

How Central Bank Announcements Affect Expectations

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preliminary

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Abstract

Central bank interest rate announcements shift public interest rate expectations by partially resolving uncertainty about how decisions are made. For Federal Reserve announcements, I argue expectations data show the uncertainty is over how the Fed will interpret public information, rather than its possible private knowledge. Fed announcements do not shift the public's rate expectations towards the Fed's own expectations on average, and lower-frequency expectations in general are too dispersed to be consistent with a shared subjective model. I develop a framework combining information frictions with idiosyncratic shocks to beliefs about what is driving economic fluctuations. Along with interest rate expectations, the model can match evidence used to support central banks having private knowledge, including unexpected policy tightenings not followed by output and price-level declines. Policy transmission is delayed when there is ambiguity about the central bank's beliefs.

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1 Introduction

When central banks announce and explain an interest rate decision, public expectations about the path of future interest rates often shift, even when the decision itself was fully anticipated. These shifts suggest a fundamental asymmetry where the central bank has private information relevant for its own future actions that its announcements shed light on. A large literature tries to pin down the nature of this information, with most depicting the central bank as privately informed about the underlying state of the world, such as current economic conditions or its policy decision rule.¹ For example, a central bank announcement might reveal private knowledge of an ongoing productivity boom, or how it will systematically respond to one, causing expectations of future interest rates to shift up. But even if the public doesn't see a boom as more likely, it would also revise its rate expectations up if the central bank unexpectedly reveals it *perceives* one since it has interest rate setting power (Caballero and Simsek, 2022; Sastry, 2026).

In this paper, I use expectations data to break this observational equivalence and argue the Federal Reserve's private information is primarily limited to knowledge of its subjective reading of public information. I find Fed interest rate announcements on average do not shift public expectations of future interest rates closer to the Fed's own expectations, a precise null result at both high and low frequencies across a variety of expectation measures. If the Fed had meaningful private knowledge beyond its own reading of public data, its pre-announcement expectations would have predictive power for the change in public expectations. If instead subjective belief differences create pre-existing disagreements about future interest rates, the public receives announcements as news about how quickly the Fed will come around to the consensus view. Returning to the productivity boom, suppose the public knows its growth forecast is smaller than the Fed's. Then the only uncertainty from its perspective is the extent of the Fed's over-optimism, so the announcement should be roughly as likely to move public expectations up towards the Fed as down away.²

We also need subjective models as the primary source of asymmetry to match lower-frequency expectations about both interest rates and the broader economy. Federal Reserve projections of its own future actions are not systematically better (Amodeo, 2026) and feature the same persistent forecast errors documented in private sector forecasts (Cieslak, 2018; Schmeling et al., 2022; Farmer et al., 2024). In fact, I find their forecast error autocorrelation is even more pronounced. The Fed and public having different beliefs is also not unique to this institutional relationship. I derive an upper bound on the level of belief dispersion possible when everyone shares the same model of the world and show it is violated by professional forecaster

¹Notable contributions include Romer and Romer (2000); Campbell et al. (2012); Nakamura and Steinsson (2018); Cieslak et al. (2019); Cieslak and Schrimpf (2019); Jarociński and Karadi (2020); Miranda-Agrippino and Ricco (2021); Hillenbrand (2024); Bauer and Swanson (2023a,b); Sastry (2026); Acosta (2026).

²For interest rates in the near future, there necessarily must be some alignment of expectations because of the Fed's rate setting power. I find near-term expectations are already so aligned before the announcement that this effect is not detectable.

and household surveys about the economic outlook. Central banks in practice are governed by committees meant to be representative of the population (Reis, 2013; Faust, 2016), making subjective beliefs play an important role in monetary policy decisions and news by design.

After establishing heterogeneous subjective models as driving the response of beliefs to announcements, it's natural to ask why these models wouldn't converge. I build a general equilibrium framework that generalizes the two key features of Angeletos and La'O (2013): information frictions and idiosyncratic shocks to beliefs. The latter is in part deployed to tractably mimic non-stationary dynamics; disagreement recurs because *what we're disagreeing about* is changing. At the same time, there is a tension at face value between the apparent unimportance of central bank private information and prevailing uncertainty about aggregate conditions. Uncertainty about the aggregate state is caused by information being dispersed throughout the economy, and in these environments, learning the beliefs of others can be valuable (Townsend, 1983). The existence of private information, even if it's not more precise, creates a "signaling channel" of monetary policy: central banks sending a signal about their beliefs through the setting of interest rates acts as a broader signal about the aggregate state that everyone can see and coordinate behavior around (Morris and Shin, 2002; Melosi, 2017; Hillenbrand, 2024; Acosta, 2026). But after conditioning on the central bank's interest rate setting power, this signal may have no or negligible effects on the beliefs of others if this private information is effectively spanned by information that is already publicly available, consistent with my empirical findings. In the model, I specify the information structure so that this holds.

I create dispersed information in an environment with a continuum of island economies. Each island is a closed New Keynesian economy facing a common interest rate, which the central bank sets using its best estimates of cross-island aggregates.³ At the same time, I assume a finite number N islands also release their forecasts. Since all private signals (including the central bank's) are drawn from a common distribution, the value of the central bank's signal is the difference between a panel of N and $N + 1$ forecasters. Because the marginal information gain is concave in N , it will be possible to set N low enough that meaningful aggregate uncertainty remains yet high enough that an additional estimate of aggregates is quantitatively irrelevant. Intuitively, when Goldman Sachs, JP Morgan, and many other firms publish their forecasts, it's not surprising that the only effects of the central bank's forecast come from its interest rate setting power. To match data on interest rate expectations and disagreement, I shock beliefs about what type of aggregate shock occurred in the period.⁴ For example, two islands can observe the same productivity increase but have different beliefs about how transitory the boom will be, even if they have the same information.

³I simplify the information structure by assuming signals about endogenous aggregate variables are observed with a lag. As a result, the framework can be applied to essentially any linear-Gaussian structure for the islands.

⁴Caballero and Simsek (2022) instead shock beliefs about the magnitude of noise in public data and make beliefs fully rigid. I extend their model with more structure in Online Appendix B and show it is still insufficient to match these data.

Model Applications. For quantitative exercises, I perform Bayesian estimation of a version where each island is a [Smets and Wouters \(2007\)](#) economy. Beyond replicating the motivating empirical facts, the model speaks to several questions about monetary policy, especially topics in central bank communication.

First, recall a signaling channel of monetary policy exists when the central bank has private information about the underlying state of the world. An ongoing debate takes the existence of the signaling channel as given but seeks to clarify its exact mechanism. The two leading perspectives are that the public learns about the economy from central bank communications ([Romer and Romer, 2000](#); [Nakamura and Steinsson, 2018](#); [Jarociński and Karadi, 2020](#); [Miranda-Agrippino and Ricco, 2021](#)) and that the public learns the central bank is more responsive to economic conditions than it had thought ([Bauer and Swanson, 2023a,b](#); [Cieslak et al., 2019](#)).⁵ The discussion has converged to a focus on why changes in interest rate expectations around policy announcements are correlated with (i) information available prior to the policy announcement and (ii) professional forecasters revising their outlook in an expansionary direction. My model can match both facts without a signaling channel, confirming the arguments given in [Bauer and Swanson \(2023a,b\)](#) and the sensitivity analysis of other comprehensive overviews ([Sastry, 2026](#); [Acosta, 2026](#)).⁶ In companion work, I add to these reviews and find more evidence for the asymmetric interpretation framework ([Bousquet, 2026b](#)).

The signaling channel is also commonly invoked to explain why empirical estimates of the effects of monetary policy are sometimes "puzzling", or inconsistent with standard economic theory. Specifically, a popular strategy to estimate the effects of policy is to use high-frequency changes in asset prices around policy announcements, as in the pioneering work of [Kuttner \(2001\)](#); [Cochrane and Piazzesi \(2002\)](#) using interest rate futures. These high-frequency changes are often treated as exogenous policy shifts in both theory ([Casini and McCloskey, 2026](#); [Casini et al., 2026](#)) and practice (e.g., [Gertler and Karadi, 2015](#)). This assumption is falsified if policy announcements reveal information about the economy or the central bank's systematic policy response, and this concern is one major contributor to the extensive discussion on the signaling channel. It's been informally conjectured that a lack of signaling channel is a sufficient condition for high-frequency identification ([Nakamura and Steinsson, 2018](#), fn. 20; [Bauer and Swanson, 2023a](#), p. 119). I use my model to demonstrate the lack of signaling channel is not sufficient but instead necessary for valid identification. In my model, puzzles can occur without a signaling channel. While I offer a brief discussion on this result, a proper treatment is outside the scope of this paper. In separate companion work, I use economic outlook disagreement to microfound why there might be random movements in policy high-frequency identification can recover, but also more rigorously outline how differences in beliefs are not

⁵An important topic not considered in this paper is how central banks signal their credibility or commitment ([Debortoli and Lakdawala, 2016](#); [King and Lu, 2025](#); [Cieslak et al., 2026](#); [Amodio, 2026](#); [Caravello et al., 2026](#); [Bocola et al., 2026](#)).

⁶[Bauer and Swanson \(2023a,b\)](#) argue (i) can be caused by small sample sizes and general persistence in the data and (ii) can occur because interest rate expectations are measured at high frequency while forecast revisions are monthly.

a substitute for randomness (Bousquet, 2026a).

Finally, there is a progressively established consensus in support of central bank transparency (Woodford, 2005; Reis, 2013; Bernanke, 2024; Cieslak et al., 2026), with countervailing arguments often appealing to a signaling channel (Morris and Shin, 2002; Iovino et al., 2022; Ou et al., 2025). The model in this paper provides a natural setting to assess the effects of imprecision in communication. In the baseline model, it's assumed that the central bank perfectly communicates the inputs to its Taylor (1993) rule. I show that when the components of its rule are not observed separately, policy transmission is delayed.⁷ Future work will seek to provide further characterizations of how this equilibrium disagreement affects the transmission of policy, such as how central banks should respond to disparate views and higher-order beliefs in line with Caballero and Simsek (2022); Rungcharoenkitkul and Winkler (2026).

2 Facts about Interest Rate Expectations

This section presents three facts about Federal Reserve and private sector interest rate expectations:

1. Fed announcements do not move the public's expectations closer to the Fed's own expectations.
2. Differences between Fed and private sector expectations are predictable.
3. The Fed's forecast errors tend to be more persistent than the private sector's.

Section 2.1 describes the expectation measures. Section 2.2 shows how interest rate expectations respond to Fed announcements, finding they do not systematically move the public's expectations toward the Fed's. Section 2.3 shows Fed announcements and communications, as well as differences between Fed and public expectations, are predictable, adds comparisons with low-frequency expectations, and discusses further considerations for inference. Section 3 then explains why these facts indicate the Fed and the public form expectations using different subjective models, and why these subjective differences are substantially larger than any private knowledge the Fed might have.⁸ The facts are therefore consistent with announcements moving expectations by providing news about how the Fed interprets publicly available data.

2.1 Data

I use three measures of Federal Reserve interest rate expectations. The first is the baseline interest rate forecast the Fed staff prepared for meetings of the Fed's deliberative body, the Federal Open Market Committee

⁷This is related to recent separate work demonstrating "hump-shaped" responses from frictions in information acquisition and expectation formation (Woodford, 2003; Angeletos et al., 2021, 2026; Cai, 2025; Auclert et al., 2026).

⁸Section 3 also makes precise the sense in which expectation differences are "large"; belief dispersion within the public violates a bound implied by an environment with a common subjective model.

(FOMC), from September 1982 to January 2020. The second is the Summary of Economic Projections (SEP), a quarterly publication of each FOMC member’s (initially anonymized) public projections. For both measures, I exclude periods where they indicate the Fed expected interest rates to stay at zero through the end of the next calendar year. As discussed in [Section 2.3](#), both are imperfect proxies for the Fed’s internal expectations of interest rates, in part because they are explicitly modal rather than mean forecasts. Appendix [A.1](#) constructs a third measure from transcripts of internal deliberations, which classifies the Fed’s expected path of future interest rates as {higher, lower, ambiguous} relative to private sector expectations. For private sector expectations, I use data from interest rate futures markets since 1993, the Blue Chip Financial Forecasts since 1985, and the New York Fed’s Survey of Primary Dealers since 2014.

These measures suggest the Fed often perceives a materially different path of future interest rates than the private sector.⁹ [Figure 4](#) compares Fed staff policy projections to different measures of private expectations, and [Figures 3 and 12](#) (Appendix [A.1](#)) make the same comparison using the SEP. From 2015–2024 (excluding COVID), the Fed perceived a higher path of future interest rates for nearly the entire period. [Figure 11](#) in Appendix [A.1](#) shows divergences using the transcript measure. From 1993–2008, the Fed perceived an unambiguously different path from the private sector at roughly half of its meetings.

A natural question is what effect Federal Reserve policy decisions have on these differences in expectations. To identify these effects, I look at how interest rate expectations move immediately after the Fed announces its latest interest rate decision. For roughly a decade after the Fed began setting a target for the federal funds rate in 1982, decisions reached at FOMC meetings were not publicly released, and the public could only infer what had happened with a delay ([Thornton, 2006](#); [Swanson and Jayawickrema, 2024](#)). The Fed now formally announces its decisions in a scheduled time window, and high-frequency data from interest rate futures markets around these announcements have been made publicly available and are regularly updated ([Jarociński, 2024](#); [Acosta et al., 2026](#)). For the rest of the paper, I assume that the expectation changes observed around these event windows are entirely attributable to what the Fed announced and communicated.

2.2 High-Frequency Response of Interest Rate Expectations

I find that interest rate announcements do not systematically move the public’s interest rate expectations toward the Fed’s own expectations. Formally, the difference in expectations D that exists immediately before an announcement is not associated with the change C in private sector interest rate expectations immediately after it. To see this link, suppose $D > 0$ (i.e., the Fed expects a higher rate than the public). Then $C > 0$ means the private sector shifted toward the Fed’s expectation. So if C, D are not correlated, announcements do not systematically move the public towards the Fed.

⁹Divergences in the first two measures were previously documented by [Caballero and Simsek \(2022\)](#); [Amodeo \(2026\)](#).

Making this precise, consider expectations immediately before and after a monetary policy announcement. Let $\mathbb{E}_t^F[i_{t+h}]$ denote the Fed's expectation of the interest rate at $t+h$, given its private knowledge of i_t , the rate it is about to announce. Importantly, $\mathbb{E}_t^F[i_{t+h}]$ already internalizes how the Fed thinks the announcement will affect the public's expectations. I assume that after the announcement, the Fed's interest rate expectations do not change. Let $\bar{\mathbb{E}}_t^-[i_{t+h}]$ and $\bar{\mathbb{E}}_t^+[i_{t+h}]$ denote the public's expectations before and after the announcement of i_t . Define

$$D_{t,h} = \mathbb{E}_t^F[i_{t+h}] - \bar{\mathbb{E}}_t^-[i_{t+h}] \quad (1)$$

as the ex ante difference in expectations and

$$C_{t,h} = \bar{\mathbb{E}}_t^+[i_{t+h}] - \bar{\mathbb{E}}_t^-[i_{t+h}] \quad (2)$$

as the public's revision in expectations.

As best we can measure the Fed's expected interest rate path, $C_{t,h}$ and $D_{t,h}$ are uncorrelated. Perhaps the best indicator is simply a time series of $C_{t,h}$. [Figure 1](#) plots the change in one-year-ahead interest rate expectations implied by futures markets around each announcement. In principle, these changes should be unpredictable, but the Fed may have useful information about future interest rates market participants lack. If so, positive expectation changes about i_{t+h} should occur when the Fed anticipates higher rates than the public and negative changes when it anticipates lower rates. The observations in [Figure 1](#) are colored by the transcript classification of the Fed's expected rate path and show this is not the case.

Across the two continuous measures of $D_{t,h}$, the upper bounds of the 90% confidence intervals for the correlation with $C_{t,h}$ are uniformly below 0.10. For the Fed staff measure, I use the difference with the staff forecast and the federal funds futures-implied forecast for $h = 1$ and 2 quarters ahead, and $C_{t,h}$ is the high-frequency change in the same futures contracts in a narrow window around Fed announcements from January 1993 to January 2020, excluding 2009–2015. The scatterplots and lines of best fit in [Figure 2](#) show the lack of correlation is not driven by any particular time period. [Appendix A.1](#) runs similar tests with bond yields to cover longer-horizon forecasts over the same sample, translating Fed staff forecasts into an "as if" yield using the expectations hypothesis. The same uncorrelatedness remains, even after various term premia adjustments.

[Figure 3](#) shows a similar pattern using the difference between the Fed's median SEP projection for the federal funds rate at the end of the next calendar year and the corresponding futures contract. The Fed's projections were above futures-implied expectations for nearly the entire period (2014–2026, excluding COVID), so if announcements systematically aligned expectations, futures-implied rates should have mostly shifted up. Instead, many of the largest negative high-frequency changes in futures ever recorded occurred

during the Fed’s aggressive interest rate increases that began in March 2022. As an illustration, futures markets prior to the March 2023 announcement expected rates to be cut by the end of the year. At the announcement, the published SEP showed the median committee member projected a rate 60 basis points higher than markets, and the FOMC chair emphasized "we don’t see rate cuts this year." After the announcement, futures priced in even more cuts. Consistent with this, Appendix A.1 shows futures adjust much less than one-for-one with survey-based proxies for SEP surprises.¹⁰

2.3 Predictability, Performance, and Measurement of Fed Expectations

Figures 1–3 show that interest rate expectations almost always shift after Fed announcements. Because these shifts occur even when the interest rate decision itself was a foregone conclusion, announcements of i_t must generally reveal information. Yet learning this information does not tend to move the public’s expectation closer to the Fed’s. Two complementary observations provide context for this finding: Fed announcements and communications are predictable and the Fed’s interest rate forecast errors in my sample are larger and more persistent than the private sector’s. I discuss each observation and conclude with some possible rationalizations and sensitivity analyses that do not reconcile the findings.

2.3.1 Predictability

The shifts in interest rate expectations caused by announcements are typically small relative to the level of interest rates. Table 1 shows the typical shift in expected rates three months, one year, and two years ahead is less than 5 basis points, while the median interest rate target over the sample is around 400 basis points. If there is low uncertainty about what will transpire at announcements, whatever information they could even potentially reveal must be modest.

There is also little uncertainty about the Fed’s public interest rate projections. The New York Fed’s Survey of Primary Dealers asks respondents for their own modal forecast of the federal funds rate at the end of the following year and for their forecast of the median SEP projection at the same horizon. The SEP median may not perfectly capture the Fed’s true expectations, but the projections FOMC members choose to submit are still a direct consequence of whatever private knowledge they have about future interest rates. If that knowledge is consequential, dealers should have lots of uncertainty over these projections. Yet from 2014–2025 (excluding COVID), Figure 14 in Appendix A.1 shows the interquartile range (IQR) of dealers’ forecasts of the SEP median is zero in 40% of surveys. If dealers perceive the Fed projections as the best

¹⁰The surveys, from Bloomberg and the Survey of Primary Dealers, are imperfect and the samples are short.

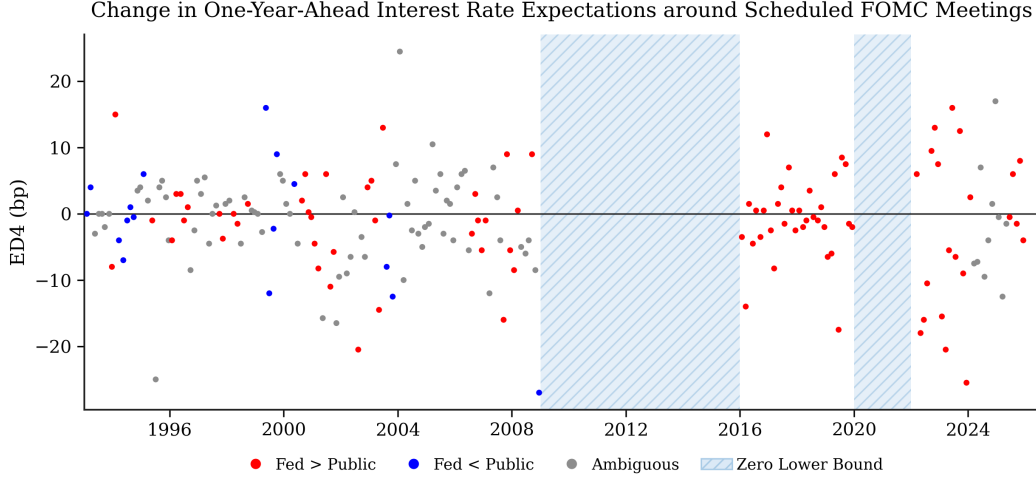


Figure 1: Changes in interest rate expectations for one year ahead around scheduled Fed interest rate announcements (implied by ED4 futures contract). Observations are colored by whether deliberation transcripts indicated the FOMC had a higher, lower, or ambiguous expected path of future interest rates relative to interest rate futures markets (Appendix A.1).

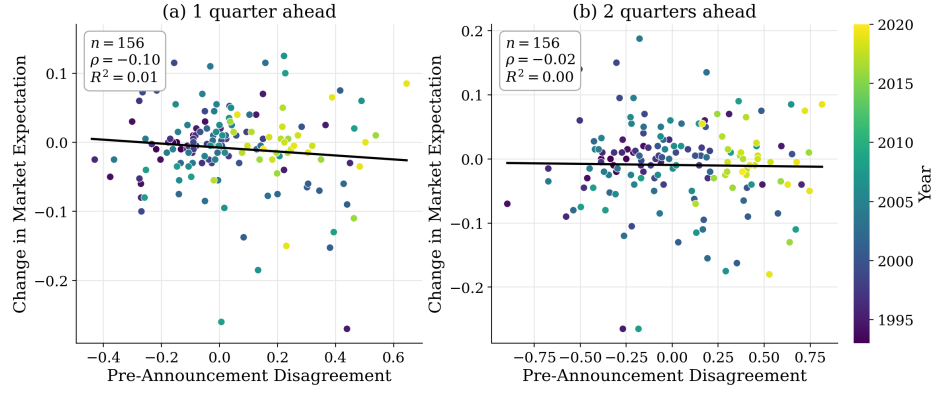


Figure 2: Change in interest rate futures around policy announcements ($C_{t,h}$) vs. disagreement ($D_{t,h}$, the difference in Fed staff forecasts and pre-announcement public expectations) for $h = 1, 2$ quarters ahead. See main text for additional details.

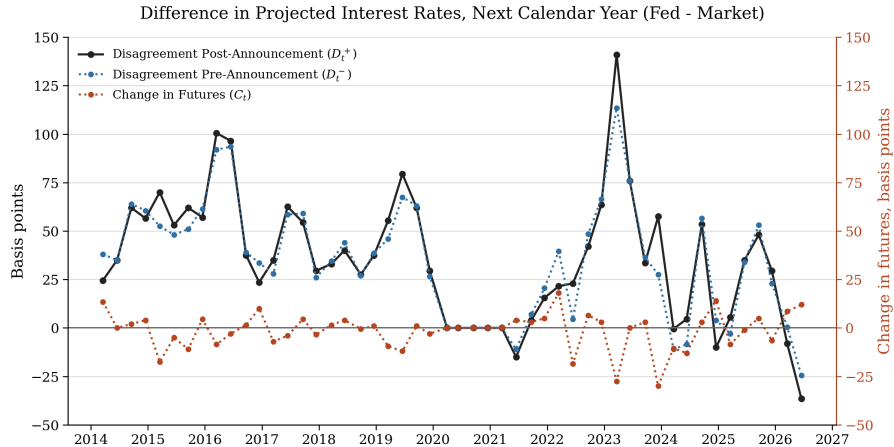


Figure 3: The left y-axis is the difference between the FOMC's Summary of Economic Projections median for the appropriate level of the federal funds rate at the end of the next calendar year and the relevant interest rate futures contract at the end of the announcement day. The right y-axis shows the change in the futures contract (daily frequency).

possible interest rate forecast, their own rate forecasts would be similarly concentrated. Instead, the median IQR of dealers’ rate forecasts across surveys is more than 6 times that of their forecasts of the SEP median.¹¹

Another implication of the predictability is whatever information is released cannot be what causes the differences in expectations between the Fed and the public; these differences are an order of magnitude larger. For example, [Figure 3](#) plots the difference between the median SEP projection for the federal funds rate at the end of the next calendar year and the expectation implied by the corresponding futures contract. The average absolute difference is 38 bp, larger than *any* shift in the price of that futures contract around an interest rate announcement. Fed officials also communicate between meetings, but the resulting movements in expectations are generally even smaller ([Swanson and Jayawickrema, 2024](#); [Vissing-Jorgensen, 2024](#)). So some differences in expectations are not closed by further communication, and seemingly could not be.

Table 1: Changes in Interest Rate Expectations Around Federal Reserve Interest Rate Announcements

Series	Median($ x $)	Mean($ x $)	Std(x)	IQR(x)
FF4 ($N = 192$)	1.50	2.78	4.34	3.00
ED4 ($N = 192$)	4.00	5.75	7.86	8.13
ED8 ($N = 183$)	3.50	5.18	7.12	7.00

Notes: Entries are in basis points. The series correspond to interest rate futures contracts. High-frequency price movement is a measure of the change in the federal funds rate expected to prevail three months later (FF4), four quarters later (ED4), and eight quarters later (ED8). Data are sourced from [Jarociński \(2024\)](#); [Acosta et al. \(2026\)](#), and the sample contains scheduled meetings from 1993–2025, excluding the years where the nominal interest rate target was zero (2009–2015, 2020–2021). The columns are the absolute median and mean, the standard deviation, and the interquartile range.

2.3.2 Performance

The exercises above rely on the Fed and the public having different expectations. Whenever expectations differ, one side could have information the other does not, but the predictability suggests this information is not what causes the difference. Forecast performance offers another check: under a shared subjective model of the world and nested information sets, the side with the nesting information set should be a superior forecaster. Outside the zero lower bound, [Amodeo \(2026\)](#) shows Fed staff projections have higher mean squared error than interest rate expectations implied by futures markets, a difference that is statistically significant at several horizons. Previous work shows private sector interest rate forecasts make autocorrelated errors ([Cieslak, 2018](#); [Schmeling et al., 2022](#); [Farmer et al., 2024](#)). [Figure 4](#) shows the Fed makes similar errors, and tests in [Appendix A.1](#) indicate the Fed’s errors tend to be more persistent. The transcript classification in [Figure 11](#) shows that over 1993–2008 the Fed tended to be further "behind the curve" than markets; when interest rates were expected to rise, markets underpredicted how much they would rise and the Fed underpredicted even further (and vice versa). For example, the easing cycle that began in 2001

¹¹The median IQR gap is 44 bp. Alternatively, the median size of a survey’s gap is 16% of that survey’s median forecast.

eventually resulted in roughly 550 basis points of interest rate cuts. Along the way public expectations consistently underestimated how low rates would fall. Over much of this period, the Fed believed markets were projecting too low a terminal rate. At its May 2001 meeting, the Fed lowered the federal funds rate to 4 percent. Markets expected further easing, while Fed Chair Alan Greenspan projected the Fed "should be able to hold at 4 percent in June" and later undo some of the cuts. This suggests the lack of expectations alignment is not due to the public willfully ignoring information the Fed releases.

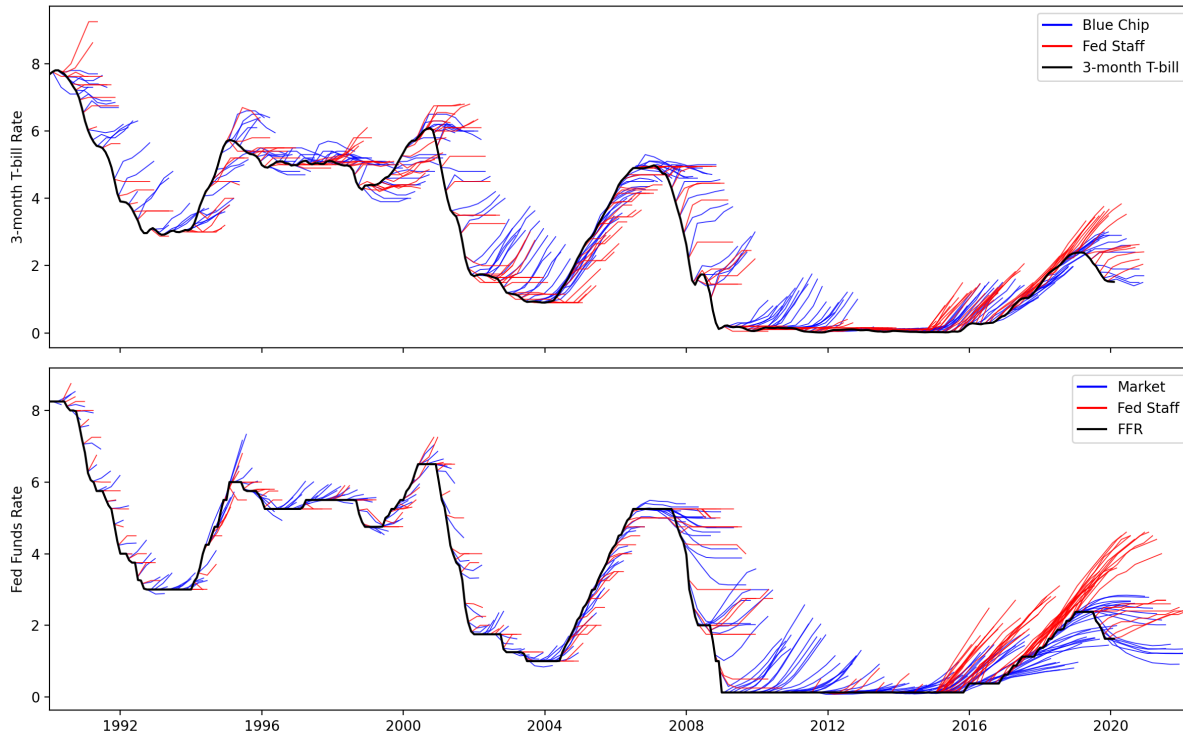


Figure 4: Forecasts of the quarterly average 3-Month T-bill rate (DTB3) and the federal funds rate against the realized quarterly average. The top panel uses the Blue Chip Financial Forecast, the bottom panel uses federal funds rate futures contracts, and the Fed staff projections are from the Federal Reserve Bank of Philadelphia (Greenbook/Tealbook).

2.3.3 Measurement and Robustness

Changes in market expectations around announcements are uncorrelated with proxies for the disagreement between the Fed and markets that existed beforehand. One possible explanation is that alignment instead occurs in response to formal and informal Fed communication between announcements. This cannot explain the results because differences in expectations persist from meeting to meeting, and inter-meeting communications tend to provide much less news than announcements. [Vissing-Jorgensen \(2024\)](#) notes the vast majority of these events generate little detectable activity in asset prices, so there must not be much information released. [Table 3](#) in [Appendix A.2](#) compares interest rate futures movements around inter-meeting communication by the Fed chair and around macro data releases, showing movements around data releases

tend to be larger than Fed chair speeches.¹² What information is released seems to be mostly about short-term policy action. If communications revealed meaningful information about how the Fed systematically conducts policy, we would observe detectable repricing at the long end of the yield curve (Ricco and Savini, 2025).¹³ Communications providing little information about longer-run behavior is consistent with the observation that expectations about the Fed have historically shifted at low frequencies (Romer and Romer, 2023; Bianchi et al., 2026).

A different concern is measurement error in expectations can also generate low correlations. Appendix A.2 shows the level of classical measurement error required to explain these results is infeasible. Returning to the scatterplots in Figure 2, the low correlation comes from the observations being distributed relatively evenly across the four quadrants. If the true correlation is perfect, correctly measured observations would lie only in the first and third quadrants. But unsystematic measurement error would also scatter the observations that currently sit in the first and third quadrants, so a sizable correlation could only be attenuated this much if true disagreement is nonexistent and nearly the entire disagreement measure is noise. Unsurprisingly, this extreme scenario can be ruled out. The measurement error required to generate even the upper bound of the correlation’s confidence interval would imply an impossibly large (population) OLS slope. Measurement error could instead be non-classical. For the non-transcript measures of Fed expectations, this could happen because the elicited forecasts are more accurately described as modal, and the mode can differ systematically from the mean. Appendix A.1 outlines some reasons this distinction should not matter for most observations, including that Fed staff macroeconomic forecasts share similar properties with those of forecasters who explicitly report mean forecasts. For the public’s expectations, the concern would be that risk premia in interest rate futures make measurement error systematic. Previous work suggests premia in these markets are negligible (Piazzesi and Swanson, 2008; Amodeo, 2026). Figure 15 in Appendix A.1 shows measuring disagreement using the Blue Chip professional forecaster survey instead does not make much of a difference, and what difference remains should not be interpreted as premia because futures-implied expectations outperform the Blue Chip.

A final possibility to consider is even if the public’s expectations do not move toward the Fed’s at high frequency, they may converge over time. A natural test is regressing changes in disagreement ($D_{t+k,h} - D_{t,h}$) on measures of C_t . Bousquet (2026b) details many variants on these exercises and shows the maximum effect (at the boundary of the confidence interval) is still within a rounding error. As an illustration, Figure 16 in Appendix A.1 shows one benchmark using disagreement over one-year-ahead federal funds rate expectations. But this is arguably not definitive precisely because of the small information content of announcements. An

¹²Movements around employment data releases are comparable to Fed announcements themselves (shown in Table 1).

¹³It’s difficult to explain why *no* meaningful repricing occurs, though whether market frictions prevent near-instantaneous "digesting" of new information is an interesting open question (Cieslak and Khorrami, 2026).

alternative is to look directly at how forecasts continue to be revised long after the announcement. . For example, $D_{t,2}$ measures interest rate forecast disagreement two quarters ahead. Let $R_{t+k,2}$ be the public's revision in their forecast k days later. If the Fed's expectation was formed with the correct model of the world but with more information than the public, then we would have $\mathbb{E}_t[R_{t+k,2}] = D_{t,2}$ as k approaches the end of the two-quarter horizon following the Fed announcement. This is testable by regressing $R_{t+k,2}$ on $D_{t,2}$ because the slope should converge to one. **Figure 5** plots this exercise using Fed staff forecasts and shows we can reject convergence. The point estimates trend downward and are eventually negative, consistent with a lack of forecasting advantage.

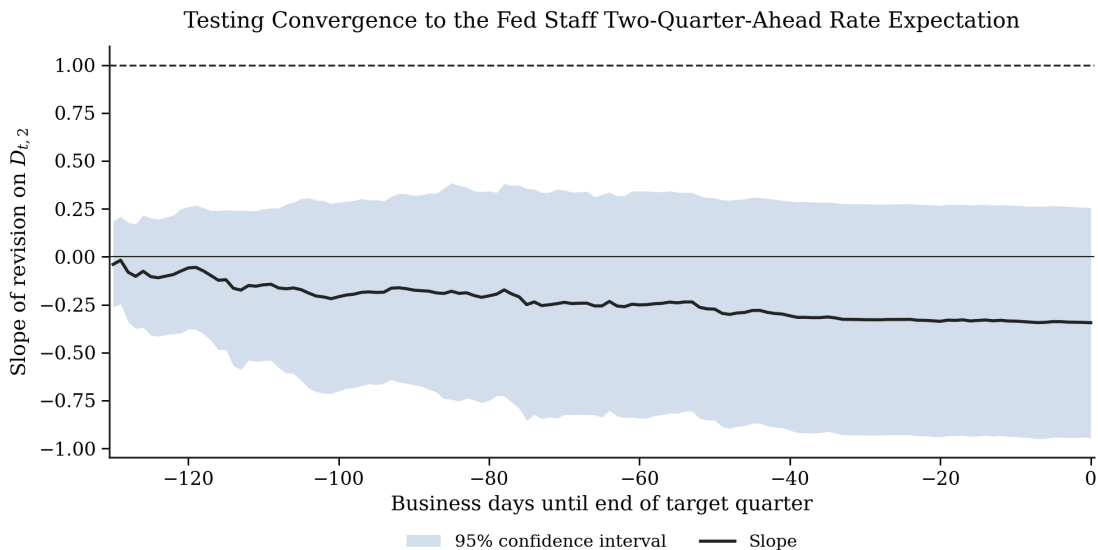


Figure 5: The slope from a regression of $R_{t+k,2}$ on $D_{t,2}$ as k increases, where $R_{t+k,2}$ is the revision in the average federal funds rate expected to prevail two quarters after a Fed announcement at t and $D_{t,2}$ is Fed-public interest rate disagreement (1) using Fed staff forecasts from 1993–2007. The null hypothesis of convergence is equivalent to a slope of 1.

3 Explaining the Facts with Belief Heterogeneity

Central banks are often thought to affect expectations by getting the public to align with their own, but **Section 2** shows announcements do not systematically pull the public's expectations towards the Fed's. **Section 3.1** uses a simple example to demonstrate why this might seem puzzling and proposes a resolution: there must be predictable differences in expectations and the Fed must be expected to change its mind (i.e., be "data dependent"). **Section 3.2** provides formal results showing that the insight generalizes and that disagreement observed within the public is too large to be consistent with a shared subjective model. **Section 3.3** considers other evidence in the literature and argues that belief heterogeneity is not only necessary but sufficient to model the asymmetry between the central bank and the public.

3.1 Simple Example

Let $i_t = \rho i_{t-1} + F_t$ be an arbitrary interest rate rule, where $F_t \equiv \mathbb{E}_t^F[x_t]$ is the Fed's belief about everything it systematically responds to. Before i_t is announced, the public's expectation of the Fed's belief is $\bar{F}_t \equiv \bar{\mathbb{E}}_t[F_t]$. The Fed knows what interest rate it's about to announce, while the public does not. So trivially, all of the pre-announcement disagreement about i_t is the *unpredictable* news $u_t = F_t - \bar{F}_t$ about the Fed's belief, and the announcement moves the public's expectation of i_t all the way to the Fed's.

But what about expectations of future interest rates? For simplicity, say the Fed's belief about tomorrow is also $\mathbb{E}_t^F[x_{t+1}] = F_t$, while the public's is $P_t \equiv \bar{\mathbb{E}}_t[x_{t+1}]$. If the public expects the Fed to adopt the public's current belief tomorrow, no matter what i_t is announced today, then $\bar{\mathbb{E}}_t[F_{t+1}] = P_t$. The Fed and public's expectations of i_{t+1} differ by $(1 + \rho)u_t + \delta_t$, where $\delta_t = \bar{F}_t - P_t$ is the *predictable* difference in expectations. Whether an announcement moves the public closer to the Fed then depends entirely on the relative balance of news u_t to predictable disagreement δ_t .

For example, suppose the Fed expects a higher i_{t+1} than the public before the announcement. In a world with large and predictable disagreements, this will tend to be because $\delta_t > 0$. From the public's perspective, they know the Fed wrongly expects higher interest rates, and the announcement of i_t just answers "How wrong are they?". Learning the Fed's expectation is lower than it thought ($u_t < 0$) is news that the Fed is coming around to the "correct" view even faster (beginning at t instead of all at once at $t + 1$). Since rates are persistent, this lowers the public's expected path of future interest rates. So when the Fed reveals it agrees with the public more than anticipated, the public moves further away from the Fed because its expectations already factored in a certain level of disagreement. Though stylized, the example shows a lack of convergence does not indicate a communication failure or irrationality. When the Fed and the public predictably disagree about interest rates because they foresee different trajectories of fundamentals, an announcement of i_t revealing a shift in the Fed's expectations should cause the public's expectations to shift roughly in parallel.

3.2 Heterogeneous Beliefs Are Necessary

The insights from the previous example generalize: the lack of post-announcement expectation shifts towards the Fed can be uniquely linked to large predictable disagreement. To see this, we will decompose the correlation documented in [Section 2](#) between the pre-announcement disagreement $D_{t,h}$ in (1) and the post-announcement change in public expectations $C_{t,h}$ in (2). Define $\delta_{t,h} \equiv \bar{\mathbb{E}}_t[D_{t,h}]$ as the predictable differences in interest rate expectations. Without loss of generality, we can write $D_{t,h} = \delta_{t,h} + u_{t,h}$, where $u_{t,h}$ is

unpredictable news about the Fed's expectations. Then we have¹⁴

$$\text{Var}(D_{t,h}) = \text{Var}(\delta_{t,h}) + \text{Var}(u_{t,h}) \quad (3)$$

$$\text{Cov}(C_{t,h}, D_{t,h}) = \text{Cov}(C_{t,h}, u_{t,h}). \quad (4)$$

For a more straightforward analytical expression, we will use the slope β_h from a regression of $C_{t,h}$ on $D_{t,h}$ rather than their correlation

$$C_{t,h} = b_h + \beta_h D_{t,h} + \epsilon_{t,h}. \quad (5)$$

It's useful to write β_h in terms of relative variances

$$V_h = \frac{\text{Var}(\delta_{t,h})}{\text{Var}(u_{t,h})} \quad \lambda_h = \frac{\text{Cov}(C_{t,h}, u_{t,h})}{\text{Var}(u_{t,h})} \quad (6)$$

$$\beta_h = \lambda_h (1 + V_h)^{-1}. \quad (7)$$

V_h^{-1} measures how much news matters for explaining disagreement, while λ_h is how strongly news about the Fed's expectations passes through to the public's own expectations. If for instance the news fully reveals the Fed's expectation and the public moves to match it exactly, then $\lambda_h = 1$. Because this passthrough should always be a positive fraction, we can bound $\beta_h \in [0, 1]$ under extremely general conditions.¹⁵ We can see this by considering two special cases

Proposition 1: If the unpredictable component is the entire cause of path differences ($V_h \rightarrow 0$, $\lambda_h \rightarrow 1$), $\beta_h \rightarrow 1$. Conversely, as predictable disagreement grows without bound ($V_h \rightarrow \infty$), $\beta_h \rightarrow 0$.

When the only source of disagreement is the Fed's unpredictable information, expectations are fully passed through (i.e., disagreement predicts the entire change in expectations). The passthrough would be attenuated if the public cannot fully infer the Fed's expectation from the announcement, but as with classical measurement error, Appendix A.2 shows the communication noise needed to generate a low estimated slope is implausible. So the uncorrelatedness of $C_{t,h}$ and $D_{t,h}$ requires a large ratio of predictable to unpredictable disagreement V_h , which is only possible with subjective differences in expectations. But the Fed and the public do not willfully disagree, as their beliefs largely change together even though the differences are persistent and often large. Typical frameworks cannot deliver this combination because all disagreement must come from private information, which has a bound on the disagreement it can generate.¹⁶

¹⁴This is a slight abuse of notation because $\mathbb{E}[\cdot]$ is not the true expectations operator. Proposition 1 holds if we alternatively define $u_{t,h}$ as satisfying $\text{argmin}_u \mathbb{E}_t[u^2]$ subject to $\text{Cov}(C_{t,h}, D_{t,h}) = \text{Cov}(C_{t,h}, u)$ and define $\delta_{t,h} = D_{t,h} - u_{t,h}$.

¹⁵ $\lambda_h < 0$ would be unusual, e.g., when the Fed announces it intends to raise interest rates more than was expected, the public on average now expects cuts. Expected "self-inflicted reversals" seldom occur in the data (at the time horizons I study).

¹⁶Caballero and Simsek (2022) also emphasize belief heterogeneity. I extend their model in Online Appendix D and show it can only match $\text{Corr}(C_{t,h}, D_{t,h}) \approx 0$ at the boundaries of the feasible parameter set, generating counterfactual behavior.

To illustrate, suppose a continuum of forecasters $j \in [0, 1]$ are trying to forecast a latent fundamental x_t

$$x_t = \rho x_{t-1} + \varepsilon_t^x \quad \varepsilon_t^x \sim \mathcal{N}(0, \Sigma_x). \quad (8)$$

When all agents share the true expectations operator $\mathbb{E}[\cdot]$ then

$$\mathbb{E}_t^j[\cdot] = \mathbb{E}[\cdot \mid \mathcal{I}_{j,t}]. \quad (9)$$

Suppose each agent observes an unbiased signal of x_t

$$s_{j,t} = x_t + \eta_{j,t} \quad \eta_{j,t} \sim \mathcal{N}(0, R). \quad (10)$$

Proposition 2: Define scalars x_t , $\mathbb{E}_t^j[x_{t+h}]$, and $s_{j,t}$ as in (8)–(10). Define $\text{Var}(x_t) = V < \infty$ and let $s_{j,t} \in \mathcal{I}_{j,t}$. The cross-sectional dispersion in h -step ahead forecasts is bounded from above by $\frac{\rho^{2h}}{4}V$.

Proof: Define cross-sectional dispersion over beliefs about a random variable y_t as

$$D_y = \mathbb{E} \left[\int \left(\mathbb{E}_t^j[y_t] - \int \mathbb{E}_t^i[y_t] di \right)^2 dj \right]. \quad (11)$$

Suppose $\mathcal{I}_{j,t} = s_{j,t} \forall j$. Then for $y_t = x_{t+h}$, $D_y = \rho^{2h} \left(\frac{V}{V+R} \right)^2 R$. Note $\forall V, R \in \mathbb{R}^+$, $(V+R)^2 \geq 4VR$ ■.

Proposition 2 holds under *any* information structure, so long as all agents know the true data generating process. And this environment is simply a special case of a common prior model with private information. We can derive a more general bound

Proposition 3: Let y_t be any random variable with $\text{Var}(y_t) = V < \infty$. If expectations (9) have cross-sectional dispersion D_y that exists and is finite by (11), then D_y is bounded from above by $\frac{1}{4}V$. For any $\mathcal{P}_t$ that is $\mathcal{I}_{j,t}$ -measurable $\forall j$, D_y is bounded above by $\frac{1}{4}(V - \text{Var}(\mathbb{E}[y_t \mid \mathcal{P}_t]))$.

In Appendix A.2, I derive additional results and compare them to data on disagreement between the Fed and the public, as well as disagreement within the public. Even among "attentive" groups like professional forecasters, the magnitude of forecast dispersion violates these bounds and is also not trending downward over time (Patton and Timmermann, 2010; Andrade et al., 2016; Rich and Tracy, 2026). As the second result of Proposition 3 foreshadows, more difficulties arise when embedding this structure into an economic model because information aggregators like market prices and public data releases are often sufficient for beliefs to converge (Grossman and Stiglitz, 1980; Blume and Easley, 2006; Beker and Espino, 2011). Since the Fed is an institution designed to be representative Reis (2013); Faust (2016), its belief differences with measures of a public consensus are downstream of the lack of convergence within the public, and observed equilibrium disagreement clearly requires more than dispersed information and heterogeneous priors over

fixed objects.¹⁷

3.3 Are Heterogeneous Beliefs Also Sufficient?

An asymmetry between the central bank and the public can be caused by different information or different beliefs. There is an extensive ongoing debate on whether central banks shape expectations by revealing to the public something about the economy or their policy decision rule, known as the "signaling" or learning channel of monetary policy (Morris and Shin, 2002; Melosi, 2017; Hillenbrand, 2024; Acosta, 2026). The two conclusions from the exercises in this paper are (a) central bank communications must shift expectations by revealing the central bank's subjective beliefs and (b) if a learning channel exists, it must be small. Though the evidence supporting these conclusions is new, this perspective is consistent with the sum total of existing evidence, summarized in companion work (Bousquet, 2026b) and other comprehensive overviews (Bauer and Swanson, 2023a,b; Sastry, 2026; Acosta, 2026). But it's still worthwhile to answer explicitly whether anything would be missed by assuming no role for central bank private information.

Private information could play a small but nonetheless quantitatively important role.¹⁸ Announcements tend to transmit little news, but it could be that what news exists is about private information and that's what people react to, or that the announcements that are more unpredictable are ones where private information plays an important role. Since subjective differences exist, at least some of the news must reveal subjective beliefs. I show in Appendix A.2 these revelations fail to make up the majority of the news only under implausible conditions, given the empirical correlations. I also find no evidence that announcements identified as "informational" announcements by Jarociński and Karadi (2020) are more likely to move the public's expectations closer to the Fed's.

Central bank private information has also been used to explain certain correlations with the high-frequency yield curve movements we have used as proxies for $C_{t,h}$. Because premia on interest rate futures are small (Piazzesi and Swanson, 2008; Amodeo, 2026) and high-frequency changes in these premia should be even smaller, the change in these futures should represent a pure measure of changes in interest rate expectations. But various $C_{t,h}$ have been shown to be correlated with information available prior to the policy announcement (Bauer and Swanson, 2023a,b; Miranda-Agrippino and Williams, 2026) and with professional forecasters revising their outlook in an expansionary direction (Campbell et al., 2012; Nakamura and Steinsson, 2018). At face value, these findings seem at odds with conventional notions of efficient markets, monetary policy shocks, or both. Bauer and Swanson (2023a) argued that both correlations could be explained in a model without central bank private information, in particular pointing out that models

¹⁷Patton and Timmermann (2010) use the term structure and cyclicalities of belief dispersion to come to the same conclusion.

¹⁸A small amount of information about a persistent process can be meaningful (Miranda-Agrippino and Ricco, 2023; Acosta, 2026).

with persistence can mechanically generate such small sample relationships (Eva and Winkler, 2023). In companion work (Bousquet, 2026b), I validate this claim in a structural model and review and add to prior evidence showing the correlations are sensitive and have minimal out-of-sample predictive power.

Another argument for the signaling channel builds on the observation that empirically estimated responses to monetary policy surprises are sometimes "puzzling", or contradict predictions of standard economic theory. For example, an estimated increase in the price level following a positive surprise is often described as evidence the Fed was acting on private information about inflation. ?? shows puzzles can be generated without a signaling channel. This issue is explored more in depth in Bousquet (2026a).

4 Heterogeneous Beliefs about Aggregates in General Equilibrium

I create a model of information frictions using a continuum of closed, island economies and persistent belief heterogeneity through repeated shocks to beliefs about aggregate stochastic processes, as in Angeletos and La'O (2013). Islands are all self-sustaining production economies that share a common interest rate, which the central bank sets following a Taylor (1993) rule using its best estimate of cross-island aggregate variables. This monetary policy regime makes it necessary for islands to form beliefs about each other. I additionally specify the information structure so that the central bank's setting of the nominal interest rate reveals only an ignorable amount of information about the underlying aggregate economy. I present the core framework below in a special case with a simple New Keynesian economy.

4.1 Island Economies

There is a continuum of island economies and we assume each island $j \in [0, 1]$ is self-sustaining with a New Keynesian structure. Each agent on island j observes all random variables indexed by j . The island economy satisfies

$$\tilde{y}_{j,t} = \mathbb{E}_t^j[\tilde{y}_{j,t+1}] - i_t + \mathbb{E}_t^j[\pi_{j,t+1}] + r_{j,t}^* \quad (12)$$

$$\pi_{j,t} = \beta \mathbb{E}_t^j[\pi_{j,t+1}] + \kappa \tilde{y}_{j,t}, \quad (13)$$

where $\pi_{j,t}$ is island j 's inflation rate, $\tilde{y}_{j,t}$ is the output gap, i_t is an interest rate common to all islands, and $r_{j,t}^*$ is an island-specific natural rate of interest

$$r_{j,t}^* = r_t^* + \varepsilon_{j,t}^r, \quad (14)$$

but islands do not observe the common component r_t^* which follows¹⁹

$$r_t^* = a_t + \varepsilon_t^r \quad a_t = \rho_a a_{t-1} + \varepsilon_t^a. \quad (15)$$

To simplify the analysis further, we will proceed by carrying around just one endogenous variable by assuming fully sticky prices ($\kappa = 0$) to make inflation drop out. Aggregating across islands gives a mechanical (non-fixed point) relation

$$\tilde{y}_t = \int \tilde{y}_{j,t} dj \quad \mathcal{Y}_t^e = \int \mathbb{E}_t^j[y_{j,t+1}] dj \quad (16)$$

$$\tilde{y}_t = \mathcal{Y}_t^e - \tilde{v}_t, \quad (17)$$

where $\tilde{v}_t = i_t - r_t^*$ is the aggregate interest rate gap.

4.2 Information Structure

Island j does not observe $\{\tilde{y}_t, r_t^*\}$. Instead, its own $\{r_{j,t}^*\}$ acts as a private signal of the aggregate economy. All islands also observe a vector of noisy public signals $\mathbf{p}_t$ at the beginning of t

$$\mathbf{p}_t \sim \mathcal{N}(\boldsymbol{\mu}_{t-1}, \Sigma_{p,t}), \quad (18)$$

where, for tractability, we assume $\boldsymbol{\mu}_{t-1}$ is measurable with respect to information realized before time t . Otherwise, we leave the signal structure general. Each $\mathcal{I}_{j,t}$ contains the entire history of all publicly available information $\mathcal{P}_t = \{\mathbf{p}_k, i_{k-1}\}_{k=0}^t$ and all t -measurable random variables and private signals with a j subscript. Without loss of generality, we assume i_t is set by "island 1" and is measurable with respect to $\mathcal{I}_t^{CB} = \mathcal{I}_{1,t-1} \cup \mathcal{P}_t$. As an example, suppose the central bank follows²⁰

$$i_t = \phi_y \mathbb{E}_t^{CB}[\tilde{y}_t]. \quad (19)$$

The other public signals include a "data release"

$$d_t \sim \mathcal{N}(\tilde{y}_{t-1}, \sigma_d^2), \quad (20)$$

and a signal of a quasi-"nowcast" $n_t = \int \mathbb{E}^j[\tilde{y}_t \mid \mathcal{I}_{1,t-1}, \mathcal{P}_{t-1}, d_t]$

$$\hat{n}_t \sim \mathcal{N}(n_t, \sigma_n^2). \quad (21)$$

If alternatively we assume that a finite number N islands release their nowcasts alongside the central bank, this would constitute a special case of (21) with a particular signal noise.²¹

¹⁹The distribution of the natural rate shocks follows $(\varepsilon_{j,t}^r, \varepsilon_t^r, \varepsilon_t^a)' \sim \mathcal{N}((0, 0, 0)', \text{diag}(\sigma_r^2, \bar{\sigma}_r^2, \sigma_a^2))$.

²⁰The only feedback in the rule is for cross-island aggregates, which creates indeterminacy because islands are closed. For selection, I impose that an island's relative price level (with respect to the cross-island price level) has finite variance.

²¹The signal noise is endogenous to the equilibrium (the cross-sectional variance of forecasts divided by N).

The only thing linking islands together is this common interest rate. Because information is dispersed and the central bank sets the interest rate using its best estimate of the aggregate economy, there is a role for higher-order beliefs (expectations of expectations). Let the average belief operator be defined by

$$\bar{\mathbb{E}}_t[\cdot] \equiv \int \mathbb{E}_t^j[\cdot] dj. \quad (22)$$

Higher-order average beliefs are defined recursively by

$$\bar{\mathbb{E}}_t^{(n+1)}[\cdot] = \bar{\mathbb{E}}_t \left[\bar{\mathbb{E}}_t^{(n)}[\cdot] \right]. \quad (23)$$

4.3 Belief Shocks

The model features direct shocks to the beliefs of agents, conceptually similar to [Angeletos and La'O \(2013\)](#). Expectations are formed optimally given the beliefs these shocks induce. The specific belief shocks I introduce are about the composition of aggregate shocks. Agents are endowed with beliefs about the realization of aggregate shocks

$$\mathbf{e}_t \equiv \begin{pmatrix} \varepsilon_t^r \\ \varepsilon_t^a \end{pmatrix} \sim_j \mathcal{N}(\boldsymbol{\theta}_{j,\tau}, P_0). \quad (24)$$

Typically, we would choose $\boldsymbol{\theta}_{j,\tau}$ and P_0 so that this is simply the unconditional distribution. The distribution of beliefs is multivariate normal with diagonal variance-covariance matrix Σ_θ

$$\boldsymbol{\theta}_{j,\tau} \sim \mathcal{N}(\hat{e}_{j,t}, \Sigma_\theta).. \quad (25)$$

Beliefs are distributed around some island-specific object $\hat{e}_{j,t}$. I use the following specification

$$\hat{e}_{j,t} = \mathbb{E}_t^{\bar{K}}[\mathbf{e}_t \mid \mathcal{P}_t, r_{j,t}^*] + b_t \quad (26)$$

$$b_t = \rho_b b_{t-1} + \varepsilon_t^b \quad (27)$$

where $\mathbb{E}_t^{\bar{K}}[\mathbf{e}_t \mid \mathcal{P}_t, r_{j,t}^*]$ is the filtered estimate of $\mathbf{e}_t$ given the public information set and the island j -specific shock at t , using the Kalman gain $\bar{K}$ common to all islands, and b_t is a persistent aggregate belief shock, see [Hassan and Mertens \(2017\)](#); [Miao et al. \(2021\)](#) for more discussion.²² This structure is meant to capture the dynamics that would exist in a non-stationary world. In a stationary environment, prior beliefs are endowed once at period zero and then unlearned over time. When there are structural breaks, this effectively acts as a new "period zero" ([Sargent, 1986](#)). Though the evidence in [Section 3](#) shows some departure from a common subjective model is necessary, here islands still form expectations optimally conditional on the beliefs they are endowed with.

²²The common Kalman gain $\bar{K}$ will only correspond to the optimal gain under the correct specification of P_0 in (24).

4.4 Solving the Model

The model admits a representation structurally similar to traditional full information rational expectations environments. The primary difference is the common expectations operator is replaced with an average belief operator (22) and an aggregate belief wedge. The belief wedge arises because the expectation of the average is not necessarily equal to the average of island expectations about their own economy. For a given aggregate variable, using $\tilde{y}_t$ as an example, define the gap between island j and the aggregate economy by

$$g_j(\tilde{y}_t) = \tilde{y}_{j,t} - \mathbb{E}_t^j[\tilde{y}_t]. \quad (28)$$

Define the average expected gap that will prevail in $t + 1$

$$\Delta_t^y = \int \mathbb{E}_t^j[g_j(\tilde{y}_{t+1})] dj \quad (29)$$

$$\implies \mathcal{Y}_t^e = \bar{\mathbb{E}}_t[\tilde{y}_{t+1}] + \Delta_t^y. \quad (30)$$

Substituting into (17) yields

$$\tilde{y}_t = \bar{\mathbb{E}}_t[\tilde{y}_{t+1}] - \tilde{v}_t + \Delta_t^y. \quad (31)$$

These wedge objects $\Delta_t = (\Delta_t^y)'$ are zero in this simplified setup (with no endogenous state variables and i.i.d. island shocks) but are preserved to maintain some level of generality. To briefly describe the solution to this class of models, let the aggregate latent state be $\mathbf{S}_t = (r_t^*, \boldsymbol{\mu}'_{t-1}, \mathbf{B}_t)'$ and let the full aggregate state be $\mathbf{X}_t = (\mathbf{S}'_t, \mathbf{p}'_t)'$.²³ Define higher-order beliefs over $\mathbf{X}_t$ by

$$\mathcal{B}_t^0 = \mathbf{X}_t \quad \mathcal{B}_t^{n+1} = \bar{\mathbb{E}}_t[\mathcal{B}_t^n], \quad (32)$$

and higher-order beliefs over Δ_t by

$$\lambda_{j,t}^0 = g_{j,t}(\mathbf{X}_t) \quad \lambda_{j,t}^{n+1} = \mathbb{E}_t^j[\lambda_{j,t}^n] \quad \Lambda_t^n = \int \lambda_{j,t}^n dj. \quad (33)$$

For sufficiently large N (Nimark, 2017), stack these objects as

$$\mathcal{X}_t^N = (\mathcal{B}_t^{0'}, \mathcal{B}_t^{1'}, \dots, \mathcal{B}_t^{N'}, \Lambda_t^{0'}, \dots, \Lambda_t^{N'})'. \quad (34)$$

A solution consists of finding $\mathcal{M}$ consistent with the law of motion for $\mathcal{X}_t^N$ that also satisfies

$$\mathbf{Y}_t = \mathcal{M}\mathcal{X}_t^N, \quad (35)$$

where in this special case $\mathbf{Y}_t = (\tilde{y}_t)'$. Notice that this solution concept generalizes to a broad class of models. Provided each island's economy is linear-Gaussian, aggregating across islands will lead to the same structure.

²³With slight abuse of notation, $\mathbf{p}_t$, $\boldsymbol{\mu}_{t-1}$, and $\mathbf{B}_t$ can be redefined and expanded to nest i_t .

5 Quantitative Exercises

5.1 Interest Rate Expectations and Disagreement

The framework in [Section 4](#) can be used to estimate a broad class of models through different specifications of the island economies. To match interest rate expectations, I take the [Smets and Wouters \(2007\)](#) model as a base, using the sample period of 1983-2008. The solution method allows for Bayesian estimation as in a typical linear state space model, with more details on modifications and technicalities provided in the [Appendix](#).

[Figure 6](#) shows the model can match the qualitative features of interest rate expectations data. The top panel overlays the realized federal funds rate with the forecast paths from the Blue Chip consensus and the Federal Reserve staff at each origination date (see [Section 2](#)), and the bottom panel plots the same objects under the model fit. In both panels the forecast paths fan out around the realized rate and turn slowly at cyclical peaks and troughs, running above the funds rate through the easing cycles of the early 1990s and early 2000s.

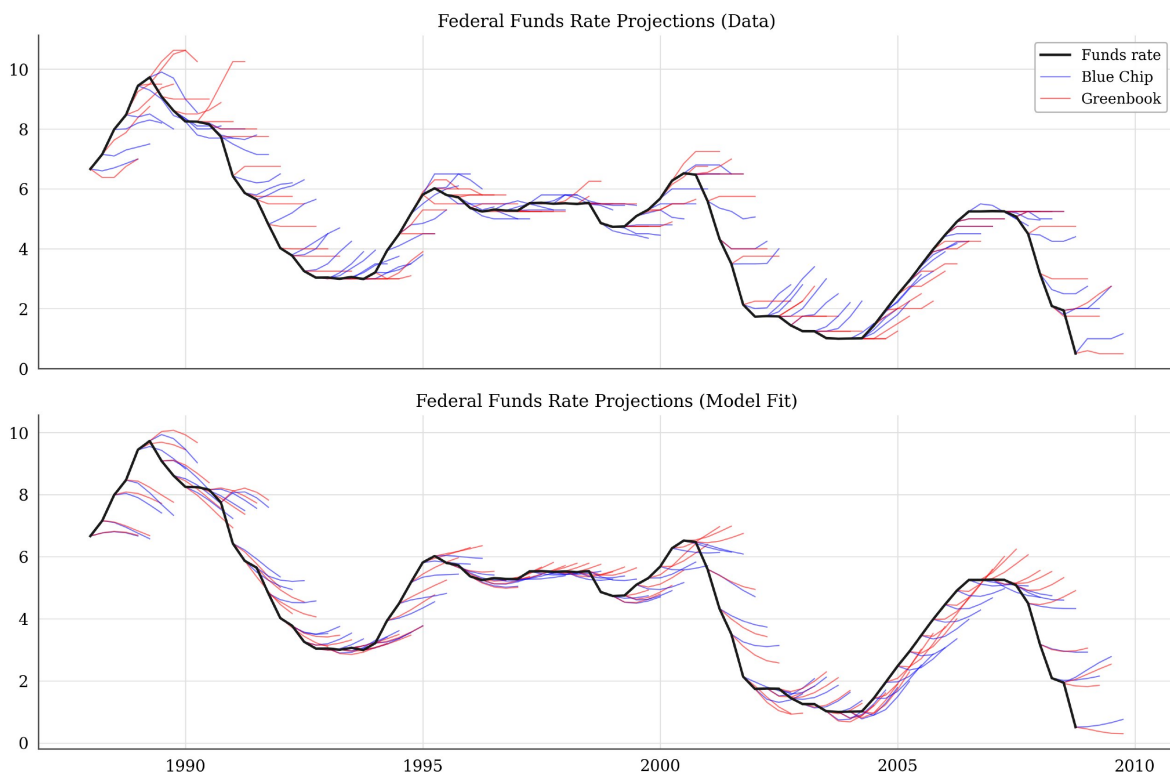


Figure 6: The federal funds rate in percent at an annual rate (black) plotted against the path of forecasts issued at each origination date by the Blue Chip consensus (blue) and the Greenbook (red). For the model fit, a noisy measurement of the average belief is in blue and the central bank's own projection is in red.

The left panel of [Figure 8](#) shows the disagreement that exists about interest rate expectations is largely predictable, as disagreement and the change in interest rate expectations are uncorrelated. Each point is one announcement, with total disagreement plotted against the public’s yield update C_t in annualized basis points, and the fitted line through them is flat. Given any central bank private information would increase the correlation, the question is how much information would induce a *detectable* relationship. The right panel of [Figure 8](#) shows this comparison, tracing the correlation against the standard deviation of ϕ_π , the inflation response parameter in the interest rate rule, which we allow to be time-varying so that the central bank has private information on the interest rate path. It takes very little private information to generate the correlations. When the standard deviation of ϕ_π is 0.3, the standard deviation estimated in [Bauer et al. \(2024\)](#), the correlation jumps to 0.5.

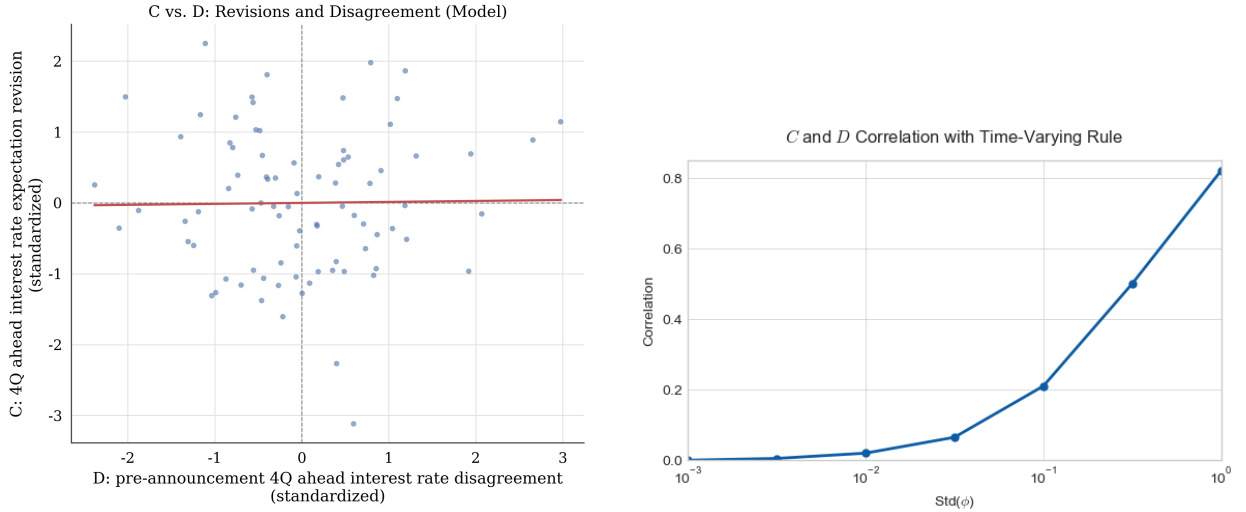


Figure 8: Both panels show the correlation between C_t and disagreement D_t . The left panel is a scatter plot at the posterior mode. The right panel shows the correlation as the variance of the inflation response parameter ϕ_π increases (log scale).

5.2 Previous Evidence for the Signaling Channel

Monetary policy surprises, measured as $C_{t,h}$ in [\(2\)](#), have been shown to be correlated with (i) professional forecasters revising their outlook in an expansionary direction and (ii) information available prior to the policy announcement. [Bousquet \(2026b\)](#) adds to and extends other comprehensive probes of (i) and (ii) ([Bauer and Swanson, 2023a,b](#); [Acosta, 2026](#); [Sastry, 2026](#)) showing they are unstable, rendering them unhelpful for distinguishing competing theories. [Bauer and Swanson \(2023a\)](#); [Sastry \(2026\)](#) also point out they can be generated without a signaling channel. (i) is a frequency mismatch — monthly growth forecast revisions against intraday interest rate forecast revisions. (ii) can simply be an artifact of persistence in the data generating process, where correlations that were not exploitable in real time appear ex post. Consistent

with this, the correlations drift around substantially, their statistical significance is sensitive to outliers, and the out-of-sample predictive power is minimal. It's also discussed that puzzling impulse responses can come from a signaling channel.

Figure 9 shows this framework is flexible enough to produce all three. The left panel plots the distribution of the revision-surprise coefficient, with the value implied by the structural shocks backed out of the data and the point estimate from Nakamura and Steinsson (2018)-style regressions over the same period marked by dotted vertical lines.²⁴ The two happen to sit almost on top of each other, but more relevant is the width of the distribution, as the correlation can be essentially anything depending on the structural shocks. The middle panel plots the distribution of the absolute t statistic on the lagged output gap across samples of $T = 100$; 31.9% of the statistics exceed the critical value of 1.96. This result is generated by the same persistence in the data generating process needed to match Figure 6. The right panel plots the median correlation between the surprise and inflation h quarters ahead, which is positive at short leads and crosses zero between the third and fourth quarter. And positive monetary policy surprises are associated with increases in inflation, even without a signaling channel.

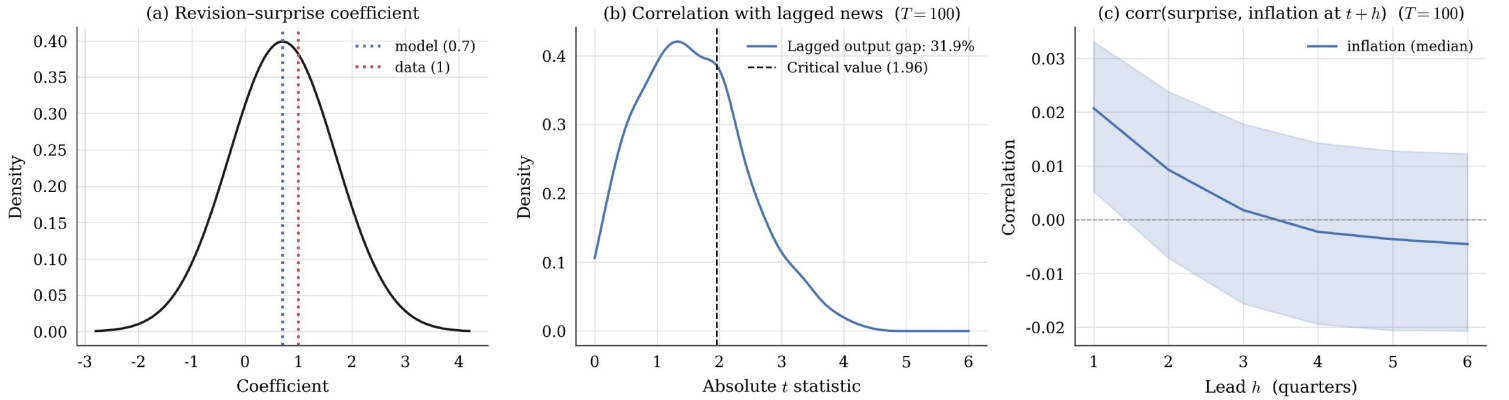


Figure 9

5.3 Rational Unpredictable Policy

To better understand why the model can generate fact (i) and produce inflationary responses to surprise changes in interest rates, we need to establish that not all unpredictable changes in policy are created equal. In the model, the central bank surprises the public with how it interprets the latest data. Because the central bank's interpretation will be unbiased on average, it does not make systematic errors. Interest rate

²⁴As discussed in Bauer and Swanson (2023b); Sastry (2026); Acosta (2026); Bousquet (2026b), the point estimates in these regressions are sensitive. Pooling across specifications, I use a benchmark in which a one-basis-point surprise to the Fed's interest rate target is associated with a one-basis-point revision in one-quarter-ahead growth.

surprises arising from these belief differences therefore have a substantially different distribution from random disturbances to a fixed policy rule.

Unpredictable movements in interest rates are often used as instruments to estimate the effects of policy. Here, we will focus on forecast errors of the interest rate itself, defined as $\hat{z}_t \equiv C_{t,0}$. It has been informally conjectured that if the cause of unpredictability is revelation of subjective beliefs, as is the case in this model, then we can think of these surprise movements $\hat{z}_t$ as exogenous changes in policy (Nakamura and Steinsson, 2018; Bauer and Swanson, 2023a). In a companion paper (Bousquet, 2026a), I show this is untrue. Intuitively, if, given an interest rate decision i_t , the central bank knows the resulting interest rate surprise $\hat{z}_t$, then $\hat{z}_t$ should not be associated with deviations from how the central bank expects the economy to evolve (given its policy decision). In fact, if $\hat{z}_t$ does not have precisely zero relationship with economic aggregates (in population), it may be an indicator of suboptimal policy.

Consider a generic structural equation for some macroeconomic aggregate Y_{t+h}

$$Y_{t+h} = \alpha_h i_t + u_{t+h}. \quad (36)$$

We are interested in whether $\hat{z}_t$ is a valid instrument to recover α_h . Given $\mathbb{E}[\hat{z}_t i_t] > 0$ is satisfied, we need an exclusion restriction

$$\mathbb{E}[\hat{z}_t u_{t+h}] = 0. \quad (37)$$

Without loss of generality, consider $Y_{t+h} = \pi_{t+h}$ as inflation in a model that's been log-linearized around the central bank's inflation target, so $\pi_{t+h} \neq 0$ is a deviation from target. Suppose the central bank sets i_t such that inflation will be at target in $t+h$. If the central bank knows the value of $\hat{z}_t$ given i_t , then $\mathbb{E}[\hat{z}_t \pi_{t+h}] = 0$, provided the central bank does not make systematic forecast errors. Multiplying the structural equation by $\hat{z}_t$ and taking expectations

$$0 = \alpha_h \mathbb{E}[\hat{z}_t i_t] + \mathbb{E}[\hat{z}_t u_{t+h}]. \quad (38)$$

It is therefore impossible for policy to be completely stabilizing and (37) to hold simultaneously. When policy is not necessarily stabilizing, satisfying the exclusion restriction is still a knife-edge case, meaning standard econometric exercises with $\hat{z}_t$ will be disconnected from policy transmission. Bousquet (2026a) shows it's straightforward to construct examples where $\hat{z}_t$ has any desired correlation with future macroeconomic aggregates, unlike a hypothetical random disturbance to some decision rule for i_t . Appendix A.3 contains some more insight into why this paper's framework specifically can produce positive correlations.

5.4 How Communication Shapes Policy Transmission

All the results so far have assumed the central bank’s beliefs are perfectly observable. With implementation noise in the interest rate rule and imperfect communication of the central bank’s beliefs, agents must use signal extraction to distinguish implementation noise from changes in beliefs. This will invariably delay the transmission of policy. [Figure 10](#) shows responses to changes in beliefs under a modification of the [Smets and Wouters \(2007\)](#) model where all the adjustment costs have been turned off, so the responses to changes in policy should be most potent on impact (or one period later). The left panel plots the true path of the belief innovation against the perceived path under four scenarios, indexed by the share of the innovation attributed to beliefs at impact. Given a change in beliefs without a contemporaneous implementation noise innovation, if agents cannot separate the two they will always attribute some of this change to possible implementation noise ([Bauer and Swanson, 2023a](#); [Caravello et al., 2026](#)). Agents gradually learn which innovation occurred. [Figure 10](#) shows when a progressively smaller share is initially attributed to changes in beliefs, their effects are delayed. This is consistent with the effects of learning on delaying policy transmission that have been documented in other contexts ([Woodford, 2003](#); [Angeletos et al., 2021, 2026](#); [Auclert et al., 2026](#)).

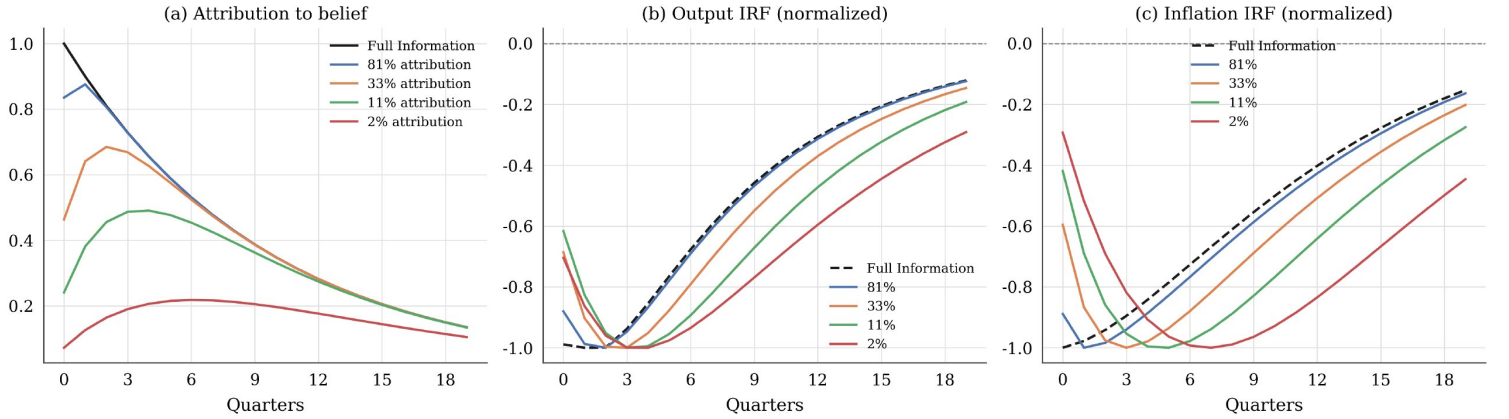


Figure 10

6 Conclusion

Central bank announcements affect beliefs through releasing private information. There is a large debate over what this private information is, in part because many proposed tests suffer from an observational equivalence problem ([Bauer and Swanson, 2023a,b](#); [Sastry, 2026](#); [Bousquet, 2026b](#)). This paper presents a framework where the private information is the central bank’s knowledge of its own economic model and argues U.S. expectations data reject alternatives, providing a new test showing the lack of correlation between interest rate expectation responses and differences in the Federal Reserve and public’s expected path of future interest rates. Other features of expectations data reinforce this inference. Expectations responses

to Federal Reserve communication are small, which means that the information content must be small, but differences between the Fed and public interest rate expectations are an order of magnitude larger than these changes. This is only consistent with predictably different subjective models. Further validation is achieved by looking at the Fed's errors in forecasting its own future actions: they are not smaller than the public's (Amodeo, 2026) and tend to be even more autocorrelated. In general, expectations within the public about the economy are too dispersed to be consistent with a shared subjective model.

Beyond matching the motivating empirical facts, my paper resolves a key tension in the literature: prevailing aggregate uncertainty would seemingly imply a role for central bank private information to have meaningful effects as in Morris and Shin (2002). I present an information structure where both can coexist because the marginal gain from the central bank providing an additional forecast is not material when other forecasts are also publicly available, as we would expect from the visibility of signal aggregators like professional forecast surveys and market prices. This is an important nuance because many of the findings suggesting central bank transparency may be welfare reducing rely on this "signaling" role for the central bank and its private information, in contrast to the results I show. Further, the framework negatively resolves an open conjecture about event study identification in macroeconomics. Because the central bank internalizes the effects of its revelation on the public, "monetary policy surprises", which in my framework are errors in the central bank's forecasts of equilibrium objects, have important differences from standard structural policy shocks and are endogenous objects. In companion work, I motivate why it might be reasonable to make stronger assumptions to restore valid identification. Finally, this paper aspires to establish a paradigm for thinking about monetary policy in a world of belief differences. A social planner making decisions in these environments faces many tradeoffs, amplified by the communication game the central bank and markets must engage in (Caballero and Simsek, 2022; Rungcharoenkitkul and Winkler, 2026). As in the broader macroeconomics literature on heterogeneous agent models, this paper shows future work on optimal policy must take belief heterogeneity seriously to deliver actionable advice to policymakers.

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Appendix

A.1 FOMC Policy Forecasts

A.1.1 Mean vs. Modal Forecasts

The Fed staff and SEP forecasts are imperfect measures of expectations. Appendix A.2 demonstrates it would require an implausible amount of measurement error to generate the precise zero correlations observed in the data. A different concern is these forecasts may suffer from a form of non-classical measurement error. [Aruoba and Drechsel \(2026\)](#) presents compelling evidence that the Fed staff forecasts are modal, rather than mean, forecasts, and the SEP is explicitly described as presenting the "appropriate" path of policy conditional on the economy's modal trajectory. During periods of short-term pronounced tail risk, this difference can matter substantially. Overall, this distinction appears to not be important for these exercises. [Aruoba and Drechsel \(2026\)](#) note that under an asymmetric distribution, forecast errors using the mode will be predictable. At the same time, the predictability of forecast errors is a well-documented phenomena of professional forecasters [Eva and Winkler \(2023\)](#). Fed staff macroeconomic forecast have roughly comparable accuracy and predictability to professional forecasters (see [Table 2](#) as an example), suggesting Fed staff forecasts are largely a good substitute for a true mean forecast. A larger concern is that the Fed staff forecasts for future interest rates are special, often filtered through a Taylor Rule with sometimes limited adjustments made ex post.²⁵ Also, there are a wide range of philosophies about how to submit policy forecasts to the SEP, as some may see it as an opportunity to signal credibility to the public rather than express their truly held views [Faust \(2016\)](#). In both cases, the most likely and expected states of the economy should be converging in the forecast horizon. Interest rates are sufficiently difficult to forecast that Fed governors would presumably respond the same way to "what do you expect interest rates to be" and "what will interest rates most likely be" if asked about a sufficiently far period in the future. Returning to the original premise, it's also not obvious that the difference between mean and mode is not analogous to classical measurement error. Though tail risk historically has been thought to be more concentrated as increased probability of recessions, pointing to a left skew in interest rates, this is counterbalanced by the zero lower bound, which induces a right skew. Overall, we would need such extensive and specific measurement error that qualitatively disagreement is frequently mismeasured (measures say Fed is more hawkish than markets but truly is the opposite). Over the subsample of 2015-2024, this is especially not a concern and the same precise zero correlation exists. Ultimately, the best solution to these arguments is to construct a better measure of expectations, which direct quotes from Fed deliberations can provide.

²⁵Tealbook A from April 2019 provides useful insight into this process. The degrees of freedom Fed staff have in shaping the policy forecast is generally meeting-dependent.

Table 2: FORECAST ERROR PREDICTABILITY TESTS: GREENBOOK VERSUS BLUE CHIP

	(1) current quarter	(2) 1-quarter ahead	(3) 1-year ahead	(4) 5-quarter ahead	(5) current quarter	(6) 1-quarter ahead	(7) 1-year ahead	(8) 5-quarter ahead
<i>Panel A: Greenbook forecast errors</i>								
First PC of all sentiments	-0.047** [0.021]	-0.114** [0.049]	-0.445** [0.190]	-0.590** [0.242]				
Economic activity sentiment					-0.044* [0.023]	-0.098** [0.048]	-0.285* [0.165]	-0.354* [0.202]
Constant	-0.036** [0.018]	-0.070** [0.033]	-0.082 [0.121]	0.014 [0.152]	-0.036** [0.018]	-0.069** [0.035]	-0.077 [0.145]	-0.001 [0.180]
R^2	0.087	0.149	0.248	0.291	0.059	0.097	0.090	0.095
Number of observations	110	210	210	177	110	210	210	177
<i>Panel B: Blue Chip (BCEI) consensus forecast errors</i>								
First PC of all sentiments	-0.044** [0.015]	-0.130** [0.038]	-0.511** [0.150]	-0.683** [0.197]				
Economic activity sentiment					-0.047** [0.017]	-0.111** [0.039]	-0.349** [0.139]	-0.442** [0.181]
Constant	-0.030** [0.013]	-0.059** [0.028]	-0.032 [0.105]	0.074 [0.136]	-0.030** [0.014]	-0.057* [0.031]	-0.026 [0.134]	0.059 [0.178]
R^2	0.110	0.206	0.367	0.406	0.099	0.133	0.152	0.153
Number of observations	110	210	210	177	110	210	210	177
<i>Panel C: Difference in errors, Panel B – Panel A (= Greenbook – Blue Chip forecast gap)</i>								
First PC of all sentiments	0.003 [0.011]	-0.016 [0.018]	-0.065 [0.051]	-0.093 [0.061]				
Economic activity sentiment					-0.003 [0.012]	-0.013 [0.016]	-0.064 [0.043]	-0.087* [0.050]
Constant	0.006 [0.010]	0.011 [0.020]	0.050 [0.045]	0.060 [0.049]	0.006 [0.010]	0.011 [0.019]	0.051 [0.044]	0.059 [0.050]
R^2	0.001	0.010	0.053	0.085	0.001	0.006	0.045	0.068
Number of observations	110	210	210	177	110	210	210	177

Notes: Panel A reproduces Table 2 of [Aruoba and Drechsel \(2026\)](#) using their narrative sentiment measures extracted from Fed staff materials using the September 1982–October 2008 sample. The outcome variable they use is Fed staff unemployment forecast errors. Panel B does this same exercise on Blue Chip consensus forecast, and Panel C tests the difference in the point estimates. The same Newey–West procedure is used to compute standard errors. * and ** denote significance at the 10% and 5% levels.

A.1.2 Transcript Classification of Fed Interest Rate Expectations

Finally, transcripts of internal Federal Reserve deliberations always contain commentary on private sector expectations, committee members own expectations, and frequently comparisons between the two sides. **Figure 11** shows results using Large Language Models to classify each meeting based on whether the internal path of the Federal Reserve was definitively higher or lower than the private sector, or when the difference is close enough to be ambiguous. Conditional on non-ambiguity, the classifications align (qualitatively) with staff projections in 80% of meetings.

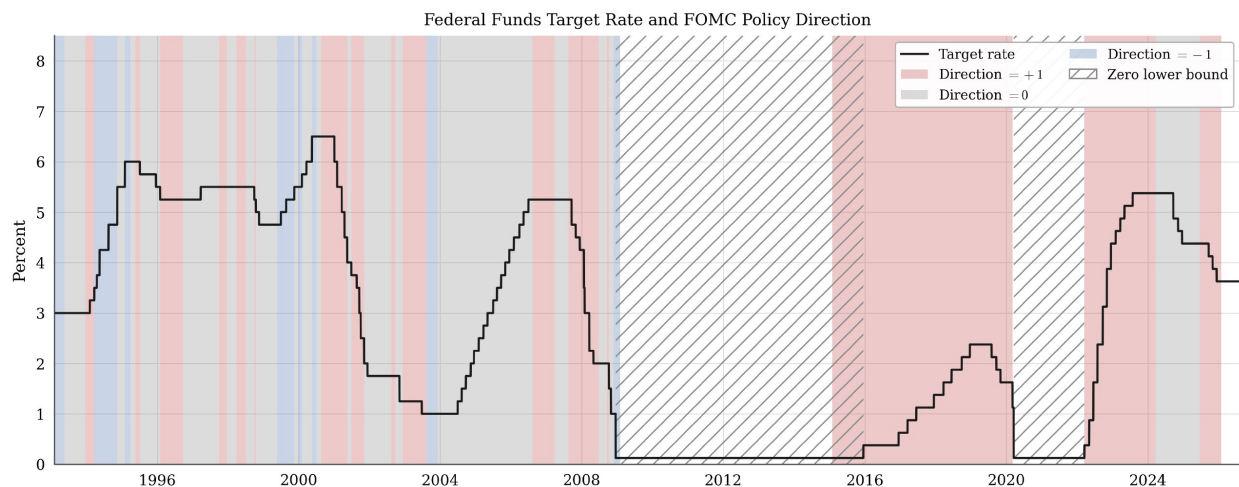


Figure 11

A.1.3 Persistent Forecast Errors

A.1.4 More Forecast Comparisons: SEP

Figure 4 illustrates Fed Staff are not superior forecasters of future interest rates. But what about members of the Federal Open Market Committee (FOMC)? These comparisons are a bit more difficult because there is a much more limited forecast history (beginning during the first zero lower bound episode), set of variable (yearly averages), and frequency (quarterly). **Figure 12** performs the best possible comparison using the Summary of Economic Projections (SEP) and the relevant Federal Funds futures contracts, with quadratic interpolation to approximate a path of rates implied by the annual averages. Over the sample period (2015-2025) it's clear the FOMC does not have a superior forecasting performance. In particular, the initial zero lower bound liftoff ended up relatively in the middle of the FOMC and professional forecaster trajectories.

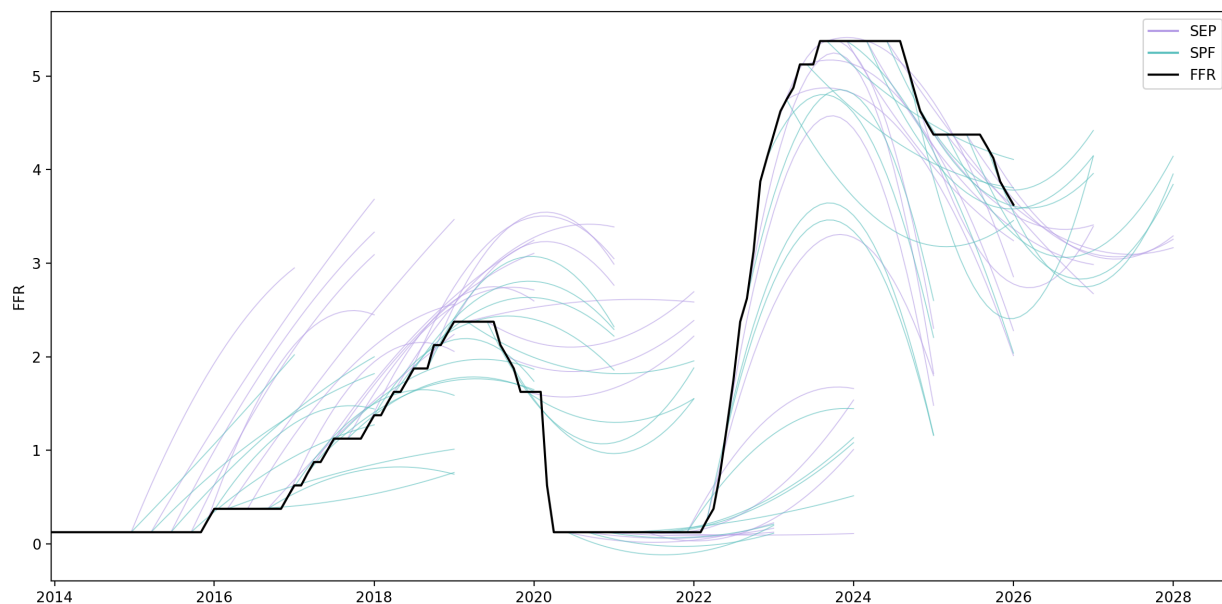


Figure 12: FOMC vs. Professional Forecast of the Fed Funds Rate

Another relevant exercise is seeing how the response of private sector expectation response corresponds to forecast errors of the central bank committee itself. [Figure 13](#) shows that, with a caveat of difficulties in measurement, the response is less than 1 for 1. There are two forecasts of the SEP: the New York Fed's Survey of Primary Dealers and Bloomberg Economic Forecasts ([Martinez and Sinclair, 2026](#)). As a point of comparison, whichever survey delivered the lowest forecast error is selected. The forecast specifically is of the median Federal Funds Rate at the end of the next calendar year, and the change in the Federal Funds futures contract for that month is used to proxy for the change in private sector expectations (as in [Figure 3](#)). [Figure 14](#) shows dispersion in dealer forecast about what the median SEP projection will be is much smaller than dispersion in their own modal forecasts.

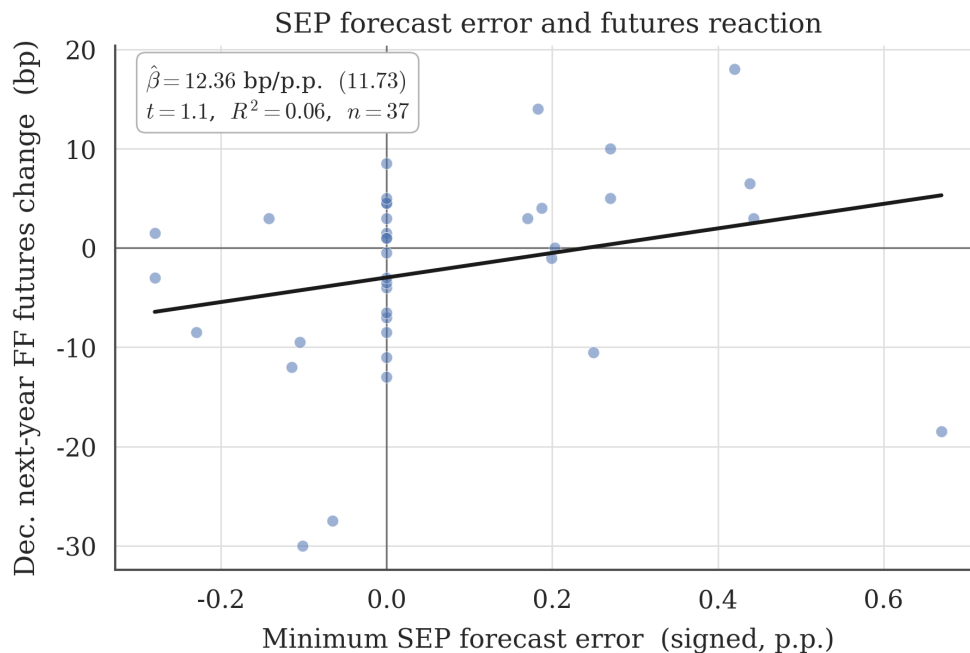


Figure 13: Change in Futures vs. Forecast Error in Summary of Economic Projection

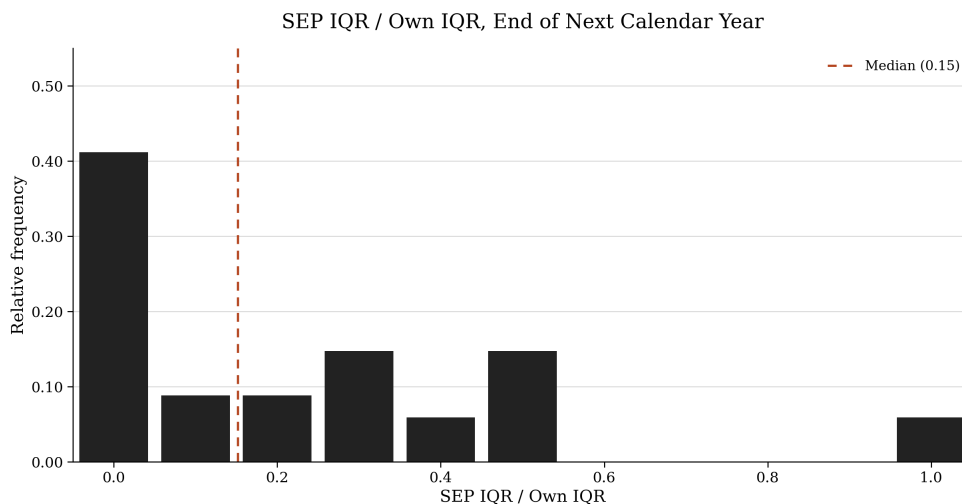


Figure 14: Histogram of ratio of interquartile ranges for two questions from the NY Fed's Survey of Primary Dealers. "SEP" is the IQR for the forecast of the Summary of Economic Projections median for interest rates at the end of next calendar year. "Own" is the IQR for dealers' own modal forecast for interest rates at the end of next calendar year. The sample contains 34 Primary Dealer surveys from December 2015 to March 2026, excluding 2020Q1—2021Q2.

A.1.5 More Forecast Comparisons: Fed Staff

Figure 15 shows the disagreement measure used in Figure 2 as well as the same disagreement measure using the Blue Chip Financial Forecast survey. Figure 16 shows that disagreement does not go down over time following Fed announcements.

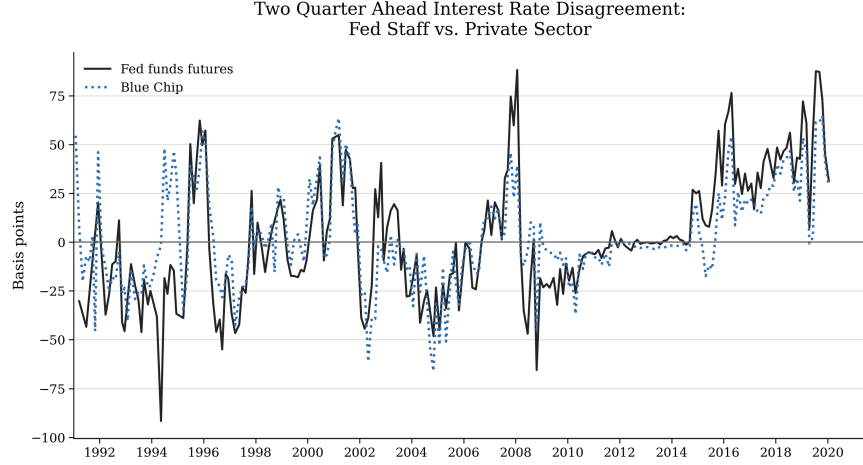


Figure 15

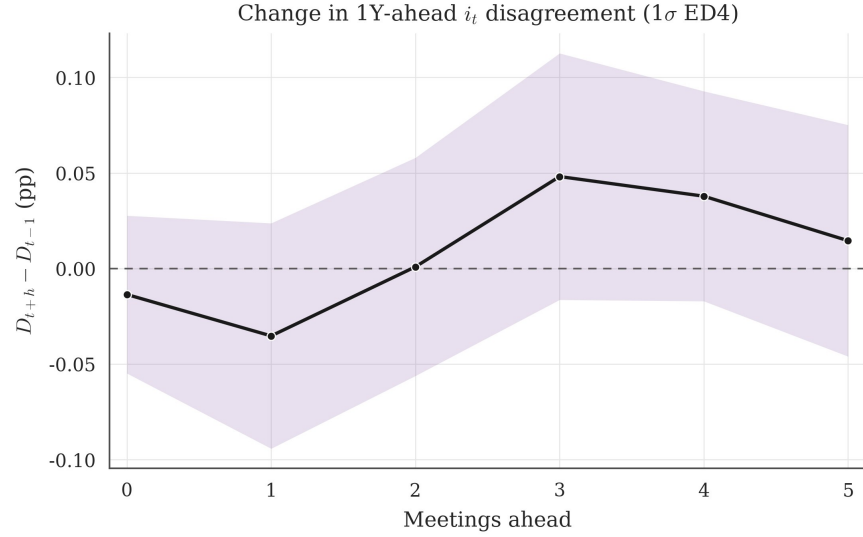


Figure 16

A.2 Impossibility and Implausibility Results

A.2.1 Revisions and Accuracy

A model of central bank private knowledge cannot explain why the public and Fed would have different interest rate expectations yet the decisions themselves be predictable and the Fed not be a better forecaster of its future actions. We can demonstrate this tension in a simple environment.

Suppose there are a continuum of forecasters $j \in [0, 1]$ of some random variable x . Let $m_j = \mathbb{E}[x \mid \mathcal{I}_j]$ be the mean forecast of agent j , let $F = \mathbb{E}[x \mid \mathcal{I}_i]$ be the forecast of some fixed agent i (the Fed), and let $f = \int m_j dj$ be the average forecast. Define public-Fed disagreement as $D = \mathbb{E}[(F - f)^2]$ and cross-sectional

dispersion as $D_x = \int \mathbb{E}[(m_j - f)^2]dj$. Let the unpredictable component of the Fed's forecast to agent j be $u_j = F - \mathbb{E}[F | \mathcal{I}_j]$ and let the revision after learning the Fed's forecast be $r_j = \mathbb{E}[x | \mathcal{I}_j, F] - m_j$. Let $U = \int \mathbb{E}[u_j^2]dj$ be the aggregate unpredictability of the Fed's forecast and let $R = \int \mathbb{E}[r_j^2]dj$ be a measure of the aggregate revision the release of the Fed's forecast induces.

Proposition 4: Let $\Delta = \text{MSE}(f) - \text{MSE}(F)$ be the Fed's forecasting advantage over the public in mean squared error.

$$\Delta + D + 2D_x \leq 2\sqrt{UR}, \quad (39)$$

which also implies $\Delta \leq 2\sqrt{UR}$.

As discussed in the main text, in the data D, D_x are an order of magnitude larger than U, R and δ is negligible.

A.2.2 Noisy Communication and Measurement Error

Even when the Fed puts out a public projections of future interest rates, it's an imperfect gauge of its internal expectations. The bounds in Proposition 1 in the main text assume there is no noisy communication and no measurement error. A reasonable question is whether these factors could explain the low correlations we observe. I present some simple results to establish that the level of noise required to explain away these results is implausible.

Suppose the Fed sees signals s_1, s_2 while the public only sees s_1 . Let the Fed's forecast of some random variable x be $F = \mathbb{E}[x | s_1, s_2]$ and the public's initial forecast be $f = \mathbb{E}[x | s_1]$. At an announcement, the Fed releases n , a noisy signal of s_2 . Let σ_n^2 be the noise of this signal and let $f^+ = \mathbb{E}[x | s_1, n]$ be the new public expectation. Define $D = F - f$ and $C = f^+ - f$. $\text{corr}(D, C) = \sqrt{(1 + \sigma_n^2 / \text{Var}(s_2))^{-1}}$. To explain the correlations observed empirically, the noise of the signal the Fed sends would have to be over 100 times the variance of s_2 , itself a noisy signal. Similarly, the measurement error attenuation for any generic formulation follows $\text{Corr}(D, C) = \hat{\rho} \sqrt{(1 + \sigma_\nu^2)^{-1}}$, where ρ is the true correlation and σ_ν^2 is the measurement error of D . It would take similarly implausible measurement error to generate the observed correlations.

A.2.3 Content of Information Releases

We can decompose disagreement and belief updating by their source. Define

$$D_t = D_t^X + D_t^B \quad (40)$$

$$C_t = C_t^X + C_t^B \quad (41)$$

with $D_t^X \perp D_t^B$. Here, D^X can be thought of as determinants of disagreement D_t caused by "fundamental knowledge" (about the economy or the policy rule of the central bank). D^B is formally the component of disagreement orthogonal to fundamentals, which we take as the disagreement caused by subjective beliefs. Similarly, define C^X and C^B as the change in expectations attributable to each component. Recall that we are measuring the changes in a small window immediately before the central bank's announcement of policy, implicit communication of beliefs, as well as giving more explicit communication during the announcement. Communication is imperfect along two margins: news may arrive outside the event window, and communication within the window is noisy. Let ω_j and N^j respectively denote the fraction of component j news that arrives within the event window and the noise variance of event window communication. Define $\kappa_j = \frac{\text{Var}(D^j)}{\text{Var}(D^j) + N^j/\omega_j}$ as the variance-weighted precision of event window communication. If each announcement contains a bundled signal of fundamental and belief news, then²⁶

$$\text{Var}(C_t^X) = \omega_X \kappa_X \text{Var}(D^X) \frac{1 - \kappa_B}{1 - \kappa_X \kappa_B} \quad (42)$$

$$\text{Var}(C_t^B) = \gamma \omega_B \kappa_B \text{Var}(D^B) \frac{1 - \kappa_X}{1 - \kappa_X \kappa_B}, \quad (43)$$

where $\gamma \in (0, 1]$ is the pass-through of belief surprises to interest rate expectations. Define $q = \frac{\text{Var}(D^B)}{\text{Var}(D^X)}$.

Proposition 5: $\text{Var}(C^X) > \text{Var}(C^B)$, only if $\gamma q^2 < \frac{N^B/\omega_B^2}{N^X/\omega_X^2}$.

Intuitively, fundamentals dominate within-window news only when news about fundamentals is much more precise and concentrated than belief news at a level relative to the relative fundamental variance q of the components. The finding that $\beta \approx 0$ forces q to be large, which makes this condition difficult to satisfy. Suppose 90% of the Fed's communication about private information occurs within the event window but only 30% of its communication about subjective beliefs does. With $q = 10$, the necessary condition is $\gamma \frac{100}{9} < \frac{N^B}{N^X}$. With pass-through equal to 50%, communication about fundamentals would need to be more than 5 times as precise for this to hold. In practice, many would think the opposite: the X signal is harder to parse, which by definition makes the fundamental news more difficult to infer.

The main text alludes to some complementary evidence provided in ??: Fed chair speeches typically only have negligible effects on interest rate expectations. For comparison, the table provides the change in interest rate expectations following releases of inflation and employment data. Even a single inflation print, which themselves already forecasted well by Wall Street firms, has larger effects on interest rate expectations than speeches by the Fed Chair. This means that there is typically more information of all forms transmitted by the Fed during its announcements compared to inter-meeting communication.²⁷

²⁶It's possible we might be able to partially "unbundle" the signals. When $\gamma q > \omega_X/\omega_B$, this will make the inequality more stringent (i.e., raise the lower bound). In the worked example, any unbundling raises the lower bound.

²⁷This assumes markets internalize the content of communication equally quickly after speeches and announcements. Whether communication needs more time to be properly reflected in prices is an interesting open question (Cieslak and Khorrami, 2026).

Table 3: Changes in Interest Rate Expectations Around Data Releases and Fed Chair Speeches

Event	Median($ x $)	Mean($ x $)	Std(x)	IQR(x)
Fed Chair Speeches ($N = 429$)	0.50	1.13	2.08	1.00
CPI Release ($N = 200$)	1.00	1.72	3.03	1.50
BLS Employment Report Release ($N = 213$)	2.00	2.84	4.11	4.00

Notes: All entries are high-frequency changes in interest rate expectations implied from the FF4 futures contract. Entries are in basis points for a specific event. Macro data releases are the Bureau of Labor Statistics publication of the Consumer Price Index and the Employment Report (nonfarm payrolls and unemployment). The sample period is December 1997–September 2024. Days where FOMC events overlap with news releases are excluded as well as any event in 2009–2015 and 2020–2021. The columns are the absolute median and mean, the standard deviation, and the interquartile range.

A.2.4 Level Of Belief Disperison

Let x_t be a random variable with $V = \text{Var}(x_t) \leq \infty$. For a continuum of forecasters $j \in [0, 1]$, let $m_{j,t} = \mathbb{E}[x_t | \mathcal{I}_{j,t}]$ and $\bar{m}_t = \int m_{j,t} dj$. We will present some additional formal results about the difficulty of generating belief dispersion when all agents know and share the true model.

Corollary 1: Suppose each forecaster publishes their forecast and then each forecaster makes a new forecast $\tilde{m}_{j,t} = \mathbb{E}[x_t | \mathcal{I}_{j,t}, \mathcal{F}]$, where $\mathcal{F} = \{m_j : j \in [0, 1]\}$. Define D_0 as cross-sectional forecast dispersion using $m_{j,t}$ and D_1 as cross-sectional forecast dispersion using $\tilde{m}_{j,t}$. $D_0 + D_1 \leq \frac{1}{4}V$.

Corollary 2: Fix $m_{1,t}$ as an arbitrary forecast without loss of generality. Define $g_t = m_{1,t} - \bar{m}_t$ and let $\mathcal{P}$ be $\mathcal{I}_{j,t}$ -measurable $\forall j$. Then $\mathbb{E}[g_t^2 | \mathcal{P}] \leq V$.

Proof: By Jensen’s inequality and the law of total variance, $\mathbb{E}[g_t^2 | \mathcal{P}] = \int \mathbb{E}[(m_1 - m_j)^2 | \mathcal{P}] dj \leq \text{Var}(x_t | \mathcal{P})$.

Remark: If all forecasters share the a common but incorrect probability law $\tilde{\mathbb{P}} \neq \mathbb{P}$, these results hold if the objects in the inequalities are defined with respect to $\tilde{\mathbb{P}}$ (e.g., if we redefine $V = \text{Var}_{\tilde{\mathbb{P}}}(x_t)$)

Corollary 1 shows the Proposition 3 bound tightens significantly once beliefs are published. Corollary 2 gives a dispersion bound for a fixed forecaster, like the Fed. These results reaffirm that in an environment where there are numerous information aggregators and ability to see the forecasts of others, disagreement should be minimal if everyone shares a common model. ?? shows formally these founds are violated in the Blue Chip professional forecaster survey. The Fed-Public disagreement measures are more difficult to quantify, but note that the expectation of the disagreement should always be zero. In contrast, there are often

Table 4: Forecast dispersion relative to forecast variance

Series	Horizon h	Avg(Std)/Std(Avg)
RGDP	1	0.91
	2	1.09
	3	1.15
	4	1.15
CPI	1	0.57
	2	0.57
	3	0.58
	4	0.59

Notes. Avg(Std) is the time-series average of the cross-sectional standard deviation of the h -quarter-ahead forecast. Std(Avg) is the time-series standard deviation of the cross-sectional mean forecast. Both measures drop the min and max forecast in each month. Blue Chip Financial Forecasts, 1985-2019 with 2008 & 2009 excluded to avoid outliers.

A.3 Model Details

A.3.1 Estimating Policy Causal Effects

Policy may be unpredictable yet purposeful from the central bank's perspective. As a result, the typical high-frequency identification approach requires modifications to recover the effects of policy. We will first illustrate why the traditional approach fails. Then we will illustrate a fix.

Suppose the central bank unveils sets the interest rate using information available immediately before period t begins (at $t - \delta$). Define the central bank's expected inflation as

$$m_t^{CB} = \mathbb{E}_{t-\delta}^{CB}[\pi_t]. \quad (44)$$

Let the central bank follow a Taylor Rule

$$i_t = \phi m_t^{CB}. \quad (45)$$

The private sector forms expectations ($\bar{\mathbb{E}}[\cdot]$) of the central bank's expectations

$$\mu_t^{CB} = \bar{\mathbb{E}}_{t-\delta}[m_t^{CB}].$$

This means the unpredictable component of policy with respect to private sector beliefs is

$$\hat{z}_t = \phi(m_t^{CB} - \mu_t^{CB}) \quad (46)$$

$$\implies m_t^{CB} = \mu_t^{CB} + \frac{\hat{z}_t}{\phi}. \quad (47)$$

Assume forecast errors of the central bank and private sector expectation are not systematic

$$\text{Cov}(\hat{z}_t, \pi_t - m_t^{CB}) = 0 \quad \text{Cov}(\hat{z}_t, \mu_t^{CB}) = 0. \quad (48)$$

Intuitively, the first condition should hold if the central bank knows what $\hat{z}_t$ will be given their decision i_t . This is the case in practice, as central bank committees monitor expectations in real time. Under these

assumptions, we have by (47)

$$\text{Cov}(\hat{z}_t, \pi_t) = \text{Cov}(\hat{z}_t, m_t^{CB}) \tag{49}$$

$$= \frac{1}{\phi} \text{Var}(\hat{z}_t) > 0. \tag{50}$$