Financial Variables

What drives the German Bund Term-Premium?

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1st April 2024

Summary

- The large increase of long-term interest rates in 2H23 (which took the 10Y Bund yield up to 3%, a level not seen since 2011), can be partly explained by the expectations of rate hikes but also by another component, the term-premium (TP), which has undergone a significant increase in the past two years. The TP reverted to being positive in mid-2022 following a decline since the European debt crisis, which led it into negative territory for a protracted period.

- The purpose of this note is to look at the term-premium, a relevant component of the long-term interest rates, to explain its evolution and anticipate its trend going forward.

- As the TP reflects uncertainty around several economic variables, we identified the drivers of TP based on uncertainties surrounding inflation, growth, Euro Area fiscal stress and global factors.

- We present a multiple linear regression analysis that identifies the factors behind the evolution of the Bund term premium, with a focus on its recent shifts and in particular the increase in inflation expectations, uncertainty regarding long-term growth and the spillover effects of higher US term premium. Also visible are the early effects of the gradual ECB balance sheet normalization process.

- Going forward, we expect the evolution of the German 10 yr term premium to be driven by the ongoing disinflationary process, which would be partly offset by a pick up in Euro Area fiscal stress in the wake of the normalization of ECB's unconventional policy support. Nonetheless any such fiscal stress will remain contained due to the effect of ECB's Transmission Protection Instrument (TPI).

Long term interest rates and the term-premium: a brief introduction

The large increase in long rates in 2H23 (which took the 10Y Bund yield to 3%, a level not seen since 2011), was partly dragged by the expectations of rate hikes but also by another component, the term-premium, which has undergone a significant change over the past two years. The term-premium (TP) reverted to positive in mid-2022 following a decline since the European debt crisis, which took the TP into negative territory, where it remained for a protracted period. We are interested in analyzing the elements that explain its evolution to determine where it can go in the future.

In fact, the bond selloff in the second half of 2023 puzzled investors as the rise in yields exceeded prevailing market expectations of higher for longer short term rates and the yield curve slope increased (figure 1). While expectations of higher long-term nominal policy rates had risen, a mix of factors drove yields up. Potential candidates included expected high real rates led by positive macro surprises, widening fiscal deficits, elevated US Treasury debt issuance in the backdrop of waning foreign central bank support and rising geopolitical risks. In addition, changes in monetary policy strategy by the Fed and the ECB since 2019[1], have fueled uncertainty around
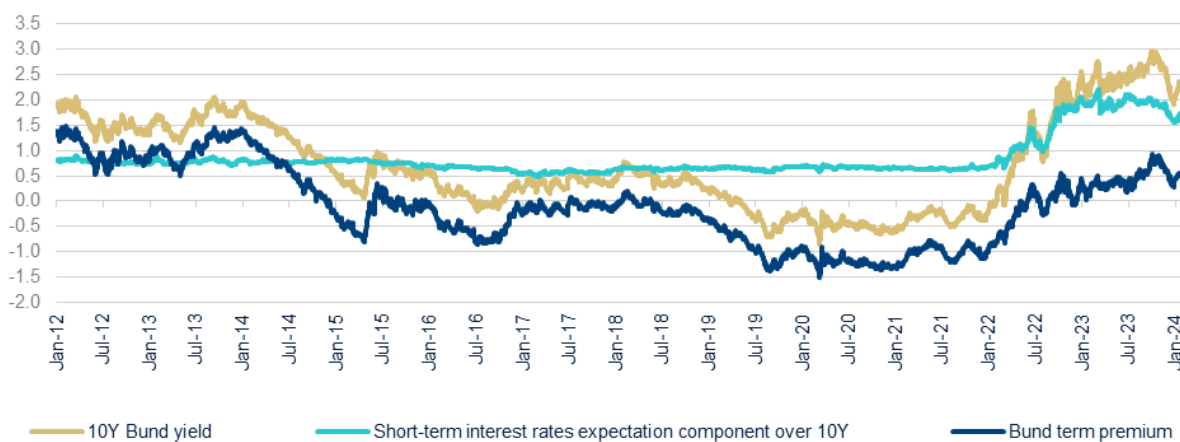
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[1] On July 2021 the ECB announced its new monetary policy framework, in which the price stability objective was "an inflation target of 2% over the medium term" changing it from previous "CPI below but close to 2%". Ihttps://www.ecb.europa.eu/home/search/review/html/price-stability-objective.en.html. Previously in 2020 the

CB's inflation tolerance, with implications for inflation uncertainty. These 'other' drivers of higher yields raised questions whether the move would lead to a visibly higher Term Premium going forward.

What is the Term Premium? The term premium reflects the extra compensation that investors demand for the interest rate risk inherent in holding long duration bonds. In other words, it is the portion of bond yield not explained by the expected path of short-term interest rates, which is mostly determined by expectations on monetary policy rates. This uncertainty premium, which is unobserved, can be primarily attributed to two factors, namely, the uncertainty surrounding inflation - the inflation risk premium - and the uncertainty surrounding real interest rates - the real risk premium. The former can be captured by volatility in long-term inflation expectations, while the latter is explained by uncertainty surrounding factors such as growth; any potential stress, such as default risk and unconventional monetary policy measures, and global factors, which are mostly reflected in the US term-premium.

We construct the German 10Y TP (Figure 1) using the method used by Adrian, Crump and Moench (or "ACM") to model the US term premium. The ACM analysis is based on a five-factor, no-arbitrage term structure model[2].

Figure 1. **10Y GERMAN YIELD DECOMPOSITION, SHORT-TERM INTEREST RATE EXPECTATIONS AND TERM-PREMIUM (%)**

Source: BBVA Research

What drives the German bund term-premium?

We use a multiple linear regression analysis[3] to capture the factors that drive the term-premium (figure 2, see also Table1 in the annex for details). Explanatory variables include:

1. **Uncertainty surrounding inflation** measured by expected oil prices and inflation expectations excluding its energy component. The former explains part of the inflation expectations, and it also reflects growth uncertainty to some extent, as oil prices are closely correlated (negatively) with European terms of trade[4].
2. **Uncertainty surrounding long-term growth**. Derived by the residual of the regression of 1 year German bund option implied volatility on inflation excluding oil and long-term oil prices. We include interest volatility as this variable provides an indication of the degree of uncertainty regarding the long-term real interest rate
3. **Euro Area fiscal stress** (probability of sovereign default and unconventional monetary policy measures. Derived from two variables: a) bond yield spread between Italy and Germany as it reflects uncertainty within the bloc related to risks of a break-up in the common currency and b) ECB's quantitative measures, as ECB's purchases play a role in term-premium as it drags down yields..
4. **Global factors**, derived from the US 10Y term premium.

Figure 2. **FIT FOR BUND TERM PREMIA***
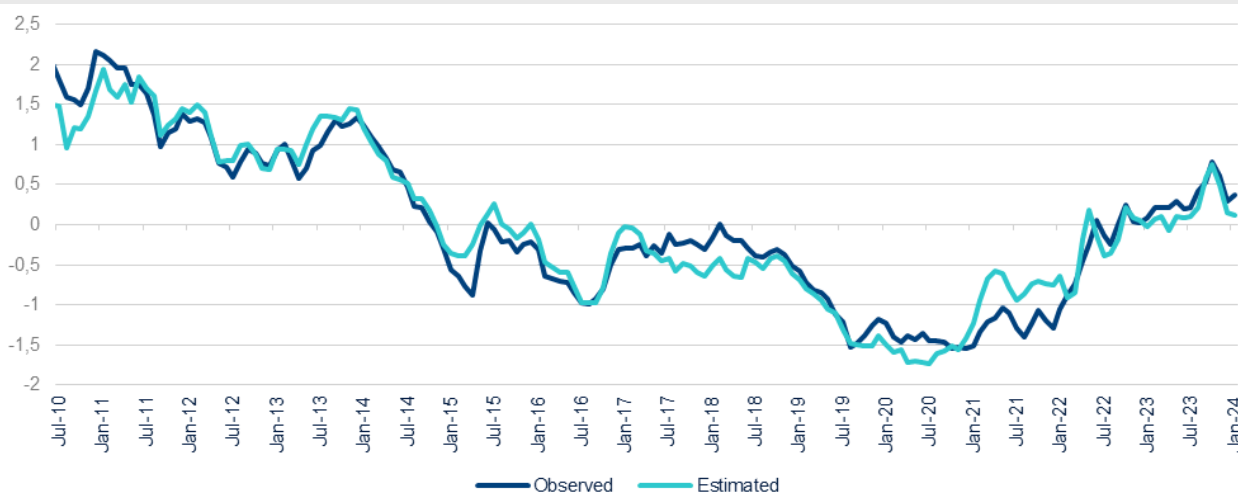
Source: BBVA Research

Our regression analysis for the 10-year German term premium (%), monthly average regressed on 1) growth: residual of 10 year bund yield implied option volatility regressed on inflation,2) inflation ex-energy: residual of Euro Area five yr-five yr forward inflation expectations (z score) regressed on oil prices, 3) Brent 3 yr ahead futures prices (z score), 4) Euro Area stress: Italy-German 10 yr yield spread (z score) 5) USTP: US 10 yr term premium (%) , 6) ECB: ECB purchases of securities under SMP, PSPP & APP (% of Euro Area GDP); regression on monthly data from June 2010 - Jan 2024 (164 observations). y = 0.109(growth) + 0.53* (inflation ex-energy) + 0.24*(oil) - 0.108*(Euro Area stress) + 0.598*(US Term Premium). R-squared = 94%, RMSE = 0.24. Variables checked for stationary and are significant at level less than 0.01.

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[3] 2018 Benjamin H Cohen, Peter Hördahl and Dora Xia "Term premia: models and some stylised facts" ; 2023 Deutsche Bundesbank "Term Structure in economic analysis"

[4] 2018 N. Bokan, M. Dossche and L. Rossi "Oil prices, the terms of trade and private consumption" ECB Economic Bulletin Issue 6/2018

The decomposition of 10 year bund premium (Figure 3) can help explain different episodes of its evolution over the past decade:

1. Since the GFC until mid-2012 the German term-premium declined (from 2% to 0.6%) led mainly by the easing in US term-premium due to Fed's QE programs (II & III). Further, lower uncertainty around inflation also contributed to the drag, but by much less. On the flipside, rising European fragmentation risk in 2H12 is evident in higher Euro Area stress, which alongside rising inflation and growth uncertainty fueled higher term premium, leading to Draghi's "whatever it takes" (figure3).

2. In 2013 German term-premium rebounded again, but without reaching previous high levels, led by spillovers from US term-premium, on the back of Fed's taper tantrum in mid-2013. That said, the start of ECB's forward guidance[5] in July 2013 set the stage for lower term premium ahead.

3. Between 2014 to 2016, the Euro Area inflation risk premia declined sharply and turned negative on falling long-term inflation expectations. Equally important was ECB's QE announcement, starting Mar '15, which dragged the German TP to a then new low -0.9% in early 2016. The decline in the US term-premium from 1% to levels close to zero also helped to drag down German term-premium.

4. During 2017 to 2018, the term-premium rebounded to (+0.1%), led in part by inflation risk-premium and unexplained factors, primarily non-energy price uncertainty, even as the decline in real term premium, namely growth, ECB purchases? and US Term Premium offset much of the upside.

5. During 2Q2018 to mid-2020 term-premia slid back (to a record low of -1.3%) led by weakening global price pressures, ample central bank liquidity support (ECB's bond purchase program -PSPP-), rate cuts and policy guidance ('lower for longer' interest rates). The COVID shock initially further weighed on inflation risk premiums while pushing central banks to double down on stimulus (PEPP). These developments led to a fall in the Euro Area and US inflation risk premiums. Meanwhile, intensifying deglobalization trends amid China-US trade war under Trump fueled growth uncertainty as also a pick up in Euro Area stress.

6. From mid-2021 until end 2023, the German term-premium has rebounded (reaching 0.9%), led mainly by the increase in inflation expectations (around 40% contribution), and part of the real risk premium, namely uncertainty regarding long-term growth and more recently the US term premium. Also visible are the early effects of the gradual ECB and Fed's balance sheet normalization process underway alongside adjustments to ECB's monetary policy strategy (aiming for 2% medium term inflation target vs. close to 2% previously), which explains 25% of the downward effect. The latter raises prospects for higher monetary policy uncertainty going forward (figures 4 & 5).
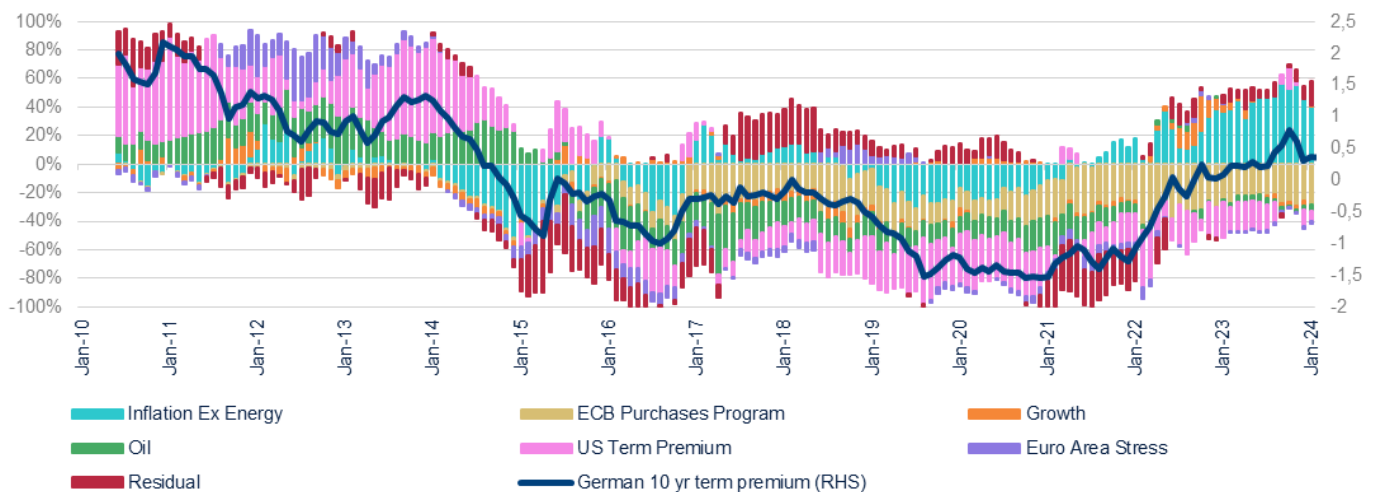
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[5] The start of the forward guidance pushed down interest rates volatility.

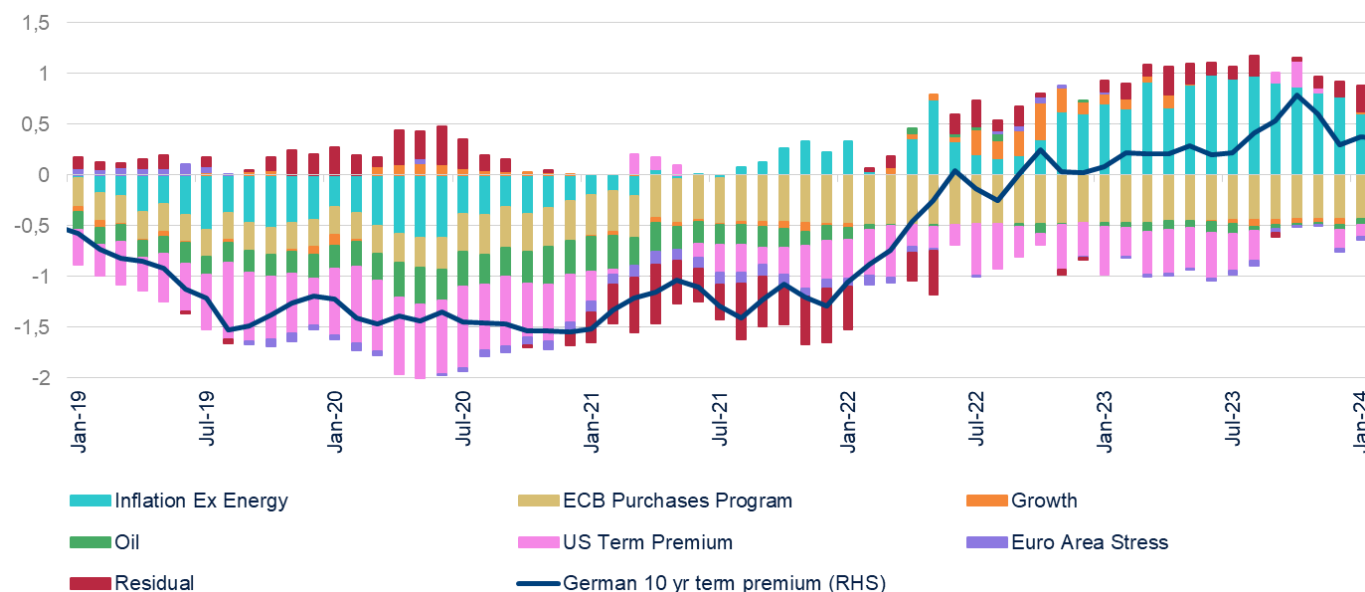Figure 3. **FACTORS DRIVING GERMAN TERM-PREMIUM - PPT CONTRIBUTION OF DRIVERS**
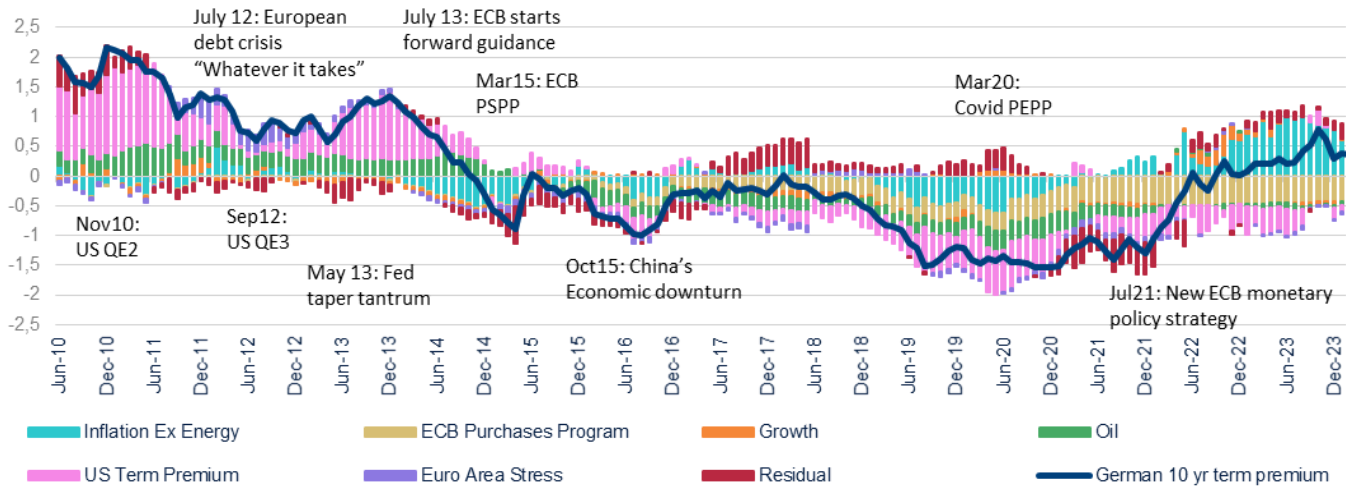
Source: BBVA Research

Figure 4. **FACTORS DRIVING GERMAN TERM-PREMIUM - PERCENTAGE CONTRIBUTION OF DRIVERS**

Source: BBVA Research

Figure 5. **FACTORS DRIVING GERMAN TERM-PREMIUM - ZOOMING IN ON THE RECENT EPISODE (PPT CONTRIBUTION OF DRIVERS)**

Source: BBVA Research

Conclusion:

Recent developments suggest that German 10 year term premium has turned positive in the aftermath of the pandemic, boosted mainly by the upward trend in the uncertainty surrounding inflation component as well as the US 10 year term-premium. In addition, uncertainty around growth prospects in the Euro Area, alongside less downward pressure on the Term Premium from ECB purchases program have also weighed, albeit to a lesser extent.

Going forward, our baseline scenario assumes that the ongoing disinflationary process will continue, leading inflation close lower towards the 2% ECB target (BBVA est: 2.3% in 2024 and 2% in 2025), while long term oil prices expectations will stay unchanged around 70 $/bbl for the 3yr futures price. On the other hand, the expected downward trend of the inflation component in the term-premium could be partially offset in the wake of ongoing normalization in the ECB asset purchase program, which in turn will widen the 10 year sovereign yield spread between Germany and Italy (Euro Area fiscal stress). Nonetheless, any such fiscal stress will remain contained due to the effect of ECB's Transmission Protection Instrument (TPI), which is designed to allow the ECB to purchase bonds of individual Euro Area states under certain circumstances in order to contain unwarranted interest rate increases. To conclude, a sensitivity analysis of the German TP to changes in the main exogenous variables of the analysis suggests that the inflation component and the global factors have a higher impact than the rest. More specifically, a 100 bps increase in inflation expectations translates to a near 1 pp increase in the German TP

whereas a 100 bps increase in US term premium results in a 0.7pp increase in the later. Finally, a 100 bps widening of the periphery/Italian risk premium has relatively limited impact, raising the German TP by 0.3pp.

Annex I: Multiple linear regression analysis to capture the factors that drive the term-premium

Explanatory variables

Table 1. **Explanatory variables**

Uncertainty type	Variable name	Variable description	Sign
Inflation uncertainty	Oil	3Y ahead Brent futures. Included as z-score with 1 month lag	+
	Inflation Ex Energy	The residual of the regression of the long-term inflation (5y5y inflation swap) on 3Y ahead Brent futures. Included as z-score with 1 month lag	+
Growth uncertainty	Growth	The residual of the regression of 10Y German bund option implied volatility on inflation excluding oil and long-term oil prices. Included as z-score with 1 month lag*	+
Euro Area Fiscal Stress	Default	10Y Italy and Germany sovereign yield spread between. Included as standard deviation from mean. 1 month lagIncluded as z-score with 1 month lag	+
	ECB's asset purchase program	ECB's Asset purchase programme: Sum of ECB's SMP, PSPP and PEPP as percentage of the Eurozone GDP. 1 month lag	-
Global factors	US Term Premium	10Y term-premium by ACM. Included as percentage 1M lag	+

*YieldF volatility reflects uncertainty about future nominal growth, and through the regression on inflation, it cleans up the inflation effect, providing the real growth and small degree of uncertainty, which in the case of the Euro Area is very small

Source: BBVA Research

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