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Decomposing Bond Yields: A Comparison with Fed Models

Summary

We compare Argedion's estimates of the US 10-year term premium and expected short rate with three widely used Federal Reserve models. Although term premium estimates co-move substantially across models, they imply markedly different decompositions of long-term yield movements. In our model, term premia account for only 29% of monthly fluctuations in the 10-year Treasury yield, compared with 47–77% in the Fed models, leaving a correspondingly larger role for revisions in expected short rates. These differences are particularly pronounced since late 2024: the Argedion model attributes recent movements in the 10-year yield predominantly to expected short rates, while the Fed models — especially ACM — assign a much larger role to term premia. Overall, the results show that models with broadly similar cyclical patterns in estimated term premia can provide very different economic interpretations of movements in long-term yields.

1 Introduction

Bond yields can be decomposed into two unobservable components: an expectations component, reflecting the average expected path of short-term interest rates over the maturity of the bond, and a term premium, representing the additional compensation investors require for bearing interest rate risk.

Argedion's methodology for estimating these components is based on Berardi, Brown, and Schaefer (2026). In this note, we compare our estimates of the US term premium and

expected short rate with three widely used estimates produced within the Federal Reserve System: Kim and Wright (2005) (KW), Adrian, Crump, and Moench (2013) (ACM), and Christensen and Rudebusch (2012) (CR).

The three Fed models provide useful benchmarks and differ substantially in their estimation approaches. The KW model is an arbitrage-free three-factor Gaussian term structure model, incorporating survey forecasts to help pin down long-horizon interest rate expectations. The ACM model uses a five-factor affine term structure model estimated through a linear regression approach, with the factors extracted from Treasury yields using principal components. The CR model is a dynamic Nelson–Siegel term structure model subject to no-arbitrage restrictions, with level, slope, and curvature factors describing movements in the yield curve.

Our approach differs from all three benchmarks along several important dimensions. Most importantly, our model allows yield volatility to vary over time, whereas the Fed models assume constant volatility. We also use a richer information set, fitting yields out to 25 years rather than 10 years and jointly incorporating yields, forward rates, and yield volatility. These differences are important for identifying the two unobservable components of long-term yields. In particular, long-maturity rates provide additional information about the expected path of short rates and, as shown in Berardi, Brown, and Schaefer (2026), can substantially improve the precision with which expected short rates and term premia are estimated.

We first compare the resulting decompositions of the 10-year Treasury yield and then examine how these differences translate into contrasting interpretations of recent movements in long-term yields.

2 Yield Decomposition

The term premium on a τ-maturity zero coupon bond, $TP_t(\tau)$, is defined as the difference between the τ-maturity yield $Y_t(\tau)$ and average expected short rate $ER_t(\tau)$:

$$TP_t(\tau) = Y_t(\tau) - ER_t(\tau),$$

where $ER_t(\tau) = \frac{1}{\tau}\int_0^\tau \mathrm{E}_t[r_{t+s}]ds$ and r is the short rate.

This decomposition separates movements in long-term yields into changes in the expected path of future short rates and changes in the compensation investors require for bearing interest rate risk. Since neither component is directly observable, their relative importance

depends on the term structure model and the information used in estimation.

The comparison below therefore focuses not only on differences in the estimated levels of the two components, but also on their dynamics and their contribution to fluctuations in long-term yields.

3 A Comparison of US Estimates

Figure 1 compares the time series estimates of the 10-year term premium and expected short rate obtained from our stochastic volatility model (ARG) with those from the three Fed models.[1] The sample runs from January 2000 to August 2026.

The figure shows substantial commonality in the broad movements of the estimated components, but also important differences across models. Term premia (Panel A) tend to rise and fall together, but the amplitude of these fluctuations differs considerably. ARG and KW generally display smoother term premium dynamics, while ACM and especially CR exhibit much larger swings. These differences have a counterpart in Panel B, where the models also display substantial differences in the dynamics of expected short rates. Together, the two panels suggest markedly different allocations of movements in long-term yields between expectations and term premia, a pattern quantified below.

Table 1 provides summary statistics for the corresponding decompositions of the 10-year Treasury yield. Panel A shows that the average ARG term premium is 51 bps, close to the 48 bps estimated by KW and below the approximately 67 bps estimated by both ACM and CR. The models differ much more markedly in the volatility of their estimates. The annualised standard deviation of monthly changes in the term premium is 44 bps for ARG and 48 bps for KW, compared with 85 bps for ACM and 121 bps for CR.

Despite these differences in levels and volatility, monthly changes in the term premium remain substantially correlated across models. As shown in Panel B, the correlation between changes in the ARG term premium and the corresponding Fed estimates is 0.68 for ACM, 0.67 for KW, and 0.62 for CR.

Differences are also apparent in expected short rates. Their average level is virtually identical in ARG and KW, at around 300 bps, but somewhat lower in ACM and CR. Unlike for term premia, however, ARG does not generally produce smoother expected short rates: their volatility is higher than in KW and ACM, although lower than in CR. Monthly changes in the ARG estimate are highly correlated with KW (0.84), but considerably less so with

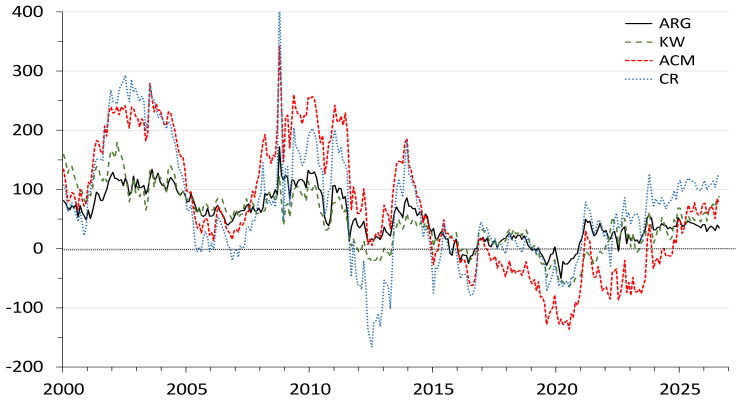
[1] Updated estimates are available from the Federal Reserve for KW, the Federal Reserve Bank of New York for ACM, and the Federal Reserve Bank of San Francisco for CR.

ACM (0.58) and CR (0.35).

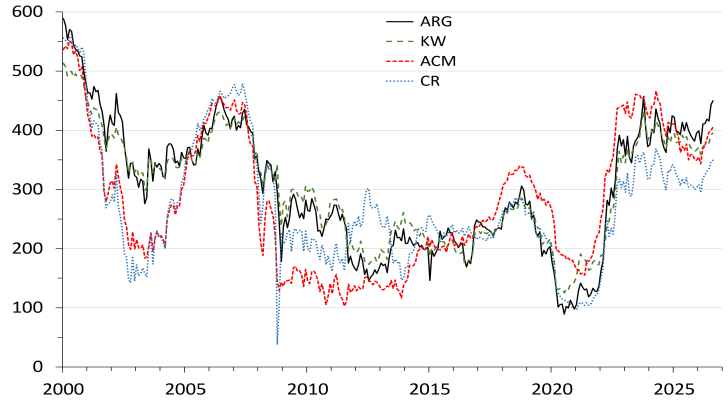
Figure 1
US Term Premia and Expected Short Rates

This figure shows the time series of the US 10-year term premium and expected short rate for the Argedion (ARG) and Fed models: Kim and Wright (2005) (KW), Adrian, Crump, and Moench (2013) (ACM), and Christensen and Rudebusch (2012) (CR). Values are expressed in basis points. The sample period is from January 2000 to August 2026.

Panel A: Term premium



Panel B: Expected short rate



These differences are reflected in how the models attribute movements in long-term yields. Following Moench (2019), we decompose the variance of monthly changes in the 10-year yield into the contributions of the term premium and the expected short rate. Panel C shows that the term premium accounts for 47% of yield variation in KW, 60% in ACM, and 77% in CR, compared with only 29% in ARG. Accordingly, expected short rates account for 71% of the

variation in the 10-year yield in our model.

Table 1
US 10-Year Yield Decomposition

This table shows summary statistics for the time series of the US 10-year term premium and average expected short rate estimated by our stochastic volatility model (ARG) and the Fed models: Kim and Wright (2005) (KW), Adrian, Crump, and Moench (2013) (ACM), and Christensen and Rudebusch (2012) (CR). Panel A reports the mean of term premia and average expected short rates and the annualised standard deviation of their monthly changes (values in basis points), while Panel B shows the correlation between monthly changes in term premia and average expected short rates. Panel C reports, for each model, the variance decomposition of monthly changes in the 10-year yield into its two components: the term premium and the average expected short rate (values in percentage terms). The sample period is from January 2000 to August 2026.

Panel A: Summary statistics on term premium and average expected short rate

	term premium		exp short rate	
model	mean	stdev	mean	stdev
ARG	51.3	43.5	300.2	70.1
KW	48.1	48.0	300.2	47.9
ACM	67.0	85.0	279.7	58.2
CR	67.4	120.8	273.1	86.0

Panel B: Correlation between term premia and expected short rates

	term premium			exp short rate		
model	ARG	KW	ACM	ARG	KW	ACM
KW	0.67			0.84		
ACM	0.68	0.77		0.58	0.51	
CR	0.62	0.62	0.87	0.35	0.16	0.78

Panel C: Variance decomposition of 10-year yield

	ARG	KW	ACM	CR
Term premium	29	47	60	77
Expected short rate	71	53	40	23

The difference is economically important. Although the estimated term premia co-move substantially across models, all three Fed models attribute a larger share of fluctuations in long-term Treasury yields to changes in term premia, particularly ACM and CR, whereas our estimates assign the dominant role to revisions in expected short rates.

The larger role assigned to term premia by the Fed models may partly reflect differences in the estimated persistence of interest rates. Bauer, Rudebusch, and Wu (2012) and Bauer, Rudebusch, and Wu (2014) show that upward bias in estimated mean reversion in VAR-based term structure models (including ACM) can generate excessive variability in estimated term premia, thereby reducing the variation attributed to expected short rates.

4 Diverging Interpretations after the Tightening Cycle

The period following the peak of the Federal Reserve's 2022–23 tightening cycle provides a useful illustration of the differences across models. We take December 2023 as the starting point, when the federal funds rate had reached the peak of the tightening cycle and attention was increasingly shifting toward the timing and pace of future policy easing. **Figure 2** shows cumulative changes since December 2023 in the 10-year term premium and average expected short rate.

The differences are striking. By August 2026, the ARG term premium was only slightly above its December 2023 level. Over the same period, term premia increased by around 80 bps in KW, 110 bps in ACM, and 55 bps in CR. A very different picture emerges for expected short rates. The ARG estimate increased by around 80 bps, compared with only 10 bps in KW and 30 bps in CR, while the ACM estimate declined by around 20 bps.

Thus, although the models decompose essentially the same observed movements in Treasury yields, they provide markedly different interpretations of their underlying drivers. In ARG, the cumulative increase in the 10-year yield since December 2023 is predominantly attributed to higher expected short rates, whereas the Fed models assign a much larger role to term premia. The contrast is particularly stark for ACM, where the rise in the term premium more than accounts for the increase in the yield, offsetting a decline in the expected short rate.

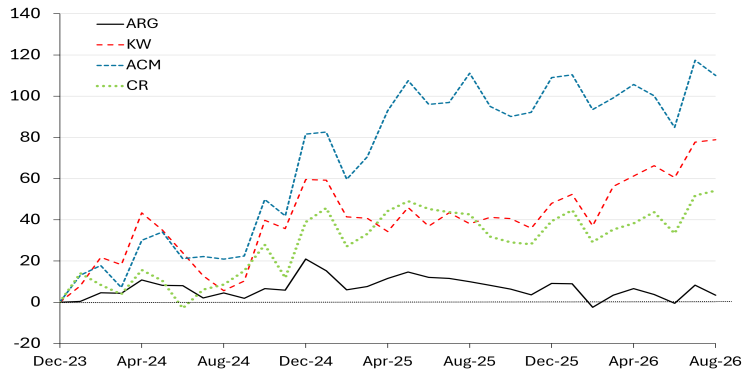
Importantly, these differences are not confined to the comparison of the two endpoints. **Figure 2** shows that the decompositions begin to diverge persistently from late 2024 onwards, as the Federal Reserve began to ease monetary policy while longer-term yields remained elevated. In ARG, subsequent movements in the 10-year yield are reflected predominantly in a higher expected path of future short rates, while the term premium remains comparatively stable. In ACM, by contrast, the cumulative increase in the term premium continues to build while the expected short rate component moves in the opposite direction. KW and CR generally lie between these two cases, suggesting a spectrum of interpretations ranging from predominantly expectations-driven movements in ARG to predominantly term

premium-driven movements in ACM. The divergence therefore reflects a persistent difference in how the models interpret the same sequence of yield movements rather than a temporary discrepancy at the end of the sample.

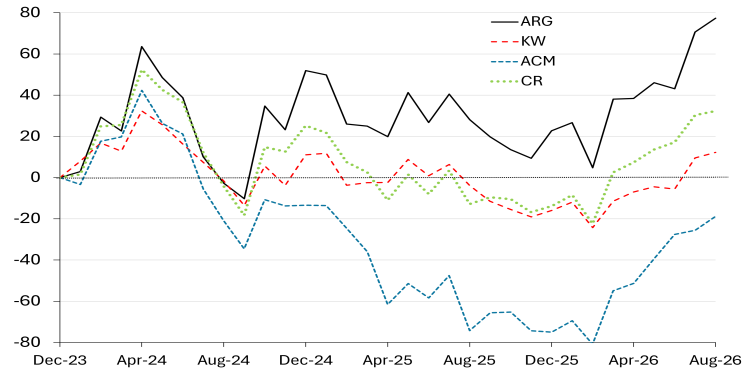
Figure 2
Cumulative Changes after the Tightening Cycle

This figure shows cumulative changes in the US 10-year term premium (Panel A) and average expected short rate (Panel B) for the Argedion model (ARG) and the Fed models: Kim and Wright (2005) (KW), Adrian, Crump, and Moench (2013) (ACM), and Christensen and Rudebusch (2012) (CR). Changes are measured relative to December 2023 and are expressed in basis points. The sample ends in August 2026.

Panel A: Term premium



Panel B: Expected short rate



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