Tough Talk: The Fed and the Risk Premium

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We study how monetary policy affects financial risk premia. Unlike existing studies, we focus on the Federal Open Market Committee's (FOMC's) forward-looking policy stance, beyond the current announcement and macroeconomic forecasts, which we derive from the policymakers' private deliberations. A more hawkish policymakers' stance in the FOMC meeting predicts lower risk premia during the intermeeting period. This effect is not explained by the content of the FOMC statement and unfolds gradually after the announcement. We document the importance of intermeeting communication via speeches and minutes to show how communicating forward-looking stance is vital in managing policy-induced risk perceptions.

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I. Introduction

The Federal Reserve faces a challenge of supporting the economy while remaining attuned to the possibility that inappropriate policy choices, or policy mistakes, can worsen economic outcomes. At the same time, investors price risky assets considering how policy affects the evolution of the economy. Understanding the financial market response to the Fed is therefore inseparable from the content of the policy stance that markets are reacting to.

We study how communication of policy stance by the Fed affects asset prices. We contribute to the literature by providing evidence on the mapping between the Fed's policy views in private deliberations, their communication to the public, and asset price reactions day by day outside the narrow FOMC windows. While there is extensive literature on the effects of monetary policy on financial markets, we focus on forward-looking policy stance not revealed by the current announcement and distinct from typical measures of forward guidance. We document a novel channel whereby policymakers' views that a different-from-current policy may be needed impact risk premia in financial markets.

We start with the premise that the extent of policy considerations can be identified from the internal policymakers' deliberations in an FOMC meeting. Exploiting the FOMC members' language recorded in the transcripts of FOMC meetings, we elicit a measure of policy stance within the meeting that captures the breadth of the policy discussion. We purge the language of its relationship with the current and lagged policy choices, as well the economic outlook captured by the staff's Greenbook forecasts, to focus on policy views about the potential need for a tighter or easier policy over and above the current policy and outlook. As such, our measure of policy stance summarizes the Fed's forward-looking intentions and contingencies as they are perceived by policymakers in real-time, even if these potential policies may not be adopted or reflected in the narrow policy announcement. Deriving from the meeting transcripts, this information is not directly observable to financial markets in real time at the time of the meeting.

Our first main empirical finding is that a more hawkish (dovish) stance emerging from within the FOMC meeting predicts reductions (increases) in premia over the subsequent intermeeting period, after controlling for the Fed's macroeconomic forecasts and the policy rate. The effect unfolds gradually in days *after* the FOMC announcement and accounts for an economically significant amount of intermeeting volatility of long-term interest rates and aggregate stock market returns. Specifically, a one-standard-deviation increase in FOMC's hawkishness in a given meeting forecasts a risk premium reduction corresponding to about 17% of intermeeting ten-year yield volatility and about 15% of intermeeting stock return volatility.

As the premium movements that we document occur outside of narrow FOMC announcement windows, they are distinct from the previously studied "on impact" asset price reactions to the Fed's announcements.[2] To understand how and when the Fed's internal views reach the outside world, we trace out the Fed's communication during the intermeeting period. Using publicly available Fed documents, we construct language-based policy stance from the FOMC statements, speeches, and minutes. Consistent with the lack of an on-impact effect, we show that the content of the internal deliberations driving risk premia between meetings is not revealed to the public via the FOMC statements. While the FOMC minutes do provide a fairly detailed reflection of the Fed's deliberative process, their release is typically not associated with a large reaction of financial markets, suggesting that the content is already largely anticipated ahead of the minutes' release. Instead, as the information flow from the Fed intensifies soon following the FOMC announcement, we find that speeches are an important conduit through which forward-looking policymakers' views reach the financial markets over the intermeeting period. According to our estimates, the policy stance communicated via speeches could, in principle, account for the magnitude of the overall intermeeting effect on the risk premium that we find.

These results complement the literature documenting the Fed's effect on long-duration assets on the FOMC announcements. By measuring monetary policy surprises from interest rate changes in narrow announcement windows, the seminal studies of Bernanke and Kuttner (2005) and Hanson and Stein (2015) show that an unexpected policy easing raises stock and long-term bond valuations, which they attribute to reductions in risk premia. Recent theoretical advancements focus on explaining how dovish surprises can cause risk premium to fall (e.g., Pflueger and Rinaldi, 2022, Kekre and Lenel, 2022). It is however ex-ante unclear whether the Fed's dovishness is always desirable and should unambiguously lower premium. Kashyap and Stein (2023) argue that the Fed's policy could create an intertemporal trade-off

[2] See, e.g., Cochrane and Piazzesi (2002), Gürkaynak, Sack, and Swanson (2005a), Gürkaynak, Sack, and Swanson (2005b), Bernanke and Kuttner (2005), Hanson and Stein (2015).

whereby a low risk premium today comes at the cost of future financial instability. Caballero and Simsek (2022a) develop a model, in which the Fed and the markets disagree and show that if policy announcements provide information about the scope of disagreements, the market will price a higher "policy-mistakes" premium. In line with this emerging research, our empirical evidence indicates that the Fed's communication of dovish views, extending beyond its current policy and economic outlook, can indeed result in elevated premia. Conversely, communication of forward-looking hawkishness tends to mitigate premia.

A specific example helps interpret the negative sign of the newly documented relationship between our measure of the Fed's stance and the premia. The Fed faces a trade-off between cutting rates aggressively to save the economy in downturns and potentially opening large output gaps, which can be inflationary and ultimately destabilizing for the economy if rates stay low for too long. The risk premia can rise if the market perceives the Fed's stance to be a mistake. By credibly promising a tighter stance, should the need arise, the Fed can convey to the public a contingency plan allowing to stabilize financial premia in the near term. While our evidence indicates that this channel has been economically significant at least since the late 1980s, the interaction between the Fed's stance and financial markets during the post-pandemic inflation bout shows its continued relevance today. Indeed, before the aggressive policy tightening and the pivotal hawkish speech by Chair Powell in Jackson Hole in August 2022 (Powell, 2022), the Fed was criticized for inaction and excess dovishness seen as a policy mistake, and blamed for driving higher risk premia in financial markets.[3] When we further dissect our empirical result, we show that the predictive power of our stance measure for the intermeeting premia is particularly strong outside periods when the Fed has explicitly implemented an interest rate change, and accrues mainly during prolonged easing episodes that follow aggressive interest rate cuts.

Understanding policy effects during the intermeeting period is challenging as it requires attributing asset price movements at high frequency (daily or higher) to economically interpretable news sources. Most plausibly, multiple policy transmission channels—through news about expected short rate, economic outlook, and/or risk premia—operate simultaneously,

[3] See, e.g., the leader "The Fed that failed" by the Economist on April 23, 2022, `https://www.economist.com/leaders/2022/04/23/why-the-federal-reserve-has-made-a-historic-mistake-on-inflation`. Cieslak, McMahon, and Pang (2024) analyze communication successes and failures over this period documenting implications of the Fed's communication for the term premia.

both at the time of the Fed announcement and, perhaps even more importantly, during the intermeeting period when the Fed predominantly relies on communication. Investigating the overall stock or yield movements will not deliver clear answers on which channel is at work as they could be either mutually reinforcing or offsetting and, therefore, hard to detect in aggregate asset prices.[4] To address these issues, we dissect the types of news driving financial markets at a daily frequency using a sign-restricted structural VAR approach proposed by Cieslak and Pang (2021). Using the joint variation in stock returns and interest rate changes across different maturities, we disentangle short-rate news from risk-premium news on any given day. We then show that the Fed's more hawkish communication of policy stance during the intermeeting period simultaneously lowers risk premia on stocks and long-term bonds, which we refer to as the "common risk premium" effect. For robustness, we verify these results using the decomposition of long-term yields from Kim and Wright (2005), demonstrating that indeed a more hawkish stance reduces distant term and forward premia over the intermeeting period but has no significant effect on short-rate expectations.

Our work is related to several strands of literature. A growing body of research documents that monetary policy acts through other channels beyond short-rate news whereby the Fed changes the current short rate or the public expectations of future short rates. Outside this standard "expectations hypothesis" logic, the channels that have been examined can be broadly separated into information effects (e.g., Campbell, Evans, Fisher, and Justiniano, 2012, Nakamura and Steinsson, 2018) and risk premium effects (e.g., Bernanke and Kuttner, 2005, Bekaert, Hoerova, and Lo Duca, 2013, Hanson and Stein, 2015).[5] In the former, the Fed provides the public with information about macroeconomic fundamentals (other than its effect on the short rate); in the latter, it impacts public perceptions of risk and/or

[4]Suppose, for example, that the Fed signals that future increases in interest rates are likely. As one possible scenario, such a signal could induce the public to simultaneously raise short-rate expectations, downgrade growth expectations, and also perceive less uncertainty about future discount rates. Alternatively, higher rates could indicate the Fed's positive outlook for the real economy and lower uncertainty about economic growth. The fact that various constellations of belief updates are possible poses an identification challenge. Additionally, the timing of the public belief updates is unclear as certain news may be harder to interpret and can accumulate slowly over the intermeeting period.

[5]The literature assessing the importance of these channels is rapidly growing, e.g., Jarocinski and Karadi (2020), Lunsford (2020), Miranda-Agrippino and Ricco (2021), Bauer and Swanson (2023a,b). A few recent papers separately analyze the role of news about future short rates versus risk premia, e.g., Hansen, McMahon, and Tong (2018), Cieslak and Schrimpf (2019), Cieslak and Pang (2021), Kroencke, Schmeling, and Schrimpf (2021), Pflueger and Rinaldi (2022), Bianchi, Lettau, and Ludvigson (2022), Bianchi, Ludvigson, and Ma (2022), Bundick, Herriford, and Smith (2024). Bauer, Bernanke, and Milstein (2023) review evidence on how announcements impact risk appetite.

the willingness to take risk. The investigation of these channels centers on the asset price responses to announcements, thus revealing the belief updates of investors. We instead link the asset price reactions directly to the content of policy deliberations.

Related research rationalizes the Fed's effect on the risk premia with theoretical models. Pflueger and Rinaldi (2022) study a New Keynesian setting with habit formation in which monetary easing induces reductions in risk aversion, thus lowering risk premia. Kekre and Lenel (2022) develop a heterogeneous agent model where agents differ in their marginal propensity to take risks, and show that an unexpected easing lowers risk premia by redistributing wealth to households with a high risk-taking propensity. Ai and Bansal (2018) postulate that announcements carry information about future economic growth and characterize intertemporal preferences for the representative consumer, under which announcements drive positive realizations of market equity premium via resolution of uncertainty. In a related way, Hu, Pan, Wang, and Zhu (2022) also argue that the Fed- and macro-announcements resolve uncertainty; agents learn about the news magnitude (whether the surprise will be large or small) before the announcement, which imparts additional risk premium effects. The above work focuses on the FOMC announcement effects. Our results suggest an additional channel linking risk premia to a novel dimension of the Fed's communicating its forward-looking policy stance in a way not revealed by the announcement or captured by the Fed's information about the economy.

While the implications of the Fed announcements for asset prices on impact are increasingly understood, there is also growing evidence that news from the Fed comes out outside the narrow event windows. The results provided by Cieslak, Morse, and Vissing-Jorgensen (2019), Cieslak and Pang (2021), Neuhierl and Weber (2019), Swanson (2023), Swanson and Jayawickrema (2023), and Bianchi, Ludvigson, and Ma (2022) suggest that policymaking happens on a continuous basis in the intermeeting period. We contribute to this body of work by identifying an essential component of policy stance that is developed during the FOMC meeting, but that does not get revealed via the FOMC announcement. We then show that this information reaches the public domain via the Fed's communication, affecting risk premium throughout the intermeeting period.

A separate line of work explores the time-variation in the Fed's policy rule and its role for risk premia. The evidence suggests that the Fed has switched toward a more activist policy in recent decades (Boivin and Giannoni, 2006, Bianchi, 2013, Primiceri, 2005, Coibion and Gorodnichenko, 2011). Bianchi, Ludvigson, and Ma (2022) develop a mixed-frequency, New Keynesian style framework with multiple monetary transmission channels, and emphasize the role of shifting investors' beliefs about the Fed's reaction function parameters for the equity risk premia. Ang, Boivin, Dong, and Loo-Kung (2010) develop a dynamic quadratic term structure model embedding a time-varying coefficient Taylor rule and analyze its implications for bond risk premia. Bauer, Pflueger, and Sunderam (2022) estimate public perceptions of the Fed's time-varying policy rule using surveys and show that changing policy perceptions affect bond risk premia. These studies rely on observable dynamics of interest rates, macro variables, or public survey expectations to identify the time variation in the perceived policy rule. We take a complementary approach by using the text of the FOMC's deliberations to measure policy stance in deviation from current policy, and then tying it to the risk premium variation in the intermeeting period via the Fed's communication. Our results are consistent with the idea that investors' belief updating about the Fed's policy stance significantly impacts risk premia.

Extracting information from the texts of the Fed documents has become increasingly common. The primary focus lies in analyzing the FOMC statements (Lucca and Trebbi, 2009, Apel and Blix Grimaldi, 2012, Handlan, 2020, Doh, Song, and Yang, 2022, Gardner, Scotti, and Vega, 2022) and public communications such as policymakers' speeches (e.g., Neuhierl and Weber, 2019, Malmendier, Nagel, and Yan, 2021). Several authors use text to control for the Fed's information effects in monetary policy surprises constructed from high-frequency interest rate changes around FOMC announcements (Ochs, 2021, Aruoba and Drechsel, 2023, Acosta, 2022). A smaller set of papers aims to understand the Fed's reaction function by analyzing private deliberations during the FOMC meetings (Meade, 2005, Hansen, McMahon, and Prat, 2018, Shapiro and Wilson, 2022).[6] Cieslak, Hansen, McMahon, and Xiao (2023) use transcripts to explore the drivers of the FOMC's decision making, highlighting the Fed's concern with policy-induced uncertainty as a determinant of the policy stance over and above the Fed's macroeconomic forecasts. Exploiting the structure of deliberations during the FOMC meetings, they construct a range of measures of policymakers' perceived moments of economic distributions as well as their policy stance. While building on this work, our focus

[6] Istrefi (2019) and Bordo and Istrefi (2023) use a classification scheme of FOMC members based on narrative records in the public media that discuss policy preferences of individual FOMC members.

is different as we connect internal deliberations in the transcripts to information revealed via public communication, including FOMC statements, speeches, and minutes. This allows us to trace the link between the private policy stance within the FOMC meeting, public communication of that stance, and ultimately, the financial market reaction.

II. How could the Fed affect the risk premia?

To set the stage for our empirical analysis, we start with a simple illustration in New Keynesian spirit of how policy stance could affect public risk perceptions and risk premia.

In the baseline New Keynesian model (Clarida, Galí, and Gertler, 1999), assuming the Fed can observe the shocks driving the economy, the optimal policy fully offsets the demand shocks. Thus, if demand shocks are the only source of fluctuations, policy eliminates risk entirely, simultaneously stabilizing output and inflation, a result frequently referred to as "divine coincidence."

In practice, monetary policymaking is more complex, even absent the cost-push shocks that induce the well-known policy trade-off. The demand shocks are empirically hard to pin down, especially in real time, as is the assessment of the size of the output gap, i.e., the deviation of current output from its natural level. While both a positive demand shock and a positive productivity shock raise output, they require a different policy response. Thus, an important challenge in implementing optimal policy stems from imperfect information about sources of fluctuations in real time.

The public (the "market") and the Fed may form different views on the underlying economic shocks and the Fed's optimal reaction to those shocks.[7] These differences give rise to monetary policy shocks as perceived by the market (Caballero and Simsek, 2022b,a). Our illustration centers on how such policy shocks can become a source of risk premia.

II.A. A simple illustration

Suppose the market believes that the macroeconomy is described by the system:

[7] Although the Fed may have genuinely private information (such as bank balance sheet data) which affects its assessment (Peek, Rosengren, and Tootell, 2003), to a first approximation, the market has access to the same kind of macroeconomic data as the central bank. Overall, the informational advantage of the Fed over markets appears small (e.g., Bauer and Swanson, 2023a).

$$x_t = \rho_x x_{t-1} - \theta(i_t - \delta\pi_t) + \eta_t \tag{1}$$

$$\pi_t = \rho_\pi \pi_{t-1} + \kappa x_t, \tag{2}$$

where x_t is the output gap, π_t is inflation, and i_t is the nominal short rate. The model is entirely backward-looking and all variables are in deviations from the steady state. Equation (1) represents the IS curve, where η_t is an aggregate demand shock, with $\theta > 0$, and $0 < \delta < 1$, and $E_t(\pi_{t+1}) = \delta\pi_t$. Equation (2) is the Phillips curve, with $\kappa > 0$.[8]

The market assumes that the Fed follows a simple rule setting the nominal short rate:

$$i_t = \phi_x x_t + \phi_\pi \pi_t + \varepsilon_t. \tag{3}$$

For simplicity, the market believes the optimal coefficients $\phi_x > 0, \phi_\pi > 0$ are time-invariant. The market-perceived shocks η_t and ε_t are uncorrelated with each other, and have conditional variances, σ_η^2 and σ_ε^2. The policy rule residual ε_t captures the idea that, in the market's assessment, the Fed does not perfectly offset the demand shocks, thus divine coincidence does not hold. This is in line with Galí (2015)'s interpretation of the monetary policy shock "as a random, transitory deviation from the 'usual' conduct of monetary policy as anticipated by the public, due to a change in policymaker's preferences, a response to unusual unanticipated event, or simply and error in the implementation of monetary policy." For now, we treat ε_t as reflecting a broad notion of perceived policy mistakes but leave their sources unspecified. We turn to an interpretation in Section VII.

The backward-looking terms (time-$(t-1)$) do not matter for the risk premia, and thus, we ignore them in the discussion below. We denote innovations with a tilde, e.g., $\tilde{x}_{t+1}$ is the innovation to output gap. We assume that aggregate consumption equals aggregate output and that shocks to output gap $\tilde{x}_{t+1}$ are priced by the market, with the real log SDF given by

$$m_{t+1} = -r_t - 0.5\gamma^2\sigma_x^2 - \gamma\tilde{x}_{t+1}, \tag{4}$$

where $\gamma > 0$, $\sigma_x^2 = Var_t(\tilde{x}_{t+1})$, and the real rate is $r_t = i_t - E_t(\pi_{t+1})$.

[8]The system (1)–(3) can be thought of a stylized description of the post mid-1980s environment, where the demand shocks dominate economic fluctuations (see e.g., Pflueger, 2023, Bianchi, Ludvigson, and Ma, 2022), and which is the period we focus on in our empirical analysis that follows.

To illustrate the properties of risk premia, we focus on the claim to the next period's consumption ("stock", paying real cash flow equal to x_{t+1}) and two-period nominal bond (paying $-i_{t+1} - \pi_{t+1}$ in real terms). Assuming joint log-normality, the conditional risk premium on the stock (rp_t^x) and bond (rp_t^b) is given by the minus covariance of the log SDF innovations and payoff innovations:

$$rp_t^x \equiv E_t(rx_{t+1}^x) + 0.5Var_t(rx_{t+1}^x) = -Cov_t(\tilde{m}_{t+1}, \tilde{x}_{t+1}) \tag{5}$$

$$rp_t^b \equiv E_t(rx_{t+1}^b) + 0.5Var_t(rx_{t+1}^b) = -Cov_t(\tilde{m}_{t+1}, -\tilde{i}_{t+1} - \tilde{\pi}_{t+1}). \tag{6}$$

where rx_{t+1} denotes log excess returns. Solving the market's model (1)–(3) for the endogenous innovations and calculating covariance terms in (5) and (6) yields:

$$\begin{aligned} rp_t^x &= \gamma(\overbrace{\tfrac{1}{\Omega^2}\sigma_\eta^2}^{\text{demand}} + \overbrace{\tfrac{\theta^2}{\Omega^2}\sigma_\varepsilon^2}^{\text{mon. pol.}}) \\ rp_t^b &= \gamma(\overbrace{-\tfrac{\phi_x+\kappa(1+\delta)}{\Omega^2}\sigma_\eta^2}^{\text{demand}} + \overbrace{\tfrac{\theta[1-\kappa\theta(1+\delta)]}{\Omega^2}\sigma_\varepsilon^2}^{\text{mon. pol.}}) \end{aligned} \tag{7}$$

where $\Omega = 1 + \phi_x\theta + (\phi_\pi - \delta)\kappa\theta$.

The above risk-premium expressions capture the intuition whereby demand uncertainty (σ_η^2) induces a positive risk premium on stocks but a negative risk premium on bonds (as interest rates tend to fall and bond prices tend to rise in a demand-driven recession).[9] Uncertainty associated with monetary policy shocks (σ_ε^2) induces a positive risk premium on both stocks and bonds.

While we ignore sources of time-varying volatilities and abstract from complex dynamics (e.g., via learning), comparative statics on equation (7) illustrate how the Fed can impact the risk premia in stocks and bonds via $\sigma_\varepsilon^2 = Var_t(\varepsilon_{t+1})$. This channel pertains to the magnitude of the Fed's mistakes as seen by the market. At different times, the market may be more or less convinced of the Fed's assessment of the economic shocks and/or the Fed's reaction to those shocks. To the extent that σ_ε^2 changes with these perceptions, those changes

[9]The demand-driven risk-premium channel is consistent with the work by Campbell, Sunderam, and Viceira (2017), Bekaert, Engstrom, and Ermolov (2021), Ermolov (2022), Pflueger (2023), among others, highlighting the contribution of demand shocks to negative stock-bond comovement. Bekaert, Engstrom, and Ermolov (2021) estimate supply and demand risk factors from shocks to inflation and real economic variables, and show that increases in demand-driven volatility reduce bond risk premia.

act simultaneously and in the same direction on the stock and bond risk premia, which we refer to as the "common" risk premium effect.

Without additional assumptions, the above illustration does not deliver predictions on the sign of the relationship between policy stance and risk premia, i.e., whether a more dovish stance reduces or increases premia. We start with an empirical investigation of this question, and after presenting the main findings, we extend the current illustration to provide an interpretation of that directional link.

III. Measuring policy stance within the FOMC meeting

A novel feature of our analysis lies in establishing a link between the policy stance developed by policymakers in an FOMC meeting and the financial market behavior in the period following the meeting. While the literature has studied textual measures of policy stance, it has primarily focused on analyzing the statements and public communications such as speeches of the Fed officials, as opposed to private policymakers' deliberations. And yet, the FOMC meetings are a proximate venue where policy views are expressed. In this section, we discuss the measurement and the properties of the policy stance revealed by the FOMC meeting transcripts and establish its forward-looking content beyond the current policy rate or the Fed's macroeconomic expectations.

Since 1994, the Federal Reserve Board has published nearly verbatim transcripts of the FOMC meetings, with a delay of five years after the calendar year in which the meeting took place.[10] The sample period we consider spans 228 meetings from August 1987 (the first meeting of Alan Greenspan's chairmanship) through December 2015 (the last meeting for which a transcript was available at the time of data processing).[11] Scheduled FOMC meetings occur eight times per year, with occasional special meetings convened via conference call during times of macroeconomic turbulence. Since the format of these calls is irregular, we only consider regular meetings in our analysis.

[10] See `https://www.federalreserve.gov/monetarypolicy/fomc_historical.htm`.

[11] Only a small part of the May 1988 meeting was transcribed, so we treat it as a missing observation.

III.A. Internal policy stance

Our construction of policy stance follows the procedure developed by Cieslak, Hansen, McMahon, and Xiao (2023). We exploit the regular structure of FOMC meetings which has been largely unchanged throughout the years, with two core parts of the meeting being the economy round followed by the policy round (see Hansen, McMahon, and Prat (2018)). The policy round is the main source from which we measure the policy stance. The basic idea is to gauge the intensity with which policymakers express directional policy views. We focus on the views of the FOMC members (chair, vice chair, governors, and regional Fed presidents), the decision makers, and exclude the statements made by the staff. Appendix A describes the details of the construction.[12]

We calculate the frequency of occurrence of language indicating hawkishness and dovishness, scaled by the overall length of the policy round (the total number of phrases in that round attributed to the FOMC members). Denoting the resulting scores in meeting t as $Hawk_t$ and $Dove_t$, we summarize the overall policy stance by taking the balance:

$$HD_t = Hawk_t - Dove_t. \tag{8}$$

Thus, the HD_t variable reflects a directional tilt in the policy views that emerges during meeting t. For subsequent analysis, we normalize HD to have a sample zero mean and a unit standard deviation. We refer to HD as the *internal* policy stance to highlight the private nature of the policy discussions at its source.

III.B. Properties of HD

Cieslak, Hansen, McMahon, and Xiao (2023) study the properties policy stance focusing on the drivers of the FOMC's decision making within the meeting. Our goal is to emphasize the forward-looking content of policy deliberations and to ultimately tie it to asset price responses. The key feature for the purposes of our subsequent analysis is that HD captures

[12] We first apply rules to determine whether a sentence refers to monetary policy. We then separate hawkish and dovish leanings by matching policy terms with directional language at a sentence level, accounting for negations and both language indicating conventional policy and, starting from 2009, the unconventional tools. In this way, we obtain a consistent stance proxy throughout the entire sample, including the zero-lower-bound period. Additionally, to ensure that we do not simply capture language describing fluctuations in asset prices and interest rates, we exclude sentences in which such market movements are mentioned.

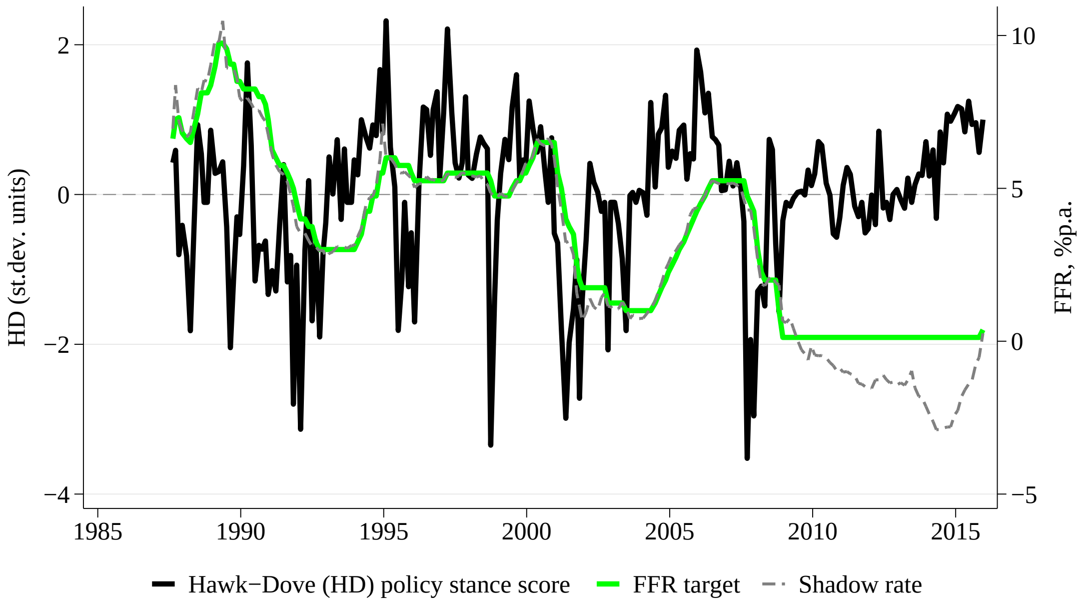

Figure 1. Hawk-dove policy score *HD* and the policy rate. The figure superimposes the hawk-dove score *HD* constructed for FOMC members in the policy round of the FOMC meeting against the FFR target and the shadow policy rate from Wu and Xia (2016).

a significantly broader notion of policy stance beyond the rule-based Fed's reaction and the current policy action, but its content does not get revealed to the public at the time of the announcement. We document these properties next.

To illustrate its evolution during our sample, Figure 1 plots the *HD*'s time series along with the federal funds rate (FFR) and the shadow rate from Wu and Xia (2016) to account for the zero-lower-bound period. The *HD* measure has intuitive business cycle dynamics, becoming elevated in expansions and declining rapidly in recessions and during periods of financial turmoil.

Table I summarizes the marginal information in *HD* relative to the typical drivers of the policy reaction function. To capture the rule-based component of the Fed's reaction function, we use Greenbook economic forecasts, forecast updates, and a proxy for the Fed's inflation target (trend inflation).[13] Greenbook forecasts are prepared by the staff at the Fed Board

[13]Following Coibion and Gorodnichenko (2012), as Greenbook controls, we use longer-term CPI inflation forecasts (four quarters ahead, $F_t(\pi_4)$), and current quarter real GDP growth forecast (nowcast, $F_t(g_0)$). We also add forecast revisions between meetings ($FR_t(\pi_3), FR_t(g_1)$), following Romer and Romer (2004) to account for changes in forecasts in addition to levels. To capture the slow-moving inflation target over the sample, we construct a trend inflation variable as the discounted moving average of past core inflation following Cieslak and Povala (2015), see also, e.g. Bianchi, Ludvigson, and Ma (2022) or Pflueger (2023) who use similar measures to estimate realistic policy rules. Including trend inflation allows the regression

ahead of each scheduled FOMC meeting, and constitute an important part of discussion during the economy round of the meeting. We measure current policy rate either with the FFR or the shadow rate. Some covariates are suppressed from Table I for brevity.

As a first key property, *HD* is a strong predictor of the current policy decision over and above the standard Taylor rule variables. Columns (1) and (2) of Table I, Panel A, focus on explaining changes in the FFR target. The sample runs through 2008:12, omitting the zero-lower bound thereafter. On a stand-alone basis, *HD* captures 41% of the FFR target change variation (column (1)). A one-standard-deviation increase in *HD* is associated with approximately an 18 basis-point increase in the FFR target (0.64 standard deviations) with a t-statistic of 9. Column (2) shows that *HD* remains economically and statistically significant once we control for the Greenbook forecasts and policy rate inertia (lagged FFR). We verify that this result does not depend on the choice of specific horizons for the Greenbook forecasts.

Analogous results follow when we use *HD* to predict a widely-adopted measure of monetary policy surprises proposed by Romer and Romer (2004) in column (3).[14] *HD* alone explains a quarter of the variation in Romer-Romer shocks. We do not include additional controls here since Romer-Romer shocks are constructed from policy rate changes that are already purged of the Greenbook forecasts. To extend the sample throughout the zero-lower-bound period, in column (4), we use the changes in the shadow rate from Wu and Xia (2016), and find that *HD* remains a highly significant predictor of the shadow rate as well. As *HD* predicts the current policy action beyond the Greenbook forecasts, this suggests that the language in the meeting is informative about the FOMC's deviations from a simple policy rule.

Second, it is perhaps not surprising that *HD* also reflects the Fed's expectations about economic conditions. A projection of *HD* on the Greenbook forecasts and the policy rate shows that *HD* has intuitively signed loadings on expected inflation and real GDP growth (Table I, Panel A, columns (5)–(8)). However, economic forecasts alone explain less than 30% of *HD*'s variation (column (5)) and less than 45% when combined with the policy rate

to capture the effect of deviations of expected inflation from the inflation target on the policy rate. We use this set of controls in all subsequent analysis unless indicated otherwise.

[14]We obtain the Romer-Romer shock series from the data set accompanying Valerie Ramey's handbook chapter on propagation of macro shocks (Ramey, 2016). The shocks are available during the pre-zero-lower-bound sample 1987:08–2007:12.

A. Contemporaneous effects

	Change in policy rate, $t-1$ to t				Policy stance, HD_t			
	(1) ΔFFR_t	(2) ΔFFR_t	(3) RR_t	(4) $\Delta SFFR_t$	(5) HD_t	(6) HD_t	(7) HD_t	(8) HD_t
HD_t	0.19***	0.097***	0.083***	0.087***				
	(9.01)	(6.26)	(4.95)	(3.77)				
$F_t(\pi_4)$		0.18***		0.12**	0.62***	0.52***	0.40	0.55***
		(3.58)		(2.09)	(3.64)	(2.64)	(1.64)	(3.21)
$F_t(g_0)$		0.15***		0.11***	0.38***	0.15*	0.21**	0.29**
		(7.73)		(3.00)	(2.99)	(1.96)	(2.06)	(2.45)
FFR_t						1.72***	1.61***	
						(7.41)	(6.40)	
FFR_{t-1}		-0.038***				-1.75***	-1.62***	
		(-3.38)				(-7.69)	(-6.63)	
$SFFR_t$								0.66***
								(3.17)
$SFFR_{t-1}$				-0.028**				-0.67***
				(-2.21)				(-3.03)
Controls	No	Yes	No	Yes	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.41	0.60	0.25	0.34	0.29	0.44	0.43	0.32
N	171	171	163	227	227	227	171	227

B. Predictive effects

	$\Delta FFR_{t,t+h}$				$\Delta SFFR_{t,t+h}$			
	$h=1$	$h=2$	$h=3$	$h=4$	$h=1$	$h=2$	$h=3$	$h=4$
HD_t	0.081***	0.13***	0.18**	0.24***	0.089***	0.16***	0.23***	0.27***
	(4.29)	(3.26)	(2.60)	(2.80)	(3.55)	(3.38)	(3.48)	(3.72)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.43	0.42	0.43	0.46	0.16	0.21	0.25	0.29
N	170	169	168	167	227	227	227	227

Table I. Properties of *HD* as a measure of policy stance. In left columns of Panel A, the dependent variables are changes in the FFR target between the current and last meeting $\Delta FFR_t = FFR_t - FFR_{t-1}$ (column (1) and (2)), the Romer-Romer surprises from Ramey (2016) (column (3)), and the change in the shadow rate $\Delta SFFR_t = SFFR_t - SFFR_{t-1}$ from Wu and Xia (2016) (column (4)). In the right columns of Panel A, the dependent variable is HD_t. The controls include Greenboook forecasts prepared for meeting t, $F_t(\cdot)$ (displayed in the table), as well as forecast updates $FR_t(\cdot)$, and a proxy for time-varying inflation target τ_t (not displayed variables are indicated as "Controls"). The sample period is: 1987:08–2008:12 in columns (1) and (2), i.e., excluding the zero-lower bound; 1987:08–2007:12 in column (3); and 1987:08–2015:12 in all other columns. In Panel B, the dependent variables are the future changes in the policy rate, from today's meeting (t) to one meeting ahead ($h = 1$) and up to four meetings ahead ($h = 4$). The *FFR* forecasts are up to 2008:12, while the *SFFR* forecasts use the entire sample for which *HD* is available, 1987:08–2015:12. We include the maximal set of controls as specified in Panel A, including the current and lagged values of *FFR* and *SFFR*, respectively. In all regressions in Panels A and B, the Greenbook forecasts and HD_t are standardized, and rates are in percentages per annum. All regressions are estimated at the frequency of the FOMC meetings. HAC t-statistics with eight lags are reported in parentheses.

(columns (6)–(8)). Therefore, a significant part of *HD* variation is not explained by economic expectations and current policy action.

The third main fact about *HD* is its forward-looking content. *HD* forecasts future policy outcomes, beyond the current policy decision. Table I Panel B shows that HD_t predicts the future path of the FFR or the shadow rate between the current meeting t and future meeting up to $t+4$. The size of the predictive coefficient stabilizes beyond the four-meetings horizon, but it remains significant up to eight meetings ahead (not shown in the table). In fact, the predictive content of *HD* for future policy actions can already be gleaned from Figure 1 showing that *HD* tends to move in anticipation of the policy that is subsequently implemented. Importantly, the regressions in Table I Panel B show that the predictive content of *HD* for future policy holds after controlling for the Fed's economic forecasts as well as the current and lagged policy rate.

III.C. The HD Gap: Measuring the forward-looking policy stance

In light of the above properties, we construct a measure of the policy stance as an orthogonal component of *HD* not spanned by either the Fed's economic forecasts or by the recent policy actions. Specifically, we define a variable, *HDGap*, as a residual from projecting *HD* on the Greenbook controls and the current and lagged policy rates:

$$HDGap_t = HD_t - \widehat{HD}_t, \quad \text{where} \quad \widehat{HD}_t = \hat{\gamma}_0 + \hat{\gamma}_1' F_t^{GB} + \hat{\gamma}_2'(FFR_t, FFR_{t-1})'. \tag{9}$$

where F_t^{GB} is a vector containing the Greenbook forecasts available at meeting t. Specification (9) corresponds to column (6) of Table I, Panel A.[15] The fitted value $\widehat{HD}$ captures the current policy action, policy inertia, and additional influence that macroeconomic forecasts can have on FOMC's policy views in the meeting beyond their effect on the policy action. While the loadings on F^{GB} are assumed to be constant, including the policy rate accounts for potentially time-varying policy responses to the economy.

Figure 2, Panel A, superimposes the variation in the overall *HD* against its fitted value $\widehat{HD}$. To display the contribution of the Greenbook forecasts, we separately plot the fitted value excluding the current and lagged policy rate (corresponding to column (5) in Table

[15] For completeness, column (7) also reports the estimates on the pre-zero-lower-bound sample.

I, Panel A).[16] Figure 2, Panel B, shows that the residual *HDGap* continues to display large fluctuations over time, in line with the fact that about 56% of the *HD* variance remains unexplained by Greenbook forecasts and the policy rate.

HDGap can be interpreted as a policy stance shock expressed in language, that is, an update to policymakers' views that is in excess of the current action or Greenbook expectations. To the extent that *HDGap* measures deviations of policymakers' views from the currently implemented policy and first-moment beliefs about the economy, it should capture forward-looking policy intentions and contingencies. The deviations can have several sources, for example, representing the Fed's concerns about tail risks, uncertainty about policy transmission, or credibility concerns. While we do not separate the Fed's motives for presenting such an excess stance in the meeting, Cieslak, Hansen, McMahon, and Xiao (2023) study how policymakers' perceptions of uncertainty and higher-moments of economic distributions more broadly (identified from the language in the economy round of the FOMC meeting) predict stance in the policy-round deliberations. They show that the inflation uncertainty perceived by policymakers (particularly in expansions) and their negative sentiment about the real economy (mainly in downturns) are key drivers of the forward-looking policy stance, after controlling for the policy rate and the Greenbook forecasts.

III.D. Does the public learn the HD Gap from the FOMC announcements?

Existing studies demonstrate the importance of the FOMC statements' language for policy transmission that extends beyond policy actions (e.g., Lucca and Trebbi, 2009, Gürkaynak, Sack, and Swanson, 2005a). The statements are immediately released after the FOMC meeting and are closely scrutinized for their content by market participants. To which extent do they already reveal the internal policy stance captured by *HDGap*?

To answer this question, we explore the relationship between *HD*, *HDGap*, and monetary policy surprises identified from high-frequency changes in interest rates in a narrow window around the FOMC announcements. We include measures from several representative studies: target and path surprises from Gürkaynak, Sack, and Swanson (2005a) as updated by

[16] Controlling for the policy rate with the shadow rate from Wu and Xia (2016) instead of the FFR does not change our results. While the shadow rate helps address the zero-lower bound, it is available at the end of months and not at the time of the FOMC meetings. Thus, for a precise timing of the Fed's actions, in subsequent analysis, we the *HDGap* residualized with respect to the FFR.

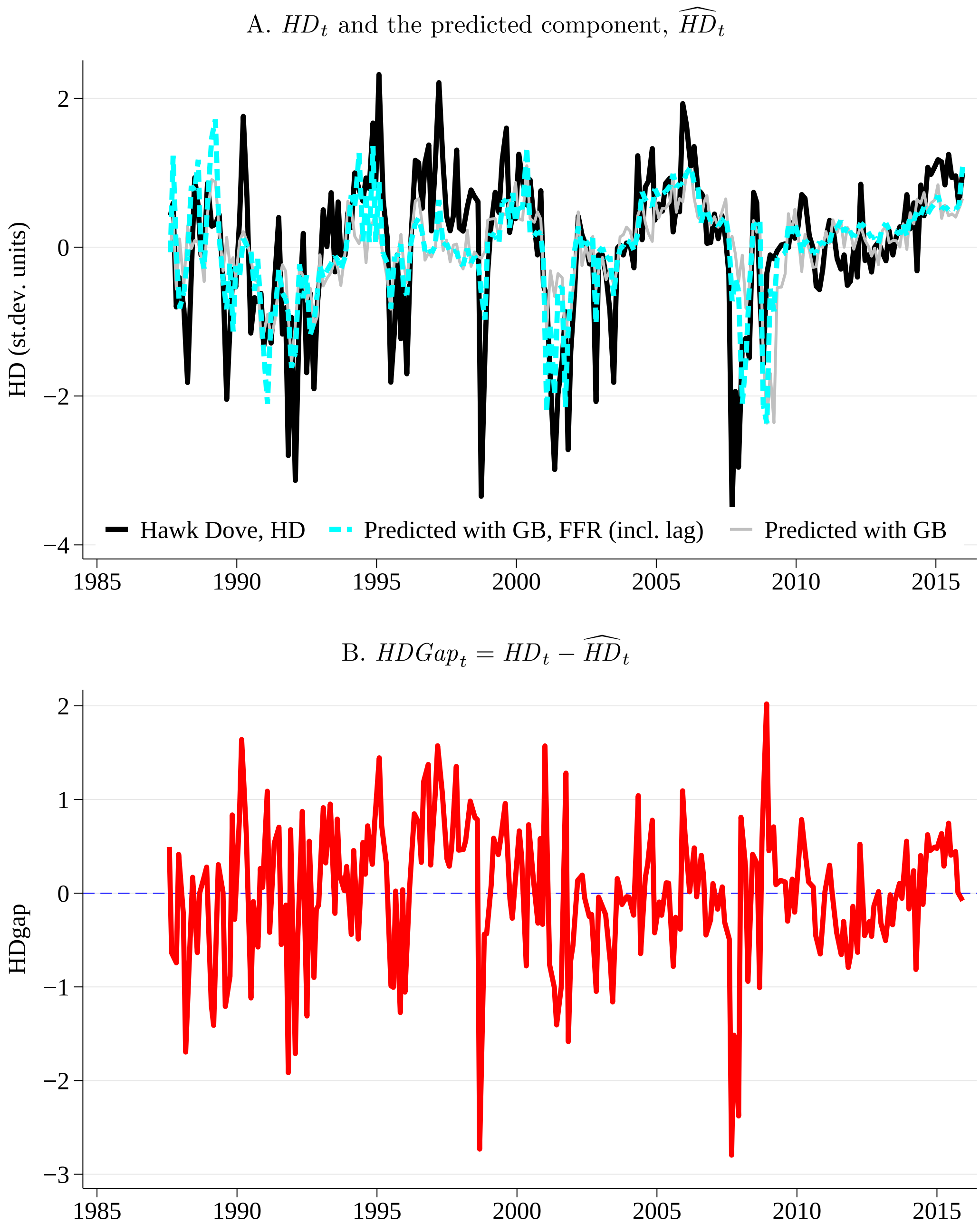

Figure 2. Policy stance *HD* and its residual component *HDGap*. Panel A superimposes the hawk-dove score HD constructed using statements by the FOMC members in the policy round of the meeting against the fitted value of the HD_t, $\widehat{HD}_t$ in equation (9) explained with the Greenbook forecasts and current and lagged policy rate, FFR_t, FFR_{t-1}, corresponding to specifications (6) in Table I. We additionally display the fitted value obtained using only Greenbook forecasts, corresponding to specifications in columns (5) of Table I. Panel B plots the $HDGap_t$ as the difference between HD_t and $\widehat{HD}_t$.

Swanson (2021), Gertler and Karadi (2015, GK), Nakamura and Steinsson (2018, NS), and Bauer and Swanson (2023b), to account for different construction details, maturities of interest rates involved and sample periods. These surprises plausibly reflect investors' belief updating due to the information released by the Fed via the announcement. Thus, to the extent that *HDGap* carries forward-looking information about policy (Table I, Panel B), and if this information gets revealed via the statement, it should be immediately reflected in the market interest rates upon the FOMC announcement.[17]

Across all specifications in Table II, the *HDGap* does not predict interest rate reactions on impact in the FOMC announcement window. This suggests that a large part of the internally discussed policy views do not reach the public domain at the announcement. Indeed, the statements are typically short and concentrate on explaining the current policy decision in the context of the Fed's perception of economic conditions. They therefore lack the scope to fully convey the FOMC's policy intentions discussed in the meeting. To support this interpretation, Panel B of Table II shows that the raw (unresidualized) *HD* variable does predict the same set of surprises with a positive coefficient.[18]

Taken together, the evidence in this section corroborates the narrative accounts by the Fed insiders who highlight the forward-looking nature of policy deliberations in the meetings: *"So was the FOMC meeting merely a ritual dance? No. I came to see policy decisions as often evolving over at least a couple of meetings. The seeds were sown at one meeting and harvested at the next. [The discussion] could change my mind, even if it could not change my vote at that meeting. (...) I was often positioning myself, and my peers, for the next meeting"* (Meyer, 2009). The forward-looking content of *HDGap* combined with the fact the markets do not seem to learn this content directly at the FOMC announcement, points to an important role of the Fed's communication in the intermeeting period, which we explore in the following analysis.

IV. Decomposing asset price dynamics over the intermeeting period

Does the information about the internal stance ultimately get revealed, and if so, how does it affect asset prices? To answer this question, it is necessary to disentangle news driving

[17]The FOMC statements have been the main source of information for the public for most of our sample period. We analyze the content of the statements in Section VI. The press conferences by the Fed chair were introduced in 2011, covering only the final four years of our main sample.

[18]The exception is $MPS^{\perp}$, which Bauer and Swanson (2023b) orthogonalize with respect to a set macroeconomic and financial variables (see Section V.C for details on the regressors). This removes the component of policy surprises that *HD* is correlated with.

Panel A. Explaining announcement surprises with *HDGap*

	(1) Target	(2) Path	(3) GK MP0	(4) GK ED12m	(5) NS news	(6) BaSw MPS	(7) BaSw MPS$^{\perp}$
$HDGap_t$	-0.038	0.046	-0.038	0.083	-0.003	-0.050	-0.092
	(-0.27)	(0.59)	(-0.38)	(0.96)	(-0.02)	(-0.43)	(-0.94)
R^2	0.0014	0.0021	0.0015	0.0069	0.0000072	0.0025	0.0085
N	197	197	190	199	154	222	222

Panel B. Explaining announcement surprises with *HD*

	(1) Target	(2) Path	(3) GK MP0	(4) GK ED12m	(5) NS news	(6) BaSw MPS	(7) BaSw MPS$^{\perp}$
HD_t	0.162	0.171***	0.382***	0.409***	0.290**	0.167*	-0.034
	(1.29)	(2.66)	(4.00)	(4.92)	(2.33)	(1.71)	(-0.35)
R^2	0.026	0.029	0.15	0.17	0.084	0.028	0.0012
N	197	197	190	199	154	222	222

Table II. Policy stance and high-frequency monetary policy surprises in narrow FOMC announcement windows. The table reports projections of high-frequency measures of monetary policy surprises at the time of the FOMC announcements on *HDGap* and *HD* variables. Columns (1) and (2) contain high-frequency target and path surprises from Swanson (2021) extending the approach of Gürkaynak, Sack, and Swanson (2005a) (1991:07–2015:10 sample). Columns (3) and (4) use shocks from Gertler and Karadi (2015) obtained from the current month fed fund futures (MP0, sample 1988:11–2012:06) and 12-month ahead Eurodollar futures (ED12m, sample 1987:08–2012:06). Column (5) is the policy news shock from Nakamura and Steinsson (2018) (sample 1995:02–2014:03). Columns (6) and (7) use surprises from Bauer and Swanson (2023b): the monetary policy surprise (MPS, first principal component of four Eurodollar futures rates, ED1 to ED4) and that surprise orthogonal to predictors of policy surprises (MPS$^{\perp}$) (sample 1988:02–2015:12). Robust t-statistics are reported in parentheses. All regressions are estimated at the frequency of FOMC meetings. The coefficients are standardized.

asset prices day by day. For our baseline results, we follow the approach in Cieslak and Pang (2021), who impose sign restrictions on the stock market and yield movements in a structural VAR framework to decompose their variation into interpretable short-rate expectations and risk premium news at the daily frequency. We later show that our results are robust to alternative decompositions.

The identification restrictions are of two types: (i) monotonicity restrictions across yield maturities, and (ii) sign restrictions on the comovement between stock and bond returns. The strategy exploits the fact that short-rate expectations news has a larger impact on yields with shorter maturities (the expectations hypothesis term, EH), while risk premium news has a larger impact on longer maturities (the risk premium term, RP). The stock-bond comovement restrictions further distill two types of EH news and two types of RP news.

IV.A. Daily news factors

Specifically, we rotate information in daily log stock returns and daily changes in two-, five- and ten-year yields into four orthogonal factors. We summarize the restrictions in Table III, denoting news factors on day τ with ω

$$\omega_\tau = \left(\omega_\tau^G, \omega_\tau^{MP}, \omega_\tau^{HRP}, \omega_\tau^{CRP}\right)'. \tag{10}$$

To interpret the factors, suppose there is a positive one-unit shock to each element in ω:

- "Growth news" ω^G raises stock prices and lowers bond prices, affecting yields at short maturities more than at long maturities (cash-flow effect);
- "Monetary news" ω^{MP} simultaneously lowers stock and bond prices, affecting yields at short maturities more than at long maturities (discount-rate effect);
- "Hedging premium news" ω^{HRP} lowers stock prices and raises bond prices, affecting yields at long maturities more than at short maturities (compensation for cash-flow news exposure);
- "Common premium news" ω^{CRP} simultaneously lowers stock and bond prices, affecting yields at long maturities more than at short maturities (compensation for discount-rate news exposure).

The ω^{MP} and ω^G components reflect the typical effects of news moving short-rate expectations (e.g., Gürkaynak, Sack, and Swanson, 2005b, Gürkaynak, Kisacikoglu, and Wright, 2018). The separation between the types of risk premium news aims to capture two effects: (i) a time-varying common premium (ω^{CRP}) that drives compensation required by stock and bond investors in the same direction due to both being exposed to discount rate news versus (ii) a time-varying hedging premium (ω^{HRP}) that drives stock and bond premia in opposite directions due to bonds providing a hedge against bad economic times (as real rates generally decline in bad times). The hedging premium is thus akin to a flight-to-safety effect.

These four factors can be mapped onto to the illustrative setting in Section II.A, with ω^G and ω^{MP} reflecting asset pricing effects of demand shocks η and monetary policy shocks ε, respectively, and ω^{CRP} and ω^{HRP} capturing the risk premium effects in equation (7). In particular, the common premium ω^{CRP} subsumes any potential movements in the discount-rate premium induced by the Fed via σ_ε^2. The hedging premium ω^{HRP} captures fluctuations stemming from uncertainty in the economy, demand uncertainty σ_η^2, outside the control of the Fed.

IV.B. Notation and timing conventions

On a given day, an observed yield change or the aggregate stock market return can be disaggregated into contributions of each factor via a historical decomposition from the VAR (see Cieslak and Pang (2021) for details). For example,

$$\Delta y_\tau^{(10)} = \sum_j \Delta y_\tau^{(10)}(\omega^j), \quad j = \{G, MP, HRP, CRP\} \tag{11}$$

is a four-way decomposition of the ten-year yield change on day τ. An analogous decomposition can be performed for daily stock returns or yields with other maturities.[19]

For interpreting economic magnitudes, we present results in terms of how different news in ω affect the ten-year yield on a given day or over some interval. For example, $\Delta y_\tau^{(10)}(\omega^{CRP}) = 10$ bps means that ω^{CRP} news induced a ten-basis-point change in the ten-year yield from day $\tau - 1$ to τ.[20]

We index scheduled FOMC meetings with $t, t+1, \ldots$. We denote a one-day yield change from a day before to the day of the t-th FOMC announcement induced by ω^j news as $\Delta y_{\tau_t}^{(10)}(\omega^j)$, where τ_t marks the day of announcement for meeting t. To explore the drivers of asset price movements between two consecutive scheduled FOMC meetings, we sum up the daily changes in yields induced by ω^j news

$$\Delta y_{t,t+1}^{(10)}(\omega^j) = \sum_{i=1+\tau_t}^{\tau_{t+1}} \Delta y_i^{(10)}(\omega^j), \tag{12}$$

where we exclude the announcement day for meeting t, τ_t.[21] We also consider yield changes over different windows following the t-th announcement, e.g.,

[19] Bond prices fall as yields increase. We characterize the effects in terms of yield changes as opposed to bond returns given that economic magnitudes are more transparent in yield units.

[20] The choice of units in terms of the ten-year yield changes is a convention we adopt. Given that (11) is a decomposition and the same ω factors span stock returns and yield changes, we could alternatively express the magnitudes in terms of stock return impacts.

[21] We verify that including the day of the announcement at the next meeting in this calculation does not materially affect the results. Below, we also present results excluding the next meeting.

	News			
	Short-rate expectations, *EH*		Risk premium, *RP*	
Impact on LT vs. ST yields	$\lvert ST\rvert > \lvert LT\rvert$		$\lvert ST\rvert < \lvert LT\rvert$	
	Growth $\omega^G \uparrow$	Monetary $\omega^{MP} \uparrow$	Hedging $\omega^{HRP} \uparrow$	Common $\omega^{CRP} \uparrow$
Bond returns	(−)	(−)	(+)	(−)
Stock returns	(+)	(−)	(−)	(−)
Stock-bond comovement	(−)	(+)	(−)	(+)

Table III. Identification of news in asset prices. The table summarizes the identification restrictions following Cieslak and Pang (2021) used for separating out different types of news moving asset prices.

$$\Delta_h y^{(10)}_{\tau_t+1,\tau_t+h}(\omega^j) = \sum_{i=1+\tau_t}^{\tau_t+h} \Delta y^{(10)}_i(\omega^j) \tag{13}$$

is the h-day yield change following announcement t, again excluding the change on the announcement day itself.

V. The internal policy stance and risk premia in the intermeeting period

We now show that the policy stance elicited within the FOMC meeting contains information that significantly impacts risk premia during the intermeeting period in the days after the public policy announcement. At the outset, it is important to emphasize that the public does not have access to the transcripts for another five years after the meeting. Results in Table II indicate that the FOMC announcement per se provides a limited insight into the forward-looking policy stance, measured with *HDGap*, emerging from the meeting. Therefore, the public needs to gradually learn about the stance in the days that follow. The decomposition of asset prices at a daily frequency into interpretable news factors allows us to trace out not only when investors revise their beliefs between meetings but also what types of beliefs are revised. In this section, we tie these revisions to the content of internal policy deliberations, controlling for a variety of potential confounders. In the following section, we then map the policy stance in the transcripts onto the Fed's communication in the intermeeting period to directly assess the extent to which the internal policymakers' views reach the public domain.

V.A. Baseline predictive results over the intermeeting period

In Table IV, Panel A, we report the results from our baseline regression specified as

$$\Delta y_{t,t+1}^{(10)}(\omega^i) = \gamma_0 + \gamma_1 HDGap_t + \varepsilon_{t,t+1}, \tag{14}$$

where the *HDGap* variable is defined in equation (9). The dependent variable is the change in the ten-year yield attributed to a given type of news and accruing from a day after the meeting-t announcement up to and including the day of the next meeting-$(t+1)$ announcement, as defined in equation (12). The three left columns of Table IV contain results for the risk premium components, while the three right columns contain analogous results for the short-rate expectations components. For comparison, in Panel B, we estimate an analogous regression using the raw *HD* score from the FOMC transcripts without any controls.

To interpret the economic significance of the predictive relationship, we express the slope coefficient such that it represents the effect of a one-standard-deviation change in $HDGap_t$ (or HD_t) on $\Delta y_{t,t+1}^{(10)}(\omega^i)$ per unit of the unconditional standard deviation of the intermeeting ten-year yield change, $\sigma(\Delta y_{t,t+1}^{(10)})$.[22] We follow this convention for all results below, unless otherwise noted.

The main result in Table IV reveals that the internal policy stance within the FOMC meeting is a strongly significant forecaster of the subsequent risk premium changes, and this effect stems entirely from the variation in the common risk premium component, ω^{CRP}. Recall that positive ω^{CRP} news simultaneously sends stocks and long-term bonds lower (and long-term yields higher), an effect that is orthogonal to pure short-rate movements. The negative coefficient of -0.17 in the *CRP* column of Panel A implies that a one-standard-deviation increase in *HDGap* forecasts a reduction in the common premium corresponding to 17% of the intermeeting volatility of the ten-year yield changes. The coefficient is similar (-0.19) when we use the raw *HD* variable as a predictor in Panel B. A comparison of Panel A and B suggests that the policy stance relevant for predicting premia in the intermeeting period is not driven by either the Fed's economic forecasts or the current policy rate decision.

[22] For example, $\frac{\Delta y_{t,t+1}^{(10)}(\omega^{CRP})}{\sigma(\Delta y_{t,t+1}^{(10)})}$ is the impact of ω^{CRP} news on intermeeting change in the ten-year yield, expressed in units of unconditional volatility of the intermeeting ten-year yield changes.

Panel A. Predictability of $\Delta y^{(10)}_{t,t+1}(\omega^i)$ with policy stance residual, $HDGap_t$

	RP components			EH components		
	RP overall	*CRP*	*HRP*	*EH* overall	*G*	*MP*
$HDGap_t$	-0.19***	-0.17***	-0.017	0.043	0.0097	0.033
	(-3.29)	(-3.52)	(-0.48)	(0.98)	(0.37)	(1.31)
R^2	0.046	0.066	0.0011	0.0060	0.00074	0.0087
N	227	227	227	227	227	227

Panel B. Predictability of $\Delta y^{(10)}_{t,t+1}(\omega^i)$ with raw policy stance in transcripts, HD_t

	RP components			EH components		
	RP overall	*CRP*	*HRP*	*EH* overall	*G*	*MP*
HD_t	-0.16**	-0.19***	0.027	0.073	-0.0095	0.082***
	(-2.54)	(-4.39)	(0.74)	(1.62)	(-0.36)	(3.27)
R^2	0.033	0.077	0.0029	0.017	0.00071	0.054
N	227	227	227	227	227	227

Table IV. Predictability of news in asset prices by the policy stance. The table reports predictive regressions of news moving asset prices over the intermeeting period (between meeting t and $t+1$) by the policy stance in meeting t. The dependent variable is the change in the ten-year yield over the intermeeting period attributed to particular news type, ω^j, with news components indicated by column titles. Columns "RP" and "EH" report the combined contributions of the risk premium news and expectations hypothesis news, respectively. Panel A uses as the dependent variable the $HDGap_t$ defined in equation (9), i.e., HD_t residualized with respect to the Greenbook controls and the current and lagged policy rate. Panel B uses the raw HD_t without controls. HD_t and $HDGap_t$ are standardized to have a unit standard deviation. The slope coefficients are expressed in units of volatility of the intermeeting ten-year yield changes, and thus, report the signed fraction of intermeeting yield volatility induced by news ω^j that is predictable by policy stance. The dependent variables display trivial autocorrelation; therefore, we use robust standard errors, which are more conservative than the Newey-West standard errors in this application. The regressions are estimated at the frequency of the FOMC meetings from 1987:08 through 2015:12.

These conclusions are unchanged when we use *HD* and control for the Fed's forecasts and the FFR directly in the regressions, which addresses the problem of *HDGap* being a generated regressor (see Appendix Table A-1). In fact, in this unrestricted specification, the results become somewhat stronger with the coefficient on *HD* increasing to -0.24. While not separately reported, analogous estimates to those in Panel A and B performed for stock returns show respectively that a one-standard-deviation increase in *HDGap* (*HD*) predicts a stock return increase of 15% (16%) of the intermeeting stock return volatility. The negative predictive relationship is a robust feature of the 1987–2015 sample. Appendix Figure A-1 shows that it is present over the 1987–2007:12 and 2008:01–2015:12 subperiods, i.e., before and after the Fed hit the zero lower bound.

It is noteworthy that the raw *HD* variable also predicts the evolution of monetary news ω^{MP} during the intermeeting period, as seen in the last column of Panel B in Table IV. The positive coefficient is intuitive and indicates that a more hawkish policy stance in the FOMC meeting predicts higher market expectations of policy rate afterward. This result is consistent with the predictive power of the *HD* variable for the future path of the short rate documented in Table II as well as with the finding in the literature that short-rate expectations evolve between the meetings and not just at the FOMC announcement (e.g., Neuhierl and Weber, 2019, Brooks, Katz, and Lustig, 2018). However, in contrast to the risk premium results, the predictability of monetary news disappears in Panel A once we purge *HD* of the Fed's economic forecast and the policy rate. The fact that the common risk premium news component remains predictable by *HDGap*, but the monetary news component is not, implies that the content of policy deliberations that affects the risk premium is distinct from the usual monetary news channel operating via market's short-rate expectations.

The negative sign of the predictive relationship between *HDGap* and the common risk premium distinguishes our results from the seminal finding in the literature (Bernanke and Kuttner, 2005, Hanson and Stein, 2015) that a surprise monetary easing lowers the risk premium on impact, i.e., at the time of the FOMC announcement. The estimates in Table IV imply that a more dovish stance in the meeting (in excess of the current action and Fed's macro forecasts) is associated with a rise of the common risk premium in days that follow the announcement. Importantly, these results complement rather than contradict the existing work in several ways. First, by being extracted directly from the FOMC language in the transcripts, *HDGap* contains novel information about policy stance, not captured by the policy surprises measured from the market reaction in narrow windows around FOMC announcements. Its effects accrue over the intermeeting period, not at the announcement as, indeed, the *HDGap* does not drive surprises on impact (Table II). Second, by relying on decomposition (12), our results pertain to asset price movements after controlling for the variation in short-rate expectations, while the previous studies focus on measuring the impacts of short-rate surprises on longer-duration assets at the time of the announcement.

V.B. Timing of the predictability during the intermeeting period

To break down the above intermeeting results, we trace out when the risk premium effect unfolds in the days following the announcement. We estimate the following regressions for different horizons h

$$\Delta_h y^{(10)}_{\tau_t+1,\tau_t+h}(\omega^{CRP}) = \alpha_h + \beta_h HDGap_t + \varepsilon_{\tau_t+1,\tau_t+h}, \tag{15}$$

where τ_t is the day of meeting t (the day of the announcement), and $\Delta_h y^{(10)}_{\tau_t+1,\tau_t+h}(\omega^{CRP})$ is the h-day yield change following meeting t announcement, defined in equation (13).

Figure 3 presents the slope coefficients β_h as a function of horizon h along with 95% confidence intervals. The result for $h = 0$ refers to the yield change from day before to the announcement day; results for $h > 0$ exclude the yield change on the announcement day. Given that the length of the interval between the FOMC meetings varies over time, we report results for $h \leq 33$ days, making sure that day τ_t+h does not include the day of the next announcement.[23] The intermeeting result is marked in Figure 3 with the horizontal line at -0.17 (taken from Table IV, Panel A, column *CRP*).

The pattern of coefficients across h shows that the predictability accumulates gradually over time, most steeply from around day five up to around day 18 after the announcement. The coefficient for $h = 0$ is insignificant in line with earlier findings in Table II and the idea that the policy stance *HDGap* is not disclosed by the FOMC statement at the announcement. The accumulating pattern of β_h suggests that information about policy stance reaches the market in the days after the announcement. Plausible channels through which such information can be revealed are the Fed officials' speeches and the FOMC minutes releases, which we analyze in more detail in Section VI.

V.C. Controlling for the known FOMC announcement effects

How does the above intermeeting predictability relate to the existing evidence in the literature that studies the impact of monetary policy surprises on asset prices? To highlight the novel dimension of our findings, in Table V we augment the horizon-specific regressions (15)

[23]The last reported regression for $h = 33$ is based on 73 observations; after this point the number of observations drops abruptly, and hence the results are not reported.

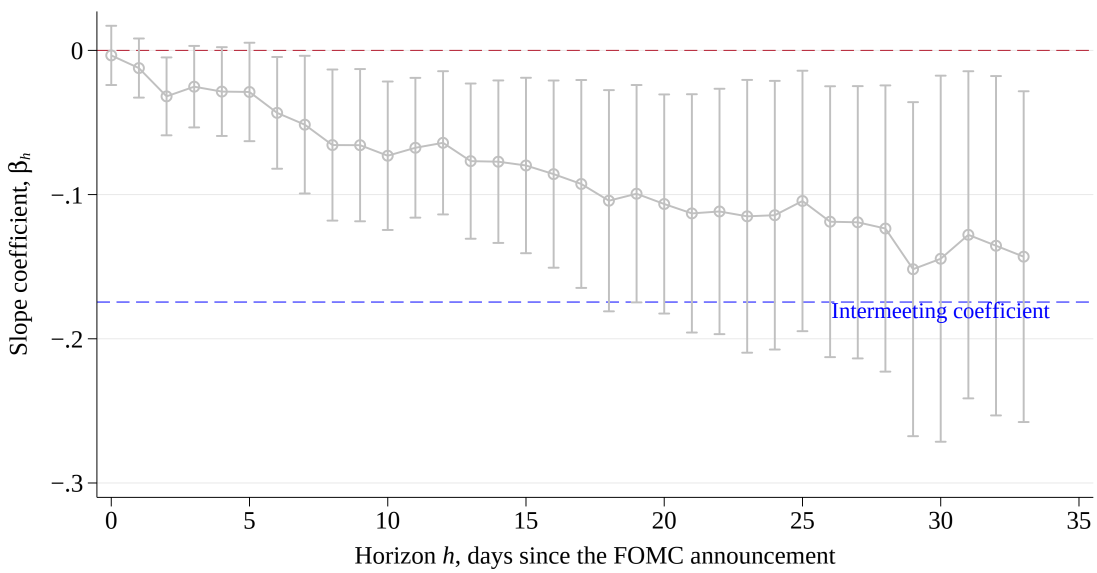

Figure 3. Timing of the *HDGap*-predictable variation in the common risk premium between meetings. The figure presents the slope coefficients from the predictive regression (15) across different horizons h, measured in days after the FOMC meeting. The coefficients are expressed as the fraction of the unconditional intermeeting ten-year yield volatility. The spikes indicate 95% confidence intervals obtained with robust standard errors.

with additional covariates available at the time of the Fed's announcement. The goal is to account for the monetary policy effects documented in prior studies.

First, we control for policy surprises in a narrow window around the FOMC announcement to document that our predictive results are separate from the known on-impact effects. Our regressions thus include the target and path monetary policy surprises from Swanson (2021), which reflect the immediate response of yields to the FOMC announcement. As part of our sample includes the period of unconventional monetary policy, we also add the LSAP factor identified by Swanson (2021).

Second, we distinguish the predictable variation in the risk premium from the ex-post predictability of monetary policy surprises due to investors' expectational frictions (deviations from the full-information rational expectations). Specifically, we control for macroeconomic and financial variables documented by previous studies to predict monetary policy surprises ex-post (Cieslak, 2018, Bauer and Swanson, 2023a, Miranda-Agrippino and Ricco, 2021). Bauer and Swanson (2023b) summarize this literature, proposing six predictors of monetary policy surprises, which we incorporate in our specification.[24] The variables are: (1) the latest non-farm payroll surprise before the FOMC announcement, (2) year-on-year log change on nonfarm employment growth, (3) log S&P500 return, (4) change in the yield curve slope, (5) log change in the Bloomberg Commodity Spot Price index, and (6) implied yield skewness from options on ten-year Treasury note futures as in Bauer and Chernov (2023). Variables (3), (4), and (5) are calculated in log changes from three months before to the day before the FOMC announcement.

Finally, including the Greenbook forecasts in the regressions accounts for potential information that the Fed reveals to the public about the economy (e.g., Nakamura and Steinsson, 2018). While *HDGap* is orthogonalized with respect to these forecasts to absorb the rule-driven policy stance, reintroducing Greenbooks here allows for a direct effect the revelation of the Fed's economic forecasts could have on target or path surprises included in the regression.

The first row of Table V reports the loading of the announcement-day ($h = 0$) yield change $\Delta y_{\tau_t}^{(10)}(\omega^{CRP})$ on $HDGap_t$, and the loadings of subsequent yield changes $\Delta_h y_{\tau_t+1,\tau_t+h}^{(10)}(\omega^{CRP})$ on $HDGap_t$ for $h > 0$. The loading for the entire intermeeting yield change is shown in the last column. The number of observations is slightly lower than in Table IV because the target and path surprises are not available before 1991. The presence of the controls does not affect the main finding: the internal policy stance continues to negatively predict risk premia in the intermeeting period with the economic magnitude unchanged from the univariate estimates in equation (15). The table also shows a significantly positive relationship between the risk premium and the path surprise, which is consistent with risk premia amplifying the policy decision on impact, as documented by Hanson and Stein (2015). However, the path surprise coefficient is insignificant beyond a short announcement window and a few days after, contrasting with predictability by *HDGap* which strengthens over the intermeeting period.[25]

[24] We download the data from Michael Bauer's website.

[25] The fact that the target surprise is insignificant is expected. Indeed, the risk premium news component is constructed to be orthogonal to the conventional monetary news driving the short end of the yield curve.

Dependent variable: $\Delta y_{\tau_t}(\omega^{CRP})$ for $h=0$ and $\Delta_h y^{(10)}_{\tau_t+1,\tau_t+h}(\omega^{CRP})$ for $h>0$

	$h=0$	$h=5$	$h=10$	$h=15$	$h=20$	$h=IM$
$HDGap_t$	0.000063	-0.043**	-0.098***	-0.10***	-0.11***	-0.16***
	(0.01)	(-2.26)	(-3.86)	(-2.95)	(-2.77)	(-3.21)
$TgtSurp_t$	-0.015	0.024	0.0068	0.022	0.063	0.098
	(-1.59)	(1.23)	(0.30)	(0.58)	(1.12)	(1.45)
$PathSurp_t$	0.048***	0.047**	0.050	0.047	0.052	-0.042
	(4.59)	(2.34)	(1.61)	(1.25)	(1.13)	(-0.82)
$LSAPSurp_t$	-0.15***	0.0031	-0.037	0.0066	-0.038	-0.056
	(-8.20)	(0.10)	(-1.12)	(0.15)	(-0.67)	(-0.80)
GB	Yes	Yes	Yes	Yes	Yes	Yes
BaSw	Yes	Yes	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.44	0.081	0.17	0.084	0.065	0.14
N	197	197	197	197	197	197

Table V. Predictability of common risk premia with additional controls. The table augments predictive regressions in (15) with additional controls. The first column ($h=0$) uses the announcement day yield change $\Delta y^{(10)}_{\tau_t}(\omega^{CRP})$ as the dependent variable. The last column ($h=IM$) uses the intermeeting yield change, $\Delta y^{(10)}_{t,t+1}(\omega^{CRP})$. In between, the horizon h is measured in days after the FOMC announcement. The controls include the high-frequency target, path, and LSAP surprises from Swanson (2021) measured on announcement day, as well as variables documented to predict monetary policy surprises, all available before the meeting ($t-$) and complied by Bauer and Swanson (2023b) (BaSw), and the same Greenbook forecast controls (GB) as in Table I. The output for BaSw controls and GB controls is suppressed for brevity. The dependent variable is expressed in units of intermeeting volatility of the ten year yield change, and the explanatory variables are standardized to have unit standard deviation. The sample period is from 1991:07 (when high-frequency surprises are available) through 2015:12. Robust standard errors are reported in parentheses.

V.D. Conditioning on the policy regime

The analysis so far focuses on documenting the negative relationship between policy stance and risk premia at high frequencies, showing statistically and economically significant predictability patterns. Figure 4 illustrates how these results accrue over our sample period in raw data. We juxtapose the cumulative sum of the *HDGap* (accumulated over all scheduled FOMC meetings) against the cumulative sum of the daily changes in the ten-year yield due to ω^{CRP} risk premium news (accumulated over all days in the sample). The graph illustrates a systematic negative relationship at low frequencies.

To further understand in which policy environment the relationship between the policy stance and the risk premium is particularly strong, we condition the predictive regressions on the policy regimes. There are multiple ways to slice the sample. For simplicity, we define a dummy variable $D_t^{\text{cut}}=1$ ($D_t^{\text{hike}}=1$) to indicate the cutting (hiking) episode as one, in which the Fed has cut (hiked) rates in any of the meetings $t-2$ to t (current). Additionally,

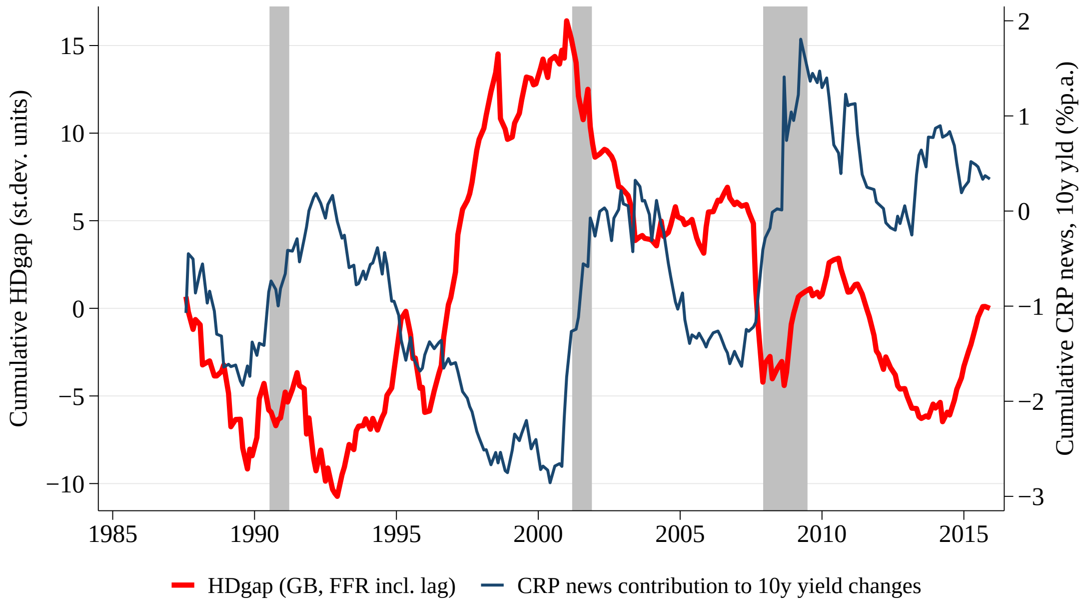

Figure 4. Low-frequency variation in the policy stance *HDGap* and the ten-year yield due to the common risk premium. The figure superimposes the cumulative sum of *HDGap* (defined in equation (9)), accumulated over all scheduled FOMC meetings against the cumulative sum of the daily changes in the ten-year yield due to the ω^{CRP} risk premium news (accumulated over all days in the sample).

we define an action episode $D_t^{\text{act}} = 1$ as one in which either a cut or a hike has occurred in any of the meetings t to $t-2$. The complements of these sets, no-cut, no-hike, and no-action, respectively, are when the dummy variables take the value of zero.

Table VI presents the predictive regressions estimated on the meeting subsets. The explanatory variable is the *HDGap*. Results using the raw *HD* with controls to flexibly account for any potential changes in the rule component of stance across episodes are qualitatively unchanged and are included in Appendix Table A-2.

Column (1) of Table VI contains the results for all meetings, corresponding to the baseline specification in Table IV, Panel B. The subsequent columns reveal that the policy stance predicts premia negatively in each subset of meetings. This is consistent with the relationship not being driven by a few isolated episodes. However, comparing columns (2) and (3), the economic significance of the predictability is twice as strong in those periods when the Fed has not explicitly acted by changing rates. In the "no-act" region, a one-standard-deviation more hawkish stance predicts a reduction in risk premium equivalent to 28% of the unconditional

Dependent variable: Intermeeting yield change, $\Delta y_{t,t+1}^{(10)}(\omega^{CRP})$

	(1) All	(2) Act	(3) No-Act	(4) Cut	(5) No-Cut	(6) Hike	(7) No-Hike
$HDGap_t$	-0.17***	-0.14***	-0.28**	-0.099*	-0.23**	-0.15**	-0.17***
	(-3.52)	(-2.79)	(-2.00)	(-1.67)	(-2.56)	(-2.06)	(-2.97)
$\bar{R}^2$	0.062	0.063	0.064	0.028	0.061	0.041	0.055
N	227	125	102	70	157	55	172

Table VI. Policy regimes. The table reports the relationship between $HDGap_t$ at meeting t, and the $\Delta y_{t,t+1}^{(10)}(\omega^{CRP})$ risk premium in the subsequent intermeeting period from t to $t+1$, conditioning on different policy environments. We define an episode as "Cut", "Hike" or "Act" as one in which either a cut, a hike, or either cut or hike, has occurred in any of meetings $t, t-1, t-2$. Column "All" presents the baseline result from Table IV for the full sample. All variable definitions remain as in Table IV. The sample period is 1987:8–2015:12. Robust t-statistics are in parentheses.

intermeeting ten-year yield volatility, compared to 14% in the "act" region.[26] Subsequent columns show that the economic and statistical significance of the coefficient is especially large outside of the direct cutting episodes ("no-cut" region, column (5)). These results align with Figure 1, which indicates that *HD* adjusts relatively swiftly even while the actual policy rate may remain unchanged. The policy stance starts to display a visibly more hawkish tilt after periods of rapid easing when the actual policy rate stays low.

V.E. Robustness: Alternative risk premium measures

For robustness, we replicate our results using alternative measures of the Treasury premium following the methodology of Kim and Wright (2005). The estimates are regularly updated by the Federal Reserve Board[27] and, importantly for our purposes, are available at the daily frequency for maturities between one and ten years. Kim and Wright (2005) estimate a no-arbitrage term structure model to decompose nominal yields into premium and short-rate expectations components without further separating the news types driving each component. As such, the analysis is at a more aggregate level compared to our baseline results. We use two risk premium measures provided by Kim and Wright (2005): the term premium on the ten-year yield and the forward premium on the instantaneous ten-year forward rate. We

[26] The scaling of coefficients by the unconditional intermeeting volatility of yield changes is the same across the various sample splits.

[27] The data is available at `https://www.federalreserve.gov/data/yield-curve-tables/feds200533.csv`.

also compute short-rate expectations at one- and ten-year horizons as the yield minus the corresponding term premium.

In Table VII, we regress intermeeting changes in these objects from t to $t+1$ on the $HDGap_t$ variable. As before, we standardize the regression coefficients by the overall volatility of the intermeeting ten-year yield change. Kim and Wright (2005) data are available starting from January 1990, and thus the sample is a bit shorter than in the previous regressions. Columns (1) and (2) display the predictability of the ten-year term premium and forward premium changes. Both coefficients are negative and significant, implying that a one-standard-deviation more hawkish stance predicts a decline in the term (forward) premium equivalent to 13% (16%) of intermeeting ten-year yield volatility. This magnitude is in line with the baseline estimate of 17% in Table IV for the common risk premium component. Columns (3) and (4) also show that *HDGap* does not significantly predict short-rate expectations. The coefficients on the one-year-ahead expectations hypothesis term is positive, consistent with a more hawkish stance leading to an update of the expected short-rate path, but it is insignificant. Finally, column (5) presents the results for the total intermeeting ten-year yield change. An increase in *HDGap* forecasts a decline in the ten-year yield, with a coefficient comparable to the term premium effect. The estimate is less precise due to the confounding effects of short-rate expectations and other news uncorrelated with *HDGap*.

Overall, the Kim and Wright (2005) decomposition confirms our main conclusion so far that the primary effect of the policy stance operates via the risk premium channel, with hawkishness predicting a lower term premium in the intermeeting period.

VI. Disseminating the FOMC stance in the intermeeting period

We now investigate the Fed's communication through which the internal policy stance could be revealed to the public after the meeting. We piece together the information conveyed via the main official channels: the FOMC statements, the Fed officials' speeches, and the FOMC minutes releases. We then trace out the effect of the intermeeting communication on the risk premium behavior.

	Premium $\Delta RP_{t,t+1}$		Expect hypoth $\Delta EH_{t,t+1}$		Overall
	(1)	(2)	(3)	(4)	(5)
	$\Delta Term10y$	$\Delta Fwd10y$	$\Delta EH1y$	$\Delta EH10y$	$\Delta y^{(10)}_{t,t+1}$
$HDGap_t$	-0.13***	-0.16***	0.10	-0.022	-0.15**
	(-3.12)	(-3.30)	(1.53)	(-0.62)	(-2.07)
R^2	0.050	0.051	0.017	0.0024	0.024
N	208	208	208	208	208

Table VII. Predictability of the term premium and short-rate expectations by the policy stance. The table reports the predictability of the term premium and short-rate expectations changes by the policy stance, using the yield curve decomposition from Kim and Wright (2005). The dependent variables are the intermeeting changes (between meeting t and $t+1$) in the ten-year yield term premium (column (1)), ten-year forward premium (column (2)), short-rate expectations at one- and ten-year horizons (columns (3) and (4)), and overall ten-year yield (column (5)). Slope coefficients are expressed in units of volatility of the intermeeting ten-year yield changes. Robust standard errors are in parentheses. The regressions are estimated at the frequency of the FOMC meetings from 1990:02 through 2015:12.

VI.A. Public communication sources

The Fed began providing after-meeting decision statements in 1994, initially only when the policy rate was changed, and from 2000, after every scheduled FOMC meeting. Statements contain the policy decision and a succinct description of the rationale behind it. Before 2005, the FOMC minutes were published on average 47 days after the meeting (i.e., on average three days after the next meeting); from 2005, the publication date shifted to three weeks after the meeting (15 business days, on average). Minutes are significantly longer than statements, typically 7–10 pages, and, according to the Federal Reserve's website, are designed to "record all decisions taken by the Committee with respect to [the] policy issues and explain the reasoning behind these decisions." While the minutes in this format are available from 1993, due to the availability of statements, we start our analysis of these texts in 1994.

An important component of the Fed communication are the speeches of the Fed officials. The FOMC members commonly use speeches to provide updates on policy views between the meetings. Such communication becomes more constrained in the days before the announcement during the so-called blackout period. As per the Federal Reserve Board guideline, during this period the FOMC members are not supposed to comment on monetary policy or the economic outlook. Nevertheless, some speeches still occur in proximity to the meeting.[28]

We collect the texts of the statements, speeches, and minutes. We then estimate document-specific *HD* by applying the same approach to measure policy stance as for the transcripts, resulting in statement-*HD*, minutes-*HD*, and speeches-*HD* variables. Since minutes are structured to reflect the process of deliberations during the FOMC meeting, we use only those sections in the minutes that summarize the views of the FOMC members and their policy decision. In all cases, we express the *HD* score as a fraction of the total number of tokens in the document.

VI.B. Do FOMC statements and minutes reveal the internal policy stance in the FOMC meeting?

We start by investigating to which extent FOMC statements and minutes reveal the policy views expressed in the meeting. Minutes and statements are available at the meeting frequency and, by design, should synthesize the policy views of the committee during the meeting. Table VIII summarizes the common content across these sources and the meeting transcripts. Given their chronology, we predict the content of the statements with the transcripts, and the content of minutes with the transcripts and statements, all of which are associated with the same meeting t. In our previous results, we have established that it is the residual *HDGap* that predicts risk premium variation in the intermeeting period. The relevant question is whether and to which extent statements and minutes convey this residual policy stance dimension. To understand the source of common variation in *HD* measures from different sources, we therefore report estimates with and without controls for the Greenbook forecasts and the policy rate in the regressions. In regressions with controls we include the same variables as those in Table I.

The results in Table VIII indicate that statements reveal only part of the policy stance emerging from the meeting. While the statements-*HD* is positively correlated with the transcripts-*HD*, the correlation weakens once we include the Greenbooks and the policy

[28]The blackout period used to stretch from the week before an FOMC meeting to the Friday of the week of the meeting (Meyer, 2009). The current policy, "FOMC Policy on External Communications of Committee Participants," adopted in 2011, stipulates that the blackout typically begins ten days before the meeting and lasts until the day after the meeting.

Dependent variable: HD_t in FOMC statements and minutes (standardized coefficients)

	Statements-HD_t		Minutes-HD_t		
	(1)	(2)	(3)	(4)	(5)
Transcripts-HD_t	0.500***	0.223*	0.768***	0.534***	0.462***
	(5.56)	(1.88)	(10.34)	(6.37)	(4.61)
Statements-HD_t					0.145*
					(1.82)
Controls	No	Yes	No	Yes	Yes
$\bar{R}^2$	0.24	0.42	0.59	0.66	0.70
N	146	146	176	176	146

Table VIII. Information about policy stance in transcripts, statements, and minutes. The table reports regressions of statements-*HD* and minutes-*HD* on transcripts-*HD*. The sample is 1994:02–2015:12, starting when the statements were first released. As not all meetings have a statement in the earlier years, we treat these observations as missing. The regression coefficients are standardized. Robust standard errors are in parentheses. The controls are the same as in Table I and include the Greenbook forecasts and current and lagged FFR.

rate (columns (1) and (2)). This is perhaps not surprising given that statements are short, focus mainly on explaining the current policy decision and economic outlook, and hence are unlikely to disclose the entire prospective deliberations of a meeting. More importantly, it is also consistent with the fact that the risk premium predictability by the transcripts-*HD* does not accrue immediately at the announcement, and as such, absent significant information processing frictions by market participants, should not be driven by the information in the statement. In contrast to statements, the minutes display a relatively tighter link with the transcripts, and this link stems in large part from the gap component of the stance (columns (3) and (4)), i.e., the portion unexplained by the Greenbooks and the policy rate. A one-standard-deviation increase in the transcripts-*HD* is associated with 0.5-standard-deviations increase in the minutes-*HD*, in the regression with controls (column (4)). Finally, column (5) confirms that the common content of the minutes and the transcripts does not simply reflect the information coming out via statement at the FOMC announcement.

From the temporal pattern of predictability in Table V and Figure 3, one can expect that a significant share of information about the internal policy stance gets gradually revealed in the first three weeks after the announcement. In Figure 5, we superimpose the previous predictive coefficient β_h on *HDGap* from Figure 3 (dropping confidence intervals for readability) with the timing of the minutes and speeches during the intermeeting period. While the minutes partially reflect the internal policy stance, the fact that β_h drifts before their publication

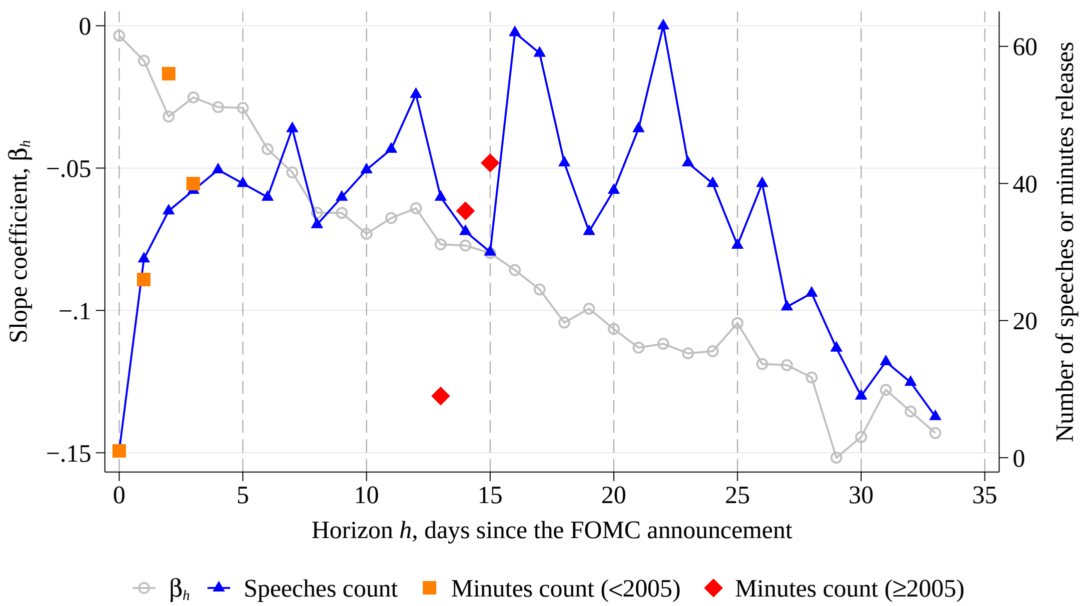

Figure 5. Timing of the Fed's communication during the intermeeting period. The figure summarizes the timing of the Fed communications via public speeches of the chair, vice chair and the governors, and minutes releases. The counts of public communication events (right axis) falling on a given day are superimposed against the estimates of predictive β_h coefficients (left axis) from Figure 3.

but does not change dramatically at the time of publication indicates that the markets learn about the stance before the minutes come out.[29] The frequency of speeches increases right after the FOMC meeting, suggesting speeches are a potential channel through which information gets revealed.

In Table IX, we augment the predictive regressions of $\Delta y^{(10)}_{t,t+1}(\omega^{CRP})$ with the policy stance in the minutes and statements. For reference, column (1) reproduces the baseline predictability using the transcripts-HD in the 1994–2015 sample, with controls. Column (2) shows that on a stand-alone basis the coefficient on the minutes-HD is negative, in line with a more hawkish stance being associated with lower premia, although the economic and statistical significance is about half of that for the transcripts-HD. If the predictability indeed originates from the internal policy stance, and if the stance is only partially or noisily revealed via the minutes, we expect the minutes-HD to be fully subsumed by the transcripts-HD. Column (3) confirms this intuition. Finally, column (4) additionally shows that statements do not contribute to

[29]This is naturally true in the earlier part of the sample when minutes were released after the next meeting. The squares in the graph in the first few days after the FOMC meeting stem from the pre-2005 period marking the minutes releases associated with the previous FOMC meeting.

Dependent variable: $\Delta y^{(10)}_{t,t+1}(\omega^{CRP})$ over the intermeeting period, scaled by $\sigma(\Delta y^{(10)}_{t,t+1})$

	(1)	(2)	(3)	(4)
Transcripts-HD_t	-0.22***		-0.23**	-0.25**
	(-2.74)		(-2.41)	(-2.32)
Minutes-HD_t		-0.100	0.022	0.033
		(-1.28)	(0.25)	(0.31)
Statements-HD_t				0.079
				(1.21)
GB+FFR	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.15	0.11	0.14	0.15
N	176	176	176	146

Table IX. Predictability of the common risk premium with the content of FOMC statements and minutes. The table presents the predictive regressions of $\Delta y^{(10)}_{t,t+1}(\omega^{CRP})$ over the intermeeting period with HD_t measures constructed from texts of FOMC statements, minutes, and transcripts. The sample period in columns (1)–(3) is 1994:02–2015:12, where both minutes-*HD* and transcripts-*HD* are available. In column (4) we only use meetings for which the FOMC released a statement over the 1994–2015 sample. Robust standard errors are in parentheses.

the predictability, supporting the interpretation that the results are not driven by the policy announcement itself.

VI.C. The role of speeches in conveying the policy stance

We now turn to the question of whether the policy stance could be transmitted to the public domain via the speeches of the Fed officials. We construct the *HD* score for each speech, again following the same approach as for the transcripts. Thus, the speech-level *HD* is expressed as the balance of the hawkish and dovish phrases relative to the overall length of the document. Our analysis covers speeches of the Fed chair, vice-chair and governors, obtained from the Federal Reserve website, for a total of 1594 unique documents. The sample runs from 1996:06 to 2022:09. There are 1361 days on which a speech has been recorded; we assign speeches occurring on the weekend to the next business day. In cases when two Fed officials gave a speech on the same day, we average the individual *HD* scores on that day to obtain a daily measure. Overall, the speeches-*HD* is available on 1326 days.[30]

[30]We also collect data of speeches of the regional Fed presidents from websites of the regional reserve banks. The coverage of these data is significantly less complete, and therefore we do not include regional president speeches in the analysis.

The information extracted from speeches is bound to be noisy. Speeches present a heterogenous set of documents covering a variety of subjects beyond the current economic and policy outlook. While their distribution over the intermeeting period allows us to conduct the analysis at a higher frequency than the frequency of the scheduled FOMC meetings, the timing of when the markets fully absorb the speeches' content is unclear. The speaking events may be scheduled outside of the market trading hours and the implications of a speech may take some time to be processed by the market participants.

To account for these issues, in Table X we use the speech-$HD_{\tau_i \in (t,t+1)}$ measured on day τ_i in the intermeeting period after meeting t to forecast the risk premia over different windows around the day of the speech, $\tau_i \in (t, t+1)$, $\Delta y^{(10)}_{\tau_{i+p},\tau_{i+h}}(\omega^{CRP})$. Column (1) in Panel A shows no effect of speeches HD in the two-day window from one day before to one day after the speech ($p = -1, h = 1$). Subsequent columns study the following days, from one day after the speech ($p = 1$) up to seven days ahead ($h = 7$). The coefficients in columns (2) through (6) are negative and increase in absolute value and statistical significance as the window expands. Their magnitude remains similar beyond day seven (not reported), implying that the effect does not mean-revert in the following days, but as expected, the statistical significance gradually weakens. The coefficient of -0.03 in the last column of Panel A means that a one-standard-deviation increase in the speech hawkishness reduces the risk premium equivalent to 3% of the intermeeting ten-year yield volatility. The economic magnitudes are naturally smaller than the overall intermeeting results reported earlier, given the shorter predictive window. Scaling up the estimated coefficient to adjust for the window size, with the median length of the FOMC cycle equal to 33 days, implies that around 16.5% of the intermeeting yield volatility could be accounted for by the stance in the speeches. This number is comparable to 19% estimated in Table IV, Panel B, using transcripts-HD. Thus, the stance communicated via speeches could in principle account for the intermeeting risk-premium effect documented in earlier sections.

In panel B of Table X, we explore additional specifications and the robustness. In column (1), we focus only on speeches between day two and day 20 after the meeting, dropping those days that occur close to the FOMC meeting during the blackout period. The coefficient strengthens to -0.034, illustrating that predictable variation in risk premia mostly happens over this interval, in line with Figure 5. Column (2) includes the Greenbooks and policy rate controls and shows, again, that it is the residual information about the policy stance that drives our results (all controls are measured as of the time of the last meeting, t).

If speeches indeed confer information about the internal policy stance developed during the meeting, speeches-HD should drive out the transcripts-HD as a predictor of risk premia in a joint specification. We test this hypothesis in column (3), by including transcripts-HD for meeting t for each day in the intermeeting period for which we have the speeches-HD information, speeches-$HD_{\tau_i \in (t,t+1)}$. We find that the transcripts-HD indeed becomes marginally statistically insignificant in the joint regression, although its economic magnitude is comparable to that of the speeches-HD. The signal in the speech-based policy stance is noteworthy as we likely only capture a fraction of actual information flows. Abstracting from noise inherent in the speech-based measures, even a comprehensive collection of speeches is unlikely to entirely span all the information about internal deliberations that policymakers reveal to the public because such communication takes place via other channels (including informal channels).

VII. Interpreting the results

To interpret the link between the forward-looking policy stance via *HDGap* and the inter-meeting risk premia, we return to the illustration from Section II, focusing on the perceived Fed mistakes as the source of monetary policy shocks, as entertained by Caballero and Simsek (2022b,a).[31] Equation (7) shows that the uncertainty induced by the marked-perceived Fed mistakes drives the risk-premium variation. However, it does not rationalize the directional effect whereby the Fed's increased forward-looking dovishness (hawkishness) would induce a risk-premium increase (decline). Below, we propose an argument based on the perceived Fed's inflation-fighting credibility to explain that asymmetry.

We continue to assume ϕ_x, ϕ_π, x_t, and π_t represent the market assessment of those concepts, as in equation (3), but abstract from many real-life aspects of dynamic environments such as learning. We label with the cb superscript the market's perception of the central bank measure; except for the interest rate i_t with which we denote the Fed-chosen short rate. The

[31] Caballero and Simsek (2022b,a) study the consequences of the disagreement about the state of the economy. We additionally highlight the disagreement about the appropriate policy reaction function, i.e., the coefficients with which the Fed responds to the macroeconomy, as the source of market-perceived policy mistakes.

Dependent variable: $\Delta y^{(10)}_{\tau_i+p,\tau_i+h}(\omega^{CRP})$

Panel A. Different windows, (p, h) days, no controls

	(1) (-1,1)	(2) (1,2)	(3) (1,3)	(4) (1,4)	(5) (1,5)	(6) (1,6)	(7) (1,7)
Speeches-$HD_{\tau_i \in (t,t+1)}$	0.00042	0.0019	-0.0043	-0.010	-0.019**	-0.025***	-0.030***
	(0.08)	(0.53)	(-0.69)	(-1.34)	(-2.32)	(-2.68)	(-3.07)
R^2	0.0000060	0.00028	0.00070	0.0025	0.0065	0.0082	0.010
N	1326	1327	1326	1326	1326	1326	1326

Panel B. Robustness, window (1,7) days

	(1) Narrow	(2) Contr	(3) +Tr-HD	(4) +Min-HD
Speeches-$HD_{\tau_i \in (t,t+1)}$	-0.034***	-0.033**	-0.031**	-0.033**
	(-2.82)	(-2.16)	(-2.00)	(-2.06)
Transcripts-HD_t			-0.035	
			(-1.58)	
Minutes-HD_t				-0.028
				(-1.29)
GB+FFR	No	Yes	Yes	Yes
R^2	0.014	0.042	0.049	0.047
N	903	1013	1013	1013

Table X. Within intermeeting period evidence using speeches-*HD*. The table presents predictability of the common risk premium with speeches-*HD* during the intermeeting period. Panel A considers different widows over which the ω^{CRP} news effect on the ten-year yield is measured. In column (1), (-1,1) denotes interval from the day before the speech to day after the speech; subsequent columns are for intervals after the speech, from days after up to seven days. Panel B considers robustness of the results for the (1,7)-day interval (corresponding to last column in Panel A). Column (1), "Narrow", uses only days 2 to 20 after the meeting, columns (2)–(4) include the Greenbook controls and the current and lagged FFR. The sample period in Panel A covers days with speeches from 1996:06 through 2022:09. The sample period in Panel B is a subset of these days, with columns (2)–(4) estimated from 1996:06 through 2015:12 as in the main analysis. HAC t-statistics (in parentheses) use eight lags (days) to account for potential overlap in the dependent variable.

Fed is seen as setting its policy according to $i_t = \phi^{cb}_{x,t} x^{cb}_t + \phi^{cb}_{\pi,t}\pi^{cb}_t$. We denote the market's perceived optimal interest rate with i^{mkt}_t. Thus, $i_t = i^{mkt}_t + \varepsilon_t$, where $i^{mkt}_t = \phi_x x_t + \phi_\pi \pi_t$.

We consider two sources of differences between the Fed and the market. First, we assume disagreement over a specific realization of the demand shock, η_t:

$$\eta^{cb}_t = \eta_t + \breve{\eta}_t, \tag{16}$$

where $\breve{\eta}_t$ represents demand shock mis-judgements by the Fed, in the eyes of market participants, with $E(\breve{\eta}_t) = 0$. Given the aggregate IS equation (1), the demand shock disagreement implies different assessments of the output gap, $x_t^{cb} = x_t + \breve{\eta}_t$.

Second, we assume potential disagreements in the reaction function coefficients. For simplicity, at date t, the market and the Fed deem the same output coefficient as appropriate ($\phi_x = \phi_{x,t}^{cb}$), but the market believes that the Fed's inflation-fighting credentials, reflected in $\phi_{\pi,t}^{cb}$, may vary over time. We model the difference in the optimal inflation reaction as:

$$\phi_{\pi,t}^{cb} = \phi_\pi + \breve{\phi}_{\pi,t}, \tag{17}$$

where $\breve{\phi}_{\pi,t}$ is the central bank deviation from the market.[32]

With the setup above, even though the Fed sets i_t without introducing policy randomness, market participants perceive monetary policy errors as arising from

$$\varepsilon_t = \underbrace{\phi_x \breve{\eta}_t}_{\text{shock assessment error}} + \underbrace{\breve{\phi}_{\pi,t}\pi_t}_{\text{reaction function error}}. \tag{18}$$

As seen in Section II, those errors become a driver of economic fluctuations *in the eyes of the market*. Market participants face an identification challenge: they observe i_t chosen by the Fed, but they don't perfectly observe the Fed's policy inputs and, thus, assess their values at $\phi_{\pi,t}^{cb}$ and x_t^{cb}.

Equation (18) gives content to the notion of monetary shocks and, via equation (7), allows to tie the uncertainty induced by those shocks, $\sigma_{\varepsilon,t}^2 = Var_t(\varepsilon_{t+1})$, to the common risk premium component affecting stocks and bonds. The market perception of (potentially time-varying) uncertainty stemming from future policy errors drives the risk premium. Let $V(z) = \sigma_z^2$ be the conditional variance of variable z. To keep expressions tractable, we assume that market beliefs of disagreements $(\breve{\phi}_{\pi,t}, \breve{\eta}_t)$ are uncorrelated with each other *and* economic conditions,[33] obtaining:

[32] Sastry (2022) studies disagreement about monetary policy and finds evidence for asymmetric beliefs about the policymaker's reaction to public signals, and asymmetric confidence in those signals. He finds less support for the Fed's private information channel.

[33] $V_t(\varepsilon_{t+1}) = V_t(\phi_x\breve{\eta}_{t+1}) + V_t(\breve{\phi}_{\pi,t+1}\pi_{t+1}) + 2Cov_t(\phi_x\breve{\eta}_{t+1}, \breve{\phi}_{\pi,t+1}\pi_{t+1})$; our assumptions give us $Cov_t(\phi_x\breve{\eta}_{t+1}, \breve{\phi}_{\pi,t+1}\pi_{t+1}) = 0$ and $E_t(\breve{\eta}_{t+1}) = 0$.

$$V_t(\varepsilon_{t+1}) \equiv \sigma^2_{\varepsilon,t} = (\phi_x)^2 V_t(\breve{\eta}_{t+1}) + V_t(\breve{\phi}_{\pi,t+1}) V_t(\pi_{t+1}) + \left[E_t(\breve{\phi}_{\pi,t+1})\right]^2 V_t(\pi_{t+1}). \qquad (19)$$

Equation (19) decomposes the sources of the market-perceived uncertainty σ^2_ε induced by policy.

Focusing on the role of the Fed's inflation-fighting credentials via $\breve{\phi}_\pi$, assume that most of the time, the market sees the Fed as being appropriately hawkish toward inflation (i.e., $\phi^{cb}_\pi = \phi_\pi$), but the market also worries, to a varying degree over time, that the Fed could become too dovish ($\phi^{cb}_\pi = \phi_\pi - \Delta$, $\Delta > 0$) or too hawkish ($\phi^{cb}_\pi = \phi_\pi + \Delta$).[34] We capture this idea with $\breve{\phi}_\pi$ that follows as a three-state mixture model:

$$\breve{\phi}_{\pi,t+1} \sim \begin{cases} +\Delta & \text{w.p. } q_t \\ 0 & \text{w.p. } 1 - p_t - q_t \\ -\Delta & \text{w.p. } p_t \end{cases} \qquad (20)$$

and p_t (q_t) is the probability attached to the Fed becoming too dovish (hawkish). Reflecting our view that these concerns are tail risks on the Fed's type, we assume that $q_t, p_t << 0.5$, and also assume that $p_t > 0$ and $q_t > 0$ beliefs do not occur at the same time. A positive probability $p_t > 0$ captures the fact that the market assesses an excessively dovish switch as relatively more likely, in line with the post-Volcker experience.

Given the first two moments of $\breve{\phi}_\pi$,

$$E_t(\breve{\phi}_{\pi,t+1}) = (q_t - p_t)\Delta \quad \text{and} \quad V_t(\breve{\phi}_{\pi,t+1}) = \Delta^2 \left(p_t(1-p_t) + q_t(1-q_t) + 2q_tp_t\right), \qquad (21)$$

the terms $V(\breve{\phi}_\pi)$ and $\left[E(\breve{\phi}_\pi)\right]^2$ in (19) both increase in the probability of a Fed type switch (on the domain $q_t < 0.5$ and $p_t < 0.5$), raising σ^2_ε and, by extension, also the common risk premium via equation (7). Thus, a hawkish signal has an ambiguous effect, depending on the type of market concerns. If a hawkish signal decreases the probability of a too-dovish mistake, by reducing p_t, the common risk premium declines. If the hawkish signal instead increases the probability of a too-hawkish mistake, by increasing q_t, the common risk premium rises. Thus, our empirical results are consistent with market worries focusing

[34]The parameter Δ could differ between hawkish and dovish concerns but for simplicity, we keep the market's concerns symmetric.

primarily on the Fed shifting toward a too-dovish stance over the 1987–2015 sample. Over this period of relatively easy monetary policy, the Fed repeatedly surprised the public by keeping rates lower for longer than the public expected (Cieslak, 2018, Schmeling, Schrimpf, and Steffensen, 2022). As such, communication that clarifies the Fed's anti-inflation stance, would lower p_t via commitment to tough action if inflation takes off. This mechanism can explain the negative association between the forward-looking policy stance and risk premia we document.

Of course, in practice, policy uncertainty is likely to stem from multiple sources. Equation (19) shows that even when the market is confident about the Fed's inflation-fighting credentials ($V(\breve{\phi}_\pi) = 0$ and $E(\breve{\phi}_\pi) = 0$ in the limit of $p_t = 0$), the shock assessment error term, $V(\breve{\eta})$, remains as a possible driver of policy uncertainty and premia. At different times, the market may be more or less convinced of the Fed's assessment of the economy. For example, suppose output declines and the Fed-perceived weakness in demand leads to communication of an easier policy stance than the market expected; at the same time, the market thinks the output decline is partly (or entirely) due to a negative productivity shock. If the market's view is vindicated, the Fed would have moved in the wrong direction, opening a negative real-rate gap and increasing output gap and inflation. While finding out which view prevails takes time, the market's concerns about assessment errors raise the risk premia in the near term via an increased σ_ε^2.

Prolonged periods of low interest rates can contribute to investors' concerns about the Fed overstimulating the economy, raising risk perceptions regarding the future policy path and, consequently, risk premia. Our results suggest that the Fed can influence uncertainty during these periods by expressing its readiness to stabilize inflation and the output gap, should the need arise. We capture this as additional hawkishness in the language used during FOMC meetings. Such language can reassure the market that any policy mistakes are unlikely to persist, signaling that the Fed is closely monitoring signs of error and is prepared to quickly reverse course. The second half of the 1990s, a period known as the productivity miracle, serves as an illustration of this mechanism. Faced with a booming economy, Greenspan's Fed resisted tightening rates due to its belief in an expanded productive capacity of the economy while reassuring the public that the Fed would correct any potential errors (see Gorodnichenko and Shapiro (2007) for an analysis of this period). Figure 4 indeed shows that the increasing hawkish policy stance captured by *HDGap* from the mid to late 1990s coincided with declines in the common premium, indicating that without the Fed's communication of its forward-looking stance, risk premia would have been higher. In contrast, episodes when the Fed adopted a strongly dovish stance (as seen in the early 1990s, 2000s, and in 2007 before the financial crisis) can lead to increases in risk premia, suggesting that the markets may disagree with the Fed's negative assessment of the economy and may worry about impending policy mistakes.

VIII. Conclusions

We establish a link between the policy stance revealed through internal FOMC deliberations, the Fed's public communication of that stance, and asset price reactions in financial markets. The Fed's private deliberations contain forward-looking information about policymakers' views and intentions that are not subsumed by the typical estimates of the policy rule using the Fed's macroeconomic forecasts, the current policy rate, or the language in the FOMC statements. Measuring the stance from the policymakers' language in the policy round of the FOMC meeting, we show that it has strong predictive power for risk premia on stocks and bonds over the intermeeting period that follows the announcement. An increase in the FOMC members' relative hawkishness predicts a risk premium reduction, and an increase in relative dovishness predicts risk premium increase over the intermeeting period. Whereas the stance component impacting premia does not appear to be revealed by the statements accompanying the scheduled FOMC announcements, the FOMC members' speeches present a vital conduit through which information reaches the public domain between meetings. The effect of stance on risk premia accrues particularly in periods when the Fed has not acted directly on policy rates, emphasizing the importance of communication in these periods.

The results indicate that the Fed's communication of strongly dovish policy intentions is not unambiguously perceived as beneficial by financial markets and can induce higher risk premia if the markets' and the Fed's views are misaligned. By extension, the Fed's communication of forward-looking hawkishness, by way of reassuring the public about the Fed's readiness to stabilize inflation and the economy, can prevent risk premium increases. The findings highlight that policymaking happens continuously outside of the narrow FOMC announcement window, helping quantify the Fed's overall effect on financial conditions and the channels through which this occurs.

Our findings have implications for the communication design as part of a monetary policy strategy. Policymakers recognize the importance of effective communication, and are aware of the risks associated with communication failures. Monetary policy is "98% talk and only 2% action" and "cost of sending the wrong message can be high" (Bernanke, 2015). Indeed, with term premia involved, policymakers' "grip on the steering wheel is not as tight as it otherwise might be" (Stein, 2013). Historically, the Fed's policymaking was guided by the risk management approach, as prominently summarized by Greenspan (2004). Risk management considerations were also central to Chairs Bernanke's and Yellen's policymaking (Bernanke, 2007, Yellen, 2017). Risk management involves recognizing different possible scenarios for the economy and for the path of monetary policy. Communicating forward-looking policy stances—that different-from-current policy may be needed should the need arise—can thus be seen as part of that policymaking approach. Our results indicate that such communication has a first-order effect on the financial market premia and, therefore, should become a prime consideration in the Fed's design of its strategy.

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Internet Appendix

Tough talk: The Fed and the Risk Premium

(Not for publication)

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A. Internal policy stance construction

A.1. The structure of FOMC deliberations in the transcripts

The transcripts contain a fully attributed, statement-by-statement account of meetings. During our sample, a total of 75 unique FOMC members appear in the transcripts in at least one meeting. The typical composition of the FOMC consists of 19 members, of which twelve are regional Fed Presidents and seven are Governors. A number of Fed staff economists also participate in the meetings.

The two core parts of the meeting are the economy round and the policy round. The sectioning of meetings has been performed by manually by us. One outlier in meeting structure is the September 2009 meeting, for which the policy and economic rounds were merged into one round. In this case, we manually classify sentences as either belonging to the economy round or the policy round. For further details on the structure of FOMC meetings and the composition of the committee, see Hansen, McMahon, and Prat (2018).

The economy round makes up 43% of all sentences in the transcripts. The Fed staff economists first present their forecasts of economic activity (contained in Greenbooks) along with supporting contextual information. Each FOMC member in turn presents his or her views on economic developments. These developments can be discussed in the context of alternative interest rate paths, but FOMC members do not advocate for particular policy choices at this stage.

The policy round accounts for 24% of all sentences. It begins with the staff laying out different policy alternatives, after which FOMC members debate on which alternative to adopt before proceeding to a final vote. This section also includes a discussion of the public statement released along with the policy announcement.

The policy round is main source from which we measure the policy stance.

A.2. Algorithm for constructing HD

We now describe the algorithm following Cieslak, Hansen, McMahon, and Xiao (2023) for constructing the measures of hawkishness and dovishness used in the main text. For all meetings, we measure generic monetary policy stance using the procedure detailed below. For meetings conducted in 2009 and onwards, we additionally measure preferences over the size of asset purchases as part of the Fed's quantitative easing program. The sentences we consider consist of those in the policy round since that is the section of the meeting pertaining to the articulation of preferences.

Generic monetary policy preferences. We classify each sentence as pertaining to monetary policy stance:

1. If it contains any phrase in the set {federal funds rate, funds rate, target rate, policy rate, interest rate, taylor rule, alternative a, alternative b, alternative c, directive, language, statement, symmetry, asymmetry, hawkish, dovish}.

2. OR if 'policy' is in the sentence and NOT any phrase in the set {fiscal policy, supervisory policy, public policy, budget policy, tax policy, housing policy, regulatory policy, ecb policy, economic policy, government policy, inventory policy, health care policy, macro policy, macroeconomic policy, spending policy, legislation, law, regulation}.

3. OR if 'basis points' is found in the sentence AND any phrase in the set {[cut*, hik*, eas*, tight*, action*, moving, move, firming, recommendation, reduction, increase]}. Conditional on the occurrence of a combination of 'basis points' and any of the direction words, we drop sentences with "increase" and any of ['cpi', 'inflation', 'yield*', 'treasury'], to ensure we do not include language describing the direction of non-policy-related market prices and interest rates.

We define $Hawk'_t$ to be the count of terms in {tight*, hike*, increas*, hawkish, taper, liftoff} in policy sentences; and $Dove'_t$ to be the count of terms in {ease*, easing*, cut*, dovish, reduc*, decrea*} in policy sentences. Here, we account for negation, and if any of the hawk (dove) terms is immediately preceded by one of {'less', 'no','not', 'little', 'don't', 'doesn't', 'hasn't', 'haven't', 'won't', 'shouldn't', 'didn't'}, it is counted as belonging to dove (hawk) set.

Quantitative easing preferences. We define policy round sentences beginning in 2009 as relating to quantitative easing whenever they contain the term 'purchase*' immediately preceded by a phrase in {mortgage backed securities, mbs, asset, treasur*, agency debt}.

We then define $Hawk''_t$ to be the count of terms in {reduc*, taper, stop, purchas*} within the set of QE sentences; and $Dove''_t$ to be the count of terms in {more, additional, further} within the set of QE sentences. We again account for negation.

Overall preference measure. Let NP_t be the overall number of terms in the policy round in meeting t. Our hawk measure is

$$Hawk_t = \begin{cases} \frac{Hawk'_t}{\text{NP}_t} & \text{if meeting } t \text{ occurs prior to 2009} \\ \frac{Hawk'_t + Hawk''_t}{\text{NP}_t} & \text{if meeting } t \text{ occurs during or after 2009} \end{cases}$$

and $Dove_t$ is defined analogously.

B. Additional figures and tables

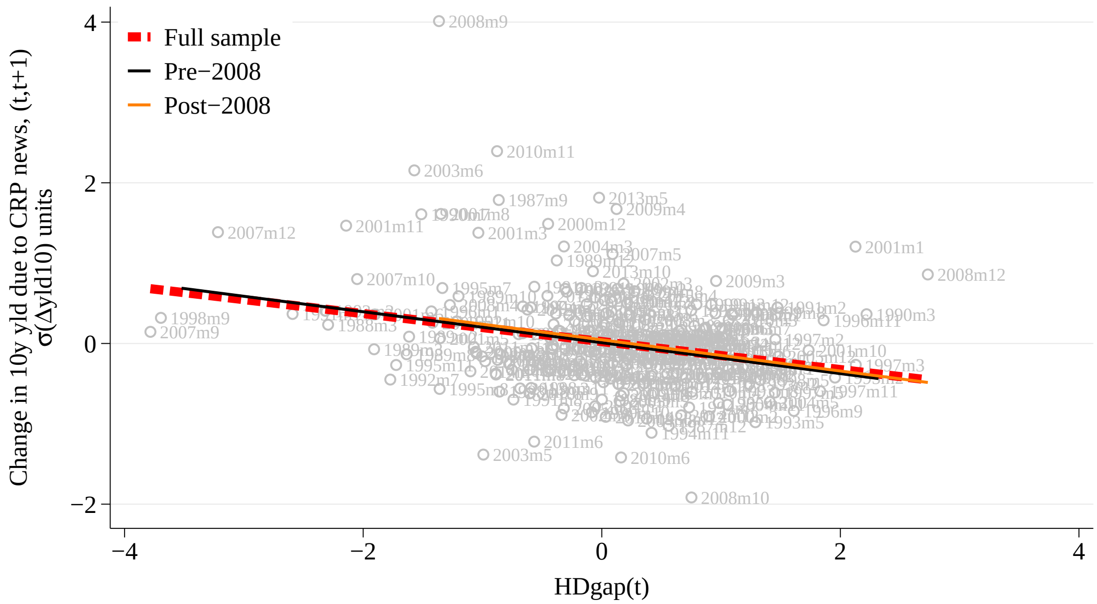

Figure A-1. Policy stance *HDGap* and the intermeeting ten-year yield changes due to the common risk premium component. The figure displays the relationship between the internal policy stance in the FOMC transcripts, measured as the $HDGap_t$ at meeting t, and the $\Delta y^{(10)}_{t,t+1}(\omega^{CRP})$ risk premium in the subsequent intermeeting period from t to $t+1$. The full-sample line corresponds to results presented in Table IV, Panel B.

Dependent variable: $\Delta y^{(10)}_{t,t+1}(\omega^{i})$

	RP components			EH components		
	RP overall	*CRP*	*HRP*	*EH* overall	*G*	*MP*
HD_t	-0.26***	-0.24***	-0.023	0.058	0.013	0.045
	(-3.46)	(-3.91)	(-0.51)	(0.99)	(0.37)	(1.33)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.089	0.12	0.024	0.019	-0.018	0.088
N	227	227	227	227	227	227

Table A-1. Predictability of news in asset prices by the internal policy stance *HD*, with controls. The table accompanies results presented in Table IV in the main text, by including Greenbook forecasts and current and lagged policy rate in the regression as controls. The controls correspond to those used to construct the *HDGap* in equation (9).

Explanatory variable: HD_t with Greenbook forecasts and policy rate controls

	(1) All	(2) Act	(3) No-Act	(4) Cut	(5) No-Cut	(6) Hike	(7) No-Hike
HD_t	-0.24***	-0.20***	-0.41**	-0.12*	-0.32***	-0.045	-0.21***
	(-3.91)	(-3.45)	(-2.24)	(-1.83)	(-2.63)	(-0.43)	(-3.13)
GB+FFR	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\bar{R}^2$	0.12	0.12	0.14	0.11	0.12	0.0048	0.12
N	227	125	102	70	157	55	172

Table A-2. Policy regimes, *HD* with controls. The table accompanies results in Table VI, allowing to flexibly control for Greenboook forecasts and current and lagged policy rate in each regression. The controls are as in equation (9).