Arbitrage and Monetary Policymaker Disagreement

September 30, 2025

Abstract

Using the Federal Reserve's dot plot dispersion from 2012-2023, we examine whether observable disagreement among policymakers about future interest rates constrains arbitrage activity. We document that higher disagreement about near-term rates is associated with reduced arbitrage in bond ETFs, particularly share creations that require warehousing interest rate risk. ETF prices deviate more from underlying values when disagreement is higher, even after controlling for policy surprises, uncertainty measures, and funding constraints. Effects are concentrated in current-year and one-year-ahead disagreement. Dot plot dispersion captures fundamental uncertainty about policy outcomes that arbitrageurs cannot resolve through better information, which has implications for price efficiency and monetary policy transmission. (104 words)

Keywords: Exchange-traded funds, monetary policy, asset prices, monetary policy transmission
JEL Classifications: G12, G14, E52

Introduction

Central bank communications are among the most closely watched economic announcements. While they generally enhance the predictability of future monetary policy decisions for market participants, their broader effects on market efficiency and economic outcomes can be more complex, potentially increasing uncertainty as they reduce information asymmetries between policymakers and markets.[1] Since the Great Financial Crisis, central banks have increasingly shifted from opaqueness and secrecy toward greater transparency (Blinder et al., 2024), with the shift particularly evident in forward guidance about future policy rates. A significant example is the Federal Reserve's "dot plot," first released in 2012 in an effort to provide insight into the thinking of individual policymakers rather than just the federal open market committee's (FOMC) consensus view. The "dot plot" graphs individual projections of appropriate policy rates from FOMC participants.

However, when these projections reveal disagreement among Fed officials about future policy, it may create uncertainty for market participants about which view will ultimately determine future policy decisions. Of particular concern are arbitrageurs in interest rate sensitive securities, as these financial intermediaries must take on interest rate risk to eliminate mispricing. When Fed officials themselves cannot agree on future policy rates, arbitrageurs may face higher inventory risk and reduce their arbitrage activities, allowing mispricings to persist. We test whether internal central bank disagreement on future rates represents a limit to arbitrage by examining whether dispersion in FOMC projections influences the willingness of arbitrageurs to warehouse interest rate risk. Our empirical setting uses bond ETF arbitrage activity by authorized participants (APs), which allows us to directly observe both arbitrage opportunities and arbitrageur behavior.

This approach addresses a gap in the extant literature, which has examined forward guidance effects generally, typically focusing on consensus policy signals and the uncertainty

[1] See Blinder et al. (2008) and Blinder et al. (2024) for literature reviews on the empirical studies on central bank communication.

they generate (Sastry, 2024). However, studies make little distinction between periods when policymakers themselves are in consensus versus disagreement about future policy. While disagreement is observable, the uncertainty it may generate is not. Existing measures of monetary policy uncertainty attempt to capture this unobservable uncertainty through media coverage or market indicators, but dot plot dispersion reveals observable disagreement at the source, when policymakers who possess the most complete information and who will ultimately determine policy outcomes do not agree. This distinction matters because internal disagreement represents a fundamental form of uncertainty that even sophisticated market participants cannot resolve through better information processing.

ETFs are a unique setting to examine monetary policymaker disagreement and arbitrage because of its built-in arbitrage mechanism. ETF trade on exchanges, with shares prices determined by supply and demand much like closed-end funds (CEFs). Any supply/demand imbalance for shares may result in price deviation from underlying net asset values (NAVs), generating an arbitrage opportunity. Importantly, however, unlike CEFs, which have a fixed number of shares, ETFs engaged in legal agreements with large financial institutions with significant trading capabilities called authorized participants (APs), allowing them to create or redeem large blocks of ETF shares to help keep ETF share prices aligned with its underlying NAV through arbitrage. When the ETF trades at a premium to NAV, APs can create new shares by delivering the underlying securities to the ETF, and when it trades at a discount, they can redeem shares to receive the underlying securities.

Our empirical analysis provides suggestive evidence consistent with monetary policymaker disagreement representing a limit to arbitrage. Using daily data on bond ETF arbitrage activity around FOMC announcements from 2012 to 2022, we document several patterns linking dot plot dispersion to arbitrage behavior. First, higher dispersion in FOMC participants' projections of both current-year and one-year-ahead policy rates is associated with reduced arbitrage activity by authorized participants, even after controlling for established measures of monetary policy uncertainty, the surprise component in FOMC

announcements, and market-based indicators of funding constraints. This association suggests that observable disagreement among policymakers may represent a distinct friction affecting arbitrage decisions, separate from other sources of policy uncertainty.

Second, we find that this reduction in arbitrage activity appears concentrated in share creations rather than redemptions. In a linear probability model where the outcome equals one if APs create new ETF shares and zero otherwise, higher dot plot dispersion is associated with lower probability of creation activity. We observe little association between policymaker disagreement and the likelihood of share redemptions. This asymmetry is consistent with creations requiring APs to deliver underlying bonds, thus taking on inventory risk, while redemptions allow APs to offload bonds, potentially reducing exposure during uncertain periods.

Third, consistent with reduced arbitrage activity, we document a positive association between dot plot dispersion and ETF pricing deviations from net asset value. Higher policymaker disagreement coincides with larger mispricings between bond ETF prices and NAVs, suggesting that mispricings may persist longer when Fed officials themselves cannot agree on the appropriate policy path. This pattern provides evidence that observable policymaker disagreement may influence the effectiveness of the arbitrage mechanism that typically keeps ETF prices aligned with underlying values.

Our findings make several important contributions to the literature. First, we extend the limits of arbitrage literature to ETF markets, documenting how a specific, observable form of uncertainty may constrain arbitrage activity. Unlike traditional limits to arbitrage that focus on noise trader risk (De Long et al., 1990; Shleifer and Vishny, 1997) or funding constraints (Gromb and Vayanos, 2010; Kondor and Vayanos, 2019), dot plot dispersion represents fundamental uncertainty that cannot be resolved through better information. Even those with the most complete information and authority to set policy do not agree on the same forward path. Importantly, this disagreement is observable directly from policymaker projects rather than inferred from market conditions, allowing us to isolate the effect of policy

uncertainty from funding or balance sheet constraints that may also affect arbitrage activity (Hanson and Stein, 2015; Pan and Zeng, 2023).

Second, our results contribute to understanding the transmission of monetary policy through financial markets (Fang, 2024). While prior research documents that ETFs serve as transmission channels for policy shocks (Rhodes and Hill-Kleespie, 2025), we provide evidence that the effectiveness of this channel may vary with the clarity of policy signals. When policymaker disagreement is high, the arbitrage mechanism linking ETF prices to underlying bond values appears less active, potentially affecting how policy uncertainty propagates through markets.

Third, we provide new evidence on authorized participant behavior in bond ETF markets. The literature documents that APs act strategically, particularly around information events (Reilly, 2022; Todorov, 2021). Our findings suggest that observable disagreement among Fed officials may influence AP willingness to warehouse interest rate risk through creation activity, highlighting a channel through which central bank communications affect arbitrageur behavior beyond the consensus policy signal itself.

1 Related Literature

1.1 Limits to Arbitrage Literature

Theoretical arbitrage requires no capital and involves no risk. In reality, arbitrage is both capital-intensive and risky. Shleifer and Vishny (1997) show that these features create important constraints on arbitrage activity. When arbitrageurs experience losses, investors may withdraw capital, forcing liquidations when mispricings are largest. De Long et al. (1990) emphasize that noise trader sentiment can intensify before correcting, creating risk for arbitrageurs even when they correctly identify mispricing. These frictions suggest arbitrage may be least effective when prices diverge furthest from fundamentals.

Beyond these seminal works, subsequent research identifies several additional constraints.

Funding and balance sheet constraints can bind when arbitrage opportunities are most attractive, and intermediary capital limitations become particularly acute during periods of market stress (Gromb and Vayanos, 2010; Kondor and Vayanos, 2019; Nagel, 2012). Transaction costs and market illiquidity create barriers to exploiting mispricings (Pontiff, 1996). More generally, uncertainty about fundamental values or the convergence horizon can deter arbitrage activity even when mispricings are observable (Shleifer and Vishny, 1997). These constraints are particularly relevant in fixed income markets, where dealer balance sheets and funding conditions significantly affect trading activity.

We examine whether observable disagreement among policymakers represents a distinct limit to arbitrage. When Fed officials cannot agree on the same forward path for policy rates, as revealed through the dot plot, arbitrageurs face fundamental uncertainty about future policy outcomes. This uncertainty differs from noise trader risk or funding constraints. It reflects disagreement among the policymakers who will ultimately determine outcomes, observable directly from their projections rather than inferred from market conditions. We test whether this disagreement constrains arbitrage activity in bond ETF markets.

1.2 ETF Literature

The literature demonstrates that APs play an important role in ETF markets, particularly in fixed income. Rather than acting as pure arbitrageurs, APs actively use the creation/redemption mechanism to manage their own inventories and accommodate client demand (Pan and Zeng, 2023; Todorov, 2021). While this activity generally improves bond market liquidity, these benefits diminish during stress periods when dealers become more constrained (Li et al., 2023; Finnerty et al., 2024). Understanding AP behavior is therefore critical for assessing how market conditions, including monetary policy uncertainty, affect arbitrage activity.

The strategic dimension of AP behavior is well-documented. Creation and redemption baskets represent only a small subset of ETF holdings and have systematically different

characteristics than the overall portfolio (Todorov, 2021). ETF sponsors strategically design these baskets by including substantial cash and dynamically adjusting composition to balance competing objectives (Koont et al., 2022). Reilly (2022) finds that when creating new ETF shares, APs systematically select bonds that subsequently underperform, reducing ETF performance by 48 basis points annually. This underperformance cannot be attributed to risk or liquidity compensation, but instead reflects APs utilizing information about future bond value changes. This strategic behavior suggests that APs are sophisticated traders who carefully consider the implications of their basket selections.

The connection between ETF markets and monetary policy has received growing attention. During the 2013 Taper Tantrum, APs maintained ETF price efficiency through redemptions that amplified selling pressure in underlying bonds (Dannhauser and Hoseinzade, 2022). More recently, Rhodes and Hill-Kleespie (2025) shows that ETFs serve as an important transmission channel for monetary policy, with ETF ownership strengthening the pass-through of policy shocks to underlying assets via primary market activity. ETF flows predict future returns in both fund shares and underlying bonds, with AP arbitrage activity transmitting non-fundamental demand shocks (Brown et al., 2021). These findings suggest that the ETF primary market is particularly active and sensitive around monetary policy announcements.

However, existing research has not examined how disagreement among policymakers themselves affects AP arbitrage behavior. When Fed officials cannot agree on the appropriate future path of rates, as revealed through dispersion in the dot plot, APs face fundamental uncertainty that cannot be resolved through better information processing. This disagreement may represent a distinct limit to arbitrage, as APs must warehouse interest rate risk when deciding whether to exploit ETF mispricings. Our paper examines whether this policymaker disagreement constrains AP arbitrage activity in bond ETF markets.

1.3 Monetary Policy Announcements and Market Behavior

Federal Open Market Committee (FOMC) announcements represent critical information events that systematically affect asset prices across markets. Both conventional policy changes and forward guidance have economically significant and persistent impacts on Treasury yields, corporate bond yields, and other asset prices (Hanson and Stein, 2015; Swanson, 2021). The ETF primary market is particularly active around these announcements, as APs respond to policy signals transmitted through ETF flows and ownership (Rhodes and Hill-Kleespie, 2025).

Market structure and balance sheet considerations create distinct trading patterns around policy events. Financial intermediaries optimize their inventory positions based on predictable liquidity patterns and trading constraints (Boyarchenko et al., 2023), with their behavior significantly influenced by accounting rules and regulatory requirements (Hanson and Stein, 2015; Pinter et al., 2024). These institutional constraints particularly affect corporate bond markets, where trading costs increase substantially during information-intensive periods like FOMC announcements (Pinter et al., 2024; Balduzzi and Moneta, 2017). For arbitrageurs warehousing interest rate risk through bond ETF positions, these constraints may bind more tightly when policy uncertainty is elevated.

However, existing research examining monetary policy effects on markets has focused primarily on consensus policy signals and the uncertainty they generate. While disagreement among policymakers is observable through instruments like the FOMC dot plot, the literature has not examined whether this internal disagreement represents a distinct constraint on arbitrage activity. When Fed officials themselves cannot agree on the same future path of rates, arbitrageurs face fundamental uncertainty about which policy view will ultimately prevail, uncertainty that cannot be resolved through better information processing or more sophisticated analysis. This policymaker disagreement may represent a unique limit to arbitrage, distinct from other forms of monetary policy uncertainty studied using media coverage or market-based indicators (Sastry, 2024).

2 Sample and Variable Construction

2.1 ETF Sample Construction

We construct our sample by first obtaining daily data from the Center for Research in Security Prices (CRSP) covering the period 2002–2023. Exchange-traded funds (ETFs) are identified using share code 73. To classify bond ETFs, we rely on the CRSP survivorship-bias-free mutual fund summary data and restrict the sample to cases where et_flag = F to identify all ETFs. We further categorize the ETFs into two groups: (i) U.S. corporate bond ETFs, defined as funds with corp orate bond holdings greater than 20 percent, excluding all non-U.S. holdings and requiring taxable status; and (ii) U.S. government bond ETFs, defined as funds with government bond holdings greater than 95 percent, likewise excluding non-U.S. holdings. These two categories together form our bond ETF sample. Because CRSP share outstanding data are not fully accurate (Ben-David et al., 2018), we supplement our dataset with ETF share outstanding information collected from ETF Global, limiting our final sample to 2012-2023.

We define AP arbitrage activity using changes in ETF shares outstanding, following the approach in Brogaard et al. (2025). Specifically, for ETF j at time t, we compute the change in shares outstanding, scale this by the ETF price on day t to obtain the dollar value of creation or redemption activity, and normalize the absolute value of this measure by the ETF market capitalization to ensure comparability across funds of different sizes.

$$|APArb_{j,t}| = \frac{|\Delta SharesOut_{j,t} \times Price_{j,t}|}{MarketCap_{j,t}}. \tag{1}$$

This measure captures the fundamental mechanism through which APs maintain price efficiency: when they identify mispricings between ETF shares and underlying bonds, they either create new shares (delivering bonds to the ETF) or redeem existing shares (receiving bonds from the ETF). This standardized measure reflects arbitrage intensity. Higher values

indicate more aggressive AP intervention to correct mispricings.

To examine whether policymaker disagreement differentially affects creation versus redemption activity, we decompose AP arbitrage activity into directional components. We construct indicator variables for creation activity, which require APs to deliver underlying bonds and take on inventory risk) and redemption activity, which allows APs to offload bonds):

$$Creation_{j,t} = \begin{cases} 1 & \text{if } \Delta SharesOut_{j,t} > 0 \\ 0 & \text{otherwise,} \end{cases} \tag{2}$$

$$Redemption_{j,t} = \begin{cases} 1 & \text{if } \Delta SharesOut_{j,t} < 0 \\ 0 & \text{otherwise.} \end{cases} \tag{3}$$

The decomposition is important to our analysis because creations and redemptions impose different risks on APs during periods of policy uncertainty. When policymakers diagree about the future path of interest rates, APs warehousing bonds through creation activity face fundamental uncertainty about how those positions will be valued as policy evolves.

We also construct a measure of arbitrage opportunities available to APs. The ETF premium captures the deviation of the ETF closing price from its net asset value (NAV):

$$Premium_{j,t} = \frac{ClosePrice_{j,t} - NAV_{j,t}}{NAV_{j,t}}. \tag{4}$$

This variable reflects the residual mispricing after AP arbitrage activity throughout the trading day. If policymaker disagreement constrains arbitrage, we expect larger absolute premiums and discounts to persist when dot plot dispersion is higher, as APs become less willing to close these gaps.

To ensure our arbitrage measure reflect price discovery activity rather than tax-motivated

transactions, we exclude transactions identified as heartbeat trades from our sample. Heartbeat trades are large creation and redemption transactions designed for tax management purposes that do not respond to mispricings (Moussawi et al., 2025). Following Moussawi et al. (2025), we classify a day as a heartbeat if four conditions jointly hold: (i) the ETF experiences an inflow of at least 1% of lagged shares outstanding; (ii) the inflow is not exactly one creation unit (25,000 or 50,000 shares); (iii) the percentage inflow is at least three times the maximum percentage flow observed in surrounding non-event windows (days -15 to -1, $+1$ to $+15$, and specifically $+8$ to $+15$); and (iv) outflows over the subsequent seven trading days reverse at least 75% of the initial inflow. We implement these rules using panel-wise rolling calculations of flows relative to lagged shares outstanding and exclude all observations meeting these criteria.

2.2 Policymaker Disagreement Measure

Our primary variable of interest captures disagreement among FOMC participants about future policy rates. We hand collect Federal Open Market Committee (FOMC) "dot plot" projections published by the Board of Governors of the Federal Reserve System from January 2012 through June 2024. Since 2012, the FOMC has released its Summary of Economic Projections (SEP) on a quarterly basis, including the target rate "dot plot," which records individual voting members' projections for the federal funds rate at the end of the current year, one-year, two-year, three-year (September and December meetings, only), and in the long run.

Figure 1 shows the dot plot from the December 17, 2014 FOMC meeting. Each dot represents an individual FOMC participant's projection for the federal funds rate at different horizons. The vertical dispersion of dots at each horizon reveals the extent of disagreement among policymakers. For example, in the 2015 and 2016 columns projections range from 0% to 2% and from 0.25% to 4%, respectively, indicating substantial disagreement about the policy rate just one and two years ahead. This dispersion, rather than the consensus view, is

the focus of our analysis.

The dot plot provides a unique window into monetary policy uncertainty at its source. Unlike market-based measures of uncertainty or media-derived indicators, dot plot dispersion reflects disagreement among the officials who possess the most complete information and who will ultimately determine policy outcomes. When FOMC participants cannot agree on the same future path of rates, arbitrageurs face uncertainty that cannot be resolved through better information processing.

We measure policymaker disagreement as the cross-sectional standard deviation of dot plot projections for each forecast horizon. For each FOMC meeting t and horizon h, we construct the measure as:

$$PMD_{t,h} = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}\left(rate_{i,t,h} - \overline{rate}_{t,h}\right)^2}, \tag{5}$$

where $rate_{i,t,h}$ is participant i's projection for horizon h at meeting t, and N is the number of participants providing projections for that meeting. We construct separate disagreement measures for current-year ($PMD_{t,0}$), one-year ahead ($PMD_{t,1}$), two-year ahead ($PMD_{t,2}$), and three year ahead ($PMD_{t,3}$) projections.

Figures 2 - 5 provide a granular view of how policymaker disagreement evolves over time and across forecast horizons from January 2012 to June 2024. Current year projections are shown in Figure 2, one-year ahead projections in Figure 3, two-year ahead projections in Figure 4, and three-year ahead projections in Figure 5. Each heat map shows the upper rate for each potential policy range on the vertical axis (e.g., 0.00% to 0.25% is recorded as 0.25%) at each meeting date on the horizontal axis. The color intensity indicates the number of FOMC participants who had the same projection, with darker shades indicating more consensus at that particular projection range.

Across these figures, several patterns emerge. First, disagreement is not constant. The

vertical spread of colors within a given meeting varies considerably, with some meetings showing tight consensus (narrow and dark color bands) and other showing wide divergence (broad color spectrum). Second, disagreement tends to be larger at longer horizons, when FOMC participants face greater uncertainty about economic conditions further in the future. Third, disagreement spikes are often associated with policy regime transitions. For example, in the 2015-2016, when the Fed shifted to gradually increasing rates following the zero-lower bound (ZLB) policy following the Great Financial Crisis, and also in 2022-2023, when the Fed began its most recent rate hiking cycle. These figures illustrate that our disagreement measure captures variation in FOMC consensus.

[INSERT FIGURE 1 HERE]

[INSERT FIGURE 2 HERE]

[INSERT FIGURE 3 HERE]

[INSERT FIGURE 4 HERE]

[INSERT FIGURE 5 HERE]

2.3 Control Variables

2.3.1 ETF Controls

We include several time-varying ETF characteristics that may affect AP arbitrage decisions independent of policymaker disagreement. We control for ETF size (*ETF Size)*, which is measured as market capitalization (shares outstanding multiplied by ETF closing price). Larger ETFs may experience greater arbitrage activity because they offer better economies of scale for AP operations and deeper secondary markets that facilitate hedging (Pan and Zeng, 2023). ETF liquidity is proxied using the Amihud (2002) illiquidity measure (*Amihud)*, calculated as the absolute value of the ETF return divided by trading volume, scaled by 1,000,000. Less liquid ETFs impose higher transaction costs on APs, potentially deterring

arbitrage activity even when mispricings are present. *Maturity* captures the average maturity of the ETF's portfolio holdings, obtained from the CRSP Survivorship-Bias-Free Mutual Fund database. Longer-maturity bond portfolios exhibit greater interest rate sensitivity, which amplifies the risk APs bear when warehousing positions during periods of monetary policy uncertainty. This control is particularly important for isolating the effect of policymaker disagreement. We expect disagreement to matter most when APs face greater interest rate risk risk.

2.3.2 Macroeconomic Controls

We include several time-varying macroeconomic variables to ensure that our measure of policymaker disagreement captures effects distinct from the consensus policy signal, general policy uncertainty, or broader market conditions.

Monetary policy surprise (MPS) captures the unexpected component of FOMC announcements. We employ the orthogonalized monetary policy surprise measure developed by Bauer and Swanson (2023). This measure addresses identification challenges in traditional measures, which may be contaminated by the Fed's response to macroeconomic conditions already known to market participants before FOMC announcements, potentially biasing estimates of monetary policy effects.[2] Controlling for the policy surprise of an FOMC announcement ensures that we isolate the effect of disagreement about future policy rates from the effect of the announced policy change itself.

Monetary policy uncertainty (MPU) is measured using the Baker et al. (2016) index,

[2]The orthogonalized MPS begins with an unadjusted surprise measure, calculated as the first principal component of changes in the first four quarterly Eurodollar interest rate futures contracts (ED1-ED4) during a 30-minute window around FOMC announcements. This principal component captures common movement across the yield curve, reflecting both current rate policy and expectations about the future path of rates (Gürkaynak et al., 2005). Bauer and Swanson (2023) then regress this unadjusted measure on six macroeconomic and financial variables known prior to the FOMC announcement to remove predictable components. The residuals from this regression form the orthogonalized MPS, normalized so that a one-unit change corresponds to a one-percentage-point change in the fourth Eurodollar futures contract. This measure is unavailable for 2020. Following Bauer and Rudebusch (2018), we use the raw unadjusted MPS for 2020. We thank Michael Bauer for making this data available on his website.

which quantifies uncertainty based on newspaper coverage of monetary policy.[3] This index spans from 2012-2023 and captures general uncertainty about monetary policy, which may differe from observable disagreement among policymakers. By including both *MPU* and out dot plot disagreement measure, we test whether internal FOMC disagreement has explanatory power beyond media-derived uncertainty measures.

Term spread is calculated as the difference between the 10-Year Constant Maturity Treasury (CMT) and the 2-Year CMT, obtained from the Federal Reserve Bank of St. Louis (FRED). The slope of the yield curve reflects market expectations about future rate movements and economic conditions, which may independently influence AP arbitrage activity in bond ETFs through its effect on hedging costs and carry trade opportunities (Pan and Zeng, 2023; Todorov, 2021).

Funding constraints is measured using the TED spread, calculated as the difference between the three-month LIBOR rate and the three-month Treasury bill rate, collected from FRED. The TED spread captures stress in interbank funding markets and reflects the cost and availability of short-term funding for financial intermediaries. Wider TED spreads indicate tigher funding conditions, which may constrain AP arbitrage through increased financing costs or reduced risk capacity (Gromb and Vayanos, 2010; Kondor and Vayanos, 2019). Because the TED spread was discontinued at January 21, 2022, with LIBOR, we use the secured overnight offer rate (SOFR)-Treasury bill spread for 2022-2023 observations, which serves as the successor benchmark for short-term funding costs.

The CBOE S&P 500 Volatility index (*VIX*) measure equity market volatility and serves as a broad indicator of financial market stress and risk aversion. Higher volatility may constrain arbitrage activity through increased heading costs or tighter risk management constraints, independent of monetary policy considerations (Gromb and Vayanos, 2010)

These controls ensure that our tests isolate the effect of observable policymaker

[3]The construction of this measure involves collecting the number of articles in the leading newspapers that cover national economic and financial news using a keyword search such as "the Fed", "central bank", "interest rate", "inflation" that features a specific focus on monetary policy in the US.

disagreement on arbitrage activity, rather than capturing correlated market conditions or other policy-related factors.

2.4 Descriptive Statistics

Our primary sample spans 48 FOMC meetings from January 2012 through December 2023, corresponding to the period when the Fed began releasing the Summary of Economic Projections with the dot plot included. The unit of observation is an ETF-meeting pair.

Table 1 reports the descriptive statistics for our key variables. Panel A presents macroeconomic variables. The policymaker disagreement measure (PMD) increases systematically with the projection horizon, consistent with greater fundamental uncertainty about policy further in the future. Current-year projection disagreement ($PMD_{t,0}$) averages 0.14 basis points (bps) with substantial variation (standard deviation of 0.13bps). One-year ahead projection disagreement ($PMD_{t,1}$) averages 0.41bps. Two- and three-year ahead disagreement have even larger means and standard deviation. The three-year ahead measure ($PMD_{t,3}$) is available for only 24 FOMC meetings because participants provide these longer-horizong projections only at the September and December meetings.

The monetary policy uncertainty index (MPU) from Baker et al. (2016) averages 90.1, with values ranging from 18.7 to 212.8, reflecting substantial time-series variation in media-derived uncertainty about Fed policy. The orthogonalized monetary policy surprise (MPS) from Bauer and Swanson (2023) has a mean near zero by construction, with surprises ranging from -8.5 to +11.8bps. The VIX averages 16.8 over our sample, while the term spread averages 81 basis points but exhibits considerable variation, including negative values during the 2019 yield curve inversion.

Panel B presents ETF-level variables descriptive statistics. AP arbitrage activity ($APArb$) occurs in approximately 27% of ETF-meeting observations (mean of 0.0037 when scaled by market capitalization), with substantial right-skew reflecting occasional large creation or redemption episodes. ETF premiums average 8bps with a standard deviation of 44bps,

indicating substantive mispricings that create arbitrage opportunities.

ETF size, measured as the natural logarithm of market capitalization, averages 7.70 (corresponding to a median market cap of approximately $171 million) with substantial dispersion. The untransformed market capitalization in our sample range from $133,000 to over $109 billion, capturing ETFs of varying sizes. Average portfolio maturity varies considerably across funds, ranging from 0.1 to 28.9 years with a mean of 7.2 years. This variation in maturity is particularly important for our analysis. Longer-maturity bond portfolios should exhibit greater interest rate sensitivity, amplifying the duration risk that APs must warehouse when creating new shares. The Amihud illiquidity measure and average portfolio maturity similarly show wide dispersion across funds, reflecting substantial heterogeneity in ETF characteristics that may influence AP arbitrage decisions.

Table 2 reports the correlation matrix for all macroeconomic uncertainty variables. We find that our policymaker disagreement measures are only weakly correlated with publicly available uncertainty indices. These low correlations suggest that dot plot dispersion captures a dimension of policy uncertainty distinct from media-derived measures or the surprise component of policy announcements. This orthogonality is important for our identification strategy. If PMD measures were highly correlated with existing uncertainty measures, we could not distinguish whether disagreement among policymakers matters per se, or whether our results simply reflect general policy uncertainty that existing measures already capture.

[INSERT TABLE 1 HERE]

[INSERT TABLE 2 HERE]

3 Empirical Strategy

Our empirical strategy exploits variation in policymaker disagreement across FOMC meetings to examine whether observable internal disagreement at the Fed constrains AP arbitrage

activity in bond ETF markets. To isolate the disagreement from other factors that may influence arbitrage around policy announcements, we estimate the following equation:

$$ArbActivity_{i,t} = \alpha + \beta PMD_t + X_{it}\delta + Z_t\delta + \theta_i + \lambda_y + \varepsilon_{i,t}, \tag{6}$$

where $ArbActivity_{i,t}$ represents AP activity for ETF i on the day of FOMC meeting t. We consider three outcome variables, each capturing a different dimension of arbitrage activity. First, we analyze overall intensity of arbitrage using the absolute value of creation and redemption activity scaled by market capitalize, as defined in Equation 1. This continuous measure captures the magnitude of AP activity regardless of direction. Second, we decompose arbitrage into direction components using indicator variables for creation activity and redemption activity, as defined in Equation 2. This decomposition is critical because creation and redemption activity impose asymmetric risks on APs. Creation new shares requires delivering underlying bonds and warehousing interest rate risk, while redeeming shares allows APs to offload bonds and reduce that risk.

Our variable of interest is $PMD_{t,h}$, which measures policymaker disagreement revealed during FOMC meeting t for the projection horizon h. The coefficient β captures the association between policymaker disagreement and AP arbitrage activity. If policymaker disagreement respresents a meaningful constraint on arbitrage, we expect a negative coefficient ($\beta < 0$). High dispersion in rate projections should be associated with reduced arbitrage activity, particularly for share creations that require APs to warehouse interest rate risk.

The identification of β requires isolating disagreement effects from other correlated factors. The vector X is a set of time-varying controls for ETF characteristics that may influence AP arbitrage decisions. These control variables include ETF size, liquidity, and the average maturity of portfolio holdings. The vector Z is a set of time-varying macroeconomic controls, consisting of the surprise component of the Fed's announcement (MPS), monetary policy

uncertainty (MPU), the term spread, the VIX index, and the TED spread. These controls ensure that our measure of policymaker disagreement captures effects distinct from the consensus policy signal, general monetary policy uncertainty, funding constraints, or broader market volatility. Section 2.3 provides detailed variable definitions.

We include ETF fixed effects (θ_i) to control for time-invariant ETF characteristics that might affect baseline arbitrage activity, such as ETF sponsor or index methodology, and year fixed effects (λ_y) to account for trends in ETF markets and monetary policy communications. We cluster standard errors at the ETF level to account for the potential serial correlation in arbitrage activity within each fund and report these in parentheses.

4 Main results

4.1 Arbitrage Activity

Table 3 presents our baseline results examining how policymaker disagreement affects overall AP arbitrage activity in bond ETFs. The dependent variable is the absolute value of creation and redemption activity scaled by market capitalization, capturing the total intensity of AP intervention regardless of direction. Across all specifications, we find a negative association between policymaker disagreement and arbitrage activity, with the effect concentrated in near-term projections.

Current-year disagreement ($PMD_{t,0}$) exhibits the strongest association with reduced arbitrage activity. This suggests that when FOMC participants cannot agree on the same policy rate even for the current year, APs significantly curtail their arbitrage operations. One-year-ahead disagreement ($PMD_{t,1}$) shows a similarly negative association, though the coefficient is slightly smaller in magnitude (-0.247 versus -0.261 for current-year disagreement). The effect dissipates for longer horizons: two-year-ahead disagreement ($PMD_{t,2}$) remains negative and statistically significant at the 10% level, while three-year-ahead disagreement ($PMD_{t,3}$) shows no significant association. This horizon pattern is consistent with APs

responding primarily to disagreement about near-term policy, which most directly affects the duration risk they bear when warehousing bond positions. Disagreement about rates three years forward may be less relevant for arbitrage decisions that typically involve holding positions for days or weeks rather than years.

The control variables perform as expected. The monetary policy surprise (MPS) is consistently negative and significant, indicating that unexpected policy tightening reduces arbitrage activity, likely reflecting heightened uncertainty and wider bid-ask spreads in underlying bond markets during surprise announcements. ETF size and maturity are positively associated with arbitrage activity, consistent with larger funds offering better economies of scale and longer-duration portfolios creating larger arbitrage opportunities when rates move.

[INSERT TABLE 3 HERE]

Tables 4 and 5 decompose total arbitrage into directional components, examining creation and redemption activity separately. This decomposition is central to understanding the mechanism through which disagreement constrains arbitrage, as creations and redemptions impose asymmetric risks on APs.

Table 4 examines share creation activity using a linear probability model where the dependent variable equals one if APs create new shares and zero otherwise. The results reveal a strong negative association between policymaker disagreement and creation probability that reflects the patterns in Table 3. Current-year disagreement exhibits the largest effect. One-year-ahead disagreement similarly reduces creation probability, with the coefficient of -10.63. The effect attenuates for two-year-ahead disagreement (-7.52, significant at 10%) and disappears entirely for three-year-ahead disagreement (coefficient of 5.15, not statistically significant). This horizon pattern reinforces the interpretation that APs focus on near-term policy uncertainty when making creation decisions.

The mechanism appears to be economically intuitive. Creating new ETF shares requires APs to deliver underlying bonds to the ETF sponsor, effectively going long interest rate risk.

When policymakers themselves cannot agree on the near-term path of rates, this interest rate risk exposure becomes riskier and perhaps more difficult to hedge. The fundamental uncertainty reflected in dot plot dispersion cannot be resolved through better models or more sophisticated analysis. APs respond rationally by reducing their willingness to take on this exposure through creation activity.

[INSERT TABLE 4 HERE]

Table 5 examines redemption activity using a linear probability model as well. The result reveal a striking asymmetry. Near term diagreement ($PMD_{t,0}$ and $PMD_{t,1}$ show weak and statistically insignificant associations with redemption probability, while two-year ahead disagreement ($PMD_{t,2}$) shows a significant negative coefficient of -6.65. This horizon asymmetry suggests a different mechanism for redemptions than creation. Redeeming ETF shares allows APs to deliver shares to the sponsor and receive underlying bonds in return, effectively unwinding interest rate exposure rather than adding it. The negative association between longer-horizon disagreement and redemptions may reflect increased execution costs and balance sheet considerations.

Across Tables 3-5, the control variables show consistent patterns. Funding constraints positively predict creation activity but negatively predict redemptions, consistent with tighter funding making it easier for APs to deliver securities (creations) but harder to take securities onto their balance sheets (redemptions). ETF size consistently predicts higher arbitrage activity of all types, confirming that economies of scale matter for AP operations. The VIX generally shows little association with arbitrage activity after controlling for other factors, suggesting that policymaker disagreement captures a dimension of uncertainty distinct from broad equity market volatility.

[INSERT TABLE 5 HERE]

4.2 Mispricing

Table 6 considers whether reduced arbitrage activity under high policymaker disagreement translates into larger mispricings. The dependent variable is the ETF premium measured at the end of the trading day. This variable captures the residual mispricing that remains after all AP arbitrage activity throughout the day. If disagreement constrains arbitrage and allows mispricings to persist, we should observe larger absolute premiums when disagreement is high.

The results support this prediction for near-term disagreement. Current-year disagreement ($PMD_{t,0}$) shows a positive and highly significant coefficient of 0.311. One-year-ahead disagreement ($PMD_{t,1}$) exhibits a similar pattern with a coefficient of 0.253. The effect becomes statistically insignificant for longer horizons: two-year-ahead disagreement ($PMD_{t,2}$) shows a coefficient of only 0.063 (not significant), and three-year-ahead disagreement ($PMD_{t,3}$) is essentially zero (0.008).

This horizon pattern of strong effects for near-term disagreement, negligible effects for longer-term disagreement tends to mirror the results for arbitrage activity in Tables 4-5. The consistency across these results supports a coherent narrative. Near-term policymaker disagreement constrains AP willingness to create shares and warehouse duration risk, which in turn allows mispricings to persist and grow larger. The arbitrage mechanism that typically keeps ETF prices aligned with NAVs appears to become less effective precisely when policymakers themselves cannot agree on the near-term policy path.

The control variables reveal additional insights. The monetary policy surprise (MPS) consistently predicts smaller premiums (negative and significant across all specifications), suggesting that policy surprises, despite increasing arbitrage activity costs in other dimensions, may actually improve price efficiency by providing clear directional signals. The VIX negatively predicts premiums, consistent with market-wide volatility encouraging arbitrage activity that narrows pricing gaps. ETF maturity positively predicts premiums, reflecting that longer-duration portfolios create both larger arbitrage opportunities and larger risks for APs

attempting to exploit them.

Taken together, the results in this study provide suggestive evidence that observable disagreement among FOMC policymakers about near-term policy rates constrains AP arbitrage activity, particularly share creations that require warehousing duration risk. This reduced arbitrage allows mispricings between ETF prices and underlying NAVs to persist and grow larger. The effect is concentrated in near-term disagreement (current-year and one-year-ahead projections), suggesting that APs respond primarily to policy uncertainty over horizons relevant for their typical holding periods. Disagreement about rates three years forward appears largely irrelevant for arbitrage decisions made over days or weeks.

[INSERT TABLE 6 HERE]

5 Conclusion

This paper examines whether observable disagreement among Federal Reserve policymakers about future interest rates is associated with constraints on arbitrage activity in bond ETF markets. Using the dispersion of projections by FOMC participants, reported in the dot plot, as a measure of policymaker disagreement, we document that higher disagreement about near-term policy rates seem to reduce authorized participants (AP) arbitrage activity, particularly share creations that require warehousing interest rate risk. This association persists after controlling for consensus policy surprises, media-derived monetary policy uncertainty, funding constraints, and broader market volatility.

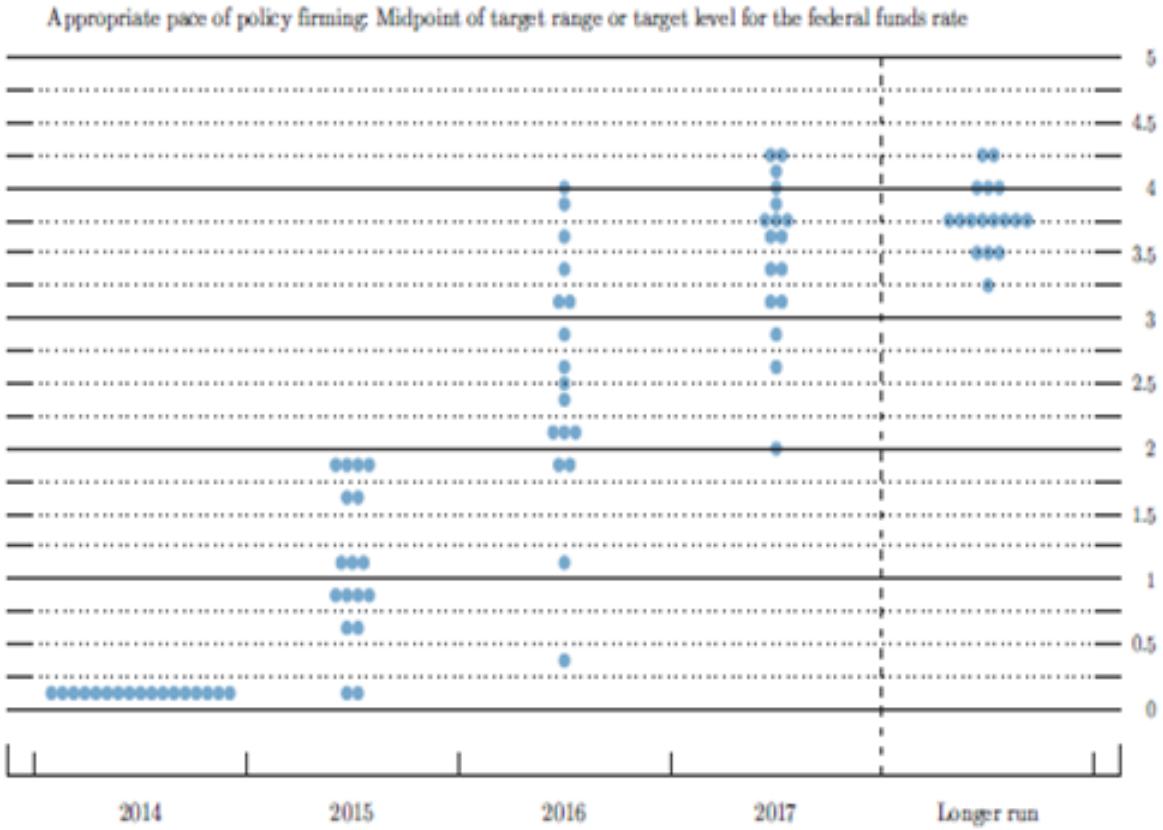
When disagreement is high, ETF prices appear to deviate more substantially from their net asset values (NAVs), consistent with the arbitrage mechanism linking ETF shares to underlying bonds becoming less effective when policymakers themselves cannot agree on the same policy path. These patterns are concentrated in disagreement about current and one-year ahead rates, with little evidence that longer-horizon disagreement affects arbitrage decision and behavior.

Our findings contribute to understanding limits to arbitrage in financial markets by documenting associations between policymaker disagreement and arbitrageur behavior. Unlike noise trader risk or funding constraints, dot plot dispersion reflects disagreement among the officials who will ultimately determine policy outcomes. Importantly, this type of uncertainty cannot be easily resolved through better information or analysis because even the policymakers themselves who have the most complete information cannot agree.

These results have potential implications for central bank communication strategies. While transparency about individual policymaker views may enhance overall market understanding of policy deliberations, the patterns we document suggest that periods of high internal disagreement may coincide with reduced arbitrage effectiveness in maintaining price efficiency. More broadly, our results are consistent with the transmission of monetary policy through financial markets varying with the clarity and consensus of policy signals, with internal disagreement among policymakers potentially associated with dampened effectiveness of arbitrage-based transmission channels.

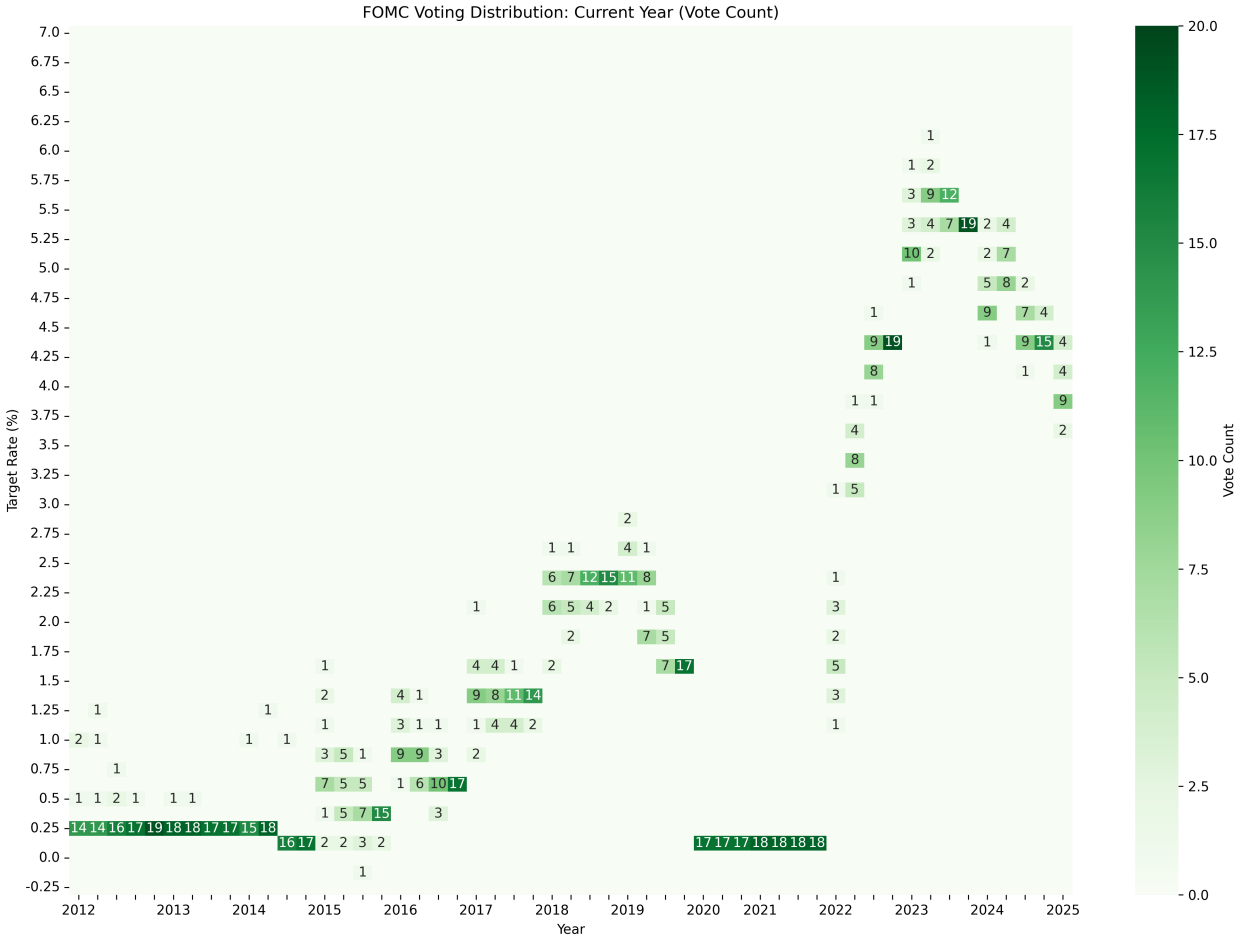
6 Figures and Tables

Figure 1: Dot Plot Example



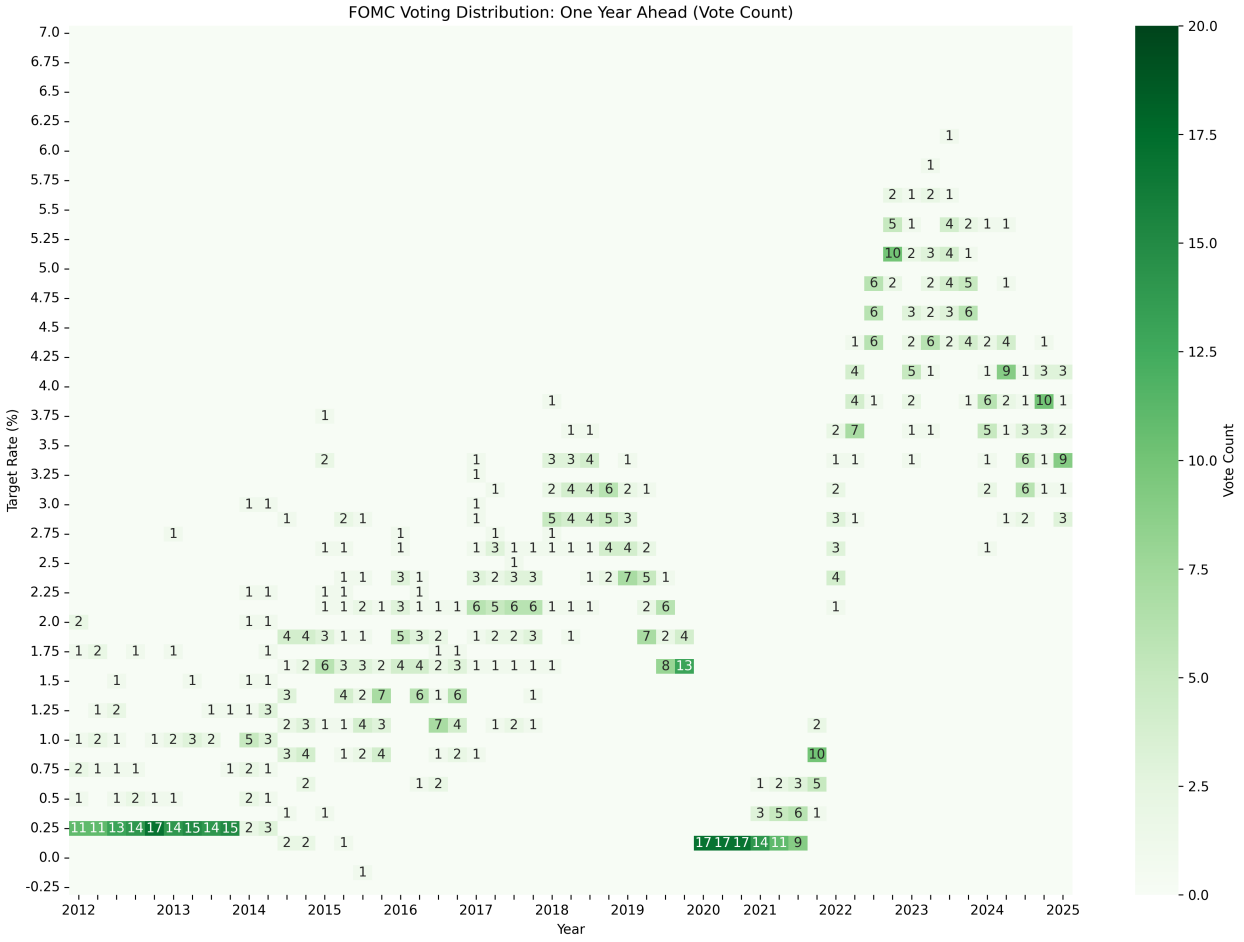
This figure shows the "dot plot" included in the Summary of Economic Projections (SEP) for December 17, 2014. Each dot represents an FOMC participant's projected target rate at the end of each year.

Figure 2: FOMC Voting Distribution of Current Year Projections



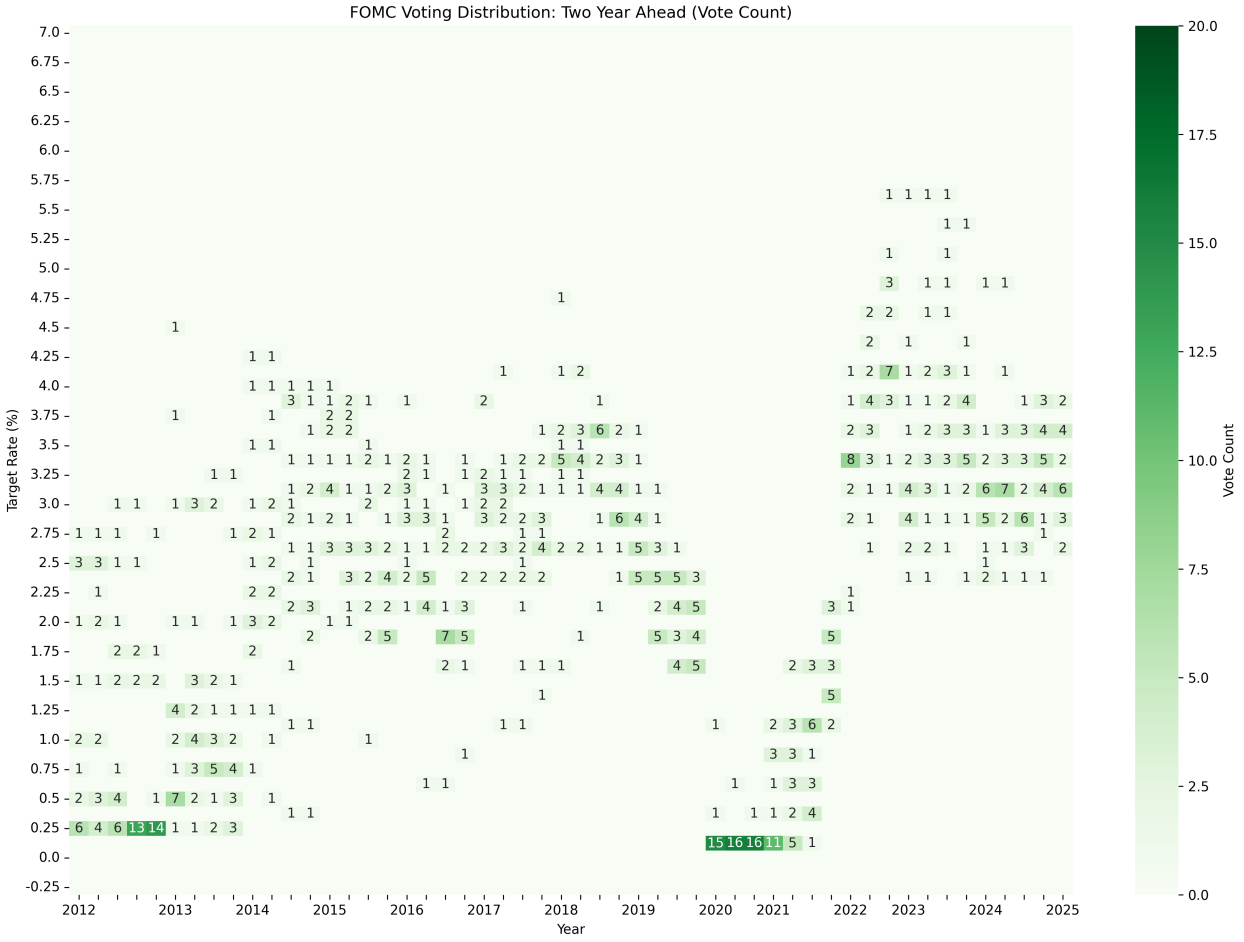
This figure illustrates the overall interest rate projection "dot" for the current year across the period January 2012 to June 2024.

Figure 3: FOMC Voting Distribution of One-Year Ahead Projections



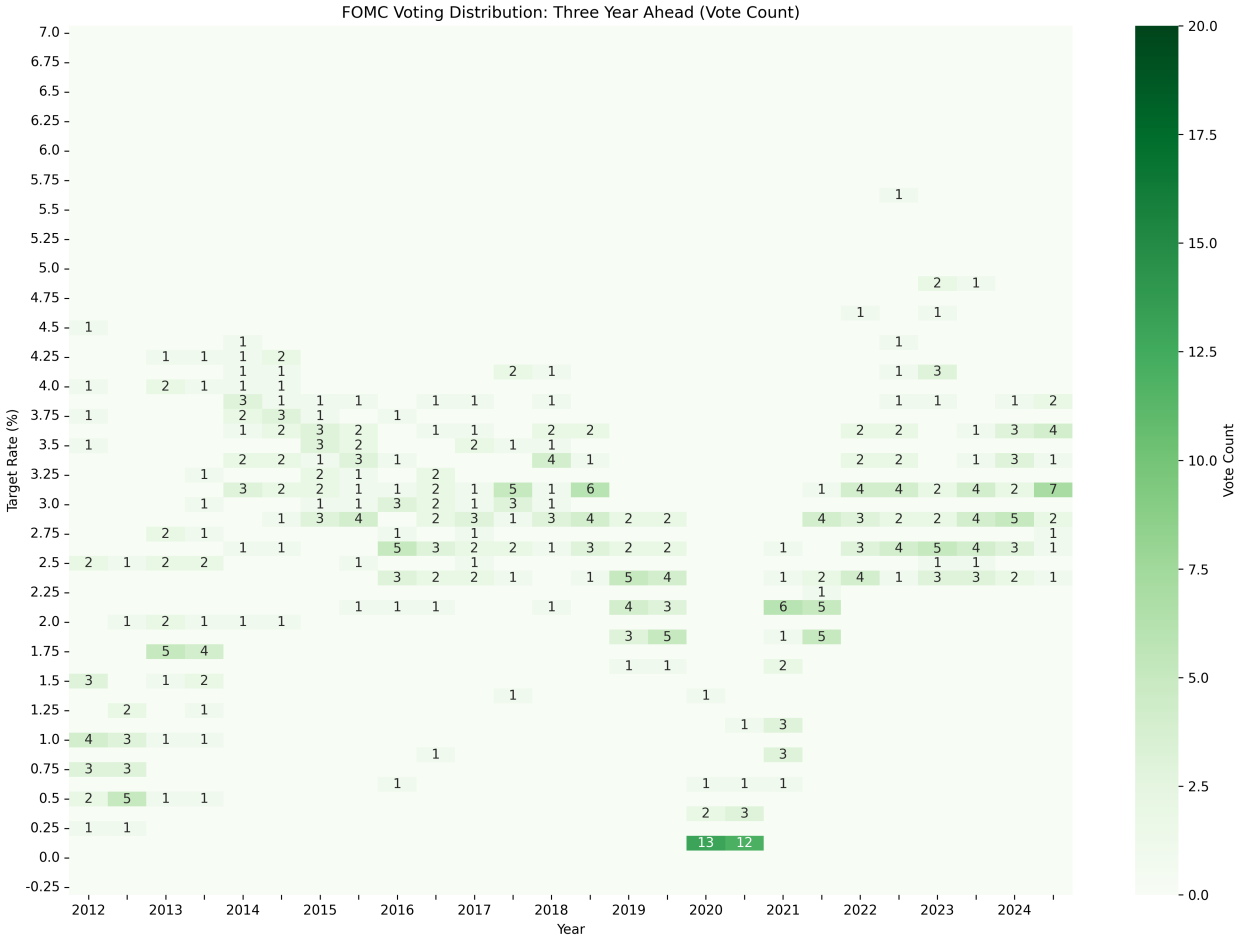
This figure illustrates the overall interest rate projection "dot" for the one year ahead across the period January 2012 to June 2024.

Figure 4: FOMC Voting Distribution of Two-Year Ahead Projections



This figure illustrates the overall interest rate projection "dot" for the two year ahead across the period January 2012 to June 2024.

Figure 5: FOMC Voting Distribution of Three-Year Ahead Projections



This figure illustrates the overall interest rate projection "dot" for the three year ahead across the period January 2012 to June 2024.

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Median	Max
Panel A: Macroeconomic Variables						
$PMD_{t,0}$	48	0.0014	0.0013	0.0000	0.0015	0.0051
$PMD_{t,1}$	48	0.0041	0.0020	0.0000	0.0040	0.0084
$PMD_{t,2}$	48	0.0062	0.0026	0.0006	0.0059	0.0120
$PMD_{t,3}$	24	0.0061	0.0028	0.0029	0.0059	0.0148
MPU	48	90.1370	52.8190	18.6830	80.2356	212.8350
VIX	48	16.8160	5.1460	9.7800	14.9900	29.6200
Term spread	48	0.8050	0.8900	-0.9100	0.8150	2.5700
Funding Constraint	48	0.1604	0.3074	-0.9900	0.2200	0.6400
MPS	46	0.0094	0.0462	-0.0849	0.0047	0.1184
Panel B: ETF Variables						
ETF arbitrage activity (APArb)	13,273	0.0037	0.0309	0.0000	0.0000	0.0899
ETF premium	13,297	0.0008	0.0044	-0.0265	0.0006	0.0127
ETF Size	13,297	2201.8020	7080.1390	0.1330	171.0000	109262.6000
Amihud	12,636	1.1520	16.1270	0.0000	.0015	645.0780
Maturity	12,638	7.2050	6.2790	0.1000	5.800	28.9000

This table reports summary statistics for the variables used in our analysis. The sample spans 48 FOMC meetings from January 2012 through December 2023. Panel A presents macroeconomic uncertainty indicators measured at the meeting level. $PMD_{t,0}$, $PMD_{t,1}$, $PMD_{t,2}$, and $PMD_{t,3}$ measure policymaker disagreement as the cross-sectional standard deviation of federal funds rate projections of FOMC participants for the current year, one year ahead, two year ahead, and three-year ahead, respectively. Three-year-ahead projections are available only for September and December meetings (24 observations). *MPU* is the monetary policy uncertainty index from Baker et al. (2016). *VIX* is the CBOE S&P 500 Volatility Index. *Term spread* is the difference between 10-year and 2-year CMT yields. *MPS* is the orthogonalized monetary policy surprise from Bauer and Swanson (2023). Panel B presents ETF-level variables. ETF arbitrage activity (*APArb*) is the absolute value of changes in shares outstanding scaled by market capitalization. ETF premium is the percentage deviation of ETF closing price from net asset value. *ETF Size* is the natural logarithm of ETF market capitalization in millions of dollars. Amihud illiquidity is calculated following Amihud (2002). *Maturity* is the natural logarithm of the average maturity (in years) of portfolio holdings.

Table 2: Correlation Matrix of Macroeconomic Uncertainty Indicators

	$\text{PMD}_{t,0}$	$\text{PMD}_{t,1}$	$\text{PMD}_{t,2}$	$\text{PMD}_{t,3}$	MPU	MPS
$\text{PMD}_{t,0}$	1.000					
$\text{PMD}_{t,1}$	0.638	1.000				
$\text{PMD}_{t,2}$	0.027	0.619	1.000			
$\text{PMD}_{t,3}$	-0.169	0.203	0.749	1.000		
MPU	-0.053	-0.348	-0.139	0.067	1.000	
MPS	-0.049	-0.241	-0.060	-0.098	-0.112	1.000

This table reports Pearson correlation coefficients among macroeconomic uncertainty indicators. $PMD_{t,0}$, $PMD_{t,1}$, $PMD_{t,2}$, and $PMD_{t,3}$ measure policymaker disagreement as the cross-sectional standard deviation of federal funds rate projections of FOMC participants for the current year, one year ahead, two year ahead, and three-year ahead, respectively. *MPU* is the monetary policy uncertainty index from Baker et al. (2016). *MPS* is the orthogonalized monetary policy surprise from Bauer and Swanson (2023). The sample includes 48 FOMC meetings from January 2012 through December 2023 (24 meetings for $PMD_{t,3}$). All correlations are calculated using meeting-level observations.

Table 3: ETF arbitrage activity and Policymaker Disagreement

VARIABLES	(1)	(2)	(3)	(4)
$PMD_{t,0}$	-0.2614**			
	(0.1202)			
$PMD_{t,1}$		-0.2466*		
		(0.1292)		
$PMD_{t,2}$			-0.2477*	
			(0.1365)	
$PMD_{t,3}$				0.1039
				(0.1481)
MPU	-0.0000	-0.0000	-0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
MPS	-0.0085***	-0.0101***	-0.0085***	-0.0045
	(0.0031)	(0.0030)	(0.0031)	(0.0046)
VIX	0.0000	0.0000	0.0000	-0.0001
	(0.0000)	(0.0000)	(0.0000)	(0.0001)
Term spread	-0.0002	-0.0005	-0.0007	-0.0024**
	(0.0005)	(0.0005)	(0.0005)	(0.0010)
Funding Constraints	0.0006	0.0006	0.0008	0.0004
	(0.0010)	(0.0010)	(0.0010)	(0.0017)
ETF Size	0.0002	0.0002	0.0002	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0002)
Amihud	-0.0000*	-0.0000	-0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Maturity	0.0009***	0.0009***	0.0009***	0.0010**
	(0.0003)	(0.0003)	(0.0003)	(0.0005)
Constant	-0.0017	-0.0007	0.0001	0.0019
	(0.0025)	(0.0026)	(0.0027)	(0.0040)
Observations	10900	10900	10900	5786
Adj. R^2	0.048	0.048	0.048	0.069

This table examines the association between policymaker disagreement and total AP arbitrage activity in bond ETFs. The dependent variable is the absolute value of changes in shares outstanding scaled by market capitalization. $PMD_{t,h}$ measures policymaker disagreement as the cross-sectional standard deviation of FOMC participants' federal funds rate projections at horizon h, where h = 0 (current year), 1 (one year ahead), 2 (two years ahead), or 3 (three years ahead). MPU is the monetary policy uncertainty index from Baker et al. (2016). MPS is the orthogonalized monetary policy surprise from Bauer and Swanson (2023). VIX is the CBOE S&P 500 Volatility Index. Term spread is the difference between 10-year and 2-year CMT yields. Funding Constraints is measured by the TED spread (LIBOR minus Treasury bill rate) through January 2022, and the SOFR-Treasury bill spread thereafter. ETF Size is the natural logarithm of market capitalization. Amihud is the Amihud (2002) illiquidity measure. Maturity is the natural logarithm of average portfolio maturity. All specifications include ETF and year fixed effects. Standard errors are clustered at the ETF level and reported in parentheses. The sample spans 48 FOMC meetings from January 2012 through December 2023 (24 meetings for column 4). * < 0.10, ** < 0.05, *** < 0.01.

Table 4: ETF Share Creation Activity and Policymaker Disagreement

VARIABLES	(1)	(2)	(3)	(4)
$PMD_{t,0}$	-15.1262***			
	(3.4985)			
$PMD_{t,1}$		-10.6275***		
		(3.6010)		
$PMD_{t,2}$			-7.5178*	
			(3.8719)	
$PMD_{t,3}$				5.1513
				(3.5708)
MPU	0.0001	0.0001	0.0000	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0002)
MPS	-0.3011***	-0.3717***	-0.3063***	-0.2028
	(0.0894)	(0.0930)	(0.0895)	(0.1469)
VIX	-0.0011	-0.0019	-0.0021	-0.0008
	(0.0015)	(0.0015)	(0.0015)	(0.0019)
Term spread	0.0090	-0.0094	-0.0192	0.0563
	(0.0142)	(0.0139)	(0.0146)	(0.0371)
Funding Constraints	0.0557*	0.0508*	0.0558*	0.1474***
	(0.0305)	(0.0307)	(0.0314)	(0.0501)
ETF Size	0.0655***	0.0656***	0.0656***	0.0679***
	(0.0041)	(0.0041)	(0.0041)	(0.0056)
Amihud	-0.0000	-0.0000	-0.0000	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Maturity	0.0535***	0.0528***	0.0523***	0.0458***
	(0.0122)	(0.0123)	(0.0123)	(0.0152)
Constant	-1.1695***	-1.1244***	-1.1132***	-1.2986***
	(0.0838)	(0.0852)	(0.0885)	(0.1286)
Observations	10904	10904	10904	5786
Adj. R^2	0.185	0.184	0.183	0.192

This table examines the association between policymaker disagreement and AP share creation activity in bond ETFs using a linear probability model. The dependent variable equals one if the ETF experiences positive changes in shares outstanding (creation activity) and zero otherwise. $PMD_{t,h}$ measures policymaker disagreement as the cross-sectional standard deviation of FOMC participants' federal funds rate projections at horizon h, where h = 0 (current year), 1 (one year ahead), 2 (two years ahead), or 3 (three years ahead). MPU is the monetary policy uncertainty index from Baker et al. (2016). MPS is the orthogonalized monetary policy surprise from Bauer and Swanson (2023). VIX is the CBOE S&P 500 Volatility Index. Term spread is the difference between 10-year and 2-year CMT yields. Funding Constraints is measured by the TED spread (LIBOR minus Treasury bill rate) through January 2022, and the SOFR-Treasury bill spread thereafter. ETF Size is the natural logarithm of market capitalization. Amihud is the Amihud (2002) illiquidity measure. Maturity is the natural logarithm of average portfolio maturity. All specifications include ETF and year fixed effects. Standard errors are clustered at the ETF level and reported in parentheses. The sample spans 48 FOMC meetings from January 2012 through December 2023 (24 meetings for column 4). * < 0.10, ** < 0.05, *** < 0.01.

Table 5: ETF Share Redemption Activity and Policymaker Disagreement

VARIABLES	(1)	(2)	(3)	(4)
$PMD_{t,0}$	-2.5768			
	(2.3517)			
$PMD_{t,1}$		-3.8903		
		(2.4298)		
$PMD_{t,2}$			-6.6535**	
			(2.6530)	
$PMD_{t,3}$				-1.9975
				(2.8648)
MPU	0.0000	0.0000	-0.0000	0.0002
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
MPS	0.0079	-0.0150	0.0140	0.0241
	(0.0643)	(0.0666)	(0.0648)	(0.0960)
VIX	0.0011	0.0010	0.0011	-0.0021
	(0.0011)	(0.0011)	(0.0011)	(0.0015)
Term spread	0.0018	-0.0001	-0.0054	-0.0833***
	(0.0116)	(0.0112)	(0.0112)	(0.0244)
Funding Constraints	-0.0508**	-0.0505**	-0.0429**	-0.0999***
	(0.0208)	(0.0210)	(0.0216)	(0.0365)
ETF Size	0.0179***	0.0179***	0.0178***	0.0153***
	(0.0030)	(0.0030)	(0.0030)	(0.0036)
Amihud	-0.0000	-0.0000	-0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Maturity	0.0002	0.0001	-0.0002	0.0035
	(0.0084)	(0.0084)	(0.0084)	(0.0106)
Constant	-0.2960***	-0.2803***	-0.2490***	-0.1515*
	(0.0639)	(0.0637)	(0.0653)	(0.0844)
Observations	10904	10904	10904	5786
Adj. R^2	0.112	0.112	0.112	0.100

This table examines the association between policymaker disagreement and AP share redemption activity in bond ETFs using a linear probability model. The dependent variable equals one if the ETF experiences negative changes in shares outstanding (redemption activity) and zero otherwise. $PMD_{t,h}$ measures policymaker disagreement as the cross-sectional standard deviation of FOMC participants' federal funds rate projections at horizon h, where h = 0 (current year), 1 (one year ahead), 2 (two years ahead), or 3 (three years ahead). MPU is the monetary policy uncertainty index from Baker et al. (2016). MPS is the orthogonalized monetary policy surprise from Bauer and Swanson (2023). VIX is the CBOE S&P 500 Volatility Index. Term spread is the difference between 10-year and 2-year CMT yields. Funding Constraints is measured by the TED spread (LIBOR minus Treasury bill rate) through January 2022, and the SOFR-Treasury bill spread thereafter. ETF Size is the natural logarithm of market capitalization. Amihud is the Amihud (2002) illiquidity measure. Maturity is the natural logarithm of average portfolio maturity. All specifications include ETF and year fixed effects. Standard errors are clustered at the ETF level and reported in parentheses. The sample spans 48 FOMC meetings from January 2012 through December 2023 (24 meetings for column 4). * < 0.10, ** < 0.05, *** < 0.01.

Table 6: ETF Arbitrage Opportunity and Policymaker Disagreement

VARIABLES	(1)	(2)	(3)	(4)
$PMD_{t,0}$	0.3111***			
	(0.0395)			
$PMD_{t,1}$		0.2527***		
		(0.0400)		
$PMD_{t,2}$			0.0634	
			(0.0547)	
$PMD_{t,3}$				0.0078
				(0.0488)
MPU	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
MPS	-0.0159***	-0.0143***	-0.0157***	-0.0187***
	(0.0016)	(0.0015)	(0.0016)	(0.0020)
VIX	-0.0002***	-0.0002***	-0.0002***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Term spread	-0.0000	0.0004*	0.0005***	-0.0016***
	(0.0002)	(0.0002)	(0.0002)	(0.0005)
Funding Constraints	0.0004	0.0005*	0.0006*	0.0002
	(0.0003)	(0.0003)	(0.0003)	(0.0004)
ETF Size	0.0000	0.0000	-0.0000	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Amihud	0.0000	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Maturity	0.0009***	0.0009***	0.0009***	0.0007***
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Constant	0.0017	0.0006	0.0011	0.0018
	(0.0015)	(0.0015)	(0.0015)	(0.0017)
Observations	10904	10904	10904	5786
Adj. R^2	0.243	0.242	0.239	0.242

This table examines the association between policymaker disagreement and ETF mispricings. The dependent variable is the absolute value of the ETF premium, defined as the percentage deviation of the ETF closing price from its net asset value. $PMD_{t,h}$ measures policymaker disagreement as the cross-sectional standard deviation of FOMC participants' federal funds rate projections at horizon h, where h = 0 (current year), 1 (one year ahead), 2 (two years ahead), or 3 (three years ahead). MPU is the monetary policy uncertainty index from Baker et al. (2016). MPS is the orthogonalized monetary policy surprise from Bauer and Swanson (2023). VIX is the CBOE S&P 500 Volatility Index. Term spread is the difference between 10-year and 2-year CMT yields. Funding Constraints is measured by the TED spread (LIBOR minus Treasury bill rate) through January 2022, and the SOFR-Treasury bill spread thereafter. ETF Size is the natural logarithm of market capitalization. Amihud is the Amihud (2002) illiquidity measure. Maturity is the natural logarithm of average portfolio maturity. All specifications include ETF and year fixed effects. Standard errors are clustered at the ETF level and reported in parentheses. The sample spans 48 FOMC meetings from January 2012 through December 2023 (24 meetings for column 4). * < 0.10, ** < 0.05, *** < 0.01.

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