When does Monetary Policy Matter? Policy Stance vs. Term Premium News

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Abstract

This paper investigates when monetary policy announcements matter for asset prices. We identify a fundamental heterogeneity in FOMC statements based on the underlying nature of information conveyed about future policy. Using a novel classification, we identify meetings that convey substantial information about uncertainty surrounding future policy as opposed to directional guidance. These statements – one-third of the total – drive most, if not all, of monetary policy effects on long-term interest rates, through term premium adjustments rather than expected short-term rates. Our classification resolves why policy announcements explain little variance in long-term rates despite driving their dynamics over time.

JEL classification: E43, E52, E58, G12.

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1 Introduction

Monetary policy announcements are pivotal events that convey multiple types of information to economic agents beyond the current policy decision and the likely future policy path.[1] There is ample evidence that monetary policy announcements affect asset prices, in particular long-term interest rates (Cochrane and Piazzesi 2002, Gürkaynak, Sack, and Swanson 2005a, Nakamura and Steinsson 2018), and Hillenbrand (2025) shows that the overall dynamics of US long-term interest rates over the last decades can be explained by their variations around FOMC announcements. However, these announcements explain only a limited fraction of the variance of long-term interest rates on FOMC days, as shown in Hanson and Stein (2015). This paper aims to reconcile these facts, which are surprising when considered together.

The starting point for our investigation is the work of Gürkaynak, Sack, and Swanson (2005b) (GSS). They decompose the asset price changes associated with a FOMC announcement into a surprise about the current decision on the Federal Funds target rate – the *Target* factor – and a surprise about the future policy path – the *Path* factor. Using short-term rate futures contracts from current-month to 1-year maturity, they extract these two factors that characterize the term structure of these policy expectations. They show that most of the news conveyed on these FOMC announcement days comes from the Path factor.

By definition, the Target factor has a correlation of one with the current-decision surprise (measured as current-month futures contract price changes on FOMC days following Kuttner 2001) and the Path factor has zero correlation. However, both factors have the same correlation with changes in 1-year futures contract prices.[2] This implies that the Target and Path factors effectively isolate information about the present, but have by construction less power in separating different types of information about future policy. We revisit this fact as a prelude to our analysis.

Our main contribution is to exploit the interplay between Target and Path factors – in terms of sign and magnitude – to uncover how monetary policy announcements affect the term structure of policy expectations. Relying on the heterogeneous adjustments in policy expectations across maturities on announcement days, we propose a simple but novel classification of FOMC statements to identify announcements that primarily convey information about uncertainty surrounding future policy versus clear directional signals about the policy stance. In other words, while the GSS decomposition isolates news about the present *within* FOMC meetings, we provide a classification *across* meetings that identifies statements with different types of information about the future.

Our classification of FOMC statements exploits a key insight from the relative sign of Target and Path surprises. Since *(i)* Target and Path are orthogonal by construction and *(ii)* current and future policy news have a positive correlation in the underlying structure of Target, the situation when Target and Path have opposite signs identifies when they convey *distinct* forward-looking signals. This situation occurs if (a) news about current and future policy in Target have opposite signs, or (b) different types of news about the future, with opposite signs, are conveyed in Target

[1] This may include policymakers' views about the economic outlook as in Romer and Romer (2000), Ellingsen and Söderström (2001) and Campbell, Evans, Fisher, and Justiniano (2012) or signals about policymakers' preferences as in Bauer, Pflueger, and Sunderam (2024) and Bocola, Dovis, Jørgensen, and Kirpalani (2024).

[2] Gürkaynak et al. (2005b) discuss in Section 2.5 these definitions and their implications – see their Table 5.

and Path. The underlying structure of the first factor (Target) makes (a) unlikely. The orthogonality condition between Target and Path, imposing that any residual Path movement must reflect news not embedded in Target, strongly supports (b). When Target and Path surprises move in opposite directions, the orthogonality restriction creates an inconsistency under pure expectations theory that can be resolved through term premium adjustments. Thus, when Target and Path have opposite signs, these factors reveal different types of information about the future. This situation enables us to identify news about the future that relates to higher-order moments of the future policy distribution, and classify FOMC statements accordingly. This simple but novel classification isolates statements that primarily convey signals about uncertainty surrounding future policy rather than directional policy guidance, complementing the GSS framework by distinguishing between different types of forward-looking information.

Our classification reveals fundamental heterogeneity in monetary policy transmission to asset prices. Based on the 188 FOMC policy announcements from 1999 to 2022, we find that *higher-order moment* statements – one-third of the total – drive most, if not all, of the effects of monetary policy on long-term interest rates. In contrast, *policy stance* statements – half of the meetings – affect short-term rates and stock prices, but have no effect on long-term rates. A key implication is that the identification of monetary policy effects comes from two distinct subsets of statements, with the remaining meetings (one-sixth) having limited identification power. This paper not only identifies *when* monetary policy matters but also *how*, documenting that, for these higher-order moment statements, the transmission operates primarily through the term premium channel.

We estimate the causal effect of monetary policy on stock prices and nominal yields using the high-frequency monetary policy surprise series of Bauer and Swanson (2023a) adjusted for economic data releases. Without any classification of meetings, we replicate the standard response of these asset prices to monetary policy surprises, extensively documented in the literature. It is worth stressing the low explanatory power of these regressions (the R^2 is 4% for 10-year rates, for instance), although FOMC announcements are the major event on these days.[3]

Allowing for heterogeneity in monetary policy transmission across our classification of statements, we find that monetary surprises have standard effects on stock prices and short-term interest rates on the subset of statements when Target and Path surprises have the same sign. The central result of this paper is that the response of medium- to long-term interest rates only comes from the subset of *higher-order moment* statements. While a 100 bp exogenous increase in the policy stance raises 10-year interest rates by 31 bp in a standard regression over all statements, the effect is 71 bp over *higher-order moment* statements, but not statistically different from zero over other statements. Not only is the effect strong, highly significant and much larger than for other statements, but its explanatory power is also much higher (five times larger over daily windows, twice over 30-min windows). Our classification helps to reconcile why monetary surprises explain little variance in interest rates despite FOMC announcements being major financial market events.

[3]When examining asset price changes in a 30-min window, monetary surprises account for a larger portion of the variance (30% for 10-year rates). To some extent, this observation is mechanical given that nothing else supposedly happens in the window and that asset price changes are a direct reflection of the monetary news. For comparison, Bauer and Swanson (2023b) document a R^2 of 36% for 10-year rates over a sample from 1988 to 2019.

We show that the effects of *higher-order moment* statements must not be confounded with those of "large Path" statements. We run a horse-race between these two types of statements and confirm that the transmission of monetary policy to long-term rates is entirely driven by higher-order moment statements. This is consistent with the fact that the Path factor alone does not discriminate information about the future. Our main finding is also robust to an alternative classification based on the series from Nakamura and Steinsson (2018). We also control for various potential confounding factors affecting long-term interest rates. We disentangle the effect of ex ante monetary policy uncertainty, quantitative easing (QE) and forward guidance announcements, QE shocks (as identified by Swanson 2021), the holding of a press conference, the publication of the Summary of Economic Projections, the presence of central bank information effects, and the release of key macroeconomic data prior to FOMC days (Alam 2023). We find that none of these elements can explain the strong effects of monetary surprises on interest rates stemming from *higher-order moment* statements. Although this second classification identifies much less higher-order moment statements, they still drive long-term interest rate responses.[4]

Importantly, we test whether this heterogeneity in the effects of monetary surprises is specific to FOMC statements. We apply the same methodology to euro area data. Using Target and Path surprises for ECB decisions, we provide evidence of the same pattern: higher-order moment statements have strong effects on long-term yields with a R^2 of 61%, compared to 5% for other statements. These estimates suggest that the main finding of this paper is at work for another major central bank and is not specific to the US.

To understand the underlying nature of the news conveyed in these *higher-order moment* statements, we decompose the responses of nominal interest rates into real interest rates and inflation compensation, as well as into the expectation hypothesis (EH) and term premium components. The first decomposition shows that the effect is driven by real interest rates, not by inflation compensation. It suggests that these statements do not convey news about the strength of the policy response to economic activity or the inflation target, but appears to affect investors' perceptions of long-run economic fundamentals as in Nakamura and Steinsson (2018).[5] Based on the second decomposition, we find that monetary surprises from higher-order moment statements affect the term premium component but not the EH component, indicating the presence of news that influence the risks associated with holding long-term securities. This suggests that these policy announcements convey signals that affect investors' beliefs about the variance or skewness of future outcomes. This result is consistent with Hanson and Stein (2015), although the mechanism operates through policymakers' signals rather than trading behavior.[6]

It is important to stress that the information identified by the sign-condition on Target and Path factors cannot be retrieved from identifying more factors.[7] The literature that decomposes asset

[4] Our result is also robust to using alternative measures of monetary surprises from Nakamura and Steinsson (2018), Gürkaynak et al. (2005b), Jarociński and Karadi (2020) and Bauer and Swanson (2023a).

[5] This is consistent with low-frequency business cycles and hysteresis effects (Jordà, Schularick, and Taylor 2017, Jordà, Singh, and Taylor 2025) or when key features of the economy are unobserved (Farmer, Nakamura, and Steinsson 2024).

[6] We also document that *policy stance* statements affect broad measures of risk premium whereas *higher-order moment* statements affect monetary policy uncertainty and term premium measures. *Higher-order moment* statements primarily affect investors' compensation required for holding long-term securities rather than their broad risk appetite.

[7] Over our sample and using policy expectations up to the one-year maturity, a third factor is statistically insignificant.

price changes into three or four factors includes medium- and long-term interest rates and/or other asset prices.[8] The marginal information conveyed by additional factors comes from the larger set of asset prices. In contrast, whereas we do *not* include long-term interest rates (and therefore information about term premium) in our factor analysis, our classification *does* capture when policy announcements affect long-term interest rates and term premium. Although policy expectations over the coming year do not embed these term premium news *per se*, the sign-condition conceptually uncovers information about the uncertainty surrounding future monetary policy.

To illustrate the content of FOMC announcements and their signals, we conduct a textual analysis using a large language model and show that higher-order moment statements contain more risk assessment and probabilistic language. Based on the most economically-relevant higher-order moment statements, we also provide evidence of the FOMC language used to convey information about the distribution of future policy outcomes.

Our finding has strong implications for state-dependent or time-varying analyses of the effects of monetary policy. The identification is not homogeneous across policy meetings: different subsets of statements imply different asset price responses to monetary surprises. In addition, central banks should be aware of how their communication – different mixes of current and future policy signals – is perceived by investors and how it affects the transmission of their decisions.

There is a prolific literature on the identification of monetary policy effects (see Ramey 2016 for a review). An important topic of attention is that policy announcements convey signals beyond monetary news (Cieslak 2018, Golez and Matthies 2025, Karnaukh and Vokata 2022, Hoesch, Rossi, and Sekhposyan 2023, Miranda-Agrippino and Ricco 2021). Various works use the sign of the co-movement in asset price responses to gain insight about the nature of policy announcements (Cieslak and Schrimpf 2019, Jarociński and Karadi 2020, Cieslak and Pang 2021 and Bianchi, Ludvigson, and Ma 2025). Related to our focus, Neuhierl and Weber (2019), Andrade and Ferroni (2021) and Lunsford (2020) highlight the role of (directional) signals about future policy for the transmission of monetary policy. While Handlan (2022), Acosta (2024) and Aruoba and Drechsel (2024) improve the measurement of monetary surprises using textual analysis, Gürkaynak, Kısacıkoğlu, and Wright (2020) focus on missing information from asset price responses.

The closest paper to ours is Boehm and Kroner (2024). They document that monetary surprises explain only a small fraction of asset prices, and use stock prices and exchange rates to identify an additional "*non-yield*" shock. They focus on the two aforementioned asset prices and the global effects of this shock, while we analyze the transmission of "standard" monetary surprises to interest rates using our classification to identify term premium news. Our paper also relates to the finding of Hamilton and Jorda (2002) that FOMC announcements can have substantially different effects according to characteristics of the decision, although they focus on changes in the Fed funds rate.

Our paper highlights a novel kind of identification issue with monetary surprises. In that respect, we extend the result of Hillenbrand (2025) that changes in long-term rates are entirely driven by FOMC days compared to non-FOMC days, by showing that they are even driven by a subset of these FOMC statements only. Our paper also relates to the literature that aims to

[8] See, among others, Altavilla, Brugnolini, Gürkaynak, Motto, and Ragusa (2019), Swanson (2021), Kaminska, Mumtaz, and Sustek (2021), Jarociński (2024), Ricco, Savini, and Tuteja (2024) and Akkaya, Bitter, Brand, and Fonseca (2024).

understand why monetary policy has a positive effect on long-term rates that is larger than what can be accounted for by the effect on the expected path of short-term rates. Gürkaynak et al. (2005a) and Bianchi, Lettau, and Ludvigson (2022) put forward that monetary policy may affect beliefs about trend inflation, while Hanson and Stein (2015), Hanson, Lucca, and Wright (2021) and Kekre, Lenel, and Mainardi (2024) suggest that the effects of monetary policy work through term premium. Our results are consistent with the main findings of the latter papers.

2 The information content of monetary surprises

Over the past thirty years, a rich literature has emerged on the measurement and identification of monetary policy shocks (Coibion 2012). Notably, we have seen a move from VAR and narrative approaches (Bernanke and Blinder 1992, Christiano, Eichenbaum, and Evans 1999, Romer and Romer 2004) to high-frequency approaches to mitigate important endogeneity concerns (Cook and Hahn 1989, Rudebusch 1998, Rigobon and Sack 2004). Kuttner (2001), Cochrane and Piazzesi (2002) and Faust, Swanson, and Wright (2004), among others, pioneered this literature using data from Federal funds rate futures.[9] These contracts are useful for distinguishing between anticipated and unanticipated changes in the policy rate. Anticipated changes are already embedded in futures prices. When the FOMC actual decision differs from what is implied by the futures, this difference represents an unanticipated change, referred to as a monetary policy surprise (MPS).

However, monetary surprises account for only a tiny fraction of interest rate changes (as in Hanson and Stein 2015 for instance) and are often negligible such that this approach comes at the cost of a reduced statistical power. In a seminal paper, Gürkaynak et al. (2005b) show that news about changes in the current policy stance represents only a small fraction of the news conveyed on FOMC announcement days. They show that the effects of monetary policy on asset prices can be adequately characterized by two factors – the first and the second principal components of policy expectations at different horizons. They offer a structural interpretation of these unobserved factors: the *Target* factor corresponds to surprise changes in the Federal Funds Rate (FFR) target while the *Path* factor corresponds to surprise changes in the path of monetary policy over the coming year. By construction, the Path factor is orthogonal to changes in the current FFR.

2.1 The standard effects of monetary policy surprises

We start by presenting the effects of standard monetary policy surprises on various asset prices as a benchmark. Nakamura and Steinsson (2018), Jarociński and Karadi (2020) and Bauer and Swanson (2023a) consider the first principal component of changes in short-term interest rate future contracts spanning the first year of the term structure in the spirit of Gürkaynak et al. (2005b), over a 30-minute window (from 10 minutes before to 20 minutes after) surrounding FOMC announcements. Bauer and Swanson (2023a) argue that central bank information effects can be attributed to investors' responses to publicly available information prior to the announcements and propose

[9] A Fed funds futures contract reflects investor consensus about the average daily effective federal funds rate for a given calendar month (Krueger and Kuttner 1996). D'Amico and Farka (2011), Barakchian and Crowe (2013) and Gertler and Karadi (2015) combines high-frequency data from futures with the VAR approach to improve identification.

a *news-adjusted* measure of monetary surprises. We consider their series and we use the updated series of the Target and Path surprises estimated by Acosta, Brennan, and Jacobson (2024).

We focus on monetary policy announcements following the 188 (scheduled) FOMC meetings that took place between 1999 and 2022. We follow the standard event-study approach to assess the effect of monetary policy surprises on two types of asset prices: stock prices and Treasury nominal yields. In particular, we run the following regressions:

$$\begin{aligned} \Delta Y_t &= \alpha + \beta_{MPS} \cdot MPS_t + \epsilon_t \\ \Delta Y_t &= \alpha + \beta_T \cdot Target_t + \beta_P \cdot Path_t + \epsilon_t \end{aligned} \tag{1}$$

where ΔY_t is the daily change in a given asset price, either stock prices (S&P 500) or zero coupon nominal interest rates at 2, 5, and 10-year maturity.[10] MPS_t are the overall monetary surprises from Bauer and Swanson (2023a) or the $Target_t$ and $Path_t$ surprises from Gürkaynak et al. (2005b), measured in a 30-min window around FOMC announcements.

Table 1: Standard monetary policy effects

	S&P 500	2y	5y	10y
MPS_t	-4.679*	0.645***	0.552***	0.308***
	[2.46]	[0.12]	[0.12]	[0.11]
R^2	0.03	0.22	0.12	0.04
Obs.	188	188	188	188
$Target_t$	-5.105	0.328**	0.175	0.039
	[3.58]	[0.16]	[0.14]	[0.13]
$Path_t$	-1.771	0.350***	0.324***	0.212***
	[1.26]	[0.04]	[0.05]	[0.05]
R^2	0.04	0.30	0.17	0.08
Obs	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Parameters are estimated from Equation 1 using OLS. They capture the effects of the high-frequency news-adjusted monetary surprises of Bauer and Swanson (2023a) and of Target and Path surprises from Gürkaynak et al. (2005b). The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4).

When considering the overall monetary policy surprises, we recover the standard effects of monetary policy largely documented in the literature (see upper panel of Table 1). We observe a negative co-movement with stock market valuations, and a positive relationship between monetary policy surprises and nominal interest rates (with a larger effect on the short-end of the yield curve). These results are consistent with the literature (see Bernanke and Kuttner 2005). Quantitatively, a 10 bp restrictive monetary policy surprise causes the S&P 500 to fall by 0.47% and interest rates to rise by 6.4 bp to 3.1 bp. Although FOMC announcements are arguably the main event of these days, their news content only explains a small fraction of the variance of these asset prices on these days – 22% for 2-year rates, but only 3% and 4% for S&P 500 and 10-year rates. Bauer

[10] Zero-coupon nominal Treasury yields have been constructed by Gürkaynak, Sack, and Wright (2007) and are available at http:// www.federalreserve.gov/pubs/feds/2006/200628/200628abs.html.

and Swanson (2023b) find that monetary policy surprises explain 36% of the variance of 10-year rates, but of the change in the narrow 30-minute window surrounding the announcement (see their Table 3).[11] When the time window for the dependent variable is widened, Hanson and Stein (2015) document that the fraction of the variance explained by monetary surprises is much lower, around 8 and 9%, for one-day and two-day changes in 10-year rates (see their Table 2).[12] One way to shed light on this puzzle may be that monetary surprises are a heterogeneous concept that captures different signals, in particular about the nature of news about the future.

When decomposing the monetary policy surprise into Target and Path surprises (lower panel of Table 1), we observe that the effect of the Target surprise is much larger than of the Path surprise on the S&P 500 (however, the estimates are not significant), whereas the effect of the Path surprise is strong and significant on interest rates. Although the use of Path surprises seems to help decomposing the effect of policy announcements on the term structure of interest rates, the share of the variance explained remains relatively low (30% and 8% at 2- and 10-year horizons). Gürkaynak et al. (2005b) finds that 94% and 74% of the variance can be explained at the same two horizons by these two factors, but, again, of the change in the 30-min narrow window bracketing the announcement (see their Table 5). When expanding the window at the daily frequency, Hanson and Stein (2015) show that the Path surprise only explains 10% of the variance of 10-year rates (see their Table 2). While Target and Path surprises help to decompose information flows about the present and future stance of monetary policy for a given meeting, they do not help to understand the reason why monetary surprises explain little of interest rate changes.

2.2 Target and Path surprises do not discriminate *future* policy

It is important to understand the different implications of the Target and Path factors for policy expectations depending on the horizon considered. The Target factor represents a standard short-term interest rate shock. The Path factor represents a typical forward guidance shock, *i.e.* a shock to interest rates at some future horizon (see McKay, Nakamura, and Steinsson 2016, Bundick and Smith 2020 and Del Negro, Giannoni, and Patterson 2023, for a detailed analysis of the effect of forward guidance). Compared with a standard MP shock, a forward guidance shock causes the policy rate to rise at a later horizon, and then to vanish according to the persistence of the shock process. Although there is no one-to-one mapping between the forward guidance shock and the Path surprise, they capture the same concept.

To better understand the nature of the information contained in Target and Path surprises, we examine in the data how these two objects move together with policy expectations at different horizons. Specifically, for each FOMC announcement t, we run the following regression on each of the k federal funds/Eurodollar futures contracts F_t^k (the current-month federal funds rate futures – FF1 – and Eurodollar futures expiring in 1, 2, 3 and 4 quarters – ED1, ED2, ED3 and ED4 –) used to construct monetary policy surprises and their decomposition:

$$\Delta F_t^k = \alpha + \beta_{MPS} \cdot MPS_t + \epsilon_t \tag{2}$$

[11] Using 30-min window changes in the dependent variables (Appendix Table A1), we find a similar fraction (30%).

[12] Kilic, Zhang, and Zotov (2024) also show using intraday data that although most of the VIX dynamics happens around the FOMC announcements, the explained variance remains small (see their Table 3).

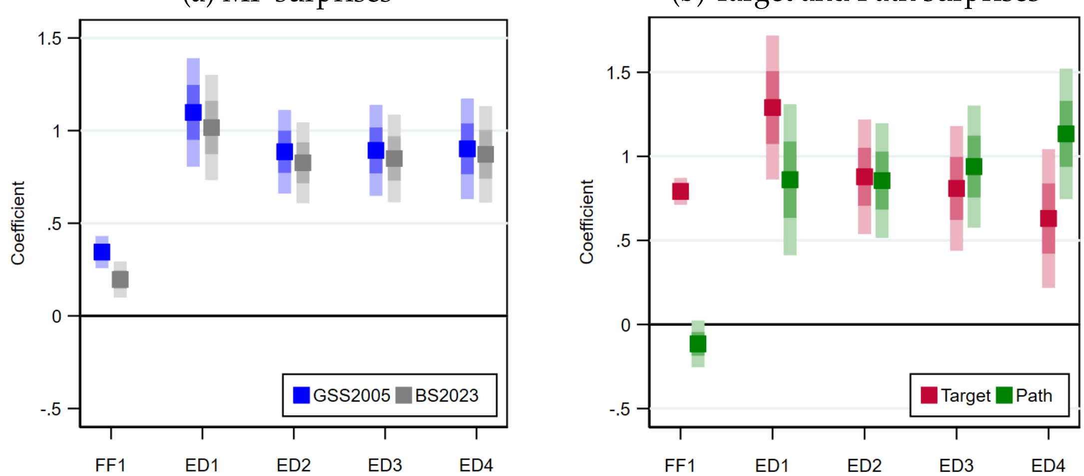
We then estimate similar regressions using the *Target* and *Path* surprises:

$$\begin{aligned} \Delta F_t^k &= \alpha + \beta_T \cdot Target_t + \epsilon_t \\ \Delta F_t^k &= \alpha + \beta_P \cdot Path_t + \epsilon_t \end{aligned} \tag{3}$$

We start by estimating Equation 2 using either the total monetary surprises from Gürkaynak et al. (2005b) – the sum of the Target and Path components – or the *news-adjusted* monetary surprises from Bauer and Swanson (2023a). We plot the estimated coefficients for both measures for the different horizons k of policy expectations in Figure 1(a). First, we can see that the coefficients are very similar for each maturity across both MPS measures. The coefficients associated with the current-month futures (FF1) are small. However, the coefficients associated with the four Eurodollar futures contracts (ED1 to ED4) are larger and close to 1. This suggests that on average, most of the information conveyed on FOMC announcements is about the future path of policy, consistent with Gürkaynak et al. (2005b).

Figure 1: Correlation with policy expectations at different maturities

(a) MP surprises (b) Target and Path surprises



Note: These figures represent the coefficient from Equation 2 (left panel) and Equation 3 (right panel) for different maturities of policy expectations and different measures of monetary policy surprises, from Gürkaynak et al. (2005b) and Bauer and Swanson (2023a) on the left panel and from Target (in red) and Path surprises (in green) on the right panel. FF1 is the current-month Fed Funds futures, ED1 to ED4 are the 1- from 4-quarter ahead Eurodollar futures. The shaded bars correspond to 1 and 2 standard errors confidence intervals.

Figure 1(b) shows the estimated parameters from Equation 3 for Target and Path surprises. These coefficients help to assess how changes in Target and Path surprises are associated with changes in policy expectations at different maturities. The usual take-away is that Target surprises are strongly associated with changes in the current policy rate whereas Path surprises are not (the coefficient is close to zero).[13] However, Target surprises are strongly associated with current quarter to fourth-quarter futures (ED1 to ED4) such that Target bears as much information about the current decision than future ones. In addition, although Path surprises show increasing coefficients across maturities with a peak at ED4, the difference between Target and Path surprises

[13]The factor loadings from the principal component analysis of Gürkaynak et al. (2005b) would be exactly zero.

is small and insignificant at these ED1 to ED4 maturities.[14] Overall, Target is as much about the present than the future, and while Target and Path surprises are effective at differentiating news about current decisions, they do not discriminate news about the future policy stance.

2.3 What information do Target and Path surprises convey?

The analysis in the previous section reveals that Target surprises actually reflect information about the current and the future policy stance such that Path surprises alone do not *identify* information about the future policy stance. This suggests that both factors may capture distinct aspects of monetary policy communication about the future.

To illustrate the information content of these factors, we can express them schematically based on the empirical patterns documented in Figure 1. The Target factor provides as much information about the present as about the future policy stance whereas the Path factor does not contain any information at all about the current policy stance. Therefore, we can write:

$$\begin{aligned} Target &= c + f^T \\ Path &= f^P \end{aligned} \tag{4}$$

where c represents news about the current policy decision and f^T denotes news about the future policy stance. The Path factor, being orthogonal to Target by construction, captures forward-looking information f^P independent of current policy news.

The key insight for our identification strategy emerges when we consider the conditions under which Target and Path can have opposite signs. This requires:

$$Target \times Path = (c + f^T) \times f^P < 0 \tag{5}$$

A necessary condition for this relation to be satisfied is that: either c and f^T have opposite signs, or f^T and f^P have opposite signs. The first possibility is empirically unlikely and conceptually inconsistent with the structure of the Target factor. Target being the first principal component of policy expectation changes across maturities, it necessarily has positive loadings on each maturity and maximizes their common variance. This construction ensures that c and f^T move in the same direction: a hawkish current decision typically signals hawkish future intentions, and vice versa. The positive correlation between current and near-future policy rates in the data confirms this theoretical hypothesis. This leaves the second possibility: f^T and f^P represent fundamentally different types of information about the future that can move in opposite directions. The orthogonality constraint between Target and Path ensures these information types are uncorrelated by construction, making conflicting movements conceptually possible and empirically observable.

We suggest that these factors capture different moments of the distribution of future policy outcomes. The forward-looking component of Target represents information about the future policy stance – in other words, *first-order moment* news about future policy. This information correlates with current policy decisions because policymakers typically adjust current rates in anticipation

[14] After rescaling, the factor loadings on ED4 are one for both Target and Path surprises in Gürkaynak et al. (2005b).

of where they expect policy to go. When the FOMC raises rates today, it often signals that further increases may be warranted, creating the positive correlation between c and f^T observed in the data. The Path factor, being orthogonal to this expectation-based information, must capture something else about the future. We argue that f^P represents information about the uncertainty, risks, or *higher-order moments* surrounding the expected policy path. This includes signals about the range of possible outcomes around the central policy scenario, the balance of upside versus downside risks to the policy outlook, or the Committee's confidence in its baseline projection.

This interpretation aligns with standard term structure theory, which decomposes long-term interest rates into expectations and term premium components:

$$i_{t,n} = \frac{1}{n}\sum_{j=0}^{n-1} E_t[i_{t+j}] + TP_{t,n} \tag{6}$$

where $i_{t,n}$ is the n-period rate, the first term represents the expectations hypothesis component and $TP_{t,n}$ is the term premium. In this framework, f^T provides information primarily relevant for the expectations hypothesis component, affecting market expectations of the average future short rate. Because this information correlates with current policy decisions, it cannot be orthogonal to Target. Conversely, f^P provides information primarily relevant for the term premium component, affecting the compensation investors demand for bearing interest rate risk over long horizons.

When Target and Path have opposite signs and convey conflicting signals, investors face a logical inconsistency under pure expectations theory. If both factors represented only first-order moment information about future policy, they should move in the same direction: hawkish or dovish surprises should raise or lower yield curve expectations across all horizons. Opposite movements violate this consistency condition. The most plausible way to maintain no-arbitrage pricing when Target and Path conflict is through term premium adjustments.[15] Investors may interpret the conflicting signals as indicating heightened uncertainty about the future policy path, credibility concerns about the central bank's ability to deliver on its stated intentions, or structural uncertainty about how monetary policy will evolve in the future. Each of these mechanisms works through the term premium rather than expectations and explains why opposite-signed movements provide identification of higher-order moment news.

This framework has important implications for empirical identification of monetary policy effects. Same-sign statements would provide clean identification of standard monetary policy transmission through expectations channels. When Target and Path move together, investors receive consistent signals for all horizons about the policy trajectory. News about the policy stance likely prevail, and higher-order moment news cannot be identified. In contrast, the situation when Target and Path have opposite signs provides unique identification of higher-order moment news. This can be illustrated by a statement in which the FOMC unexpectedly decreases the current pol-

[15] A statement that would unexpectedly raise short-term expectations of policy rates while lowering longer-term expectations of policy rates – a twist in the first-order moment of the policy path – can also generate positive Target and negative Path surprises without any change in term premium. However, the construction itself of the two factors (*i.e.*, the positive loadings across maturities of the Target factor) and policymakers' preference for gradualism make this scenario unlikely.

icy stance while shifting its language towards increased risks in the future. These conditions offer a relevant empirical setting to study monetary policy transmission.

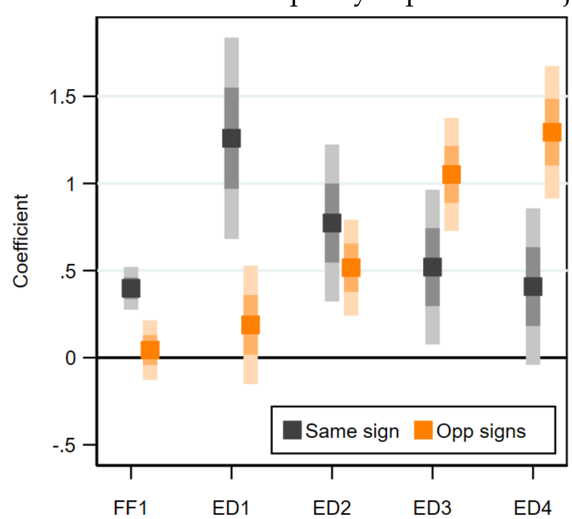
2.4 Policy stance versus higher-order moment news

We first characterize the term structure of adjustments in policy expectations on policy announcement days, based on the relative sign of Target and Path surprises. We leverage on the Target/Path decomposition of monetary surprises to propose a simple yet powerful classification of the monetary surprises associated with the 188 FOMC meetings in our sample. We classify monetary policy surprises according to whether the policy announcement resulted in (i) Path and Target surprises of the same sign, and (ii) Path and Target surprises with opposite signs:[16]

$$\mathbb{1}_t^{\text{Opp}} = \begin{cases} 1 \text{ if } Path_t \times Target_t < 0 \\ 0 \text{ if } Path_t \times Target_t > 0 \end{cases} \tag{7}$$

With this classification, we identify FOMC statements that convey clear directional signals about the policy stance (the short and long-end of policy expectations are impacted with surprises of the same sign and higher-order moment news cannot be identified) separately from those statements that convey information about uncertainty surrounding future policy (both types of news about the future move in opposite directions). Out of the 188 FOMC announcements between 1999 and 2022, there are 88 "same sign" statements (47%) and 100 "opposite sign" ones (53%).

Figure 2: The term structure of policy expectation adjustments



Note: This figure represents the estimated coefficients of Equation 2 of the two different subsamples of FOMC statements with same sign vs. opposite sign Target and Path surprises. The right-hand side variable is the *news-adjusted* monetary surprises of Bauer and Swanson (2023a) while the left-hand side variables are changes in the policy expectations at different maturities (from current-month to one-year ahead) around FOMC statements.

We first explore the shape of the term structure of policy expectations for such cases as we did in Figure 1. We estimate Equation 2 over the two subsamples of "same sign" (when $\mathbb{1}_t^{\text{Opp}} = 0$) and

[16] In practice, it is never the case that $Path_t \times Target_t = 0$ over our sample.

"opposite signs" monetary surprises (when $\mathbb{1}_t^{\text{Opp}} = 1$). Figure 2 shows the estimated correlations for policy expectations at different horizons.

We document that for FOMC statements in which Target and Path surprises point in the same direction, the estimated correlations are strong for current-quarter expectations (ED1) and decrease with the horizon (the coefficient for ED4 is barely significantly different from zero). This suggests that most of the information conveyed in these cases is about the short-end of the term structure of policy expectations: news about the policy stance affect policy expectations with decay. In contrast, for FOMC statements with opposite signs in Target and Path surprises, the coefficients are small and not significant on FF1 and ED1 (the short-end), but they increase strongly with horizons. Said differently, in these cases, Eurodollar futures at longer maturities are more correlated to the monetary surprise than shorter-maturity ones. This means that when the two types of news about the future have opposite signs – identifying higher-order moment news –, what dominates is the long-end of policy expectations. The coefficient for ED4 is statistically different from the one of "same sign" monetary surprises. It is important to stress that this is a finding, not an assumption, and that this pattern is very different from the one shown in Figure 1.

Overall, for two monetary surprises of equivalent magnitude, the one based on "same sign" will load on the short-end whereas the one with "opposite signs" will load more on the longer-end. An even more important take-away relates to the term structure of policy expectations across these maturities. The *hump-shaped* pattern towards zero we observe in Figure 2 for "same sign" surprises suggests that these statements convey signals about the policy stance, consistent with the temporary nature of monetary policy shocks and the fact that policymakers do not commit to a policy path at such horizons. In contrast, the *increasing shape* we observe for "opposite sign" surprises suggests that the monetary surprises of these statements are viewed as relevant information that gains importance in the future.[17] When policy expectations adjust more further out, it suggests that investors interpret these news as signaling more uncertainty and ask for a compensation for it that grows with horizons.

3 Two subsets of monetary policy statements

3.1 Monetary policy transmission with same vs. opposite signs

After having documented that whether Target and Path surprises convey similar or different signals affects the term structure of policy expectation adjustments, we examine the extent to which the response of asset prices to monetary policy surprises varies according to whether Target and Path surprises have same or opposite signs. To this end, we adjust Equation 1 to measure the heterogeneous effects of monetary surprises conditional on the two cases: we interact monetary surprises with the dummy identifying policy announcements with opposite signs ($\mathbb{1}^{\text{Opp}} = 1$):

$$\Delta Y_t = \alpha + \beta_1 \cdot MPS_t + \beta_2 \cdot MPS_t \cdot \mathbb{1}_t^{\text{Opp}} + \beta_3 \cdot \mathbb{1}_t^{\text{Opp}} + \epsilon_t \tag{8}$$

[17] This increasing pattern is consistent with Kaminska et al. (2021) who identify uncertainty surrounding future monetary policy from an affine term structure model using Treasury rates up to the 10-year maturity.

where Y_t denotes either S&P 500 prices or nominal yields at different horizons. The results are shown in Table 2. The first row shows the effects of monetary policy surprises on the subsample of policy announcements when Target and Path surprises have the same sign (β_1). The negative effect on stock prices and the positive effect on 2-year rates correspond to the standard effects of monetary policy. The second row shows the estimated parameter for the interaction term when Target and Path surprises have opposite signs (β_2). This marginal effect of monetary surprises on interest rates (2, 5 and 10-year rates) is positive, strong, highly significant and much larger than the effect of monetary surprises with consistent signals. To facilitate reading, we provide the average effect of monetary surprises for the subset of FOMC statements when Target and Path have opposite signs ($\beta_1 + \beta_2$) in the third row. This effect is close to one for 2- and 5-year rates. It is 10 times higher than in the "same sign" subsample for 10-year rates. Most of the effect of policy announcements on long-term interest rates comes from the "opposite sign" statements. Boyarchenko, Haddad, and Plosser (2016) find related evidence: they document that the primary impact of FOMC announcements on 10-year rates comes from a *confidence* factor. They identify two types of shocks (one standard monetary policy shock and a second affecting market confidence) around FOMC meetings using a principal component analysis similar to Gürkaynak et al. (2005b). Their factor model includes various interest rates up to 10-year maturity – the factor with large and positive loadings on changes in long-term interest rates being the confidence factor.[18]

Table 2: Monetary policy effects with same or opposite signs

	S&P 500	2y	5y	10y
MPS_t	-7.834**	0.393**	0.285	0.057
	[3.54]	[0.20]	[0.19]	[0.16]
MPS_t x $\mathbb{1}^{\text{Opp}}$	6.526	0.521**	0.553**	0.519**
	[4.69]	[0.23]	[0.24]	[0.22]
$MPS_t \mid \mathbb{1}^{\text{Opp}} = 1$	-1.308	0.914***	0.838***	0.576***
	[3.08]	[0.11]	[0.15]	[0.15]
R^2	0.06	0.26	0.15	0.07
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 8 is estimated using OLS. Only the key parameters are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the effects of monetary surprises for *same sign* statements. The second row shows the marginal effects of these monetary surprises for *opposite sign* cases. The last row ($MPS_t \mid \mathbb{1}^{\text{Opp}} = 1$) shows the average effect of monetary surprises for *opposite sign* statements.

These results are in line with the main message of Figure 2. The sample of FOMC statements with conflicting signals is characterized by an increasing shape of policy expectation adjustments with horizons. As these statements likely contain higher-order moment news over farther horizons, these monetary surprises have larger effects on long-term nominal yields. In contrast, policy announcements with consistent signals, for which policy expectation adjustments are hump-shaped in Figure 2 consistent with the temporary nature of a monetary policy shock, have barely no effects on long-term yields. This is the first important finding of this paper: the underlying

[18]So their approach follows a *within* decomposition as Gürkaynak et al. (2005b), not an *across* classification as we do.

structure of news about the policy stance versus higher-order moments in monetary surprises shapes the transmission of these monetary surprises to asset prices. Only policy announcements with conflicting signals affect long-term interest rates.

Table 3: Descriptive statistics for monetary surprises

	N	%	Mean	Mean Abs.	SD
Same Sign	88	47%	0.004	0.038	0.032
Opposite Signs	100	53%	0.004	0.031	0.032

Note: This table shows the total number and percentage of FOMC meetings for which Target and Path surprises move in the same direction (*SameSign MPS*), or in opposite directions (*OppSign MPS*). It also shows the mean, the absolute value mean, and the standard deviation of these monetary surprises.

One potential concern is that the distribution of monetary surprises across these two subsamples is not uniform. Table 3 presents the descriptive statistics for the two samples of same vs. opposite signs. Over the 188 policy announcement days, the shares are very much comparable (47% for same sign and 53% for opposite signs). More importantly, one can clearly see that monetary surprises in the two samples are indistinguishable in terms of their magnitude or variability. This suggests that the result in Table 2 is not driven by composition effects (*i.e.* larger surprises that may have larger effects).

3.2 Monetary policy transmission with higher-order moment signals

We now sort monetary surprises associated with the 188 statements according to the relative magnitude (in absolute terms) of their Target and Path surprises. In practice, we distinguish between (i) statements with a larger Path surprises and (ii) those with a larger Target surprise. This condition is informative of which information – about the policy stance or higher-order moments – dominates in a given statement with opposite signs. The conflicting signals could be driven by two different situations. When Target and Path surprises have opposite signs and the Target surprise is larger than the Path surprise, the change in the slope of the term structure of policy expectations is predominantly driven by larger news about the policy stance. In this case, the Path surprise only *attenuates* the (opposite) Target surprise and the dummy $\mathbb{1}_t^{\text{Att}}$ equals one:

$$\mathbb{1}_t^{\text{Att}} = \begin{cases} 0 \text{ if } |Path_t| \geq |Target_t| \text{ and } \mathbb{1}_t^{\text{Opp}} = 1 \\ 1 \text{ if } |Path_t| < |Target_t| \text{ and } \mathbb{1}_t^{\text{Opp}} = 1 \\ 0 \text{ if } \mathbb{1}_t^{\text{Opp}} = 0 \end{cases} \tag{9}$$

Alternatively, when Target and Path surprises have opposite signs and the Path surprise is larger than the Target surprise, the change in the slope of the term structure of policy expectations is predominantly driven by larger news about uncertainty surrounding future policy. Appendix Figure A1 plots the term structure of policy expectations for *higher-order moment* (HOM) statements. When Path is larger than (opposite-sign) Target, and the dummy $\mathbb{1}_t^{\text{HOM}}$ equals one:

$$\mathbb{1}_t^{\text{HOM}} = \begin{cases} 1 \text{ if } |Path_t| \geq |Target_t| \text{ and } \mathbb{1}_t^{\text{Opp}} = 1 \\ 0 \text{ if } |Path_t| < |Target_t| \text{ and } \mathbb{1}_t^{\text{Opp}} = 1 \\ 0 \text{ if } \mathbb{1}_t^{\text{Opp}} = 0 \end{cases} \tag{10}$$

We can now jointly test how the magnitude dimension adds to the sign dimension examined in the previous section. Over the 100 "opposite sign" statements, 68 are higher-order moment cases and 32 are attenuation cases. We use this augmented classification to test for the heterogeneous effects of monetary surprises on asset prices based on the following specification:

$$\Delta Y_t = \alpha + \beta_1 \cdot MPS_t + \beta_2 \cdot MPS_t \cdot \mathbb{1}_t^{\text{Att}} + \beta_3 \cdot MPS_t \cdot \mathbb{1}_t^{\text{HOM}} + \beta_4 \cdot \mathbb{1}_t^{\text{Att}} + \beta_5 \cdot \mathbb{1}_t^{\text{HOM}} + \epsilon_t \quad (11)$$

Table 4 shows estimated coefficients of Equation 11. First, the traditionally identified effect on stock prices (S&P 500) and short-term nominal yields (2-year rates) comes from the subset of FOMC meetings with consistent signals, *i.e.* when Target and Path surprises point in the same direction. Second, we do not find much effect of monetary surprises for statements when Target and Path have opposite signs but the Path surprise only attenuates the Target surprise. Conceptually from Section 2.3, the information content identified by these statements is unclear and this translates into the estimates of how investors react to these statements.

Table 4: Monetary policy effects with higher-order moment signals

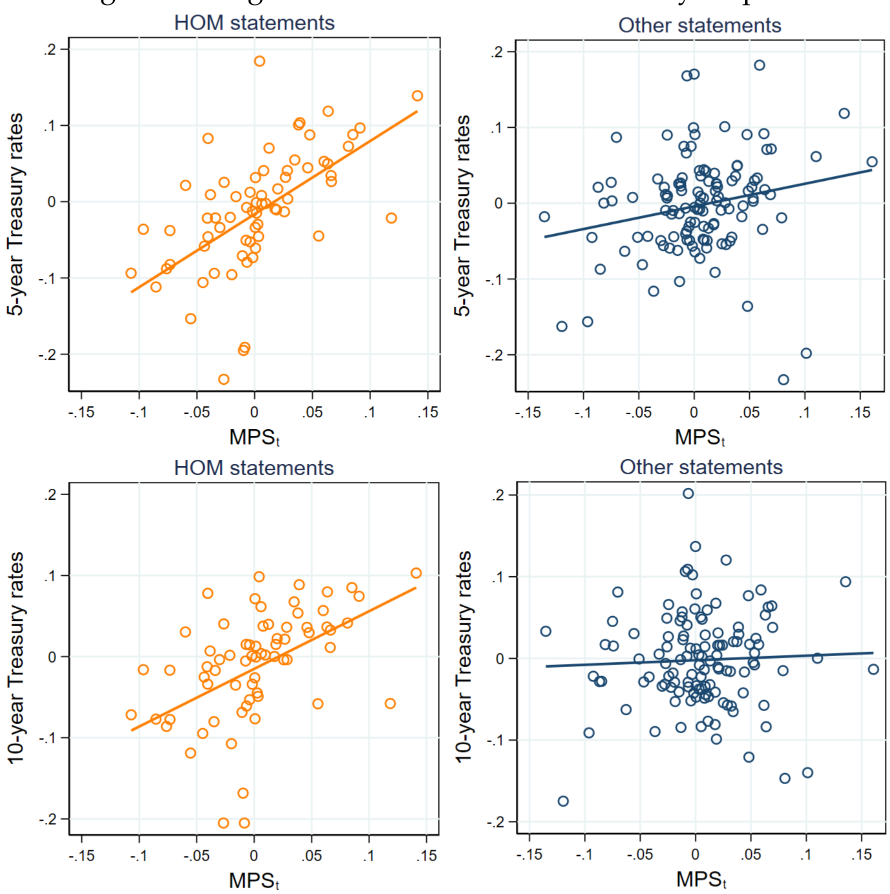
	S&P 500	2y	5y	10y
MPS_t	-7.834**	0.393**	0.285	0.057
	[3.56]	[0.20]	[0.19]	[0.16]
MPS_t x $\mathbb{1}^{\text{Att}}$	14.163**	0.192	0.060	-0.032
	[7.00]	[0.37]	[0.31]	[0.25]
MPS_t x $\mathbb{1}^{\text{HOM}}$	4.496	0.602***	0.673***	0.654***
	[4.74]	[0.22]	[0.25]	[0.23]
$MPS_t \mid \mathbb{1}^{\text{Att}} = 1$	6.329	0.584*	0.345	0.025
	[6.03]	[0.31]	[0.24]	[0.19]
$MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$	-3.338	0.995***	0.958***	0.711***
	[3.14]	[0.10]	[0.16]	[0.16]
R^2	0.07	0.27	0.17	0.10
R^2 Same Sign	0.10	0.09	0.05	0.00
R^2 Att	0.03	0.13	0.04	0.00
R^2 HOM	0.02	0.49	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect of monetary surprises for *attenuating* cases. The third row shows the marginal effect for *higher-order moment* statements. The fourth row ($MPS_t \mid \mathbb{1}^{\text{Att}} = 1$) shows the average effect for *attenuating* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Third, and more importantly, most of the effect on 2-year rates and the entire transmission of monetary surprises to long-term yields (5- and 10-year rates) comes from the subset of FOMC statements when Target and Path have opposite signs and the Path surprise has a stronger magnitude. The magnitude of the effects is several times larger for these *higher-order moment* statements (0.711 for 10-year rates) compared to other statements with same sign or attenuating signals (0.057 and 0.025 respectively). These estimates document that the transmission of monetary policy to stock prices and interest rates is not homogeneous across policy statements.

If FOMC statements convey discount rate news that affects the present value of future cash-flows, there should be a positive co-movement between monetary surprises and long-term interest rates and a negative co-movement with stock prices – what is observed for same sign statements. The strong positive response of long-term yields, combined with the absence of a reaction from stock prices, indicates that higher-order moment statements convey signals other than those relevant to stock prices – such as discount rate news (whether current or future, like a forward guidance shock). By contrast, these results suggest the presence of term premium news.

Figure 3: Long-term interest rates and monetary surprises



Note: These figures plot the daily changes in nominal yields (y-axis) for 5-year (upper panel) and 10-year rates (lower panel) against monetary surprises of Bauer and Swanson (2023a) (x-axis) for all 188 FOMC statements in our sample. The orange dots in the left panels represent the *higher-order moment* statements while the blue dots in the right panels represent the other statements. This classification is based on Target and Path surprises derived from Gürkaynak et al. (2005b).

It is important to highlight that the fraction of the explained variance of nominal yields is much higher for these higher-order moment statements. Monetary surprises explain 49, 26 and 16% of the variance of 2-, 5- and 10-year rates for those statements compared to around 10, 5 and 0% for same sign or attenuating statements. As a complement, we visually inspect the relationship between monetary surprises and nominal yields (5-year and 10-year) in Figure 3. We plot this separately for *higher-order moment* statements (left panel) and for the other statements (right panel) – *i.e.* statements with *consistent* or *attenuating* signals. We observe (i) a much steeper relationship for *higher-order moment* statements than for other statements, and (ii) the data points for *higher-order moment* statements cluster more tightly around the regression line than for other statements, indicating a more meaningful relationship.

The main result of this paper is that the transmission of monetary policy to (long-term) interest rates is very effective when (i) Target and Path surprises have opposite signs, and (ii) Path surprises are larger than Target surprises. This situation corresponds to when FOMC statements convey information about uncertainty surrounding the future policy outlook rather than directional signals. Most, if not all, of the effect of monetary policy on long-term rates comes from these *higher-order moment* FOMC statements specifically.

Table 5: The effect of monetary surprises on nominal yields at various maturities

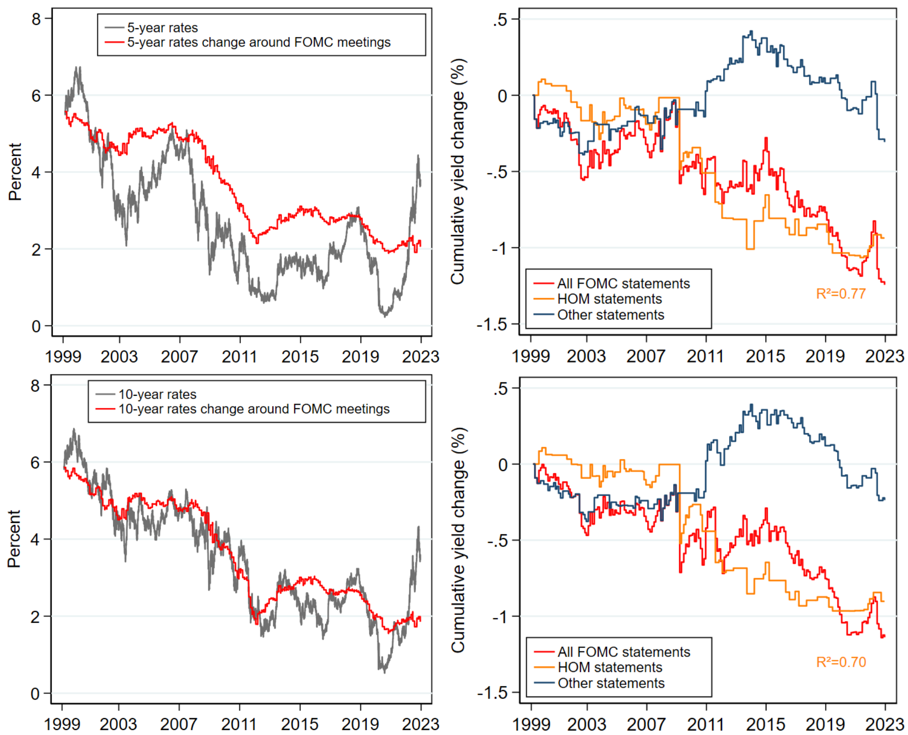
	1y	2y	3y	4y	5y	6y	7y
MPS_t	0.395**	0.393**	0.372*	0.334*	0.285	0.232	0.181
	[0.16]	[0.20]	[0.20]	[0.20]	[0.19]	[0.18]	[0.18]
MPS_t x $\mathbb{1}^{\text{HOM}}$	0.294	0.602***	0.681***	0.684***	0.673***	0.666***	0.662***
	[0.19]	[0.22]	[0.24]	[0.25]	[0.25]	[0.25]	[0.25]
$MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$	0.689***	0.995***	1.052***	1.018***	0.958***	0.898***	0.843***
	[0.09]	[0.10]	[0.12]	[0.14]	[0.16]	[0.17]	[0.17]
R^2	0.27	0.27	0.24	0.2	0.17	0.14	0.12
R^2 Other	0.16	0.10	0.08	0.06	0.05	0.03	0.02
R^2 HOM	0.46	0.49	0.41	0.32	0.26	0.22	0.19

	8y	9y	10y	15y	20y	25y	30y
MPS_t	0.134	0.093	0.057	-0.057	-0.106	-0.130	-0.145
	[0.17]	[0.17]	[0.16]	[0.16]	[0.15]	[0.15]	[0.16]
MPS_t x $\mathbb{1}^{\text{HOM}}$	0.660***	0.658***	0.654***	0.593***	0.493**	0.396*	0.319
	[0.24]	[0.24]	[0.23]	[0.21]	[0.20]	[0.21]	[0.24]
$MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$	0.794***	0.751***	0.711***	0.536***	0.387***	0.266*	0.174
	[0.17]	[0.17]	[0.16]	[0.14]	[0.13]	[0.15]	[0.17]
R^2	0.11	0.1	0.1	0.08	0.06	0.05	0.05
R^2 Other	0.01	0.01	0.00	0.00	0.01	0.01	0.02
R^2 HOM	0.17	0.16	0.16	0.15	0.12	0.07	0.02

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a) over the 188 FOMC meetings of our sample. Equation 11 is estimated using OLS. Only the main parameters of interest are reported. The dependent variables are the nominal yields for maturities from 1 year to 10 years and at 15, 20, 25 and 30 years. The first row shows the estimated effects of monetary surprises for *same sign* statements. The second row shows the marginal effect of monetary surprises for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effect for these latter statements. The classification of statements is based on Target and Path surprises derived from Gürkaynak et al. (2005b). The R^2 are computed from regressions for each subsample.

We extend the analysis of how *higher-order moment* statements matter for interest rates to various maturities, each from 1 to 10 years and at 15, 20, 25 and 30 years. Table 5 shows the estimated effects of monetary surprises based on Equation 11. We observe that the heterogeneous transmission is at work for all maturities, from 2 to 25 years. While the effect of monetary surprises on interest rates over non-*higher-order moment* statements is small, and non-significant in most cases, the effect from *higher-order moment* statements is strong and highly significant. It decreases at the 15-year horizon, becomes less precisely estimated at the 25-year horizon, and null at the 30-year horizon. The fact that the effect is pronounced at such long maturities reinforces the term premium interpretation in contrast to signals about future policy that should have no effect at such distant horizons. Long-term interest rates being key for most economic decisions, either for households or firms, these results suggest that a large part of the effects of monetary policy on the economy comes from these specific statements that contain particularly important news for the future.

Figure 4: Interest rate dynamics around FOMC meetings



Note: The figures on the left panel plot the evolution of the 5-year (upper) and 10-year (bottom) Treasury rates in grey and the hypothetical time series constructed with only the yield changes in a 3-day window around FOMC meetings in red, as in Hillenbrand (2025). The figures on the right panel show a decomposition of this hypothetical time series on FOMC statement days (red line) between higher-order moment statements (orange) and other statements (blue). The R^2 is computed based on the regression of the cumulative change in yields on FOMC statement days on the cumulative change in yields on HOM statement days.

In order to highlight the importance of higher-order moment statements for longer-term interest rates, we further explore the main result of Hillenbrand (2025) that changes in long-term Treasury rates are almost entirely driven by FOMC days compared to non-FOMC days. The left panel of Figure 4 replicates and confirms this finding for 5- and 10-year rates: the dynamics of these interest rates is well captured by changes around FOMC meetings. We then decompose this cumulative yield change over all statements of our sample between higher-order moment and other statements (right panel). We show that most of the dynamics of long-term interest rates that is captured by changes on FOMC announcement days is driven by changes from higher-order moment statements specifically.[19] More specifically, we find that HOM statements explain 77 and 70%, respectively, of the variation of 5- and 10-year interest rates on FOMC statement days over our sample.[20] Our classification reconciles the puzzling facts described in the introduction that monetary policy announcements explain much of the dynamics of long-term interest rates across time but they explain little of the variation of these long-term interest rates on policy announcement days. Higher-order moment statements resolve that contradiction: they explain long-term interest rate movements both within-days and across time.

3.3 Are higher-order moment statements capturing a large Path factor?

Large Path surprises. By definition, *higher-order moment* statements are characterized by relatively larger Path surprises than Target surprises. These statements are thus likely to occur more when the Path factor is large in absolute terms. We therefore test whether *higher-order moment* statements matters above and beyond large Path surprises. We add another interaction term between monetary surprises and a dummy for when the Path factor (in absolute value) is above its 75th percentile (regardless of the magnitude of the Target factor) in Equation 11. Appendix Table A4 reports estimates of this horse-race between HOM and large Path statements. The outcome is unambiguous and straightforward. Although 40% of higher-order moment statements occur with large Path surprises, we find no specific effect from these large Path surprises on long-term interest rates. In contrast, the marginal effect of *higher-order moment* statements remains strong and significant even when controlling for large Path surprises, such that the effect on long-term interest rates is driven by the information conveyed by these statements specifically.[21] This result is consistent with the fact discussed in Section 2.3 that the Path factor alone does not discriminate information about the future.

Small Target surprises. Because of potential measurement errors, these statements with no news on the current stance could be positive or negative near zero and would fall into our classification. We now explore whether these higher-order moment statements are actually characterized by small Target surprises such that they do not really convey a strong information content about higher-order moments, but rather little or no information content about the current decision. We therefore augment Equation 11 with an interaction term between monetary surprises and a dummy for when the Target factor (in absolute value) is below its 25th percentile. We also test whether the main result is driven by either large Path surprises *or* small Target surprises (two-thirds of higher-order moment statements) or driven by statements with large Path surprises *and* small Target surprises (only 10% of higher-order moment statements). Appendix Tables A5, A6 and A7 show that our result is not driven by small Target surprises and/or large Path surprises. Overall, these results reinforce the fact that, although we build on the GSS decomposition, our classification does not mimic the Target/Path decomposition.

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[19] These figures visually suggest a potential break around 2009. We estimate Equation 11 on two subsamples pre and post 2009 in Appendix Table A2 and find similar results to those in Table 4. The effect of monetary surprises on longer-term interest rates is more pronounced in presence of higher-order moment statements.

[20] We computed the R^2 of the regression of the cumulative change in 5- or 10-year rates on all FOMC statement days on the cumulative change in 5- or 10-year rates on HOM statement days only.

[21] Estimates in Appendix Table A3 rejects the hypothesis that this result operates through Path surprises specifically.

3.4 Alternative mechanisms and confounding factors

The stronger effect of monetary surprises in *higher-order moment* statements could also be due to confounding factors. Our classification, in selecting these statements, might well capture some other correlated dimensions that would explain the heterogeneous pass-through of monetary policy to interest rates. For instance, it is possible that these statements serve as a proxy for periods of lower economic uncertainty, during which the effect of monetary policy on interest rates is relatively stronger than in periods of higher uncertainty (Tillmann 2020).

Unconventional policy announcements. Quantitative Easing (QE) or forward guidance (FG) announcements contain by nature a strong forward-looking component. Over our sample period, the Fed calibrated its forward guidance announcements to lower long-term rates while QE purchases put similar pressure on yields (Krishnamurthy and Vissing-Jorgensen 2011, Christensen and Rudebusch 2012, D'Amico, English, López-Salido, and Nelson 2012). The *higher-order moment* statements might thus happen when these unconventional policies were announced, in such a way that we capture the effects of these policies. To control for that, we consider unconventional monetary policy announcements related to QE from the list of Corbet, Dunne, and Larkin (2019). We use the timeline provided by the Federal Reserve on policy actions and communication for FG announcements.[22] We also resort to the LSAP surprises estimated by Swanson (2021) and assess to what extent the large LSAP surprises (above their 75th percentile) can explain our result. We add a linear and interacted term in Equation 11 to control for these confounding factors and confirm that it does not affect our results (see Appendix Tables A8, A9 and A10).

Central bank information effects. We consider the possibility that policy decisions convey signals about the future economic outlook (Cieslak and Schrimpf 2019, Lakdawala and Schaffer 2019, Miranda-Agrippino and Ricco 2021, Nunes, Ozdagli, and Tang 2024, Jarociński and Karadi 2025, Ricco and Savini 2025). These signals could lead to revisions in long-term interest rates. We therefore replicate our results using Jarociński and Karadi (2020)'s MPS adjusted for central bank information effects (based on their continuous decomposition). We also confront higher-order moment statements with statements dominated by central bank information effects (using their discrete decomposition and interacting MPS_t with a dummy for information-effect meetings). Appendix Tables A11 and A12 show that our main results hold.

Press Conferences. Since 2011, the Fed has held a press conference at meetings at which it releases the (quarterly) Summary of Economic Projections (SEP). Since 2018, a press conference has been held after each meeting. The press conference starts with an opening statement followed by a Q&A session during which journalists ask clarifying questions, often on future actions or policy shifts. There is ample evidence of sizable market reactions during the press conference, comparable to, and sometimes even greater than those to FOMC statements (Ehrmann and Fratzscher 2009, Brand, Buncic, and Turunen 2010, De Pooter 2021, Boguth, Grégoire, and Martineau 2019, Swanson and Jayawickrema 2024, Narain and Sangani 2025). Even when controlling for the occurrence of press conferences, estimates confirm our main results (see Appendix Table A13).

Publication of FOMC projections. While inflation reports have been shown to influence the term structure of interest rates (Andersson, Dillén, and Sellin 2006) and central bank projections

[22] https://www.federalreserve.gov/monetarypolicy/timeline-forward-guidance-about-the-federal-funds-rate.htm.

to affect private agents' expectations (Hubert 2015), the SEP, published since 2007, contains FOMC participants' longer-run projections for GDP, inflation, and the unemployment rate, as well as the future path of "appropriate" monetary policy. It is therefore likely to influence long-term nominal yields. In Appendix Table A14, we show that the stronger effect of monetary surprises from *higher-order moment* statements holds beyond the publication of these FOMC projections.

Monetary policy uncertainty. By definition, one of the two conditions for *higher-order moment* statements is that Target and Path factors move in opposite directions, so there is conflicting news. These statements could then reflect a heightened policy uncertainty. Although the effect of monetary policy on long-term interest rates is weaker when the MPU index is large, controlling for the market-based measure of monetary policy uncertainty of Bauer, Lakdawala, and Mueller (2022) does not eliminate our main result (see Appendix Table A15). Our main finding is also robust to a measure of financial uncertainty such as the VIX (Table A16). The interest rate skewness measure of Bauer and Chernov (2024) captures the balance of interest rate risks (the asymmetry in the probability distribution of interest rate changes). Intuitively, a positive skewness indicates that large rate hikes are more likely than large rate cuts, so that the balance of risk is tilted to the upside and reflects macroeconomic risk. As such, it may contain information about the uncertainty on the likely direction of future interest rate changes. Even after controlling for interest rate skewness (Table A17), the key role of *higher-order moment* statements remains.

Macro data releases before FOMC announcements. Alam (2023) shows that the pre-FOMC drift and the FOMC announcement premium occur only when key macro announcements immediately precede FOMC announcements, which correspond to one-third of FOMC days. On the other two-thirds of FOMC days, there are no drift and announcement premium. We test whether the higher-order moment statements could occur on those meetings preceded by key macro data releases. We follow the data selection of this paper and focus on GDP, CPI, unemployment and industrial production data releases. Appendix Table A18 reports the effect of monetary surprises for the two types of meetings. Although half of the higher-order moment statements actually occur on FOMC days with data releases in the three preceding days, the effect of monetary policy on long-term rates comes exclusively from higher-order moment statements.

Turning points and policy cycles. As higher-order moment statements convey relevant information for long-term interest rates, a natural question is whether they cluster around turning points in monetary cycles, especially in the months or quarter before a new cycle start. Appendix Figure A2 plots the distribution of these statements over time according to our two classifications: the baseline one using the Target and Path factors of Gürkaynak et al. (2005b), and the one using the series of Nakamura and Steinsson (2018). The main take-away is that these statements are spread evenly throughout the sample period.

Using a probit model described in Appendix Equation 12, we estimate the likelihood of observing a *higher-order moment* statements based on different characteristics of the meeting or the decision, and of the environment (the level of uncertainty, for instance). Table A19 in Appendix shows the results of these regressions. We find a slightly higher probability of *higher-order moment* statements when there is a *status quo* decision and a forward guidance announcement. Periods of heightened monetary policy uncertainty also makes higher-order moment statements slightly more likely. Finally, we find that higher-order moment statements are less likely to occur around turning points in monetary policy cycles, suggesting that their information content is not about the initiation of a tightening or easing cycle.

3.5 Asset price responses in a narrow window

The evidence provided in Table 4 is based on daily changes in asset prices. Hanson and Stein (2015) suggest some reasons for which using lower-frequency changes can be preferable (information processing delays, reversals in market momentum, etc). However, using higher-frequency intraday changes helps avoiding potential confounding events (the release of some macroeconomic data on the same day, for instance) and circumventing the pre-FOMC announcement drift (Lucca and Moench 2015). We therefore estimate Equation 11 with 30-min changes in asset prices around the FOMC announcement (data are taken from Bauer and Swanson, 2023b).

Table 6: Monetary policy effects in a narrow window

	S&P 500	2y	5y	10y
MPS_t	-6.890***	0.683***	0.529***	0.305***
	[1.23]	[0.10]	[0.11]	[0.08]
MPS_t x $\mathbb{1}^{\text{HOM}}$	1.380	0.371***	0.532***	0.467***
	[1.80]	[0.12]	[0.15]	[0.13]
$MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$	-5.511***	1.054***	1.061***	0.771***
	[1.32]	[0.07]	[0.11]	[0.10]
R^2	0.31	0.68	0.53	0.37
R^2 Other	0.32	0.56	0.38	0.24
R^2 HOM	0.24	0.78	0.62	0.42
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the 30-min change around FOMC announcements in log S&P 500 in column (1) and in the 2-, 5-, and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect of monetary surprises for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table 6 shows the estimated effects. Although long-term interest rates respond to monetary surprises in non-*higher-order moment* statements over this narrow window, the marginal effect of monetary surprises from *higher-order moment* statements remains very strong and highly significant, such that the mean effect of monetary policy on interest rates during these meetings is extremely powerful. The explained variance within this narrow window is mechanically higher for all statements, but is much larger for *higher-order moment* statements than the other statements, as evidenced in the baseline estimates.

3.6 Alternative measures of monetary surprises and classifications

So far, we have shown that a subset of FOMC meetings is crucial for the transmission of monetary policy to interest rates. We have used Target and Path surprises as originally defined by Gürkaynak et al. (2005b) for our classification of FOMC meetings and we have established this result based on the *news-adjusted* monetary surprises from Bauer and Swanson (2023a). We now examine whether our main finding holds when using alternative measures of monetary surprises. In Appendix Table A20, we estimate Equation 11 using the series of Nakamura and Steinsson (2018). We also find that the transmission of monetary policy to nominal yields is much stronger in the subset of policy announcements where Path surprises are larger and of an opposite sign than Target ones. Appendix Tables A21, A22 and A23 also replicate these results using measures from Gürkaynak et al. (2005b), Jarociński and Karadi (2020) and the unadjusted series from Bauer and Swanson (2023a). The key role of *higher-order moment* statements for monetary policy transmission to long-term yields holds across all these alternative measures.

Table 7: Monetary policy effects based on an alternative classification

	S&P 500	2y	5y	10y
MPS_t	-7.569***	0.544***	0.471***	0.254*
	[2.60]	[0.15]	[0.15]	[0.13]
MPS_t x $\mathbb{1}^{HOM}$	11.545*	0.581***	0.588***	0.498***
	[6.54]	[0.18]	[0.20]	[0.19]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	3.975	1.125***	1.059***	0.752***
	[6.01]	[0.09]	[0.13]	[0.13]
R^2	0.08	0.26	0.14	0.07
R^2 Other	0.05	0.16	0.08	0.02
R^2 HOM	0.04	0.70	0.63	0.52
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-year, 5-year and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for*same sign* statements. The second row shows the marginal effect of monetary surprises for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effect for the latter. The classification of statements is based on the FFR and News shock series of Nakamura and Steinsson (2018). The R^2 are computed from regressions for each subsample.

We then explore whether our result is sensitive to the classification of *higher-order moment* statements derived from the Target and Path surprises of Gürkaynak et al. (2005b). It is possible to isolate *higher-order moment* statements using a classification based on the the unexpected change in the Fed funds rate ("FFR shock") and policy news shock series ("News shock") from Nakamura and Steinsson (2018). These two measures can also be used to disentangle news about the policy stance and higher-order moments, although in a slightly noisier way. The News shock is a composite measure of changes in policy expectations at different maturities up to one year, so it includes the influence of changes in the current stance.[23] Using these two series to classify state-

[23] Their first principal component can be viewed as a weighted average of the Target and Path factors.

ments, we end up with a smaller subset of *higher-order moment* announcements – possibly because the policy news shock is a noisier measure for our purpose.[24] While we identify 68 *higher-order moment* statements using the Target and Path surprises, we identify 24 *higher-order moment* statements using Nakamura and Steinsson (2018)'s series. One advantage though of using these series is that it makes the classification even more conservative.

Table 7 shows the estimates of Equation 11 with this alternative classification. In Appendix Table A24, we replicate this estimation using both this alternative classification and Nakamura and Steinsson (2018)'s measure of monetary surprises as the right-hand side variable.[25] In the two cases, the main finding fully holds despite the small sample of *higher-order moment* statements.

The 24 statements identified as *higher-order moment* ones using the series from Nakamura and Steinsson (2018) are not a perfect subset of the 68 *higher-order moment* statements originally identified with Target and Path surprises. Some meetings are classified as *higher-order moment* statements in one case, but not in the other. Interestingly, if we consider the intersection of these two subsets of statements and replicate our estimations on the common set of 19 *higher-order moment* statements, we still find an heterogeneous effect of monetary surprises on interest rates with a much stronger impact from these statements, as shown in Appendix Table A25. Note that monetary surprises explain from 50% to 70% of the variance of nominal yields over these 19 meetings.

3.7 Euro area evidence

We test whether the heterogeneous effect of monetary surprises is specific to FOMC statements. We cross-check the main result with monetary surprises and the classification of policy statements from another central bank by applying a similar approach to euro area data. To do so, we first define Target and Path surprises for ECB statements. We use asset price changes in the press release window provided by Altavilla et al. (2019). The Target surprise is essentially the change in 1-month OIS rates around the policy statement. The Path surprise is the change in 1-year OIS rates orthogonalized to changes in 1-month OIS rates. We then define higher-order moment statements the exact same way as in the FOMC case. Out of the 299 policy decisions we consider from January 1999 to October 2023, 98 appear as higher-order moment statements (33%, compared to 36% of the FOMC statements).

We estimate Equation 11 with changes in the press release window in Eurostoxx50 prices and 2-, 5-, and 10-year German sovereign yields (as a proxy of risk-free euro area interest rates). Our monetary policy surprise series is the sum of Target and Path surprises, *i.e.* the change in 1-year OIS rates around the policy statement. Table 8 reports estimates for euro area data. The interaction term between ECB monetary surprises and the dummy for higher-order moment statements is positive, large and significant. While the effect of monetary surprises on 10-year interest rates is small and barely significant (only at the 10% level), the effect of monetary policy from the higher-

[24] Appendix Figure A3 shows that this alternative classification with these different series also isolates statements with increasing loadings across policy expectation horizons effectively.

[25] In Tables A20 and A24, the estimated coefficients for 2-, 5- and 10-year nominal yields using Nakamura and Steinsson (2018)'s surprises are significantly larger than those estimated using series from Bauer and Swanson (2023a) (see Table 4 for instance) for both non-HOM and HOM statements. These larger elasticities are embedded in NS18 surprises themselves and are independent of the statement classification.

Table 8: Euro area evidence

	STOXX50	2y	5y	10y
MPS_t	-0.057***	0.770***	0.493***	0.131*
	[0.02]	[0.06]	[0.07]	[0.07]
MPS_t x $\mathbb{1}^{HOM}$	0.014	0.439***	0.772***	0.730***
	[0.02]	[0.15]	[0.16]	[0.14]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-0.044***	1.209***	1.265***	0.862***
	[0.02]	[0.14]	[0.14]	[0.13]
R^2	0.14	0.72	0.52	0.25
R^2 Other	0.15	0.69	0.39	0.05
R^2 HOM	0.08	0.79	0.75	0.61
Obs.	299	299	299	299

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of monetary surprises from Altavilla et al. (2019). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the intraday change in the Eurostoxx50 in column (1) and in the 2-year, 5-year and 10-year German nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same-sign* ECB statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

order moment statements is large. The associated R^2 at the 10-year horizon is also 12 times larger, suggesting an important additional information content in these statements. These estimates suggest that the main finding of this paper is not specific to the US monetary policy.

4 The information content of higher-order moment statements

Our estimates show that monetary surprises from *higher-order moment* statements have strong effects on long-term interest rates. Given that monetary policy has only temporary effects on real variables, what drives its influence on long-term interest rates? The literature has explored different channels, from the effect on term premium to private agents learning about the central bank reaction function. In this section, we investigate the underlying nature of the information that investors learn from the higher-order moment statements.

4.1 Real rates and inflation compensation

We first decompose nominal yields into their real component (using Treasury Inflation-Protected Securities, TIPS) and the inflation compensation component (measured with break-even inflation rates at equivalent maturities) to understand the information content of interest rate responses (Abrahams, Adrian, Crump, Moench, and Yu 2016, D'Amico, Kim, and Wei 2018).[26] This approach helps us shed light on what potential signals affect investors' beliefs and what potential aspects of the reaction function investors may learn about.

[26] These data are available at http:// www.federalreserve.gov/pubs/feds/2008/200805/200805abs.html and have been constructed by Gürkaynak, Sack, and Wright (2010).

Table 9: Decomposition of nominal interest rates: real rates and inflation compensation

	Nominal interest rates			**Real interest rates**			**Inflation compensation**		
	2y	5y	10y	2y	5y	10y	2y	5y	10y
MPS_t	0.39**	0.29	0.06	-0.51	0.19	0.12	0.91	0.09	-0.07
	[0.20]	[0.19]	[0.16]	[0.74]	[0.24]	[0.18]	[0.72]	[0.15]	[0.10]
MPS_t x $\mathbb{1}^{HOM}$	0.60***	0.67***	0.65***	1.50*	0.80**	0.60**	-0.90	-0.18	0.06
	[0.22]	[0.25]	[0.23]	[0.78]	[0.31]	[0.24]	[0.75]	[0.18]	[0.12]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	1.00***	0.96***	0.71***	0.99***	0.99***	0.72***	0.00	-0.03	-0.01
	[0.10]	[0.16]	[0.16]	[0.25]	[0.20]	[0.17]	[0.21]	[0.11]	[0.08]
R^2	0.27	0.17	0.10	0.06	0.14	0.11	0.06	0.04	0.07
Obs.	188	188	188	188	188	188	188	188	188

Note: Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted MPS of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily changes in nominal yields at maturities 2-, 5- and 10-year in columns (1), (2), and (3), their respective real rate components in columns (4), (5) and (6), and inflation compensation components in columns (7), (8) and (9). The real interest rate component is derived from Treasury Inflation-Protected Securities (TIPS) and the inflation compensation component is derived from the break-even inflation rates. The first row shows the effects of monetary surprises for same sign statements. The second row shows the marginal effect of monetary surprises for higher-order moment statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effect of monetary surprises for *higher-order moment* statements. The classification of statements is based on the Target and Path factors derived from Gürkaynak et al. (2005b).

Table 9 presents estimates of Equation 11 with this decomposition. We find that the effect on long-term rates from *higher-order moment* statements is primarily driven by a stronger transmission to *real* interest rates. Notably, there is no effect of monetary surprises on inflation compensation in these cases, suggesting that the observed changes in long-term nominal rates cannot be attributed to shifts in investors' beliefs about future inflation. These findings indicate that when investors update their beliefs about interest rates, they perceive monetary policy as neutral with respect to inflation. The absence of a reaction of inflation compensation suggests that investors do not update their beliefs about the inflation target π^*, as when the central bank behavior may reveal information about its target (see Clayton and Schaab 2025).[27] The fact that the inflation compensation response is muted also suggests that the news conveyed in these higher-order moment statements is not about the central bank's responsiveness to economic conditions (the "ϕ" parameters that capture the response to inflation and output gap), which would induce a policy tightening/easing with respect to the neutral rate (as in Schmeling, Schrimpf, and Steffensen 2022 and Bauer and Swanson 2023a). Bauer et al. (2024) and Bocola et al. (2024) provide compelling evidence that investors update their perceptions of the central bank reaction function when observing policy announcements. These estimates suggest that this is not what drives the effect of the subset of higher-order moment statements: the real component moves, not the inflation component.

Changes in long-term real yields may reflect revisions in beliefs about long-run economic fundamentals as in Nakamura and Steinsson (2018), consistent with low-frequency business cycle fluctuations (Jordà et al. 2017) or the long-run effects of monetary policy (Jordà et al. 2025). These news should be seen as different from "short-term" central bank information effects – identified from the response of stock prices as in Jarociński and Karadi (2020) and Cieslak and Schrimpf (2019) – that reflect updates in investors' beliefs about the near-future economic outlook based on

[27]Considering the following standard Taylor rule: $i_t = r^* + \pi_t + \phi_\pi(\pi_t - \pi^*) + \phi_y(y_t - \bar{y}_t) + \epsilon_t$.

policy decisions (and that might disappear when controlling for recent data releases). Estimates reported in Section 3.4 also suggests that the underlying news conveyed in these higher-order moment statements is not about near-term central bank information effects. In contrast, estimates from Table 9 suggest that these policy statements convey signals that affect investors' perceptions of long-run economic fundamentals.

An important take-away from Table 9 is that the standard effects of monetary policy on real interest rates documented in Nakamura and Steinsson (2018) – and shown in Appendix Table A26 – appear largely, if not exclusively, driven by the subsample of *higher-order moment* statements.

4.2 Expectation hypothesis versus term premium

To further investigate the underlying mechanisms at work in higher-order moment statements, we decompose nominal yields into two components: (i) the expectation hypothesis component, representing the average of expected future short-term interest rates from the present to the maturity of the long-term bond, and (ii) a term premium component. The term premium is a compensation investors require for holding securities to a given horizon with an uncertain future path of short-term interest rates. We use this decomposition to directly test whether the effect of monetary surprises in higher-order moment statements actually operates through the term premium, as suggested in Section 2.3. To do so, we rely on the database of Adrian, Crump, and Moench (2013) that provides a decomposition of these two objects as estimates of the expected average level of short-term interest rates and of the term premium for Treasury maturities from one to ten years using a three-step linear regression approach of the term structure of interest rates.[28] We regress each of the two components at each horizon on monetary surprises, following the specification outlined in Equation 11. We present the results in Table 10, and the first three columns reproduce the baseline results from Table 4.

Table 10: Decomposition of nominal interest rates: expectation hypothesis and term premium

	Nominal interest rates			**Expectation Hypothesis**			**Term premium**		
	2y	5y	10y	2y	5y	10y	2y	5y	10y
MPS_t	0.39**	0.29	0.06	0.53***	0.49***	0.39***	-0.13	-0.21*	-0.33**
	[0.20]	[0.19]	[0.16]	[0.18]	[0.18]	[0.14]	[0.11]	[0.11]	[0.14]
MPS_t x $\mathbb{1}^{HOM}$	0.60***	0.67***	0.65***	0.17	0.27	0.25	0.44***	0.49***	0.42**
	[0.22]	[0.25]	[0.23]	[0.20]	[0.20]	[0.16]	[0.12]	[0.14]	[0.19]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	0.99***	0.96***	0.71***	0.69***	0.76***	0.63***	0.31***	0.20**	0.08
	[0.10]	[0.16]	[0.16]	[0.08]	[0.09]	[0.07]	[0.05]	[0.10]	[0.12]
R^2	0.27	0.17	0.10	0.26	0.24	0.24	0.11	0.06	0.06
Obs.	188	188	188	188	188	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted MPS of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily changes in nominal yields at maturities 2-, 5- and 10-year in columns (1), (2) and (3), their respective expectation hypothesis components in columns (4), (5) and (6), and term premium components in Columns (7), (8) and (9). The first row shows the estimated effects of monetary surprises for same sign statements. The second row shows the marginal effect of monetary surprises for higher-order moment statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effect of monetary surprises for *higher-order moment* statements. The classification of statements is based on the Target and Path factors derived from Gürkaynak et al. (2005b).

[28]These data are available at https://www.newyorkfed.org/research/data_indicators/term-premia-tabs.

Columns 4 to 6 show the effect of monetary surprises on the expectation hypothesis component. We find no marginal effect of monetary surprises from *higher-order moment* statements compared to other statements. When FOMC statements convey consistent signals (first line of Table 10), monetary policy primarily affects long-term interest rates through expectations of future short-term rates, in line with the standard effects of monetary policy over the full sample (Appendix Table A27). It is worth noting that as same-sign statements provide clear and directional signals about policy signals, they resolve policy uncertainty and as such reduce term premium. In contrast, we find a strong and significant positive marginal effect of monetary surprises from *higher-order moment* statements on the term premium (Columns 7 to 9). It is consistent with the findings of Gertler and Karadi (2015) and Kaminska et al. (2021) who attribute an important role to the term premium in the monetary transmission. This suggests that these *higher-order moment* statements primarily convey information about the risks associated with holding these securities over a long period of time rather than about expectations of future short-term rates. The combined findings from Tables 9 and 10 suggest a role for interest rate risk, not inflation risk.

Hanson and Stein (2015) and Kekre et al. (2024) also highlight a channel of monetary policy through the term premium. However, their yield-seeking mechanism in segmented markets is likely to operate across all FOMC statements, not just a subset. Our finding that the effect of this subset of *higher-order moment* statements operates through the term premium suggests a different underlying mechanism. One possible interpretation, as already suggested in Section 2.3 and supported by these estimates, is that these policy announcements convey signals that affect investors' beliefs about the variance and skewness of long-run economic fundamentals. In the FOMC language, this refers to the balance of risks for the economic outlook. Stein and Sunderam (2018) put forward that, for long-term rates to respond to monetary policy announcements, one needs that a small portion of monetary surprises reflects innovations to the FOMC's own views of the economy.[29] Stein and Sunderam (2018) assume that this information is about its preferred value of the policy rate. We suggest an additional source of news: the FOMC's own views of the balance of future risks. One possibility is that changes in the FOMC's own perceptions of the balance of risks affect long-term interest rates through the term premium. This interpretation is consistent with the literature that suggests that the central bank has no information advantage on the *level* of future inflation or output, and that investors do not necessarily update their macroeconomic forecasts in response to central bank announcements (see market participants' survey answers in Bauer and Swanson 2023a). This state-dependent term premium channel could also relate to the time-varying risk compensation associated with economic conditions of Campbell, Pflueger, and Viceira (2020) and Pflueger and Rinaldi (2022).

4.3 Textual analysis of higher-order moment statements

To better understand what distinguishes higher-order moment statements from other FOMC announcements, we conduct a textual analysis of their content (see, among others, Lucca and Trebbi 2009, Hansen and McMahon 2016, Hubert and Labondance 2021). First, using a system-

[29] If the FOMC implemented a reaction function based solely on publicly observable variables, investors would only react to data releases, not FOMC statements. By definition, investors have to learn something from FOMC statements to react to them.

atic approach, we provide qualitative validation of our quantitative classification by showing that higher-order moment statements contain more risk assessment and probabilistic language. Second, we provide anecdotal evidence, based on the key higher-order moment statements, of the specific types of signals that investors interpret as conveying information about higher-order moments of future economic conditions.

Linguistic feature analysis. Using a large language model (LLM), we conduct a systematic linguistic analysis of all 188 FOMC statements to quantify the differences in language patterns between policy stance and higher-order moment statements. Using predefined vocabulary lists and calculating word densities per 1,000 words, we examine four key linguistic dimensions: uncertainty vocabulary, risk assessment terms, probabilistic language, and policy stance language.[30]

The results reveal striking differences in communication patterns that align with our findings. Higher-order moment statements contain significantly more uncertainty vocabulary (10.2 vs 9.3 per 1,000 words, +9%) and probabilistic language (7.2 vs 4.7 per 1,000 words, +52%), suggesting a greater distribution of future outcomes. Most remarkably, higher-order moment statements use risk assessment terminology at nearly eight times the rate of policy stance statements (0.42 vs 0.05 per 1,000 words), indicating more explicit risk evaluation. Conversely, policy stance statements contain 24% more future policy guidance language (20.4 vs 16.5 per 1,000 words), as expected given their focus on communicating the intended policy stance.

This quantitative linguistic analysis confirms that higher-order moment statements systematically employ language emphasizing uncertainty, risk assessment, and probabilistic outcomes rather than directional policy guidance. The substantially higher usage of risk-focused terminology in higher-order moment statements provides direct textual evidence supporting our interpretation that these announcements convey information about higher-order moments of future economic conditions. This focus on the balance of risks rather than point forecasts explains the differentiated transmission through term premium rather than expected future short-term rates.

Key higher-order moment statements. We then identify the most economically significant higher-order moment statements using multiple criteria. Table 11 presents excerpts from statements that satisfy at least two of the following four conditions: (i) belonging to the intersection of the GSS- and NS-based classifications (indicating robust identification), (ii) being associated with one of the ten largest monetary policy surprises in our sample, (iii) generating one of the ten largest changes in 10-year interest rates, or (iv) producing one of the ten largest ratios of yield changes to monetary surprises (indicating strong transmission). This systematic approach identifies eleven statements across different policy cycles.

Overall, the FOMC language in the most important higher-order moment statements explicitly mention greater variance or asymmetry in the balance of future risks. These statements exhibit several distinctive linguistic features. First, they emphasize "risks" and "balance of risks" rather than point forecasts. The August 2001 statement notes *"risks are weighted mainly toward conditions that may generate economic weakness"*, while March 2014 warns that low inflation *"could pose risks to economic performance"*. This language signals information about the distribution of possible outcomes, not just expected outcomes. Second, these statements explicitly acknowledge uncer-

[30] We used the Sonnet 4.0 model of Claude AI. The prompt enabling exact replication appears in Appendix B.

Table 11: Excerpts from higher-order moment statements

Date	Com.	MPS	Δ10y	Ratio	Excerpt
5 Oct 1999	✓	✓			*"the Committee adopted a directive that was biased toward a possible firming of policy going forward"*
21 Aug 2001	✓			✓	*"the risks are weighted mainly toward conditions that may generate economic weakness in the foreseeable future"*
13 Aug 2002	✓	✓	✓		*"the Committee recognizes that (...) the risks are weighted mainly toward conditions that may generate economic weakness"*
6 May 2003	✓	✓			*"the Committee believes that (...) the balance of risks to achieving its goals is weighted toward weakness over the foreseeable future"*
28 Jan 2004		✓	✓		*"the probability of an unwelcome fall in inflation has diminished (...) and now appears almost equal to that of a rise in inflation"*
21 Mar 2007	✓	✓			*"the Committee's predominant policy concern remains the risk that inflation will fail to moderate as expected"*
18 Mar 2009			✓	✓	*"the Committee sees some risk that inflation could persist for a time below rates that best foster economic growth in the longer term"*
09 Aug 2011			✓	✓	*"moreover, downside risks to the economic outlook have increased"*
19 Mar 2014			✓	✓	*"the Committee recognizes that inflation persistently below its 2 percent objective could pose risks to economic performance"*
27 Jul 2016		✓		✓	*"near-term risks to the economic outlook have diminished"*
16 Mar 2022	✓	✓			*"the implications for the US economy are highly uncertain"*

Note: This table lists excerpts from FOMC statements available at https://www.federalreserve.gov/monetarypolicy/fomc.htm. We selected a subset of the 68 higher-order moment statements based on whether the statement validates at least two of the following four criteria. Column 2 reports whether the statement is among the GSS and NS *common* subset of 19 higher-order moment statements, Column 3 whether the statement is associated with the one of the 10 largest monetary surprises, Column 4 whether the statement is associated with the 10 largest changes in 10-year interest rates, and Column 5 whether the statement is associated with the 10 largest ratios of changes in 10-year interest rates over monetary surprises.

tainty or changing risk assessments. August 2011 states *"downside risks to the economic outlook have increased"*, while March 2022 notes *"implications for the US economy are highly uncertain"*. Such language directly indicates that the central scenario may be less reliable, leading to an higher term premium. Third, many statements contain probabilistic risk assessments that do not map to directional policy guidance. January 2004 illustrates this: *"the probability of an unwelcome fall in inflation has diminished (...) and now appears almost equal to that of a rise in inflation"*. This type of statement conveys information about tail risk assessment information without directional policy signals.

It is worth stressing that the content of these statements has evolved across policy cycles. Statements in the early 2000s focused on inflation-growth trade-offs (*"balance of risks to achieving its goals is weighted toward weakness"*). During and after the financial crisis, higher-order moment statements addressed unconventional policy uncertainty (*"inflation could persist for a time below rates that best foster economic growth"*). Recent statements focus on new uncertainty sources, from pandemic effects and trade tensions to geopolitical developments.

To highlight what makes higher-order moment statements distinctive, it is informative to compare them with typical "same sign" statements. These statements tend to provide clearer guidance by using more directional language about the likely policy path. For instance, a typical "same sign" statement might read: *"The Committee expects that economic conditions will evolve in a manner that will warrant gradual increases in the federal funds rate"* (20 September 2017). Such language provides clear guidance without acknowledging uncertainty and risks as higher-order moment statements do.

This qualitative analysis supports our quantitative findings about the transmission mechanism. When the FOMC uses language emphasizing the balance of risks, uncertainty, or probability assessments rather than point forecasts, investors update both their policy expectations and their assessment of uncertainty around those expectations. Higher uncertainty naturally increases term premia as compensation for bearing the risks associated with unexpected policy developments. The focus on higher-order moment signals about economic growth prospects, policy effectiveness, or structural changes – factors that would affect real rates – rather than signals about inflation target helps to explain why effects operate through real rates rather than inflation compensation. This qualitative evidence suggests that higher-order moment statements convey fundamentally different information than standard policy announcements, focusing on uncertainty and risk assessment rather than directional policy guidance. This explains their differentiated effects on long-term interest rates through term premium above expected future short-term rates.

4.4 Balance of risks versus risk appetite

Our analysis documents that higher-order moment statements primarily affect long-term interest rates through term premium channels, while policy stance statements affect stock prices and short-term rates. To further understand the distinct transmission mechanisms, we examine how these two types of statements differentially affect various risk, uncertainty and term premium measures.

We estimate the effects of monetary surprises from both types of statements on changes in several higher-order moment indicators: the VIX (equity market volatility), the risk appetite measure of Bauer, Bernanke, and Milstein (2023) and the risk aversion measure of Bekaert, Engstrom, and Xu (2022) together with the term premium and forward term premium estimated by Kim and Wright (2005) and the monetary policy uncertainty indicator of Bauer et al. (2022).

Table 12: Monetary policy effects on various higher-order moment measures

	Risk appetite			**Term premium and uncertainty**				
	VIX	BBM23	BEX21	TP_{1Y}	FTP_{1Y}	TP_{10Y}	FTP_{10Y}	BLM22
MPS_t	9.683**	-5.198*	2.279*	0.032	0.056	0.064	0.061	0.035
	[4.38]	[2.71]	[1.18]	[0.03]	[0.05]	[0.07]	[0.09]	[0.06]
MPS_t x $\mathbb{1}^{HOM}$	-6.351	7.645**	-2.296*	0.119***	0.207***	0.293***	0.333***	0.189*
	[5.51]	[3.80]	[1.23]	[0.04]	[0.06]	[0.10]	[0.12]	[0.10]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	3.331	2.447	-0.017	0.151***	0.264***	0.356***	0.394***	0.224***
	[3.34]	[2.66]	[0.32]	[0.02]	[0.04]	[0.06]	[0.08]	[0.08]
R^2	0.04	0.05	0.06	0.18	0.18	0.15	0.11	0.24
R^2 Other	0.03	0.06	0.05	0.03	0.03	0.02	0.01	0.01
R^2 HOM	0.01	0.02	0.00	0.32	0.32	0.24	0.18	0.08
Obs	188	183	188	188	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in the VIX (column 1), the risk appetite measure of Bauer et al. (2023) (2), the risk aversion measure of Bekaert et al. (2022) (3), 1- and 10-year term premium and forward term premium (4 to 7) estimated by Kim and Wright (2005), and the monetary policy uncertainty indicator of Bauer et al. (2022) controlling for financial stress using the VIX (8). The first row shows the estimated effects of monetary surprises for *same sign* statements. The second row shows the marginal effect of monetary surprises for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effect for the latter. The classification of statements is based on Target and Path surprises derived from Gürkaynak et al. (2005b). The R^2 are computed from regressions for each subsample.

Table 12 presents the estimates. They reveal a clear dichotomy in the transmission channels. Policy stance statements – those with consistent directional signals about monetary policy – have strong and significant effects on risk appetite measures (Columns 1 to 3). These effects, combined with the negative response of stock prices to these statements, are consistent with the traditional risk premium channel of monetary policy (see Bernanke and Kuttner 2005, Bekaert, Hoerova, and Duca 2013, Gorodnichenko and Weber 2016, Drechsler, Savov, and Schnabl 2018 and Kroencke, Schmeling, and Schrimpf 2021, among others), where policy surprises affect investors' risk appetite and their willingness to hold risky assets.

In contrast, higher-order moment statements show no effect on these broad credit and equity risk premium measures, but have significant effects on Treasury term premia and monetary policy uncertainty. The same 100 basis point surprise from higher-order moment statements increases 10-year term premium by more than 30 basis points. Consistently with this effect, the monetary policy uncertainty indicator also increases in response to monetary surprises from these statements. This pattern suggests that higher-order moment statements convey information that is specific to the term structure of interest rates rather than affect risk appetite across asset classes.

This differential impact pattern provides insights into the nature of the information conveyed by higher-order moment statements. While policy stance statements affect risk premia broadly – consistent with their role in signaling changes in the overall monetary policy stance that affect discount rates across many asset classes –, higher-order moment statements appear to convey signals specific to the compensation required for holding long-term securities. This specificity supports our interpretation that higher-order moment statements primarily affect investors' assessment of the balance of risks for long-run economic fundamentals rather than through changes in broad risk appetite.

5 Conclusion

This paper contributes to the understanding of monetary policy transmission by emphasizing the heterogeneous effects of monetary surprises on asset prices. By classifying policy announcements through the lens of the interplay of Target and Path factors, we identify a subset of statements in which higher-order moment information dominates. These statements, while constituting only a third of all meetings, move short-term interest rates but disproportionately shape long-term rates. They drive most, if not all, of the effects of monetary policy and account for a large fraction of the variation in these rates. In contrast, statements with consistent signals – half of the meetings – affect short-term rates and stock prices. These findings underscore that the transmission of monetary policy is not uniform: the identification of the effects of monetary policy depends on different subsets of statements according to the outcome variable considered.

Our findings suggest that these higher-order moment statements affect long-term rates by conveying information about the balance of risks for future policy outcomes. Our results thus have strong implications for policymakers' communication strategies. Central banks should be aware of how different mixes of current and future policy signals are perceived by investors and how it affects the transmission of their decisions. Our analysis highlights the importance of considering these dimensions in empirical analyses of the state-dependent effects of monetary policy.

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Appendix
For online publication

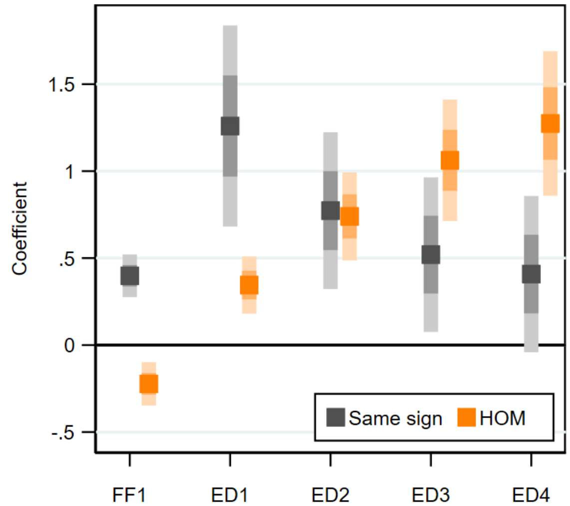
A Additional evidence

Table A1: Standard monetary policy effects in a 30-min window

	S&P 500	2y	5y	10y
MPS_t	-6.020***	0.806***	0.723***	0.474***
	[0.89]	[0.07]	[0.08]	[0.06]
R^2	0.29	0.64	0.46	0.30
Obs	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. Parameters are estimated from Equation 1 using OLS. They capture the effects of the high-frequency news-adjusted monetary surprises of Bauer and Swanson (2023a). The dependent variables are the 30-min change around the FOMC announcement in log S&P 500 in column (1) and in the 2-year, 5-year and 10-year nominal yields in columns (2), (3) and (4).

Figure A1: The term structure of policy expectations:
same sign vs. higher-order moment statements



Note: This figure represents the estimated coefficients of Equation 2 of the two different subsamples of FOMC statements: same sign vs. higher-order moment statements. The right-hand side variable is the *news-adjusted* monetary surprises of Bauer and Swanson (2023a) while the left-hand side variables are changes in the policy expectations at different maturities (from current-month to one-year ahead) around FOMC statements.

Table A2: Monetary policy effects over subsamples

	S&P 500	2y	5y	10y
	Pre 2009			
MPS_t	-9.955**	0.508**	0.363	0.190
	[3.86]	[0.23]	[0.23]	[0.21]
MPS_t x $\mathbb{1}^{HOM}$	5.311	0.500**	0.559**	0.500**
	[5.19]	[0.25]	[0.25]	[0.23]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-4.643	1.008***	0.922***	0.690***
	[3.47]	[0.10]	[0.11]	[0.10]
R^2	0.16	0.38	0.32	0.23
R^2 Other	0.08	0.20	0.13	0.05
R^2 HOM	0.07	0.65	0.64	0.54
Obs	77	77	77	77
	Post 2009			
MPS_t	-1.969	0.093	0.085	-0.273
	[6.14]	[0.40]	[0.35]	[0.23]
MPS_t x $\mathbb{1}^{HOM}$	-0.256	0.916**	0.990*	1.074**
	[8.42]	[0.45]	[0.52]	[0.45]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-2.225	1.008***	1.075***	0.801**
	[5.77]	[0.21]	[0.38]	[0.39]
R^2	0.06	0.19	0.12	0.10
R^2 Other	0.01	0.00	0.00	0.03
R^2 HOM	0.01	0.38	0.17	0.10
Obs	111	111	111	111

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS, over a sample ending in December 2008 (upper panel) and from January 2009 (bottom panel). Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A3: Path factor instead of monetary surprises

	S&P 500	2y	5y	10y
$Path_t$	-3.634	0.328***	0.291**	0.130
	[3.23]	[0.11]	[0.11]	[0.11]
$Path_t$ x $\mathbb{1}^{HOM}$	2.464	0.056	0.072	0.133
	[3.51]	[0.12]	[0.13]	[0.13]
$Path_t \mid \mathbb{1}^{HOM} = 1$	-1.171	0.384***	0.362***	0.264***
	[1.37]	[0.04]	[0.06]	[0.06]
R^2	0.04	0.30	0.19	0.11
R^2 Other	0.05	0.16	0.08	0.02
R^2 HOM	0.02	0.58	0.32	0.20
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of Path surprises of Gürkaynak et al. (2005b). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A4: Controlling for large Path surprises

	S&P 500	2y	5y	10y
MPS_t	-6.694**	0.366	0.207	-0.059
	[3.38]	[0.23]	[0.21]	[0.17]
MPS_t x $\mathbb{1}^{HOM}$	5.942	0.593**	0.629**	0.582**
	[5.49]	[0.26]	[0.28]	[0.25]
MPS_t x Large Path	-3.096	0.049	0.160	0.243
	[5.41]	[0.29]	[0.28]	[0.23]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-0.752	0.959***	0.836***	0.523**
	[4.98]	[0.26]	[0.27]	[0.23]
R^2	0.07	0.27	0.17	0.11
R^2 Other	0.04	0.10	0.05	0.01
R^2 HOM	0.04	0.50	0.26	0.16
Obs	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements (excluding those with large Path surprises). The second row shows the marginal effect for *higher-order moment* statements. The third row shows the marginal effect for large Path (when the Path factor in absolute value is above its 75th percentile). The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A5: Controlling for small Target surprises

	S&P 500	2y	5y	10y
MPS_t	-8.312**	0.380*	0.248	0.015
	[3.65]	[0.21]	[0.20]	[0.17]
MPS_t x $\mathbb{1}^{HOM}$	4.048	0.590***	0.638***	0.615***
	[4.70]	[0.22]	[0.24]	[0.22]
MPS_t x Small Target	6.750	0.181	0.524	0.583
	[5.01]	[0.30]	[0.47]	[0.49]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-4.264	0.969***	0.886***	0.631***
	[3.29]	[0.10]	[0.15]	[0.14]
R^2	0.07	0.27	0.17	0.11
R^2 Other	0.04	0.10	0.05	0.01
R^2 HOM	0.04	0.50	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A6: Controlling for small Target or large Path surprises

	S&P 500	2y	5y	10y
MPS_t	-8.058**	0.401	0.226	-0.059
	[3.47]	[0.25]	[0.23]	[0.18]
MPS_t x $\mathbb{1}^{HOM}$	4.733	0.595**	0.600**	0.544**
	[5.60]	[0.26]	[0.29]	[0.26]
MPS_t x Small Target | Large Path	0.080	-0.004	0.148	0.259
	[5.46]	[0.31]	[0.30]	[0.24]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-3.325	0.995***	0.826***	0.485*
	[5.32]	[0.29]	[0.30]	[0.25]
R^2	0.07	0.27	0.17	0.10
R^2 Other	0.04	0.10	0.05	0.01
R^2 HOM	0.04	0.50	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A7: Controlling for small Target and large Path surprises

	S&P 500	2y	5y	10y
MPS_t	-7.872**	0.392*	0.280	0.051
	[3.60]	[0.20]	[0.19]	[0.17]
MPS_t x $\mathbb{1}^{HOM}$	4.824	0.528**	0.549**	0.529**
	[4.82]	[0.22]	[0.23]	[0.21]
MPS_t x Small Target & Large Path	-5.874	1.363*	2.314*	2.323
	[6.86]	[0.71]	[1.28]	[1.49]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-3.048	0.920***	0.829***	0.580***
	[3.30]	[0.09]	[0.13]	[0.13]
R^2	0.07	0.32	0.27	0.22
R^2 Other	0.04	0.10	0.05	0.01
R^2 HOM	0.04	0.50	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A8: Controlling for quantitative easing announcements

	S&P 500	2y	5y	10y
MPS_t	-6.403**	0.355*	0.204	-0.022
	[3.01]	[0.21]	[0.20]	[0.15]
MPS_t x $\mathbb{1}^{HOM}$	4.368	0.600**	0.668***	0.648***
	[4.70]	[0.23]	[0.25]	[0.23]
MPS_t x Unconv	-15.141	0.377	0.811	0.783
	[13.02]	[0.36]	[0.54]	[0.61]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-2.035	0.955***	0.872***	0.626***
	[3.43]	[0.10]	[0.15]	[0.15]
R^2	0.09	0.28	0.20	0.13
R^2 Other	0.05	0.10	0.05	0.00
R^2 HOM	0.03	0.51	0.30	0.20
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4) and the VIX in column (5). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A9: Controlling for large LSAP surprises

	S&P 500	2y	5y	10y
MPS_t	-7.657*	0.670***	0.529***	0.227
	[3.92]	[0.14]	[0.16]	[0.17]
MPS_t x $\mathbb{1}^{HOM}$	5.658	0.473**	0.667***	0.685***
	[4.62]	[0.20]	[0.23]	[0.22]
MPS_t x Large LSAP surprises	-7.982*	-0.421	-0.419	-0.289
	[4.81]	[0.30]	[0.30]	[0.25]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-1.999	1.143***	1.195***	0.913***
	[3.31]	[0.14]	[0.16]	[0.15]
R^2	0.13	0.37	0.24	0.14
R^2 Other	0.04	0.10	0.05	0.01
R^2 HOM	0.04	0.50	0.26	0.16
Obs.	161	161	161	161

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The third row shows the marginal effect of statements with large LSAP surprises (above their 75th percentile) from Swanson (2021). The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A10: Controlling for forward guidance

	S&P 500	2y	5y	10y
MPS_t	-6.189**	0.342	0.203	-0.028
	[2.93]	[0.21]	[0.19]	[0.14]
MPS_t x $\mathbb{1}^{HOM}$	6.929	0.547**	0.576**	0.546***
	[4.34]	[0.21]	[0.22]	[0.20]
MPS_t x FG	-16.129***	0.526***	0.828***	0.850***
	[5.46]	[0.19]	[0.30]	[0.32]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	0.739	0.889***	0.779***	0.518***
	[3.44]	[0.10]	[0.14]	[0.14]
R^2	0.15	0.28	0.20	0.14
R^2 Other	0.05	0.10	0.05	0.00
R^2 HOM	0.03	0.51	0.30	0.20
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A11: Purging monetary surprises from information effects

	S&P 500	2y	5y	10y
$JK20_{MP}$	-10.973***	0.325*	0.262	0.071
	[3.08]	[0.18]	[0.19]	[0.18]
$JK20_{MP}$ x $\mathbb{1}^{HOM}$	5.030	0.795***	0.960**	0.897**
	[4.40]	[0.23]	[0.38]	[0.43]
$JK20_{MP} \mid \mathbb{1}^{HOM} = 1$	-5.943*	1.120***	1.222***	0.968**
	[3.14]	[0.15]	[0.33]	[0.39]
R^2	0.14	0.32	0.25	0.17
R^2 Other	0.12	0.10	0.06	0.01
R^2 HOM	0.06	0.59	0.40	0.27
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of the CBI-adjusted monetary surprises of Jarociński and Karadi (2020) (using the median continuous decomposition). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected subsample.

Table A12: Controlling for large central bank information effects

	S&P 500	2y	5y	10y
MPS_t	-8.551**	0.419**	0.295	0.041
	[3.72]	[0.21]	[0.20]	[0.17]
MPS_t x $\mathbb{1}^{HOM}$	4.098	0.619***	0.681***	0.646***
	[4.62]	[0.23]	[0.26]	[0.24]
MPS_t x Large CBI	5.437	-0.203	-0.074	0.117
	[5.25]	[0.19]	[0.20]	[0.20]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-4.454	1.038***	0.976***	0.687***
	[3.20]	[0.13]	[0.19]	[0.19]
R^2	0.07	0.27	0.17	0.10
R^2 Other	0.04	0.10	0.05	0.01
R^2 HOM	0.04	0.50	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The large CBI dummy equals one based on the discrete decomposition of Jarociński and Karadi (2020). The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected subsample.

Table A13: Controlling for press conferences

	S&P 500	2y	5y	10y
MPS_t	-8.518**	0.481**	0.365*	0.152
	[3.77]	[0.19]	[0.20]	[0.18]
MPS_t x $\mathbb{1}^{HOM}$	4.354	0.619***	0.695***	0.674***
	[4.70]	[0.22]	[0.24]	[0.22]
MPS_t x PressConf	3.020	-0.387	-0.362	-0.423*
	[5.72]	[0.30]	[0.30]	[0.23]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-4.163	1.100***	1.060***	0.826***
	[3.33]	[0.13]	[0.16]	[0.16]
R^2	0.07	0.28	0.18	0.11
R^2 Other	0.04	0.11	0.06	0.01
R^2 HOM	0.03	0.49	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A14: Controlling for *Summary of Economic Projections* (SEP)

	S&P 500	2y	5y	10y
MPS_t	-9.354**	0.464**	0.368*	0.134
	[4.11]	[0.21]	[0.20]	[0.18]
MPS_t x $\mathbb{1}^{HOM}$	3.614	0.646***	0.704***	0.656***
	[4.58]	[0.22]	[0.25]	[0.23]
MPS_t x SEP	5.834	-0.273	-0.316	-0.288
	[4.43]	[0.25]	[0.29]	[0.24]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-5.740*	1.110***	1.072***	0.790***
	[3.26]	[0.14]	[0.18]	[0.17]
R^2	0.08	0.28	0.17	0.11
R^2 Other	0.05	0.10	0.05	0.00
R^2 HOM	0.03	0.51	0.30	0.20
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A15: Controlling for monetary policy uncertainty

	S&P 500	2y	5y	10y
MPS_t	-18.015**	1.373***	1.265***	0.560*
	[7.41]	[0.33]	[0.34]	[0.32]
MPS_t x $\mathbb{1}^{HOM}$	3.702	0.663***	0.728***	0.678***
	[4.86]	[0.22]	[0.23]	[0.22]
MPS_t x MPU	10.543	-1.009***	-1.007***	-0.515
	[7.80]	[0.39]	[0.38]	[0.32]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-14.313**	2.036***	1.993***	1.237***
	[7.21]	[0.42]	[0.43]	[0.36]
R^2	0.09	0.33	0.21	0.11
R^2 Other	0.09	0.13	0.07	0.01
R^2 HOM	0.03	0.49	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A16: Controlling for financial market volatility (VIX)

	S&P 500	2y	5y	10y
MPS_t	1.113	0.577**	-0.004	-0.639*
	[6.98]	[0.27]	[0.34]	[0.34]
MPS_t x $\mathbb{1}^{HOM}$	2.652	0.580**	0.745***	0.801***
	[4.85]	[0.22]	[0.27]	[0.25]
MPS_t x VIX	-0.366	-0.007	0.012	0.028**
	[0.30]	[0.01]	[0.01]	[0.01]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	3.765	1.158***	0.740***	0.162
	[5.80]	[0.17]	[0.22]	[0.21]
R^2	0.09	0.30	0.20	0.16
R^2 Other	0.09	0.13	0.07	0.01
R^2 HOM	0.03	0.49	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A17: Controlling for interest rate skewness (ISK)

	S&P 500	2y	5y	10y
MPS_t	-8.036**	0.375*	0.260	0.029
	[3.46]	[0.20]	[0.18]	[0.15]
MPS_t x $\mathbb{1}^{HOM}$	3.231	0.586**	0.597**	0.555**
	[5.46]	[0.26]	[0.29]	[0.27]
MPS_t x ISK	6.959	0.118	0.445	0.565
	[7.88]	[0.57]	[0.55]	[0.42]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-4.805	0.960***	0.856***	0.584***
	[3.65]	[0.16]	[0.21]	[0.19]
R^2	0.08	0.29	0.19	0.14
R^2 Other	0.09	0.13	0.07	0.01
R^2 HOM	0.03	0.49	0.26	0.16
Obs.	188	188	188	188

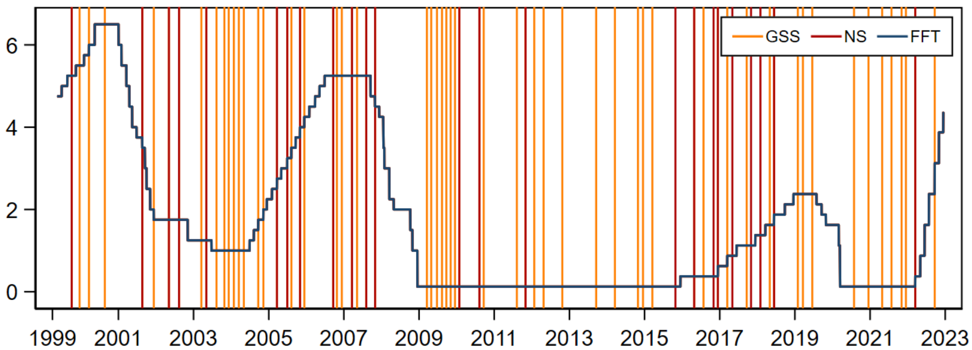
Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The ISK variable is the interest rate skewness measure of Bauer and Chernov (2024). The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A18: Controlling for macroeconomic data releases before FOMC statements

	S&P 500	2y	5y	10y
MPS_t	-7.878**	0.534***	0.285*	-0.051
	[3.38]	[0.16]	[0.16]	[0.17]
MPS_t x $\mathbb{1}^{HOM}$	4.478	0.556***	0.675***	0.690***
	[4.38]	[0.20]	[0.24]	[0.23]
MPS_t x FOMC macro data	0.734	-0.282	-0.019	0.189
	[4.72]	[0.24]	[0.26]	[0.24]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-3.400	1.091***	0.959***	0.639***
	[3.65]	[0.13]	[0.17]	[0.16]
R^2	0.09	0.28	0.17	0.11
R^2 Other	0.04	0.10	0.05	0.01
R^2 HOM	0.04	0.50	0.26	0.16
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Figure A2: Distribution over time of *higher-order moment* statements



Note: This figure plots the distribution of *higher-order moment* statements over time, using two classifications. In grey, we identify these statements using the Target and Path factors derived from Gürkaynak et al. (2005b) and in red, we use the FFR and news shocks of Nakamura and Steinsson (2018). The blue line represents the Federal Fund Target (FFT), taking the middle point of the range after 2009.

Probit model for Table A19:

$$\Pr(\mathbb{1}_t^{HOM} = 1) = \Phi\,(\beta_0 + \beta_1 \cdot \text{QE} + \beta_2 \cdot \text{FG} + \beta_3 \cdot \text{SEP} + \beta_4 \cdot \text{Press Conf} \\ + \beta_5 \cdot \text{Turning Point} + \beta_6 \cdot \text{Status Quo} + \beta_7 \cdot \text{MPU} \\ + \beta_8 \cdot \text{ISK} + \beta_9 \cdot \text{VIX}) \tag{12}$$

Table A19: Probit model for higher-order moment statements

	Probability that $\mathbb{1}_t^{HOM} = 1$								
QE	0.092								
	[0.12]								
FG		0.232**							
		[0.11]							
SEP			-0.002						
			[0.08]						
Press conf				-0.026					
				[0.07]					
Turning					-0.297***				
					[0.09]				
Status quo						0.140*			
						[0.07]			
MPU							0.128*		
							[0.07]		
ISK								0.064	
								[0.07]	
VIX									-0.003
									[0.00]
R^2	0.00	0.03	0.00	0.00	0.02	0.02	0.02	0.00	0.00
Obs.	188	188	188	188	188	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the results of the probit estimation of Equation 12. The dependent variable is the probability that a statement is identified as a *higher-order moment* statement using the Target and Path factors derived from Gürkaynak et al. (2005b). The independent variables are, in turn: a dummy that takes the value of 1 if the FOMC meeting decides on a change in quantitative easing (QE) policy; a dummy that takes the value of 1 if the FOMC meeting decides on a change in forward guidance (FG) policy; a dummy that takes the value of 1 if the FOMC meeting is accompanied by a Summary of Economic Projections (SEP); a dummy that takes the value of 1 if the FOMC meeting is followed by a press conference (Press conf.); a dummy that takes the value of 1 if the FOMC meeting is a turning point, *i.e.* decides the last or first hike/cut before pauses; a dummy that takes the value of 1 if the FOMC meeting is decide a status quo; an indicator of monetary policy uncertainty (MPU); an indicator reflecting macro uncertainty (ISK); and finally an index of the market volatility (VIX).

Table A20: The effect of an alternative measure of monetary surprises

	S&P 500	2y	5y	10y
NS18	-10.308*	0.688***	0.496**	0.188
	[5.28]	[0.19]	[0.22]	[0.23]
NS18 x $\mathbb{1}^{\text{HOM}}$	3.774	1.456***	1.573***	1.330***
	[8.95]	[0.29]	[0.42]	[0.44]
NS18 $\mid \mathbb{1}^{\text{HOM}} = 1$	-6.534	2.144***	2.070***	1.518***
	[7.22]	[0.22]	[0.36]	[0.38]
R^2	0.06	0.33	0.20	0.12
R^2 Other	0.05	0.16	0.07	0.02
R^2 HOM	0.02	0.58	0.31	0.18
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of *news shock* of Nakamura and Steinsson (2018). Equation 11 is estimated using OLS. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-year, 5-year and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* statements. The second row shows the marginal effect of monetary surprises for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effect for the latter. The classification of statements is based on Target and Path surprises derived from Gürkaynak et al. (2005b). The R^2 are computed from regressions for each subsample.

Table A21: The effect of the overall monetary surprises of GSS2005

	S&P 500	2y	5y	10y
GSS05	-3.427	0.254***	0.199**	0.082
	[2.10]	[0.07]	[0.08]	[0.08]
GSS05 x $\mathbb{1}^{HOM}$	2.124	0.173**	0.207*	0.215*
	[2.57]	[0.08]	[0.11]	[0.11]
GSS05 | $\mathbb{1}^{HOM} = 1$	-1.303	0.428***	0.407***	0.297***
	[1.49]	[0.04]	[0.07]	[0.07]
R^2	0.06	0.32	0.20	0.11
R^2 Other	0.05	0.14	0.08	0.02
R^2 HOM	0.02	0.56	0.29	0.17
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the overall monetary surprises of Gürkaynak et al. (2005b). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A22: The effect of the unadjusted series of JK2020

	S&P 500	2y	5y	10y
JK20	-6.936**	0.438***	0.320**	0.120
	[3.26]	[0.12]	[0.14]	[0.15]
JK20 x $\mathbb{1}^{HOM}$	3.641	0.704***	0.802***	0.722***
	[5.07]	[0.17]	[0.25]	[0.27]
JK20 $\mid \mathbb{1}^{HOM} = 1$	-3.295	1.142***	1.122***	0.842***
	[3.88]	[0.12]	[0.21]	[0.23]
R^2	0.07	0.34	0.21	0.12
R^2 Other	0.06	0.16	0.08	0.01
R^2 HOM	0.02	0.58	0.32	0.20
Obs.	188	188	188	188

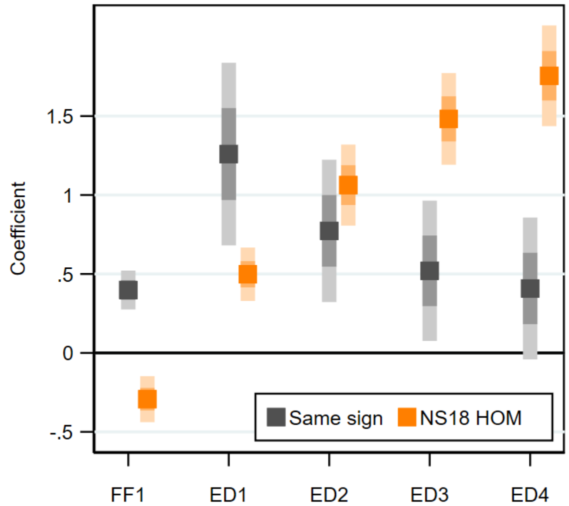
Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the monetary policy surprises of Jarociński and Karadi (2020). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A23: The effect of the unadjusted series of BS2023

	S&P 500	2y	5y	10y
MPS_t	-7.031**	0.396***	0.305**	0.124
	[3.41]	[0.14]	[0.15]	[0.16]
MPS_t x $\mathbb{1}^{HOM}$	4.170	0.596***	0.649***	0.586**
	[4.82]	[0.18]	[0.24]	[0.26]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	-2.861	0.993***	0.954***	0.710***
	[3.41]	[0.11]	[0.19]	[0.20]
R^2	0.07	0.32	0.20	0.12
R^2 Other	0.06	0.13	0.07	0.01
R^2 HOM	0.02	0.58	0.31	0.19
Obs.	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table shows the estimated effects of the unadjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Figure A3: The term structure of policy expectations:
same sign vs. higher-order moment statements with NS2018 classification



Note: This figure represents the estimated coefficients of Equation 2 of the two different subsamples of FOMC statements: same sign vs. higher-order moment statements. The classification of statements is based on the sign and magnitude of the FFR and News shock series of Nakamura and Steinsson (2018). The right-hand side variable is the *news-adjusted* monetary surprises of Bauer and Swanson (2023a) while the left-hand side variables are changes in the policy expectations at different maturities (from current-month to one-year ahead) around FOMC statements.

Table A24: Monetary surprises and statement classification from NS2018

	S&P 500	2y	5y	10y
NS18	-9.581**	0.913***	0.738***	0.408**
	[4.38]	[0.19]	[0.20]	[0.19]
NS18 x $\mathbb{1}^{HOM}$	19.212	1.133***	1.140***	0.914***
	[12.37]	[0.29]	[0.34]	[0.31]
NS18 | $\mathbb{1}^{HOM} = 1$	9.631	2.046***	1.877***	1.322***
	[11.57]	[0.22]	[0.28]	[0.25]
R^2	0.06	0.28	0.14	0.06
R^2 Other	0.06	0.20	0.09	0.03
R^2 HOM	0.06	0.69	0.59	0.48
Obs.	188	188	188	188
Obs. HOM	24	24	24	24

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the News shock series of Nakamura and Steinsson (2018). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for *same sign* FOMC statements. The second row shows the marginal effect for *higher-order moment* statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is based on the sign and magnitude of the FFR and News shock series of Nakamura and Steinsson (2018). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A25: Combined classifications from GSS2005 and NS2018

	S&P 500	2y	5y	10y
MPS_t	-7.364***	0.560***	0.490***	0.267**
	[2.58]	[0.15]	[0.15]	[0.13]
MPS_t x $\mathbb{1}^{HOM}$	10.606	0.556***	0.536***	0.461**
	[6.71]	[0.18]	[0.20]	[0.19]
$MPS_t \mid \mathbb{1}^{HOM} = 1$	3.243	1.116***	1.026***	0.728***
	[6.19]	[0.10]	[0.14]	[0.14]
R^2	0.07	0.25	0.14	0.06
R^2 Other	0.05	0.17	0.09	0.03
R^2 HOM	0.02	0.70	0.63	0.51
Obs.	188	188	188	188
Obs. HOM	19	19	19	19

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 11 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in log S&P 500 in column (1) and in the 2-, 5- and 10-year nominal yields in columns (2), (3) and (4). The first row shows the estimated effects of monetary surprises for non-HOM statements as defined by the combined GSS and NS classification. The second row shows the marginal effect for HOM statements. The last row ($MPS_t \mid \mathbb{1}^{\text{HOM}} = 1$) shows the average effects of monetary surprises in this latter case. The classification of statements is the combined subset of statements based on the sign and magnitude of the Target and Path surprises derived from Gürkaynak et al. (2005b) and of the FFR and News shock series of Nakamura and Steinsson (2018). The associated R^2 are derived from regressions estimated on each selected sub-sample.

Table A26: Decomposition of nominal interest rates

	Nominal interest rates			Real rates			Inflation comp.		
	2y	5y	10y	2y	5y	10y	2y	5y	10y
MPS_t	0.645***	0.552***	0.308***	0.263	0.571***	0.401***	0.382	-0.019	-0.093
	[0.12]	[0.12]	[0.11]	[0.42]	[0.15]	[0.11]	[0.40]	[0.11]	[0.08]
R^2	0.22	0.12	0.04	0.01	0.09	0.07	0.01	0.00	0.02
Obs.	188	188	188	188	188	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 1 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in the the 2-year, 5-year and 10-year nominal yields in columns (1), (2) and (3), and their respective real rate component in columns (4), (5) and (6), and inflation compensation in columns (7), (8), and (9).

Table A27: Decomposition of nominal interest rates

	Nominal interest rates			Expectation hypothesis			Term premium		
	2y	5y	10y	2y	5y	10y	2y	5y	10y
MPS_t	0.645***	0.552***	0.308***	0.622***	0.618***	0.500***	0.028	-0.065	-0.191**
	[0.12]	[0.12]	[0.11]	[0.11]	[0.10]	[0.08]	[0.07]	[0.07]	[0.10]
R^2	0.22	0.12	0.04	0.25	0.23	0.22	0.00	0.00	0.02
Obs.	188	188	188	188	188	188	188	188	188

Note: Huber-White heteroskedasticity-robust standard errors in brackets. * p < 0.10, ** p < 0.05, *** p < 0.01. This table shows the estimated effects of the news-adjusted monetary surprises of Bauer and Swanson (2023a). Equation 1 is estimated using OLS. Only the key parameters of interest are reported. The dependent variables are the daily change in the 2-year, 5-year and 10-year nominal yields in columns (1), (2) and (3) and their respective EH component in columns (4), (5) and (6), and term premium component in columns (7), (8), and (9).

B Prompt for textual analysis

Analyze the attached FOMC statements Excel file with the following specifications:

Data Setup:

- Read 'FOMC_statements.xlsx'
- Use column 'HOM' where 1 = Higher-order moment statements, 0 = Policy stance statements
- Use column 'Statement' for text analysis
- Calculate densities as terms per 1000 words
- Use the vocabulary definitions below (use exactly these terms)

Linguistic features and Tone analysis:

1. **Uncertainty Vocabulary**: ['uncertain', 'uncertainty', 'risk', 'risks', 'may', 'might', 'could', 'would', 'potential', 'appears', 'seems', 'concern', 'concerns', 'mixed', 'challenging', 'volatile']
2. **Risk Assessment Terms**: ['balance of risks', 'weighted toward', 'predominant concern', 'upside risk', 'downside risk']
3. **Probabilistic Language**: ['probability', 'likely', 'unlikely', 'chances', 'likelihood', 'possible', 'perhaps', 'might', 'may', 'appears', 'seems']
4. **Policy Language**: ['further', 'appropriate', 'over time', 'discount rate', 'foster', 'considerable', 'target range', 'maintain', 'asset purchases', 'securities purchases', 'as long as', 'additional', 'continue', 'necessary', 'expects to', 'gradual', 'until', 'going forward', 'intends to', 'reinvestment']

Analysis Requirements:

- Count each term using word boundary regex: \b${term}\b (case insensitive)
- Calculate density = (term count / word count) * 1000
- Split data by HOM=1 (Higher-order moments) vs HOM=0 (Policy stance)
- For each category, report:
  - Higher-order moments average density/metric
  - Policy stance average density/metric
  - Difference and percentage difference
- Format results exactly as: "Higher-order moment statements: X.X per 1000 words, Policy stance statements: Y.Y per 1000 words, Difference: +Z.Z (+W.W%)"

Use the exact vocabulary lists above and calculate densities per 1000 words for precise replication.