Temi di discussione

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MACROECONOMIC SHOCKS
AND THE TERM PREMIUM IN THE US

by Kevin Pallara*, Luca Rossi** and Fabrizio Venditti***

Abstract

This paper analyzes the macroeconomic drivers of the US ten-year term premium using a daily Structural Vector Autoregressive model with sign and narrative restrictions, a framework that has not been previously applied in this context. Domestic uncertainty, inflation compensation, and domestic demand shocks explain most of the daily variation in the term premium. Domestic uncertainty, in particular, plays a central role, as it is the only shock that explains the strong negative co-movement between the expected short-term rate and the term premium, a stylized fact that has so far gone unnoticed in the literature. We use the model to revisit the behaviour of the term premium since the onset of the Great Financial Crisis, with a focus on more recent events where changes in the term premium have been at the centre of policy debate. Our results shed light on the quantitative relevance of specific channels and challenge existing narratives about these episodes.

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1 Introduction[1]

Yields on long-term US Treasury bonds are a key determinant of global financial conditions. Given the dominant role of the US dollar as reserve currency and the central position of the US economy in global markets, movements in US yields tend to spill over to other asset classes, both domestically and internationally.

Long-term yields can be decomposed into the sum of an expectation component, which captures the expected return of rolling over one-period bills for the maturity of the long-term note, and an extra yield, the term premium. This premium compensates investors for committing to a long-term security with a fixed return, rather than rolling over short-term instruments and thereby retaining the flexibility to reassess investment opportunities as conditions evolve. Technically, the term premium reflects compensation for duration risk, the risk that fluctuations in short-term interest rates will affect the value of long-term bonds. The fact that the term premium cannot be directly observed has given rise to a large literature on how to measure it effectively (see Appendix A for a review).

We stress three reasons that make the term premium, and in particular that on US bonds, interesting for both central banks and private investors. First, although the average expected short-term rates determine most of the *level* of the ten-year US Treasury yield, the term premium accounts for most of its *volatility*: within our sample, the standard deviation of daily changes in expected rates equals 3.3 basis points, compared to a value of 5.6 for the term premium, almost twice as much. This stylized fact holds not only for the US, but more generally for global bond markets (Moench, 2019). Understanding the macroeconomic determinants of the term premium is therefore essential for interpreting movements in long-term interest rates. Second, balance sheet policies, a standard monetary policy tool since the Global Financial Crisis, change the average duration of the bonds available to the market and influence long-term rates primarily via the term pre-

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mium. Third, the substantial international co-movement of sovereign bond yields is to a large extent driven by the term premium (Moench, 2019; Neely, 2015).

Despite its relevance, little research has been devoted to understanding the macroeconomic shocks driving the term premium and in developing models to interpret its dynamics in real time. Our paper contributes to filling this gap. We use a high-frequency Structural Vector Autoregressive (SVAR) model in which the term premium and other asset prices are a function of five orthogonal macroeconomic disturbances, namely monetary policy, inflation compensation, domestic uncertainty, domestic demand and global risk appetite shocks.

The choice of shocks is motivated by economic theory. Monetary policy shocks affect the term premium by changing either the aggregate level of duration in the market via asset purchases and sales (D'Amico and King, 2013b; Krishnamurthy and Vissing-Jorgensen, 2011a; Greenwood and Vayanos, 2014) or the desire of investors to be exposed to duration. For example, Hanson and Stein (2015) show that yield-oriented investors reduce their exposure to long-term bonds in favor of higher-yielding shorter tenors when the central bank hikes rates. In the presence of financial frictions (e.g. limited ability of counterparts to absorb these changes in portfolio composition) this reduced demand for long-dated bonds increases the term premium. A similar mechanism is highlighted in Varraso (2024), who shows that the impact of monetary policy on bond markets can be amplified when the investor base is segmented and balance sheet constraints limit arbitrage, reinforcing the duration-risk channel studied by Greenwood and Vayanos (2014). Besides asset purchases and actual rates changes, implicit or explicit guidance about the future path of short-term rates affects investor expectations and the risk compensation required to hold long-term bonds (Kim and Wright, 2005; Gürkaynak et al., 2004; Swanson and Williams, 2014).[2]

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[2]An additional channel of transmission from monetary policy, specific to the US, is mortgage refinancing (Hanson, 2014). In the US, most mortgages are supplied at fixed rates, but they can be pre-paid and refinanced at no cost. When rates fall, there is an incentive for households to pre-pay the old mortgage and to re-finance at a lower rate. This has implications for the market for government bonds. Investors that have a

Second, inflation risk is a critical determinant of the term premium due to the vulnerability of long-term bonds to unexpected inflation. Higher inflation risk increases uncertainty about the real returns of fixed income securities, prompting investors to demand a higher term premium as compensation (Campbell and Shiller, 1991). Inflation risk is also influenced by central banks' credibility. When investors believe that central banks can maintain stable inflation, the inflation risk premium declines (D'Amico and King, 2013b; D'Amico et al., 2018) while the term premium rises when inflation expectations become less anchored or more volatile (Breeden et al., 1989; Fleckenstein et al., 2014). This is the reason why economies that credibly commit to targeting inflation benefit from a fall in long-term interest rates.

Domestic uncertainty is our third key driver of term premium dynamics. When uncertainty about economic fundamentals increases, the perceived risk of holding long-duration assets rises (Bekaert et al., 2013). Also, when the volatility of inflation and GDP is higher, investors demand additional compensation for holding long-term bonds (Wright, 2011; Jurado et al., 2015). This relationship is quantitatively meaningful, as measures of macroeconomic uncertainty explain a substantial fraction of variations in the term premium (Ludvigson and Ng, 2009a) and shape its co-movement with consumption and investment (Bianchi et al., 2023).

Fourth, domestic demand shocks capture changes in expectations about real economic activity that are not driven by monetary policy. They may originate from surprises in consumption, investment, or fiscal policy and their relevance for the term structure has been highlighted in studies linking real activity to bond risk premia (e.g., Ludvigson and Ng, 2009a), as well as in models distinguishing growth from discount rate news (e.g., Piazzesi et al., 2006; Cieslak and Pang, 2021).

Last, global risk appetite shocks capture broad shifts in investor sentiment and portfo-

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preference for longer duration turn from the mortgage market to the government bond market, increasing the demand for long-dated government bonds and causing a reduction of the term premium. The opposite occurs when interest rates rise, therefore pushing up the term premium. Given the size of the MBS market, the effects can be large.

lio preferences unrelated to domestic macroeconomic or monetary developments. These shocks reflect time-varying risk tolerance, including toward duration, credit, and liquidity, often triggered by geopolitical tensions, financial instability, or global capital flows reversals. Their role is stressed in the literature on global financial cycles (e.g., Forbes and Warnock, 2012; Rey, 2015) and in models featuring time-varying risk aversion or intermediary constraints (e.g., He and Krishnamurthy, 2013; Adrian et al., 2014).

Findings. Our main findings indicate that domestic uncertainty, inflation compensation, and domestic demand shocks account for the majority of the daily fluctuations in the term premium. Among these, domestic uncertainty emerges as a particularly influential factor, confirming results in the literature that identifies uncertainty shocks as key drivers of business cycle dynamics (Christiano et al., 2014; Bianchi et al., 2023). Notably, this shock also helps explain a previously overlooked stylized fact: the average expected short-term interest rate and the term premium tend to exhibit persistent negative co-movement, as illustrated in Figure 1. The figure employs Adrian et al. (2013) (ACM henceforth) decomposition, but this result holds also when using the one in Christensen and Rudebusch (2012) (CR henceforth). This pattern is consistent with the dual impact of uncertainty: while it depresses the expected level of economic activity (i.e., lowers expected growth), it simultaneously raises expected volatility. Financial markets internalize these effects by revising down their expectations for short-term rates while demanding a higher term premium to compensate for increased risk (Bianchi et al., 2023).

Next, we show how the model can be used to construct economic narratives around events of interest. In particular, we review the reasons for the increase in the term premium (i) after the taper tantrum in May 2013, when the Federal Reserve announced that it would taper asset purchases, (ii) in July 2023, when the increase of the term premium at the peak of a monetary policy tightening cycle prompted a debate on the risk of over-tightening,[3] and (iii) after the tariffs' announcement on April 2nd by President Trump.

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[3]See, for instance, Diercks and Asnani (2024).
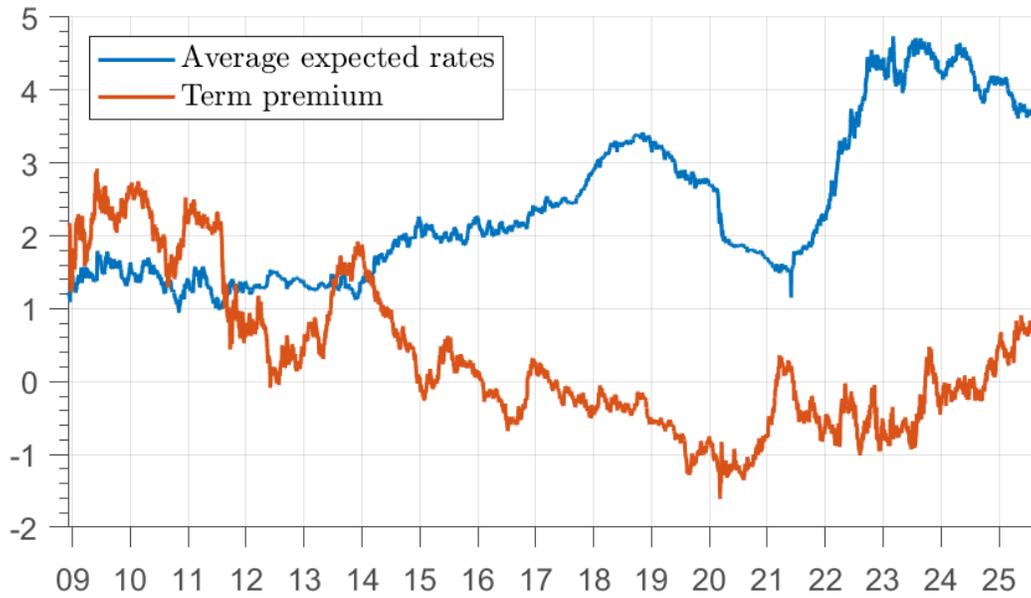
(a) Average expected rates and term premium
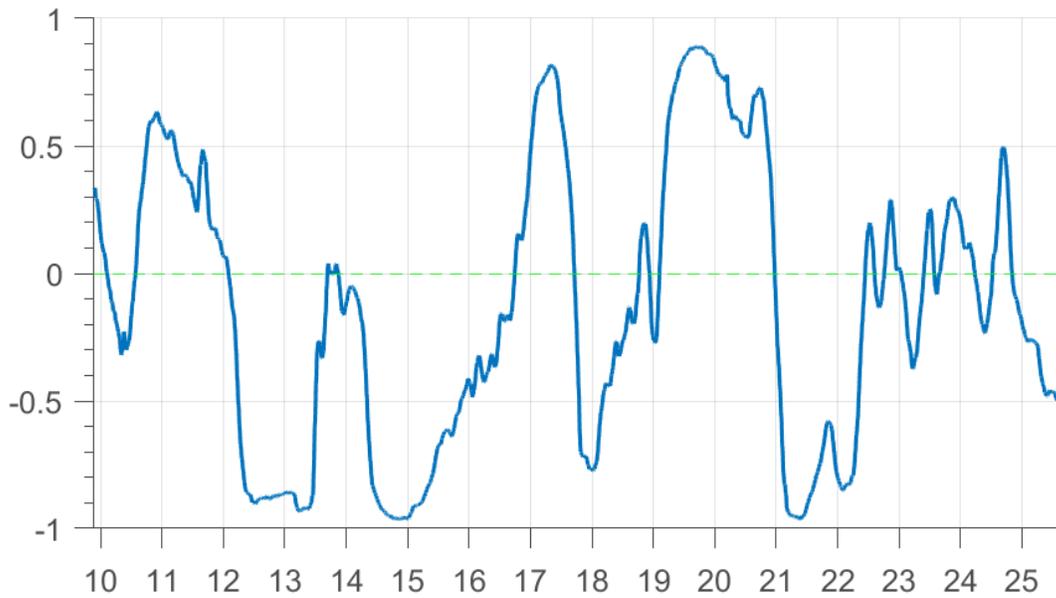
(b) Time-varying correlation between average expected rates and the term premium.

Figure 1: Term premium, average expected rates and time-varying correlations. The top panel shows the time series of Adrian et al. (2013) average expected rates and the term premium over the estimation sample period. The bottom panel shows their one-year rolling correlation.

Our model indicates that, while the rise in the term premium after the taper tantrum was predominantly due to monetary policy shocks, domestic uncertainty and inflation risk played a key role in the other two episodes.

Relationship with the literature. Our paper contributes to two strands of the literature. First, we add to a growing literature (Hoynck and Rossi, 2023; Gazzani et al., 2024) that uses asset prices to estimate economic shocks and that blends the use of financial data at the daily frequency in Vector autoregressions (Campbell and Ammer, 1993) with structural shocks identification (Sims, 1980). Our paper relates to the recent contribution by Cieslak and Pang (2021), who study common shocks in stock and bonds. Their focus is narrower, as it concentrates on the relationship between the term structure and stock prices. We use a wider set of asset prices and shocks, and therefore provide a richer economic narrative of movements in the term premium.

Second, our paper is connected with the macro-finance literature that uses Affine Term Structure Models (ATSMs) to decompose bond yields into expected rates and the term premium (Dai and Singleton, 2000; Kim and Singleton, 2008). While ATSMs relate the term premium to macroeconomic conditions, they are primarily concerned with the estimation of the term premium per se, and do not provide a structural interpretation of the shocks that determine the joint behaviour of the term premium and other asset prices. The regression-based approach devised by ACM, which studies the relationship between the term premium and macro factors, such as inflation, GDP growth, and monetary policy indicators, suffers from a similar limitation. In the context of Dynamic Stochastic General Equilibrium (DSGE) models Rudebusch and Swanson (2007) and Bianchi et al. (2023) demonstrate how macroeconomic shocks, such as changes in monetary policy, affect the term premium. This approach, however, works at lower frequencies and therefore does not provide a method to interpret the term premium in real time.

2 Stylized facts and identification of the shocks

Our model is a daily SVAR that includes the ACM term premium, the average expected short term rate, equity prices,[4] the Nominal Effective Exchange Rate (NEER), and ten-year Inflation Linked Swaps (ILS). The model includes five lags and is estimated using data between the beginning of December 2008 and the end of July 2025 using standard Bayesian methods. Estimation is performed using prior shrinkage in a Bayesian framework. A classic Minnesota prior is complemented with two further priors on the sum of the VAR coefficients, introduced to favor unit roots and cointegration, so called sum-of-coefficients and dummy-initial-observations priors (Bańbura et al., 2010).

While we cannot rule out bias introduced by the use of generated regressors (average expected rates and the term premium), Section 3.4 shows that our results are robust to using the different CR decomposition even with different maturities, thereby reassuring us that bias is not guiding our results.

Identification of the shocks is achieved with a mix of sign and narrative restrictions. Our identification strategy builds on economically motivated sign restrictions, which are particularly suited to settings where theory delivers clear directional implications but timing assumptions are hard to defend at high frequency (e.g. Uhlig, 2005; Rubio-Ramirez et al., 2010; Arias et al., 2018). We follow the recent macro–finance strand that uses daily asset-price information in VARs to recover economically interpretable shocks and construct real-time narratives (Campbell and Ammer, 1993; Gazzani et al., 2024; Hoynck and Rossi, 2023; Cieslak and Pang, 2021). To further sharpen identification, we complement sign restrictions with narrative restrictions that exploit a small number of well-identified event days on which prior information about the dominant driver of market moves is unusually strong, in the spirit of narrative sign restrictions (Antolín-Díaz and Rubio-Ramírez, 2018) and the broader narrative approach in macroeconomics (Romer

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[4]We measure equity prices via the S&P Consumer Discretionary equity index – henceforth referred to as "equity" – rather than the full index since the latter has become increasingly dominated by the Information Technology (IT) sector. In the last part of our sample, IT made up more than 30% of the S&P 500 index.

and Romer, 2004; Ramey, 2011). In practice, narrative restrictions help discipline the set of admissible rotations that satisfy the sign restrictions, while preserving the flexibility needed to accommodate alternative transmission channels at the daily frequency.

The sign restrictions, summarized in Table 1 and described below, are consistent with macroeconomic theory.

To identify monetary policy shocks we use standard restrictions (first column of Table 1) motivated by the literature reviewed in the Introduction. Specifically, we assume that a monetary tightening raises average expected rates, the term premium and the value of the dollar, while it lowers stock prices and inflation compensation.

A positive domestic demand shock (second column of Table 1) raises both the term premium and expected yields. It also increases equity prices and inflation compensation, leading to an appreciation of the dollar.

The inflation compensation shock (third column of Table 1) reflects pressures on the term premium arising from the risk of higher inflation and, consequently, higher nominal interest rates. Such pressures may stem from adverse supply shocks – for example, the energy shock following Russia's invasion of Ukraine – or from concerns over fiscal sustainability. The resulting increase in the inflation risk premium raises inflation compensation and expected interest rates but lowers equity prices. The impact on the exchange rate is ambiguous: while higher rates support the dollar, the associated drag on economic activity pulls in the opposite direction.

The global risk appetite shock (fourth column of Table 1) captures shifts in investor demand for safe assets in periods of heightened global market volatility – triggered, for example, by financial instability or geopolitical tensions. This increased demand typically leads to a decline in the risk-free rate and, consequently, in the average expected short-term interest rates. However, the impact on the term premium is theoretically ambiguous. On the one hand, a classic flight-to-safety episode prompts investors to reallocate their portfolios toward Treasuries and away from riskier assets such as equities. If this rebal-

ancing occurs uniformly across the yield curve, the term premium tends to decline. On the other hand, if the flight-to-safety is accompanied by a surge in risk aversion – resulting in reduced appetite for duration risk – investors may also shy away from longer-term Treasuries in favor of cash or very short-term instruments. In such cases, the term premium may rise. Additionally, the US dollar is expected to appreciate due to safe-haven flows, while equity prices decline.

We identify a domestic uncertainty shock (fifth column of Table 1) building on the framework developed by Bianchi et al. (2023), which explores the relationship between uncertainty, macroeconomic dynamics, and the term premium. In their model, an uncertainty shock increases both precautionary savings and the investment risk premium, leading to a contraction in economic activity – reflected in our model by a decline in equity prices – and a reduction in expected interest rates. The yield curve, however, steepens, as investors are less willing to hold long-duration assets in the face of heightened uncertainty; the term premium thus rises. We also assume that the US dollar depreciates following an uncertainty shock, consistent with weaker domestic economic prospects and expectations of a more accommodative monetary policy.[5]

Importantly, uncertainty shocks – and potentially risk appetite shocks – are the only disturbances in our model that generate divergent movements in average expected interest rates and the term premium. This feature may help explain historical episodes of negative correlation between these two variables shown in Figure 1.

In addition to the sign restrictions, we also impose two narrative restrictions on days where we have strong priors as to which shocks dominated fluctuations in given variables. In particular we assume that: i) on a day in which the Fed announced that it would start unwinding its balance sheet (May 4th, 2022) there was a positive monetary policy shock; ii) Marketable Borrowing Estimates announced by the US Treasury on May 1st 2023 – which surprised market for the sheer size of the increase in the supply of debt –

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[5]We do not constrain the impact response of inflation-linked swaps, as the effects of uncertainty on inflation in Bianchi et al. (2023) are theoretically ambiguous.

Table 1: Sign restrictions

	Monetary policy	Domestic demand	Inflation compensation	Global risk appetite	Domestic uncertainty
Term premium	+	+	+		+
Avg. exp. rates	+	+	+	-	-
Equity	-	+	-	-	-
NEER	+	+		+	-
ILS	-	+	+		

Cells filled with + (-) mean that a given shock exerts a positive (negative) effect on a specific variable on impact. Empty cells refer to situations where no assumption is imposed.

generated a positive inflation compensation shock. In both days we assume that the contribution of these shock to the term premium was higher than that of the other shocks combined.

To give a sense of how these shocks shape asset prices, we conclude by discussing five episodes for which a dominant shock is easy to identify based on market narratives, and report in Table 2 the variation in the asset prices around these events. First, in 2019 downward risks on the global outlook as well as muted inflationary pressures prompted the Fed to adopt a patient approach to its tightening cycle.[6] As a result, investors downgraded the probability of further hikes and the term premium fell together with the dollar; stocks rallied and inflation swaps increased. This co-movement is consistent with the effects of an (expansionary) monetary policy shock. Second, on July 30th, 2014, the Bureau of Economic Analysis released the advance GDP figures which reported a 4.0% annualized growth in the second quarter, from -2.1% in the first. This was a strong positive surprise: for example, economists polled by Refinitiv were expecting a 3.1% growth, making this release one with the highest forecast errors recorded in normal times. On the news, interest rates (both the expected path component and the term premium) increased, the dollar appreciated and equity and inflation compensation rose. This revealed that de-

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[6]The December 2018 rate increase turned out to be the last one of the hiking round, and eventually the Fed started to loosen policy rates at the end of July 2019.

Table 2: Asset price changes around selected events

Episodes	Likely shock	Average expected rates	Term premium	Equity	NEER	ILS
2019 Fed pivot	Mon. policy	-12.2	-11.9	13.3	-0.6	15.3
GDP release for 2014-Q2	Demand	0.9	9.4	0.6	0.3	0.8
Ukraine war	Inflation risk	54.6	34.0	-18.3	3.5	16.7
Greek debt downgrade	Global risk	-5.3	1.2	-0.8	0.4	-1.3
Covid-19 outbreak	Uncertainty	-45.2	8.8	-14.4	4.2	-40.1

The table reports variations in financial market data around selected events where asset prices co-moved in different ways. For average expected rates, term premium, and ILS, figures are first differences; for equity and NEER, the table shows log differences. All numbers are multiplied by 100. For the 2019 Fed pivot the table reports the cumulative variation of the first three months of the year; the second line is the daily variation that occurred on July 30th, 2014; in the third line we report the cumulative variation of the first three months of the Ukraine war; for the Greek sovereign debt crisis episode we focus on December 8th 2009, when Fitch downgraded Greek debt to BBB+ from A-, with a negative outlook; the last line zooms into March 2020.

mand was stronger than expected and financial markets reacted accordingly. Third, the consequences of the war in Ukraine led, although with a certain delay, financial markets to price a supply-driven increase in inflation into asset prices. Average expected rates, the term premium and inflation compensation rose, bolstering the value of the dollar, while equity prices fell almost 20%. Fourth, at the end of 2009 concerns about the sustainability of Greek public finances led Fitch to downgrade Greek debt. Global risk appetite plummeted and investors rushed to US Treasuries and the dollar. While, overall, long-term yields fell, expected average interest rates dropped by more than the term premium increased. Stock prices and inflation expectations fell. Finally, in March 2020 the extraordinary uncertainty associated with the Covid outbreak reduced equity prices and expectations about future short term rates. On the other hand, the term premium rose, consistently with an uncertainty shock.

Table 3: Forecast Error Variance Decomposition

	Monetary policy	Domestic demand	Inflation compensation	Global risk appetite	Domestic uncertainty
Term premium	8.5	22.8	26.7	11.2	30.7
Avg. exp. rates	10.2	1.1	6.9	10.5	71.3
Equity	18.7	47.0	7.7	25.5	1.1
NEER	24.6	15.7	8.4	45.1	6.2
ILS	30.8	9.3	47.1	8.5	4.4

The table shows the Forecast Error Variance Decomposition at $h = 0$; numbers are in percent.

3 Results

Table 3 reports the Forecast Error Variance Decomposition (FEVD) at horizon h=0.[7] First, domestic uncertainty shocks explain a sizable share of the variance of the term premium, about a third in the sample we analyze. Domestic demand and inflation compensation have a comparable impact, while global risk appetite and monetary policy shocks account for only about 10% of its variance. Second, uncertainty shocks explain more than 70% of the variation in average expected short term rates, a result that can be rationalized by the fact that – as shown in Figure 1b – the correlation between expected rates and the term premium is often negative, a co-movement that is mainly generated under the above shock. Third, global risk appetite is the dominant shock for the value of the dollar, consistently with the idea that the dollar serves a barometer of global risk (Avdjiev et al., 2019). Fourth, US equity prices are mostly explained by changes in domestic demand. Last, inflation compensation is the most important shock for movements in inflation-linked swaps.

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[7]FEVDs for higher horizons are very similar.
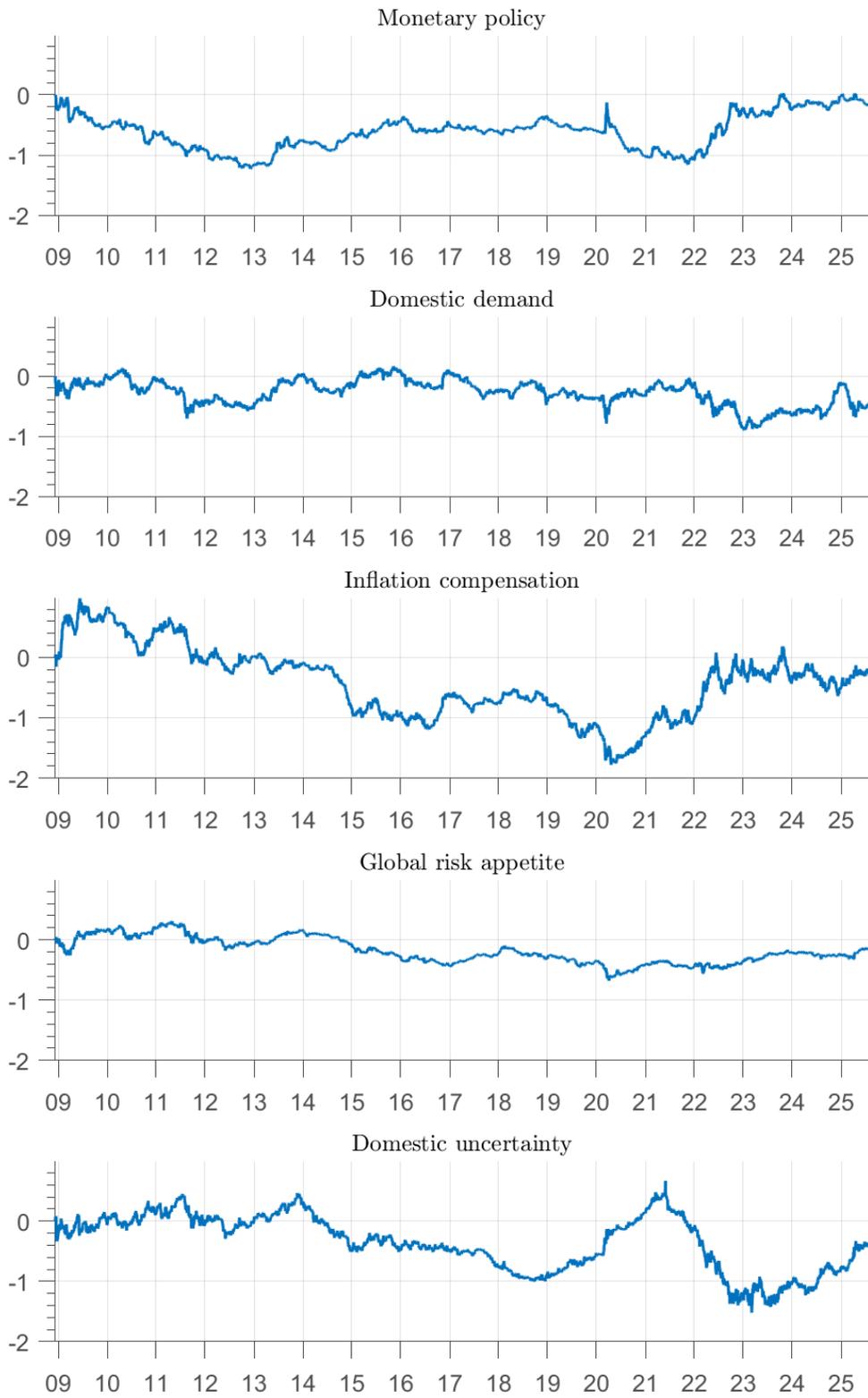
Figure 2: Historical Decomposition of term premium, full sample. The figure plots the cumulated Historical Decomposition of the term premium in the full sample.

3.1 An anatomy of term premium developments, 2008-2025

The model can be used to decompose the term premium in the contribution of the identified shocks both over the whole sample as well as for specific episodes of interest. Figure 2 plots the Historical Decomposition (HD) over the whole estimation sample, organized in five panels corresponding to the five shocks.

2008-2019. Between 2008 and before Covid, the term premium dropped by three percentage points, from 2% to -1%. A fall in inflation risk accounts for most of this decline. Falling oil prices (from above $100 per barrel in 2012-2013 to $64 in 2019) and a slowdown in the global economy, particularly in China, contributed to a disinflationary environment in the US. As a result, CPI inflation fell from 3.2% in 2011 to about zero in 2015, leading to a reduction of the compensation required by investors to hold nominal bonds. A second factor is the fall in domestic uncertainty between 2013 and 2019. This was a period of sustained economic expansion: the unemployment rate fell from 7.4% to 3.7%, cementing the post-Financial-Crisis recovery, and the S&P 500 nearly doubled. Consistently with a booming economy and rising markets, the Economic Policy Uncertainty (EPU) index (Baker et al., 2016) was on average 61% that recorded during 2009-2013, and the VIX showed a similar pattern. Monetary policy played a relatively minor role. While successive rounds of quantitative easing (QE) initially exerted downward pressure on the term premium, this effect began to reverse after 2013, when asset purchases were phased out and the Federal Reserve eventually began raising interest rates.

The Covid shock, 2020-2021. During the Covid crisis the term premium remained broadly stable, after an initial temporary increase. According to our model, this was the result of contrasting forces. Expansionary monetary policy and lower inflationary risks reduced the term premium, but their effect was offset by the surge in uncertainty. Domestic demand initially collapsed but soon recovered, benefiting from a vigorous fiscal expansion.

The post-pandemic inflation, 2021-2024. Starting in January 2021 upward pressure on the term premium stemmed first from inflation risks and later from monetary policy. Worries about inflation started materializing in January 2021 as consumer prices accelerated following the re-opening of the economy, and were reinforced by the effects of the Russian aggression of Ukraine on international energy prices. Further pressure on the term premium resulted from tighter monetary policy, as the Federal Reserve raised interest rates to curb inflation. However, as vaccination efforts progressed, domestic uncertainty declined sharply, sufficiently so to keep the term premium broadly stable despite the shift in the Fed's policy stance.

3.2   Specific events

Our model can be used to build real-time economic narratives to interpret shifts in financial markets. We provide three examples, focusing on the taper tantrum in 2013, on the rise of the term premium between July and October 2023, and on market movements following the tariffs announcement on April 2nd 2025.

Starting at the beginning of May 2013, the term premium crept up, on the back of positive economic surprises and progressively less accommodative communication by the Fed, hinting at the possibility of tapering asset purchases. The latter culminated on the FOMC meeting on June 19th, when during the press conference Bernanke said the Fed would probably stop purchasing Treasuries altogether around mid-2014. This announcement rattled financial markets and led to a 10 basis points bounce in the term premium on that day. Our model (Figure 3) finds that almost 40% of the 94 basis points increase in the term premium between May and June 2013 is explained by monetary policy, and 26% by domestic demand shocks. According to the model, the spike that followed the June 19th FOMC meeting is entirely due to the monetary policy tightening implicit in Bernanke's communication.

Second, we analyze the period between July and October 2023, when the term pre-
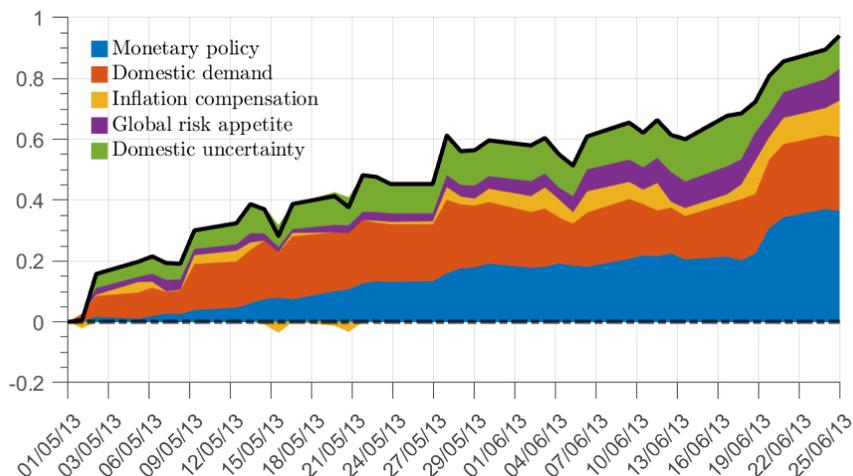
Figure 3: Historical Decomposition, May 2013 (taper tantrum). The figure shows the cumulative variations in the term premium over two distinct periods. The first refers to the 50 basis points increase following Trump's tariffs announcements on April 2nd; the second highlights developments around the days of the May 2013 "taper tantrum" episode.

mium rose by almost 1 percentage point against relatively stable short term rates, leading to a sharp steepening of the yield curve. At the time, market commentators related such steepening to three factors. First, recession risks abated on the back of better-than-expected macroeconomic releases and rising confidence that US consumers and firms were able to withstand the Fed's monetary tightening. Second, on July 31st, the Treasury announced that in the third quarter the federal government would need to issue \$274 billion of Treasury securities in excess of what was announced in May, following a string of upward revisions in borrowing needs since August 2022. These news about larger-than-expected primary deficits put further pressure on long-term yields. Third, in September the FOMC revised upwards both the growth outlook for the US economy and the projected Fed Funds rates for 2024 and 2025. Markets were particularly struck by the fact that some FOMC members reported a 2026 policy rate at 2.9%, 40 basis points more than the median longer-run estimate.

The increase in the term premium was associated with a drop in stock prices and with an appreciation of the US dollar. In equity markets, the most cyclical sectors (S&P Consumer Discretionary) suffered the largest drops, especially after the September 20th

FOMC meeting. At the same time, the dollar gained almost 4% throughout the whole period. Inflation compensation, as measured by ten-year ILS, remained broadly stable. Commentators therefore concluded that the increase in the term premium was largely unrelated to inflation risk. As we show below, this interpretation was mistaken.

The top panel of Figure 4 plots the historical decomposition for the term premium obtained with our model over this period. A rise in inflation risk, tighter monetary policy as well as increased uncertainty explain nearly all the surge in the term premium between the beginning of July and the end of October. After edging up through the summer, the term premium rose more briskly after mid-September. Notably, after the September 20th FOMC meeting and the publication of the new FOMC projections, the above dynamics intensified. The large contribution of the inflation risk premium can be traced back to specific macroeconomic news, including developments concerning the perceived contraction in US fiscal space. In the case of equity prices (middle panel), the negative effect of monetary policy shocks was only partly mitigated by positive domestic demand shocks. This can be rationalized by a simple discount model in which stock prices equal the discounted sum of future earnings. Better demand prospects raised the discounted flow of earnings, pushing equity prices higher. But this effect was more than offset by higher discount rates (driven by higher Treasury yields), due to tighter policy. The stability of inflation compensation (bottom panel) reflected the tug-of-war between inflation risks and the effort of the Fed to keep inflation in check. Indeed, the inflation risk shock pushed inflation compensation up but the effect was completely offset by monetary policy contraction.[8]

Finally, we look at the rise in the term premium, by about 40 basis points, following the April 2nd tariffs announcement by US President Trump. This increase was accompanied by an unusual combination of weakening dollar and falling stock prices, which led commentators to speculate on the loss of the special status of the dollar and of the US financial system. Figure 5 shows the model decomposition for the term premium: our

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[8]The model also indicates (not shown for the sake of brevity) that the appreciation of the dollar was predominantly due to contractionary monetary policy shocks.
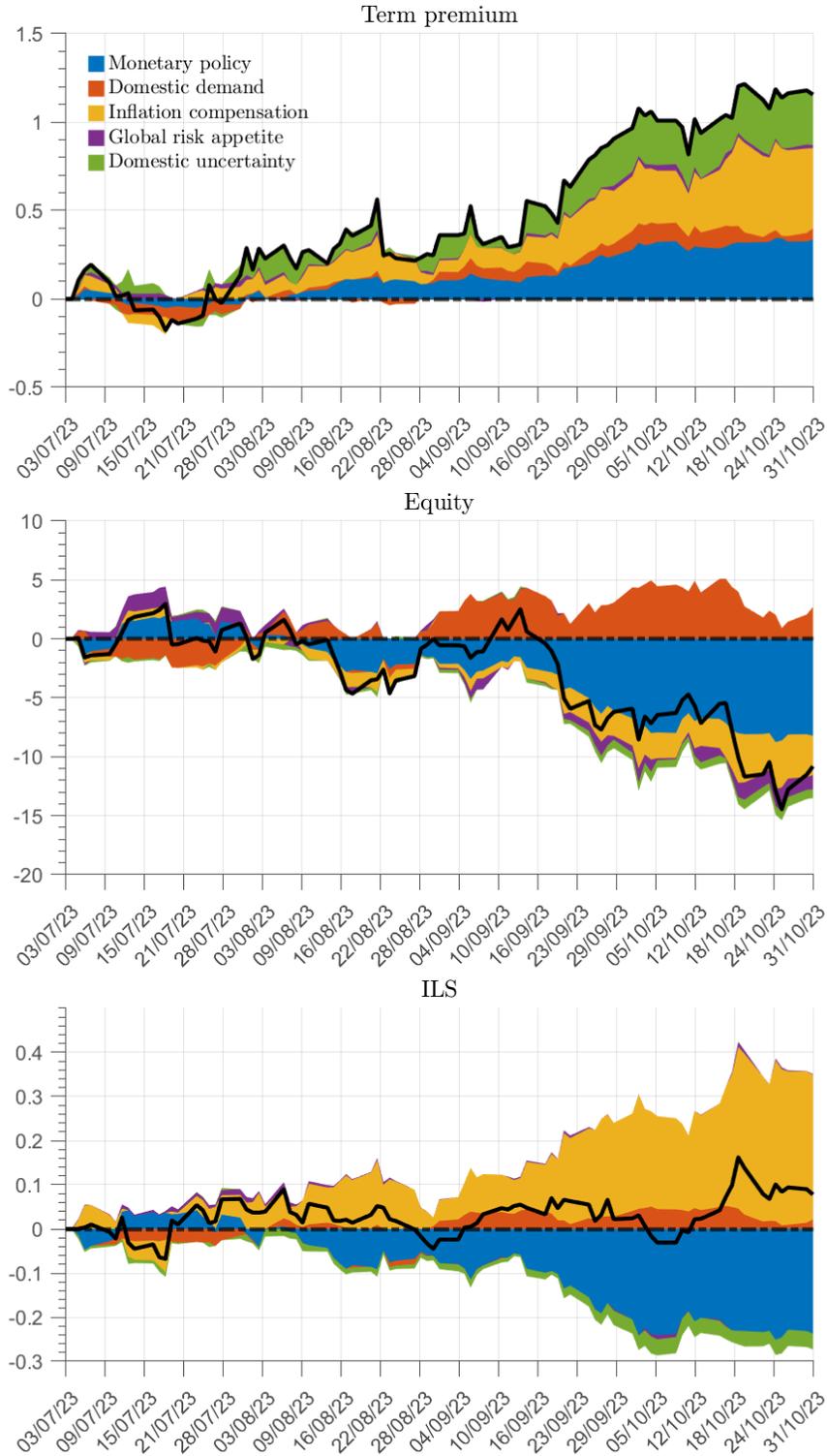
Figure 4: **Historical Decompositions, July 2023 - October 2023 subsample.** The top, middle and bottom panels show the cumulative variations of the term premium, equity returns, and ten-year Inflation-Linked Swaps, respectively.

model attributes the bulk of its increase to the rise in uncertainty about the domestic economy that followed tariffs' announcement and to worries about the inflationary impact of tariffs.
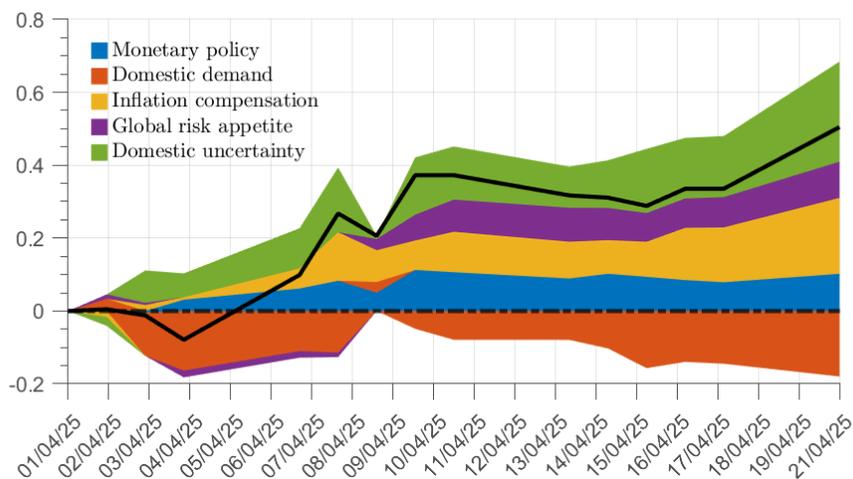
Figure 5: Historical Decomposition, April 2025. The figure shows the cumulative variations in the term premium over two distinct periods. The first refers to the 50 basis points increase following Trump's tariffs announcements on April 2nd; the second highlights developments around the days of the May 2013 "taper tantrum" episode.

3.3 Relating the model's results with macroeconomic news

To further validate the narrative behind our model we relate excess volatility in our estimated shocks with macroeconomic news (Gazzani et al., 2024). We collect surprises on nonfarm payrolls (NFP), personal consumption expenditures (PCE), ISM manufacturing (ISM), and the Consumer Price Index (CPI) from LSEG. The first three are indicators of the US business cycle to which markets have been historically quite sensitive.[9] In addition, we use surprises on short-term interest rates around policy announcements from Jarociński and Karadi (2020). We then compute the ratio of the standard deviation of estimated structural shocks during days when macro releases deviated from expectations

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[9]We use PCE rather than the more timely retail sales since the latter almost exclusively include goods consumption – food services are the only exception – and within our sample goods constitute less than one third of total consumption.

Table 4: Volatility ratios on days with non-zero macro news

Macro release	Monetary policy	Domestic demand	Inflation compensation	Global risk appetite	Domestic uncertainty
NFP	1.12**	1.29***	1.10**	1.09**	1.53***
PCE	0.92	1.13**	0.87	1.06	0.87
ISM	1.14***	1.09**	1.11**	1.29***	1.16***
Headline CPI	1.50***	0.94	1.43***	1.12**	1.38***
Core CPI	1.59***	0.98	1.60***	1.18***	1.40***
FOMC	1.70***	1.02	1.34***	1.25***	1.45***
Real releases	1.02	1.12***	1.05**	1.11***	1.23***
Price releases	1.30***	0.92	1.29***	1.10**	1.25***

The table reports the ratio of standard deviations of our structural shocks during days with non-zero macroeconomic news against those when there was either no macroeconomic release or there was one that was published in line with expectations. "Real releases" combines NFP, PCE, and ISM. "Price releases" combines headline and core CPI. The number of stars represent significance at the 10%, 5%, and 1% levels. The test is a one-sided F-test for equal variances.

vis-a-vis the standard deviation prevailing on all other days (namely, those with either a zero macro surprise or those without a macroeconomic release).

Table 4 reports the volatility ratios along with significance levels. Four results emerge. First, news about the business cycle move asset prices in a way that the model rationalizes as domestic demand and uncertainty, as well as global risk appetite shocks. Domestic demand shocks are particularly active in days of PCE and NFP releases. The latter also activate monetary policy shocks, as they are related to the employment leg of the Fed's dual mandate. Second, news about CPI are associated with significantly more volatile monetary policy shocks and inflation compensation shocks. Third, interest rates surprises around FOMC meetings – as estimated in Jarociński and Karadi (2020) – strongly and significantly affect the volatility of all shocks but domestic demand shocks. This is consistent with the fact that monetary policy decisions convey information not only about the reaction of the Federal Reserve to macroeconomic data, but more generally about macroeconomic conditions. Fourth, the volatility of domestic uncertainty shocks is affected by

five out of the six releases we consider.

When releases about the real economy and about inflation are bunched together (last two rows of the table), the association between macroeconomic news and identified shocks become neater and easier to interpret. The former are strongly connected to domestic demand and domestic uncertainty, and the latter to monetary policy and inflation compensation. All in all, the exercise confirms that our identification scheme recovers shocks that have an intuitive relationship with macroeconomic news.

3.4 Sensitivity analysis

In this section we explore the extent to which our results are robust to changing model specifications and the data we feed into the model. More specifically, we alternatively i) estimate the model with ten lags; ii) get rid of all narrative restrictions; iii) add a negative sign to the response of the term premium to a risk appetite shock, so as to recover a pure flight-to-safety shock; iv) estimate the model starting from the beginning of 2020; v) use ACM decomposition of two-year Treasury notes as well as two-year ILS; vi) do the same as in v) but with five-year maturities; vii) use CR decomposition of two-year Treasury notes as well as two-year ILS; viii) do the same as in vii) but with five-year maturities; ix) do the same as in vii) but with ten-year maturities; x) use the full S&P 500 index. Table A1 in the Appendix reports the correlations between each shock-variable cumulated HD pair in the baseline specification and that in the above ones. Correlations are generally very high: 87.6% of them are higher than 0.8, and only 6.0% are lower than 0.5; the average correlation is 0.901.

4 Conclusions

Yields on ten-year US Treasuries serve as a key indicator of both domestic and global economic conditions. The compensation that investors demand to hold these securities and

the duration risk that they carry (the term premium) reflects their views on the macroeconomy, on monetary and fiscal policy, as well as on the uncertainty that surrounds them.

This paper develops an empirical model that allows to extract such views from a small set of asset prices at the daily frequency. Five shocks, mapping the main plausible sources of variation of asset prices, are identified through Structural Vector Autoregressive model with sign and narrative restrictions. We validate the identification of the shocks by showing that their volatility is related to the release of important US macroeconomic data.

We use the model to shed some light on the historical behaviour of the term premium since 2008 and then focus on three important episodes in which changes in the term premium have been an important element of the policy discussions: the 2013 "taper tantrum", the debate on overtightening in 2023, and the tariffs announcement by President Trump in April 2025. Our model offers intuitive explanations for the increase of duration risk in these periods, in some cases confirming, in others challenging prevailing market narratives.

Besides the results on these specific exercises, a main theme emerging from our analysis is that uncertainty plays a key role in driving the term premium. This result rationalizes a stylized fact that we uncovered along the way, namely that the average expected short-term rate and the term premium are negatively correlated in many sub-samples. As uncertainty rises, investors expect monetary policy to become looser, but at the same time demand a higher compensation to hold risk, including duration risk.

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A   Term structure models and term premium estimation

The term premium represents the additional compensation investors demand for holding long-term bonds instead of rolling over a series of short-term bonds. This excess yield compensates for risks associated with long-term investment horizons, such as interest rate fluctuations or inflation uncertainty.

Early approaches to estimating the term premium were rooted in the Expectations Hypothesis (EH), which posits that long-term yields equal the average expected future short-term yields plus a constant premium (Fama and Bliss, 1984). However, empirical evidence has consistently rejected the pure EH, demonstrating that the term premium is not constant but varies over time in response to macroeconomic and financial factors (Campbell, 1987; Shiller, 1979). This realization spurred the development of models that incorporate time-varying risk premia.

The estimation of the term premium has been significantly advanced by the development of term structure models, which decompose bond yields into expectations of future short-term interest rates and a residual risk component, the term premium. Early methods relied on simple curve-fitting techniques, but these approaches lacked the flexibility and interpretability necessary for robust estimation.

A pivotal development came with the Nelson and Siegel (1987) model, which characterized the yield curve using three factors: level, slope, and curvature. This parsimonious approach captured common yield curve shapes and facilitated a clearer decomposition of yields. The extension by Svensson (1994) introduced an additional curvature term to better fit more complex yield curve patterns, particularly during periods of market stress.

Affine Term Structure Models (ATSMs) have become the cornerstone of term premium estimation. These models extend the classical arbitrage-free framework by allowing for time variation in risk premia and their dependence on macroeconomic variables. Specifically, these models assume that yields are linear (affine) functions of a set of underlying factors, which can be either observable macroeconomic variables or unobservable latent factors. ATSMs decompose bond yields into two key components: the expected path of future short-term interest rates and the term premium. The strength of ATSMs lies

in their ability to capture how macroeconomic conditions, such as inflation, economic growth, and monetary policy, influence the yield curve. By linking these factors to yields, ATSMs allow for a dynamic analysis of risk compensation over time. This framework helps disentangle shifts in investor expectations from changes in risk perception, providing a clearer understanding of the drivers behind movements in long-term yields and the term premium. Dai and Singleton (2000) introduced a widely adopted ATSM, which uses latent factors to capture the dynamic relationship between bond yields and macroeconomic fundamentals. Subsequent research by Kim and Singleton (2008) applied ATSMs to estimate the US term premium, leveraging observable macroeconomic variables such as inflation and output gaps.

Another prominent approach has been the use of Dynamic Stochastic General Equilibrium (DSGE) models, which integrate macroeconomic theory with term structure modeling. Rudebusch and Swanson (2007) pioneered this methodology, demonstrating how macroeconomic shocks, such as changes in monetary policy, affect the term premium. DSGE models provide a structural perspective, linking the term premium to agents' risk aversion, consumption growth, and policy expectations.

Adrian et al. (2013) introduce a regression-based method to decompose bond yields into expectations of future short-term rates and the term premium. Using Principal Components Analysis (PCA), they extract key yield curve factors and regress them on macroeconomic variables like inflation, GDP growth, and monetary policy indicators. This approach provides a simpler, efficient alternative to traditional affine models, offering valuable insights into how monetary policy and economic conditions shape the yield curve.

The challenges in measuring the term premium remain however significant. Different estimation models often yield varying results due to differences in assumptions, data inputs, and methodologies (Bauer and Rudebusch, 2017). Advances in machine learning and high-frequency data analysis offer promising avenues for refining term premium estimates.

B   Sensitivity Analysis: Table

Table A1: Alternative specifications

	Average expected	Term premium	Equity	NEER	ILS
i) ten lags					
Monetary policy	1	.993	.999	.999	.993
Domestic demand	.994	.989	.999	.996	.992
Inflation compensation	.988	.999	1	.997	.998
Global risk appetite	.997	.998	.998	.999	.915
Domestic uncertainty	.999	.998	.992	.997	.997
ii) no narrative restrictions					
Monetary policy	.999	.998	.998	.998	.995
Domestic demand	.926	.857	.992	.976	.845
Inflation compensation	.972	.974	.989	.996	.963
Global risk appetite	.996	.991	.997	.997	.963
Domestic uncertainty	.980	.948	.992	.960	-.305
iii) flight-to-safety					
Monetary policy	.999	1	1	.998	.999
Domestic demand	.997	.988	1	1	.99
Inflation compensation	.999	1	1	.984	.999
Global risk appetite	.974	.999	.999	.999	.974
Domestic uncertainty	.999	.997	.999	.99	.989
iv) post-2020					
Monetary policy	.994	.993	.946	.965	.844
Domestic demand	.931	.438	.988	.903	.865
Inflation compensation	.948	.97	.827	.505	.944
Global risk appetite	.997	.666	.986	.933	.427
Domestic uncertainty	.998	.962	.991	.997	.993
v) ACM two-year, two-year ILS					
Monetary policy	.99	.91	.944	.978	.939
Domestic demand	.984	.921	.996	.985	.94
Inflation compensation	.975	.977	.993	.994	.931
Global risk appetite	.967	.931	.989	.972	-.037
Domestic uncertainty	.983	.931	.975	.935	.968

	Average expected	Term premium	Equity	NEER	ILS
vi) ACM five-year, five-year ILS					
Monetary policy	.996	.973	.994	.991	.984
Domestic demand	.997	.975	.999	.998	.956
Inflation compensation	.994	.982	.999	.999	.984
Global risk appetite	.985	.996	.998	.999	.401
Domestic uncertainty	.996	.991	.999	.989	.978
vii) CR two-year, two-year ILS					
Monetary policy	.973	.875	.853	.935	.588
Domestic demand	.737	.33	.952	.915	.59
Inflation compensation	.891	.881	.966	.924	.62
Global risk appetite	.92	.789	.953	.91	-.194
Domestic uncertainty	.87	.713	.956	.866	.804
viii) CR five-year, five-year ILS					
Monetary policy	.972	.862	.892	.94	.834
Domestic demand	.471	.288	.96	.924	.661
Inflation compensation	.843	.885	.98	.962	.845
Global risk appetite	.881	.687	.947	.907	.328
Domestic uncertainty	.705	.544	.964	.832	.811
ix) CR ten-year, ten-year ILS					
Monetary policy	.958	.877	.941	.941	.843
Domestic demand	.441	.275	.959	.923	.668
Inflation compensation	.924	.906	.984	.966	.865
Global risk appetite	.646	.817	.935	.91	.74
Domestic uncertainty	.39	.264	.947	.795	.444
x) S&P 500					
Monetary policy	.997	.997	.997	.997	.997
Domestic demand	.944	.811	.983	.983	.861
Inflation compensation	.992	.975	.992	.943	.979
Global risk appetite	.998	.994	.991	.998	.943
Domestic uncertainty	.999	.998	.998	.998	.999

The table shows the correlation between our baseline HD and those recovered by changing the main specification.