being attached to higher inflation outcomes (also see Section D below).

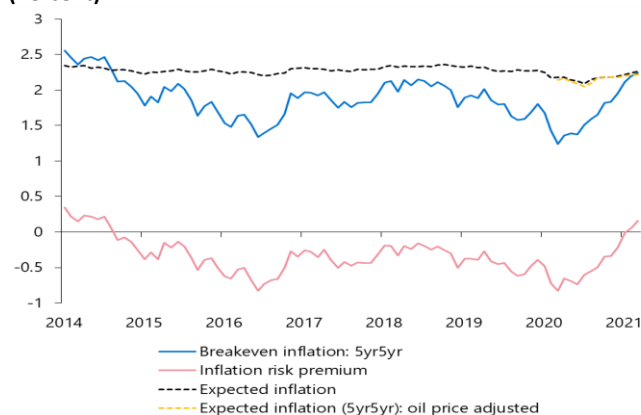
5-yr Inflation breakeven is driven by a sharp rise in the expected inflation, as well as a rise in the risk premia.

Chart 6. Drivers of US 5 Year Inflation Breakeven (Percent)



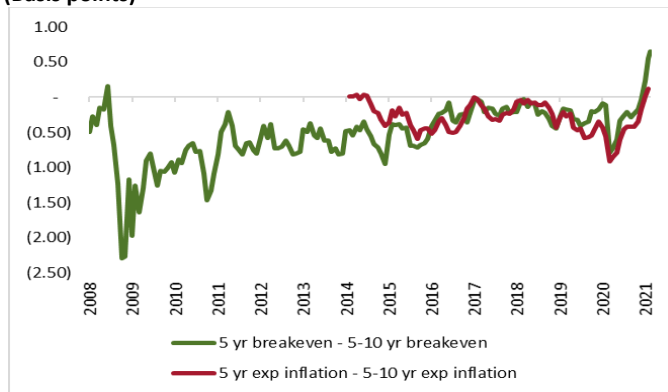
Inflation expectations are more muted over the 5–10 year tenor, while inflation risk premia has risen.

Chart 7. Drivers of US 5Y5Y Year Inflation Breakeven (Percent)



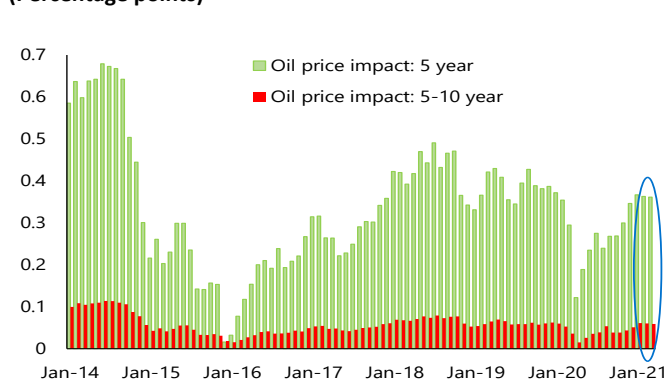
Term structure inversion is the most extreme since GFC.

Chart 8. Term Structure of Inflation Breakeven (Basis points)



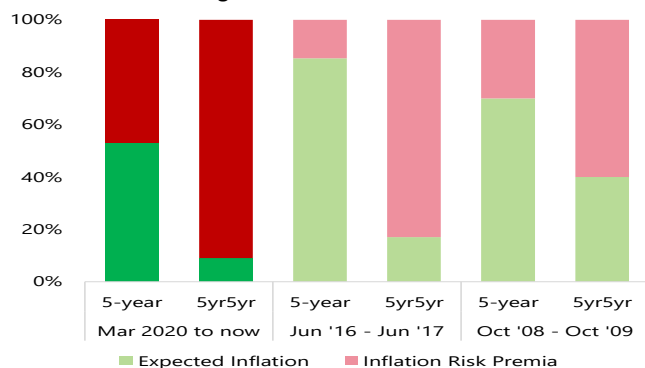
Oil had a higher impact at 5-yr inflation breakeven, with relatively limited impact over the 5–10 year tenor.

Chart 9. Impact of Oil on Inflation Breakeven (Percentage points)



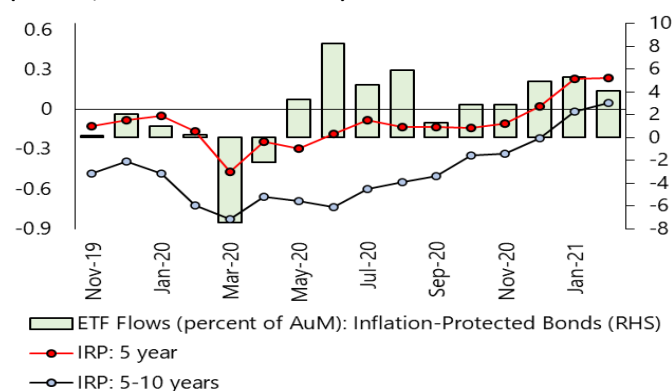
IRP has been the key driver of longer term inflation breakeven, in contrast with the 5-yr inflation breakeven.

Chart 10. Inflation Risk Premia and Expected Inflation: Relative Contributions To Changes over Different Time Periods



The rise in IRP has coincided with a sharp rise in the ETF flows to inflation protected securities.

Chart 11. Inflation Risk Premia and ETF Flows (Percent; Percent of AUM on RHS)



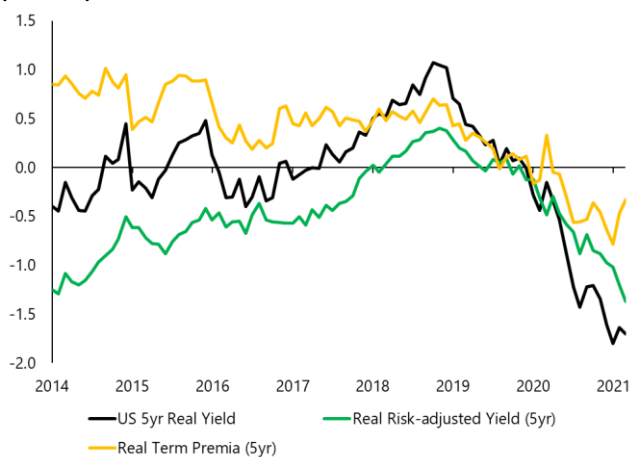
SECTION C: DECOMPOSITION OF US REAL YIELDS

While expected inflation has displayed more significant increase over the near-term, real yield—considered informative about growth outlook—appear to have been primary driver for longer-term yields. Real yield, however, can also be decomposed into two components. These are, the risk-adjusted real yield—which reflects the average expected short-term real rate (over the particular horizon)—and a real term premium, which compensates investors for uncertainty around economic outlook and/or path or policy rates.

The risk-adjusted real yield may deliver a cleaner signal for growth outlook, as it is not conflated by the influence of premia. It is found that that the 5-year real yield has remained low, even on a risk-adjusted basis, with a slight up-tick in real term premium in recent months (Chart 12). Such compression in real yield is reflective of the intended near-term effects of ultra-accommodative monetary policy. On the other hand, the recent increase in the 5yr5yr real yield has been more pronounced (Chart 13). While the risk-adjusted component corresponding to this tenor has increased, somewhat, the bulk of the increase is due to rise in real term premium over the longer term (Chart 14). Estimates suggest, therefore, that higher economic uncertainty is the major driver of higher 5yr5yr real yields, as opposed to significant improvement in market perceptions of longer-term growth outlook.

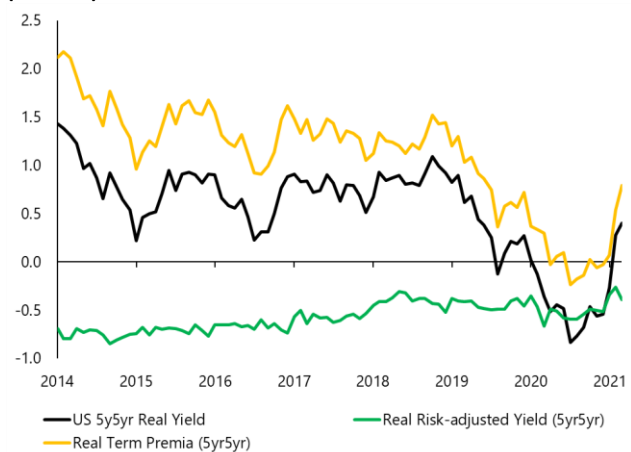
5-yr real yield remains low, even on a risk-adjusted basis, with slight up-tick in real term premium.

Chart 12. Decomposition of 5 Year Real Yields (Percent)



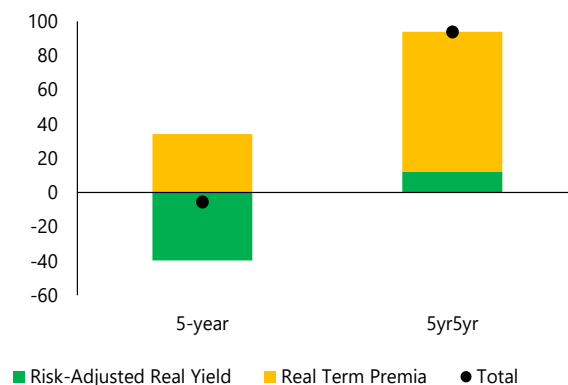
The rise in 5yr5yr real yield is mainly due to increased term premium.

Chart 13. Decomposition of 5Y5Y Real Yields (Percent)



Increased uncertainty around economic outlook, primarily, appears to be driving longer-term real yields higher.

Chart 14. Decomposition of Change in Real Yields (Basis points)

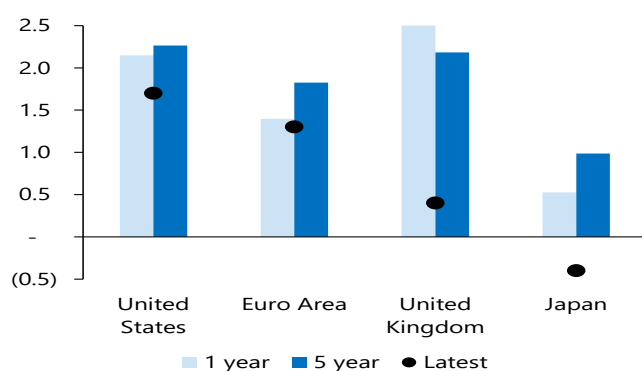


SECTION D: DISTRIBUTION OF INFLATION EXPECTATIONS IN MAJOR AEs

Consensus expectations show that inflation is expected to rise across the major AEs but remain broadly within the target range over the medium term, except for the EU and Japan. UK has the highest inflation forecast especially in the near term. It is followed by US, Euro Area and Japan (Chart 15). Inflation swaps market displays also higher expectations with the 5Y rate on the rise both in the US and the EU. Inflation options from which the market-implied probabilities of inflation expectations can be derived, show that the risks are skewed to the upside in the US, while inflation expectations are on the lower end in the Euro Area—though both have improved significantly since the peak COVID sell-off levels (Chart 16). Looking at the longer trends in the probability distributions, the probability of low inflation (<1%) in the US is at historical lows and has corrected sharply from the COVID sell-off highs (Chart 17). Probability of low inflation has declined in Euro Area as well, though remains higher than the 2018 troughs (Chart 18).

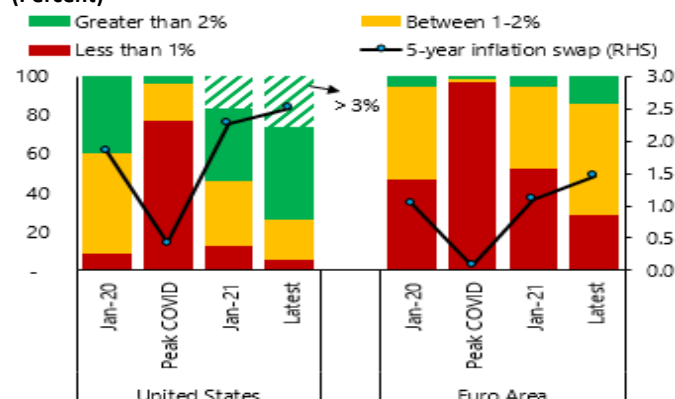
Inflation is expected to increase across the board but remain broadly inline with the target range over the medium term.

Chart 15. Consensus Forecasts for Forward Inflation and the Latest Inflation Print (Percent)



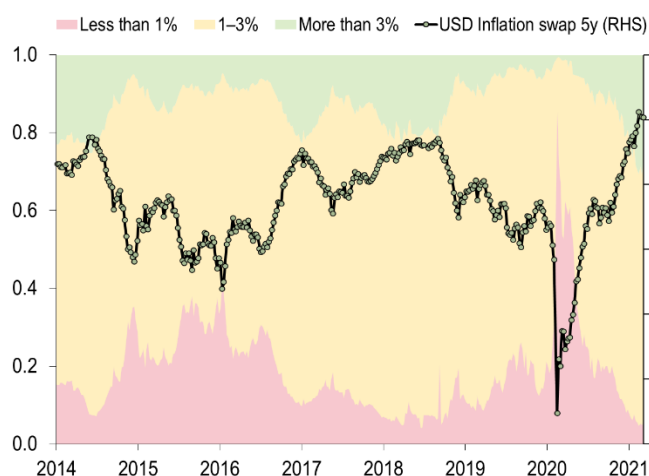
Options show that the risks are skewed to the upside in the US, while inflation expectations are on the lower end (though risen) in the Euro Area.

Chart 16. Market Implied Probabilities of 5 Year Inflation in Various Regimes – Experience during the COVID Sell-Off (Percent)



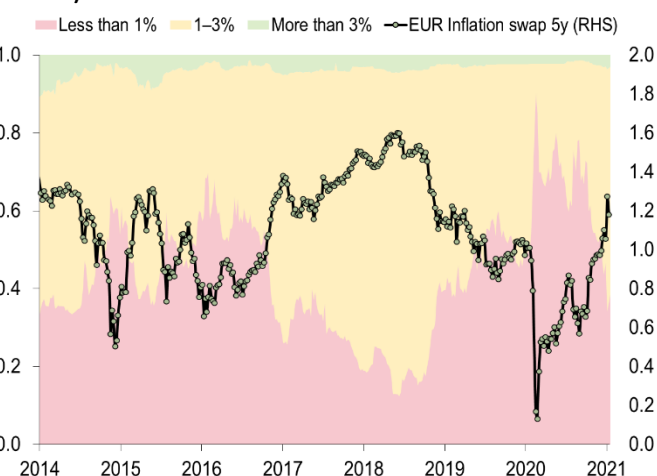
Probability of low inflation in the US is at historical lows, and corrected sharply from COVID sell-off highs.

Chart 17. US - Market Implied Probability of Inflation Distribution (Percent)



Probability of low inflation has declined in Euro Area as well, though remains higher than the 2018 troughs.

Chart 18. Euro Area - Market Implied Probability of Inflation Distribution (Percent)



Sources for all charts in the feature: Bloomberg Finance L.P.; Consensus Economics; Haver; and IMF staff calculations.

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