# Upside risks to the US term premium

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- The speed of the rise in UST yields over the past two months has surprised the market. The move was due partly to an increase in expectations about the future path of short-term rates and partly to an increase in the term premium. We see very little room for a further upward adjustment in rates expectations, while risks of a rise in 10Y UST yields could come from an increase in the term premium.
- We show that over the last few years, a decline in inflation and interest-rate uncertainty have contributed to keeping the term premium at a subdued level. As markets normalize and these sources of uncertainty increase, we see the risk that investors will start to demand higher compensation for holding duration.
- Moreover, the US is set to significantly increase its deficit, and therefore debt issuance, while the outlook for demand for USTs looks uncertain, adding to upside risks to the term premium.

## 1. What is the term premium?

The speed of the rise in UST yields over the past two months has surprised the market and a thirty-year bullish trend is beginning to show signs of cracking. What factors could push 10Y yields higher over the coming months?

In this note, we focus on one particular aspect of long-term yields, investigating recent dynamics and drivers of the "term premium" (TP), a possible source of upside risk for UST yields.

The TP is derived from a theoretical decomposition of yield levels into expectations about the future path of short-term interest rates and the additional remuneration investors require to hold long-dated bonds, rather than rolling short-term bonds over an equivalent investment horizon (the additional remuneration is generally referred to as TP).

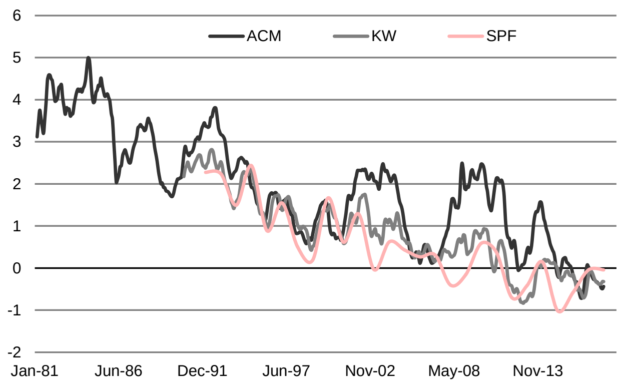
In theory, if investors were risk neutral and operating in a frictionless market, they would require the same return from a long-term bond (e.g. 10Y USTs) as for shorter-term exposure (e.g. 3M T-bill) rolled over the same maturity (ten years). In such a scenario, the TP would be zero. In practice, however, the TP is typically positive. Investors normally require a premium to bear the risk associated with longer exposure.

However, the TP is also affected by other factors (e.g. supply and demand dynamics, demographics, productivity trends), which might be particularly significant in certain periods, that have the potential to reverse this dynamic – leading to investors accepting a discount for longer exposure (i.e. a negative TP), as has happened recently.

The future path of short-term rates has moved higher recently, which leaves little room for adjustment of this variable, in our view. Since the start of the year, the most watched TP measures have also moved higher, but they remain very subdued. We think that TP developments might add upside risk to UST yields. We discuss our reasoning in this note.

Before digging further into the analysis of the TP and its drivers, let us clarify how it relates to market variables. The TP is computed as the difference between a traded long-term yield (e.g. 10Y UST yield – we focus on nominal yields and premium) and a measure of the future expected path of short-term rates. The latter is typically derived from macroeconomic models and/or surveys; therefore, it differs from the future expected path of short-term rates implied by market rates, which would already include some TP.

**CHART 1: 10Y TERM PREMIUM ESTIMATES**




Source: Fed, SPF, UniCredit Research

There is extensive literature on the TP, but on the UST curve the most watched measures are those of Adrian, Crump and Moench (ACM) and of Kim and Wright (KW), which are also available on data providers such as Bloomberg[1].

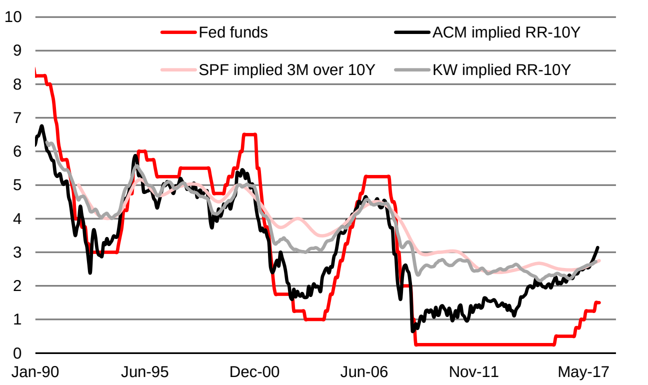
In this publication, we will refer to the TP estimates from ACM, KW and we also derive an additional TP specification from the *Survey of Professional Forecasters* by the Philadelphia Fed (SPF)[2].

[1] For an analysis of the difference in ACM and KW estimates see https://www.federalreserve.gov/econres/notes/feds-notes/robustness-of-long-maturity-term-premium-estimates-20170403.htm

[2] We derive this by subtracting the 10Y annual average forecast for the returns of 3M bills from the SPF from the 10Y UST nominal yield

A long-lasting downward trend in the TP over the past thirty years, which suggests that at least part of the fall in long-term yields over the same period can be attributed to the TP, is a well-established finding in the literature. Moreover, different TP estimates tend to be highly correlated and to be broadly consistent across economic cycles. However, as shown in chart 1, TP estimates might differ significantly on occasion. Among the chosen measures, the ACM estimate displays larger swings and more volatility. Therefore, there is a lot of uncertainty associated with the underlying value of the TP.

**CHART 2: EXPECTED FUTURE PATH OF SHORT-TERM RATES**




Source: Fed, SPF, UniCredit Research

The different expected future paths of short-term rates that underlie these estimates help to explain the reasons for the misalignments among the various TP estimates[3]. Chart 2 shows how implied short-term rates by ACM tend to closely follow official rates, and therefore display larger swings than the other TP estimates. Moreover, a more pronounced drop in ACM implied short-term rates after the great recession explains its larger TP estimate in the same period.

Interestingly, the three measures of the future expected path of short-term rates are currently very close. In the past, this happened when short-term rates reached the peak in the monetary tightening cycle.

The future path of short-term rates implied by TP estimates depicts quite a steep rise in official rates over the coming years. They point to policy rates at above 3% on average over the next ten years.

Therefore, looking at the past hiking cycle, we do not see much room for expectations of short-term rates to rise further. This means that in the future upward risks for 10Y UST yields will likely mainly come from normalization (i.e. a rise) in the TP.

[3] We obtain the expected future path of short-term rates as the difference between the 10Y nominal UST yield and the 10Y nominal TP estimate

## 2. What is behind the term premium?

The main drivers of the TP can be grouped into two categories: **1.** changes in the perceived riskiness of a long-term bond and **2.** supply and demand dynamics for those bonds[4].

The main risk in holding a long-term bond rather than rolling over short-term bonds over the same horizon are the inflation premium risk (in particular the risk that inflation is actually higher than expected), and interest rate risk (the risk that short-term rates will be different from expectations). The economic cycle also plays a role, although this is, to some extent, related to the two other factors.

Demand and supply dynamics have significantly affected the TP. There are a few examples of this in history: for instance what Alan Greenspan defined as a “conundrum” in 2005 (when the Fed was raising rates, but long-term rates remained exceptionally low) was likely the result of exceptional flows into USTs from emerging markets and other central banks, a consequence of the so-called “global saving glut”. The literature on the TP also points to the Fed’s QE absorbing a large share of free-floating USTs as a key factor driving down the TP.

In the following paragraphs we will investigate the relationship between the above drivers and the TP (in its ACM specification, using the KW would yield similar results).

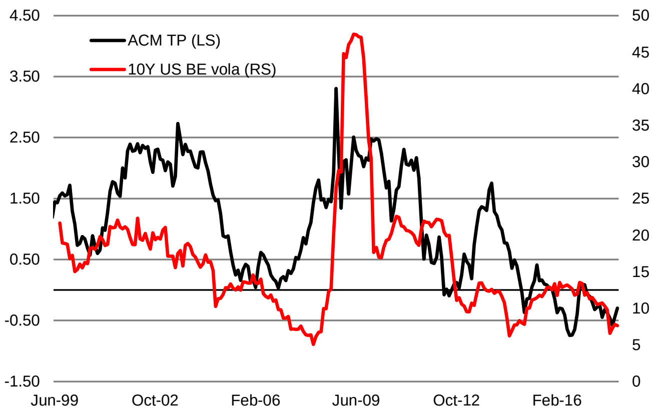
Other more-structural factors not considered in this publication could also affect the TP. Among these are demographic trends (an ageing population tends see rising demand for liquid and safe paper); regulatory changes (demanding increases in collateral holdings); factors affecting the availability of safe assets (e.g. widespread rating downgrades during a downturn or severe swings in risk appetite).

[4] See also “Why are interest rate so low, part 4: Term premiums” by Ben Bernanke, https://www.brookings.edu/blog/ben-bernanke/2015/04/13/why-are-interest-rates-so-low-part-4-term-premiums/

## 3. Inflation uncertainty

Chart 3 plots the one-year standard deviation of the 10Y US breakeven rate (as an estimate of the volatility of inflation expectations) with the TP. It shows that indeed there is a good degree of correlation between these two variables and that the decline in TP since mid-2009 has come hand in hand with a decrease in inflation uncertainty.

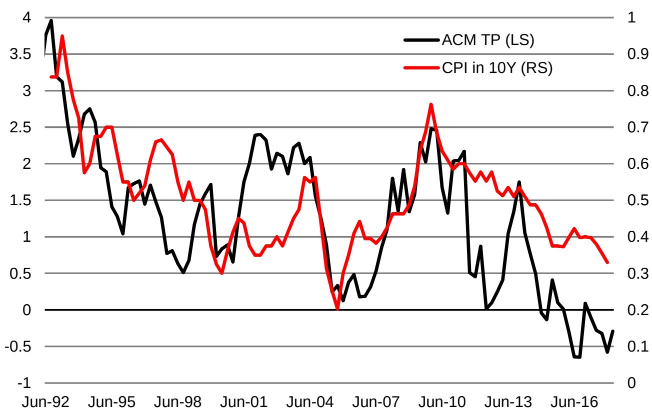
**CHART 3: TP AND VOLATILITY OF INFLATION EXPECTATIONS**




Source: Fed, Bloomberg, UniCredit Research

We obtain a similar picture using a survey-based measure of inflation uncertainty, as illustrated in chart 4, where we plot the TP along with the dispersion in 10Y-ahead CPI forecast from the SPF[5] (difference between the 75 and 25 percentile in the survey's answers).

**CHART 4: TP AND VOLATILITY OF INFLATION EXPECTATIONS**

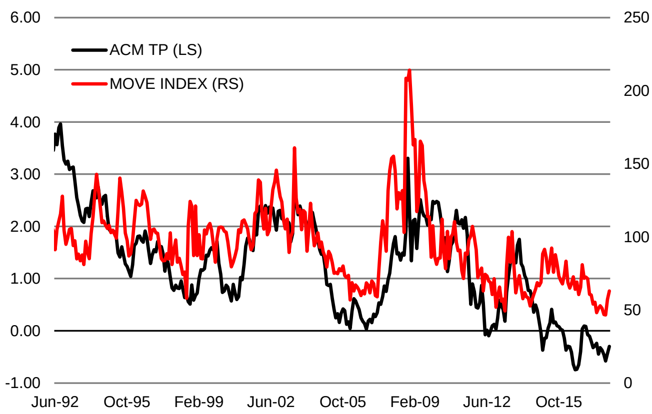



Source: SPF, Fed, Bloomberg, UniCredit Research

## 4. Interest-rate risk

Chart 5 shows that since the early 1990s, the TP and the MOVE index (a measure of implied volatility on US rates) have been moving very similarly, suggesting that the sharp decline in interest rate uncertainty might also have contributed to the fall in TP.

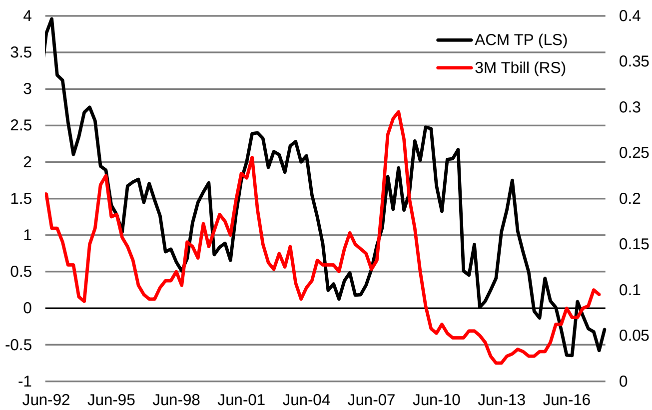
**CHART 5: TP AND THE MOVE INDEX**




Source: SPF, Fed, Bloomberg, UniCredit Research

In Chart 6, we show the TP along with the dispersion of expectations for the average yield of a 3M T-bill for the year. Periods of rising interest-rate uncertainty tend to herald a rise in the TP.

**CHART 6: TP AND THE INTEREST-RATE UNCERTAINTY**




Source: SPF, Fed, Bloomberg, UniCredit Research

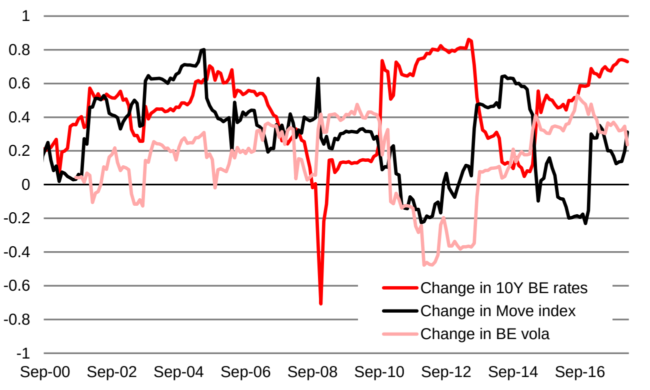
In conclusion, our analysis shows that historically, inflation uncertainty and interest-rate uncertainty have been highly correlated with the TP and, in particular, that they help to explain the decline in the TP since 2009.

[5] All the survey measures we use in this piece are derived from the *Survey of Professional Forecasters* of the Philadelphia Fed. Data are available on a quarterly basis.

Chart 7 shows the 2-year rolling correlation between monthly changes in the TP and in the MOVE index, in 10Y US breakeven rates and in the breakeven volatility.

Correlations are generally positive across the sample with few exceptions. In the most recent part of the sample, the correlation of the TP with the change in inflation expectations has been relatively stronger.

**CHART 7:**
**ROLLING CORRELATIONS OF TP WITH "FUNDAMENTALS"**




Source: Bloomberg, UniCredit Research

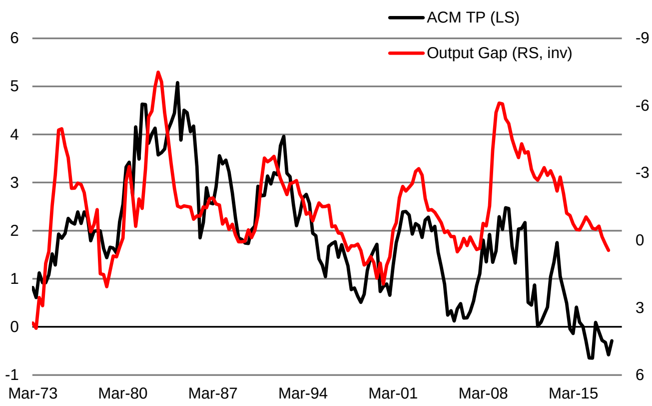
Note that the above drivers are closely related: an acceleration in inflation might increase the volatility of monetary policy expectations and of interest rates more generally (across the curve). The risk of an increase in the TP in the next few quarters comes from both of these drivers. Inflation has been lagging so far in this cycle, but the chances are that both actual inflation and its volatility will increase and investors may ask for additional compensation. To the same extent, uncertainty on the future dynamic of interest rates are likely to increase as we move further away from historical lows, creating upside risk for the TP.

## 5. Why is the term premium countercyclical?

We pointed out in section 2 that the economic cycle also plays a role in affecting the perceived riskiness of a long-term bond and therefore, the TP.

Indeed, one interesting feature of the TP is its countercyclical behavior: the TP tends to rise during economic downturns and to fall during upswings. Some authors relate this to a rise in the compensation required to hold a riskier security amid economic and market uncertainty. However, the safe-haven nature of USTs weakens this argument (and might, on the contrary, suggest a lower TP during times of market stress).

**CHART 8: OUTPUT GAP AND TP**




Source: CBO, Fed, Bloomberg, UniCredit Research

We think that the countercyclical nature of the TP comes as a consequence of its relationship with the expected path of short-term rates. Indeed, to the extent that developments in official rates affect investors projections of the future path of short-term rates (and they usually do), the TP tends to mirror moves in the slope of the curve. Hence, as the 2/10Y spread steepens in an easing cycle, the TP moves higher, whereas the opposite happens in tightening cycles, leaving the TP (like the 2/10Y) negatively correlated to the economic cycle.

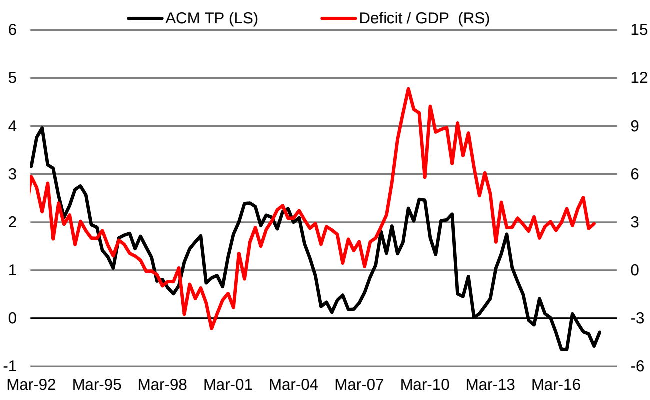
Note that fiscal policy might also contribute to the countercyclical behavior of the TP. This is part of the flow story, which we investigate in the next section.

## 6. Supply/demand dynamics

Inflation and interest-rate uncertainty, along with the dynamics of the economic cycle, are strong drivers of the TP. The economic rationale of such a relationship is strong and empirical evidence supports this view. However, flows in the supply and demand of long-dated USTs can also affect the size of such a premium. The former is strongly connected to countercyclical nature of the TP. The budget balance tends to become negative during downturns as fiscal measures are deployed to increase aggregate demand and smooth the cycle. Borrowing requirements increase and so does bond supply.

The historically tight correlation between the government deficit and the TP as presented in chart 9 shows that higher compensation is demanded for holding long-term bonds in such a scenario (similar results would be obtained using UST net issuance). This relationship broadly held until 2008, albeit showing some sign of weakness in mid-2000.

**CHART 9: GOVERNMENT DEFICIT AND TP**




Source: Bloomberg, UniCredit Research

A factor in particular contributed to keeping the TP low in mid-2000 and more decisively in 2008-14: a rise in demand for UST from relatively price-insensitive investors, such as foreign reserve managers and the Fed. More recently (since 2014), very low inflation and rates uncertainty has kept the TP low, while the deficit remained stable.

## 7. Where do upside risks for the TP come from in the next few months?

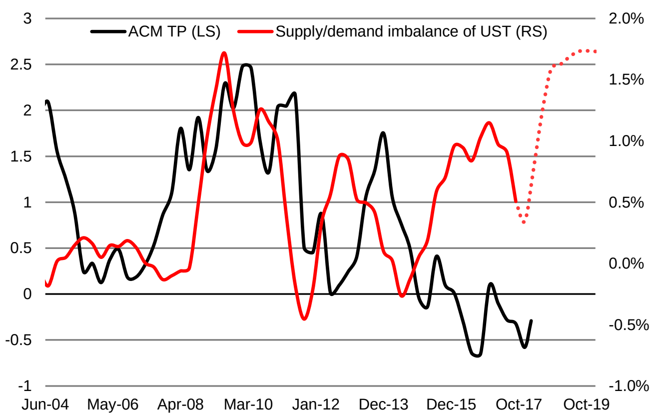
As highlighted in previous sections, uncertainty surrounding both inflation and rates expectations is slowly rising, which also leaves the TP more exposed to flows dynamics. And the latter will become more challenging over the coming quarters.

The US deficit is set to increase over the coming years and so will borrowing requirements. UST primary dealers expect just short of UST 1tn of issuance in 2018 and slightly more than USD 1tn in 2019, and recent fiscal measures increase the likelihood of an upward revision to issuance. This compares to USD 560bn in 2017. These higher borrowing requirements will happen as the Fed continues to reduce its balance sheet, while the outlook for inflows into USTs from foreign officials is uncertain.

The dotted line in chart 10 depicts the very challenging environment that UST will face over the coming quarters. Net issuance will be just short of USD 1tn in 2018 and slightly above USD 1tn next year. Meanwhile, according to our projections, the Fed will decrease its UST holdings by USD 230bn in 2018 and by USD 255bn in 2019. The IMF estimates a moderate increase in central bank reserves this year, which historically translates into moderately positive inflows into USTs from foreign official investors (their holdings represent around 65% of total foreign investment holdings).

All in all, with higher supply and more difficult demand conditions, flow dynamics add to upside risk for the TP over the coming quarters.

**CHART 10: SUPPLY/DEMAND OF USTS AND TP**




Supply/demand imbalance of UST variable is calculated as the quarterly change in US marketable debt minus the change in the stock of USTs held by foreigners minus the change in the stock of USTs held by the Fed and it is expressed as a percentage of nominal GDP. We compute moving average of this variable over the last 4 quarters.

Source: US Treasury, Bloomberg, UniCredit Research

Last but not least, the US Treasury is increasing its deficit at a late stage in the cycle, while the output gap is virtually closed. Unlike in the past, this will not help to smooth out the economic fluctuations but might end up increasing inflation uncertainty and lead investors to demand a higher risk premium to hold USTs[6], adding to the above-mentioned upside risk to the term premium.

## 8. Conclusion

We show that over the last few years, a decline in inflation and in interest-rate uncertainty has contributed to keeping the TP at a subdued level. The two above drivers are closely related: an acceleration in inflation might increase the volatility of monetary policy expectations and of interest rates more generally (across the curve).

The risks of an increase in the TP in the next few quarters come from both these drivers. Inflation has been lagging so far in this cycle, but it is likely that both actual inflation and its volatility will increase and investors may demand additional compensation. To the same extent, uncertainty as to the future dynamic of interest rates is likely to increase as we move further away from historical lows.

This will happen at a time when the US is set to significantly increase its deficit and so its debt issuance. Moreover, increased supply will unlikely be met by a particularly positive demand outlook. The Fed is shrinking its balance sheet and the outlook for foreign demand for USTs is uncertain, further adding to the risk that the TP will rise.

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[6] For analysis of how this might impact the currency, see FX Perspective “US deficit spells more trouble for the dollar”

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