

Long-Short Interest Rate Confusion*

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Abstract

We identify a common misconception that expected future changes in the policy rate predict corresponding future changes in long-term interest rates. People forecast similar shapes for the paths of policy and long rates over the next four quarters. This is a mistake because long rates should already incorporate public information about future policy rates and do not positively co-move with expected changes in policy rates. We show that this long-short rate confusion persists even among professional forecasters and distorts the real behavior of borrowers and investors. Our findings raise concerns about the efficacy of predictable monetary policy. When the central bank signals future policy rate increases, households and firms rush to lock in long-term debt before anticipated increases in long rates, undermining the intended contractionary effects of monetary tightening. These findings can help explain why forward guidance and gradual policy adjustment have often been less effective than standard macroeconomic models predict.

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With experts in agreement that mortgage rates will continue to rise as the Fed continues to update its economic policy, now is the time to lock in a low mortgage interest rate if you're planning on buying a home or refinancing your existing mortgage. —Fox Business, Jan 4, 2022

Modern central banking emphasizes predictability and transparency to effectively manage economic outcomes. The Federal Reserve, for instance, strives to avoid surprising financial markets by clearly communicating its policy objectives and strategy, often acting in a somewhat systematic way in response to incoming economic data, and utilizing communication tools such as forward guidance to signal the likely future path of policy rates. Conventional wisdom holds that these efforts towards predictability are beneficial because they reduce uncertainty and volatility in financial markets. By clearly conveying policy intentions and reaction functions, central banks help market participants make more informed decisions about investment, lending, and borrowing.

However, the effectiveness of the Federal Reserve's communication strategy and efforts to manage expectations has sometimes been disappointing in practice. This includes the specific challenge economists call the "forward guidance puzzle": the empirical observation that explicit forward guidance has been far less effective than standard macroeconomic models would predict. In this paper, we explore a potential reason why the Fed's attempts to foster predictability may not always have the desired effect. Namely, that consumers and firms may not fully understand the information that the Fed is trying to communicate.

Specifically, we document a widespread misconception—which we call "long-short rate confusion"—that can undermine the effectiveness of predictable monetary policy. Long-short rate confusion refers to the erroneous belief that predictable increases in the short-term policy rate (whether signaled by explicit guidance or inferred from the Fed's predictable response to data) will cause long-term interest rates to predictably increase in parallel, *only when those policy rate increases actually occur*. This is a misconception because long-term interest rates should be a function of the average expected policy rate over the maturity of a long-term

bond. In other words, current long-term interest rates should already incorporate all public information about the anticipated path of the policy rate.

Long-short rate confusion could arise for a variety of reasons. Some individuals may not understand the distinction between long-term rates and short-term policy rates at all, or they at least may mentally lump these rates together into a common category. Others may not lump them together but rely on a heuristic to understand how they are connected. In particular, they may incorrectly believe that predictable increases in the policy rate will lead to simultaneous increases in long-term rates because they observe that surprise increases in the policy rate lead to simultaneous increases in long-term rates. Still others may fully understand that long-term rates already reflect public information about future policy rates, but fail to fully take into account the fact that the information they have is public. Our goal in this paper is not to determine the precise source of long-short rate confusion but rather to show that such confusion exists and that it has significant implications for the effects of monetary policy on economic activity.

We begin by showing empirically that the beliefs represented by long-short rate confusion have indeed been erroneous based on historical data. Specifically, we show that when the Fed is expected to increase the federal funds rate over the next quarter, long rates do not increase over the next quarter, even though the federal funds rate does. In fact, if anything, long rates decrease over the next quarter. This is important because, although theory would seem to suggest that long rates should not move strongly in tandem with changes in short rates that were anticipated in advance, such beliefs could potentially be rationalized under certain conditions. In addition to showing that such beliefs have been incorrect historically, we also show that models that rationalize these beliefs also fail to fit the data in other significant ways as well.

Next, we examine whether professional forecasters make errors consistent with long-short rate confusion. One benefit of starting with forecast data is that doing so allows us to directly investigate mistaken beliefs. In contrast, analyzing real outcomes (e.g., long-term

debt issuance or bond fund flows) can only provide indirect evidence of mistaken beliefs, and effects could potentially be driven by other factors. Consistent with long-short rate confusion, we find that when the Fed is expected to increase the federal funds rate by 1 percentage point over the next quarter, professional forecasters believe that long rates will increase by more than 20 basis points. This belief is incorrect, as long rates actually decline on average, leading to predictable forecast errors of more than 40 basis points.

Most strikingly, we find that professional forecasters report similar shapes for the expected paths of short and long rates over the next four quarters (e.g., a V-shape or an N-shape), leading again to predictable forecast errors. In particular, the predicted change in the long rate in each of the next four quarters is more closely related to the expected change in the policy rate in the same quarter than in any of the other three quarters. This belief in similar shapes for the expected paths of long rates and policy rates is consistent with long-short rate confusion and is particularly difficult to generate in any rational model of long rate beliefs.

We explore several potential alternative explanations for our findings on professional forecasters. First, we consider whether conflicts of interest might explain why professional forecasters predict that long rates will move with expected changes in short rates. While bank-employed forecasters might have an incentive to encourage borrowing by predicting rising long rates when short rates are expected to rise, we find that they also predict falling long rates when short rates are expected to fall—a prediction that would discourage immediate borrowing. Moreover, we find similar results among forecasters at independent research institutions.

We also examine whether our results could be explained by a mistaken belief that long rates respond sluggishly to short rate news. If this were the case, forecasters' predictions should be driven primarily by recent news about future short rates rather than by expected changes in short rates that were known well in advance. However, we find that expected changes in short rates remain strong predictors of expected changes in long rates even after

controlling for news about short rates as measured by forecast revisions.

Finally, we consider whether forecasters might simply be extrapolating from recent trends in long rates, which happen to coincide with expected changes in policy rates. While we find some evidence of extrapolation, it does not explain away the strong relationship between expected changes in short and long rates. Moreover, extrapolation cannot explain why forecasters predict similar shapes for the future paths of short and long rates over multiple quarters.

Next, we explore whether households also believe that long rates will move with anticipated changes to policy rates. Using data from the Fannie Mae National Housing Survey, we find that households are 19 percentage points more likely to believe that mortgage interest rates will go up over the next year when the consensus forecast is for policy rates to increase over the same interval. Interestingly, household long-short rate confusion increases monotonically with education and income. For example, individuals without a high school degree are only 5.3 ppt more likely to expect increases in mortgage rates over the next year during times when the consensus forecast is for the federal funds rate to increase. In contrast, those with a graduate degree are 26 ppt more likely to expect increases in mortgage rates during such times. Similarly, those earning less than \$10,000 annually are only 1.5 ppt more likely to expect an increase, whereas those earning over \$200,000 are 32.8 ppt more likely.

Next, we explore the monetary policy implications of long-short rate confusion. If people suffer from long-short rate confusion, expectations of rising policy rates should prompt borrowers to rush to lock in long-term debt before further increases in long rates occur, leading to an increase in the supply of debt. On the other side, investors should be more inclined to sell long-term bonds if they expect long yields to increase, leading to a decrease in demand for long-term debt. Expectations of falling short rates would lead to the opposite behavior. In the absence of instantaneous arbitrage, these combined supply and demand shifts for long-term bonds can contribute to excess movement and subsequent reversals in long rates.

We first look at long-term debt issuance by firms. We find that a 1 percentage point expected increase in the policy rate over the next quarter is associated with a 10 percent increase in the probability of any long-term bond issuance and a 17 percent increase in the value of long-term bond issuance. When firms believe that both short and long term rates will rise, they have an extra incentive to borrow long rather than short, because borrowing short implies they will have to keep rolling over short-term loans at rising rates. Consistent with this idea, we find that the long term share of all corporate debt issuance increases by approximately 10 percent when short rates are expected to increase by 1 point. We find that these changes in corporate borrowing are especially strong at turning points in the policy rate cycle. We also show that these changes in corporate long-term debt issuance cannot be explained by hedging demand for interest rate uncertainty or real changes in capital investments.

We see similar shifts in the borrowing behavior of households. We find that expectations of rising policy rates are associated with a large increase in the volume of mortgages, in particular jumbo loans (typically larger loans exceeding \$750K in 2024). These patterns are consistent with our earlier findings related to sophistication, as wealthier households are more likely to have the flexibility to engage in market timing and to be aware of publicly available information about the path of policy rates.

Finally, we examine the behavior of investors in intermediate and long-term bond funds. We find that when policy rates are expected to rise by 1 percentage point, these bond funds experience average outflows of 1-2% of assets under management (AUM).

Our findings carry implications for monetary policy involving forward guidance and gradualism ([Woodford, 2003](#); [Stein and Sunderam, 2018](#); [Bernanke, 2020](#)). It is commonly argued that, unlike the “cold turkey” approach of abruptly adjusting policy rates to a target, gradual adjustments allow the Fed to adjust rates slowly and flexibly, while immediately affecting long term borrowing because long rates immediately react to expected changes in policy rates. Thus, forward guidance and gradualism provide the Fed with “greater influence

over the long-term interest rates that most affect the economy ... and reduces risks to financial stability” (Bernanke, 2004). However, we demonstrate that long-short rate confusion can cause such monetary policies to have perverse effects in the short run. Long-short rate confusion causes long rates to overreact to expected increases in short rates, leading to greater volatility. Moreover, when short rates are expected to gradually increase, the increase in long rates is associated with a net increase in long-term borrowing and housing demand in the present—the opposite of the intended outcome for monetary tightening. Likewise, when short rates are expected to gradually fall, the drop in long rates is associated with a net decrease in long-term borrowing in the present as firms and households wait to borrow until long rates fall further—again, the opposite of the intended effect of monetary loosening.

Our research builds on related work by Hanson, Lucca, and Wright (2021, HLW), who show that the excess sensitivity of long rates can be explained by a model of rate-amplifying demand combined with a slow arbitrage response. We differ from HLW in several ways. First, HLW focuses on refinancing and extrapolative beliefs, whereas we focus on a long-short rate confusion as the main driver of shifts in demand. Second, HLW examine the contemporaneous correlation of long and short rates, whereas we show that expectations of changes in long rates are strongly predicted by expected changes in short rates. Third, HLW finds support for Stein (2013)’s recruitment channel in which excess movements in long rates increase the effectiveness of monetary tightening, whereas we show that the increase in the long rate is driven by increased corporate and household borrowing in the face of tightening monetary policy, which can limit the effectiveness of monetary policy in the short run.

Our research also contributes to the economics literature concerning expectational errors in financial and macroeconomic forecasts. Much of the existing research focuses on mistaken beliefs about the *persistence* of shocks (e.g., Cieslak, 2018; Bordalo, Gennaioli, Ma, and Shleifer, 2020; Wang, 2020; d’Arienzo, 2020) and over- or under-reaction to news (e.g. Daniel, Hirshleifer, and Subrahmanyam, 1998; Hong and Stein, 1999; Augenblick, Lazarus, and Thaler, 2021). In contrast, we explore a different behavioral mechanism that can drive

large belief errors and distortions in real behavior. We show that accurate beliefs about one variable (short rates) can lead to large forecast errors for a related variable (long rates), due to the mistaken notion that short and long rates move in tandem even when movements in the short rate are anticipated.

Finally, our finding that some investors fail to recognize that the current long rate should already incorporate public information about expected changes in short rates is related to the mistake of trading on stale news (e.g., [DeMarzo, Vayanos, and Zwiebel, 2003](#); [Tetlock, 2011](#); [Eyster, Rabin, and Vayanos, 2019](#)). We carry these insights, which have generally been tested in equity markets, into fixed income markets and real firm and household borrowing behavior.

1 Data

In this section, we describe various data sources that we use in our analysis to detect long-short interest rate confusion. We divide the data sources into two categories: data on beliefs and data on the real behavior of borrowers and investors.

1.1 Data on beliefs

1.1.1 Professional forecasts

We use data on interest rate expectations from the Blue Chip Financial Forecasts (BCFF), which provide survey forecasts of various interest rates from professional forecasters. This monthly survey maintains a stable and large panel of professional forecasters and is the longest consistently run survey, dating back to the 1980s. Among the various datasets of professional forecasts, it is especially suitable for studying expectation formation and asset prices.

Each month, the BCFF survey collects forecasts from a panel of, on average, 40 economists from leading financial institutions and economic consulting firms. They are

asked to provide forecasts of future financial and macroeconomic variables at horizons from the current quarter (“nowcast”) to four quarters ahead. The forecasts are collected over a two-day period, usually between the 23rd and 27th of each month, and published on the first day of the following month. To study the subjective expectations of short and long-term interest rates, we require that the forecasts have reasonably long and continuous time series. Specifically, we choose the federal funds rate (FFR) as the short-term interest rate and the home mortgage rate (HMR). We also use BCFF forecasts of other long rates, including the 10-year and 30-year Treasury yields ($y^{(10)}$ and $y^{(30)}$), and Aaa and Baa corporate bond rates (Aaa and Baa).

We use the HMR as the representative long rate in our main analysis due to its longer time series in the BCFF and its relevance to mortgage borrowers, although we find similarly strong evidence of long-short rate confusion using forecasts of the 10-year Treasury yield. As depicted in Figure A.1 in the Appendix, the realized values of various long rates are highly correlated. HMR has a correlation of at least 0.97 with the 10-year and 30-year Treasury yields ($y^{(10)}$ and $y^{(30)}$) and Aaa and Baa corporate bond rates (Aaa and Baa). A sample BCFF survey questionnaire with detailed definitions of all forecasted interest rates is provided in the Appendix.

Notation and timing. We focus on one-quarter-ahead forecasts of various interest rates, denoted as $\mathbb{E}_t(\overline{X}_{t+1q})$. For each interest rate variable, BCFF asks forecasters to provide their forecasts of the average daily interest rate over the next quarter $\overline{X}_{t+1q}$. Though the forecasts are published on the first day of the following month, they are formed based on information available at the time of the survey, which is close to the end of each month. Therefore, we denote t as the time of forecast (end of the month) to line up with other end-of-month variables.

Forecasters. One of the advantages of the BCFF survey is that it includes each forecaster’s name and affiliated institution.¹ Studies that examine the individual level BCFF forecast mostly focus on the institutional level, while we are the first to map the institutions to the actual economists making the forecasts and their associated levels of education. This feature allows us to keep track of the time series of each economist’s forecasts and hence make the BCFF forecasts a panel dataset.

For each target variable, we obtain monthly forecasts of individual economists and the consensus (defined as the cross-sectional mean) from 1983:04 (when FFR forecasts became available) to 2021:12 across all forecast horizons (1-4Q).

Realized values. We obtain data on realized interest rates according to their exact definitions provided by BCFF from the Federal Reserve Economic Data (FRED) database or directly from BCFF (Aaa and Baa). We use $\bar{X}_{t+1q}$ to denote realized average daily interest rates over quarter $t + 1q$, which are available at the end of the quarter.

1.1.2 Households beliefs

We obtain household housing expectations from the Fannie Mae National Housing Survey (NHS).² After the housing crisis of 2007-08, Fannie Mae launched the National Housing Survey in 2010 to generate new information about household attitudes, intentions, and financial conditions that pertain to housing and mortgage markets. It is the only large, national, monthly survey of households focused primarily on housing. NHS is a nationally representative telephone survey polling 1,000 households a month about owning and renting a home, home and rental price changes, the economy, household finances, and overall household confidence. Each month, Fannie Mae elicits answers to about 100 survey questions on a wide range of housing-related topics. Among these questions, we focus on the question regarding

¹Among 86 unique participating institutions with more than 60 monthly forecasts, 26 are banks, 15 are broker-dealers, and 17 are primary dealers of the Federal Reserve Bank of New York. Appendix Table A.1 provides a full list of institutions that participate in the BCFF survey, grouped by type of institution.

²A detailed introduction to the National Housing Survey is available on [Fannie Mae’s website](#).

mortgage rate expectations, which asks respondents to provide their expectations of the direction of mortgage rates over the next 12 months. The question has three possible answers: up, down, or remain about the same.³

We obtain detailed individual-level responses to all questions at a monthly frequency from 2010 to 2021. Besides information about household beliefs, NHS also provides demographic information about the respondents, including age, income, education, and location. We use this information to study how different demographic groups form their beliefs about future mortgage rates.

1.2 Data on real behavior

1.2.1 Corporate borrowing data

We obtain firm-level borrowing data from the COMPUSTAT Quarterly Fundamentals file. The coverage begins in 1961, and we use the quarterly data from 1983 to 2021 to align with the BCFF survey. The primary variables we construct are long-term issuance and short-term issuance, which are the dollar amount of long-term and short-term debt issued by the firm during the quarter, respectively. We compute long term issuance by converting the year-to-date long-term debt issued (DLTISY) by the firm to a quarterly frequency. We compute short term issuance following [Baker, Greenwood, and Wurgler \(2003\)](#); [Greenwood, Hanson, and Stein \(2010\)](#) as the change in the level of short-term corporate debt outstanding (NPQ), plus one-quarter the level of short-term debt in the previous quarter. As NPQ is not available for all firms, we fill the missing values with one-quarter of the notes payable from the COMPUSTAT Annual Fundamentals file (NP). We normalize the long-term issuance by the book value of assets (AT) and lagged total debt, respectively, to adjust for the size and leverage of the firm. We compute the long-term issue share (LT Share) as the ratio of quarterly long-term issuance to the sum of long-term and short-term issuance. Finally, we aggregate the firm-level issuance to the economy level by summing up issuances from

³A screenshot of the survey question is provided in Figure [A.2](#) in the Appendix.

all firms for each quarter, and calculate the aggregate long-term issue share accordingly. In supplementary analyses, we also use aggregate data from the Fed’s Flow of Funds data.

1.2.2 Mortgage borrowing data

We obtain aggregate-level mortgage borrowing data from the National Mortgage Database Aggregate Statistics of the Federal Housing Finance Agency (FHFA). The National Mortgage Database (NMDB) is a nationally representative five percent sample of residential mortgages in the United States. It provides aggregate statistics of the quantity, dollar amount, and various characteristics of the mortgage loans covered in its sample. We use the monthly data from 1998 to 2021, which is available separately for jumbo and conventional mortgage loans.

1.2.3 Bond investor data

We measure changes in investors’ demand for long-term bonds using the net flows into long-term bond mutual funds. We obtain bond mutual funds data from the CRSP Survivorship-Bias Free Mutual Fund Database. Specifically, we define long-term bond funds as those with a Lipper objective code in the following categories: IUG, GUS, GUT, A, BBB, and IID. We follow the standard approach in the literature (e.g., [Lou, 2012](#)) to construct monthly flows to each bond fund at the share class (institutional and retail) level as: $flow_{i,t} = \frac{TNA_{i,t}}{TNA_{i,t-1}} - (1 + R_{i,t})$, where $TNA_{i,t}$ is the total net assets of fund i at time t , and $R_{i,t}$ is the monthly raw return of fund i at time t . Since CRSP’s coverage of bond mutual funds is only comprehensive after 1997, we use the monthly data from 1997 to 2021.

1.3 Summary statistics

In order to tease out the effect of long-short rate confusion on interest rate expectations and real behavior, we control for a wide range of macroeconomic and financial variables that characterize debt market conditions. We follow [Baker, Greenwood, and Wurgler \(2003\)](#) and additionally obtain the following variables from the FRED database at the St. Louis Fed:

inflation (π); the term spread; the credit spread (Baa credit spread); and the credit term spread (Baa credit term spread).

Since long-short rate confusion works through expected changes in interest rates across maturities, we difference out the current level of the interest rate and construct our interest rate expectations variables as forecasted changes in interest rates (e.g., $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$). We also include the current level of the interest rate as a control variable in all regressions.

Table 1, Panel A, provides the summary statistics of our main variables and control variables used in the analysis. The forecasted changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$) and in the Home Mortgage Rate ($\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$), as well as the actual changes in the HMR ($\overline{HMR}_{t+1q} - HMR_t$) and the forecast errors of HMR ($\overline{HMR}_{t+1q} - \mathbb{E}_t(\overline{HMR}_{t+1q})$), are included as the main variables. The main and control variables span from 1983:04 to 2021:12, with 465 monthly observations. Panel B provides the correlation matrix of these variables. Additionally, we report statistics for actual changes in other long rates, the sample period of which may vary due to data availability.

The correlations in Panel B offer a preview of our main results. We find that expected changes in the short rate are positively correlated with expected changes in the long rate (correlation = 0.40) and negatively correlated with realized changes in the long rate (correlation = -0.10).

2 Conceptual framework

Consider the one-period nominal short rate as i_t and the n -period nominal long bond yield as $y_t^{(n)}$. The holding period excess return of an n -period bond is defined as $rx_t^{(n)} = ny_t^{(n)} - (n-1)y_{t+1}^{(n-1)} - i_t$. Rearranging the definition of $rx_t^{(n)}$ and iterating the equation forward, we

obtain an accounting identity that can decompose the long rate as follows:

$$y_t^{(n)} = \underbrace{\frac{1}{n} \mathbb{E}_t \left(\sum_{\iota=0}^{n-1} i_{t+\iota} \right)}_{\text{Expectations hypothesis (EH) component}} + \underbrace{\frac{1}{n} \mathbb{E}_t \left(\sum_{\iota=0}^{n-2} r x_{t+\iota+1}^{(n-\iota)} \right)}_{\text{Term premium (TP) component}}. \quad (1)$$

The current n -period yield is the sum of investors' expectations about the future path of the short rate (the expectations hypothesis, or EH, component) and average expected excess returns over the life of the bond (the term premium, or TP, component). The expectations hypothesis component implies that the current long rate already incorporates all public information about the future path of the short rate. This identity is equivalent to the decomposition of [Campbell and Shiller \(1988\)](#) for the stock market.

Let $tp_t \equiv \frac{1}{n} \mathbb{E}_t \left(\sum_{\iota=0}^{n-2} r x_{t+\iota+1}^{(n-\iota)} \right)$ represent the term premium. We can iterate the yield identity and express the expected change in long rate over the next period as a function of the expected short rate in the very long run and the expected change in the term premium:

$$\mathbb{E}_t \left(y_{t+1}^{(n)} \right) - y_t^{(n)} = \frac{1}{n} \left(\mathbb{E}_t (i_{t+n}) - i_t \right) + \mathbb{E}_t (tp_{t+1}) - tp_t. \quad (2)$$

Equation (2) shows that it is possible to rationalize any belief about the change in the long rate through beliefs about the term premium. If the expectations hypothesis holds, i.e., the term premium is zero, it is still possible to rationalize any belief about the change in the long rate through beliefs about the short rate in the very long run, $\mathbb{E}_t (i_{t+n})$, e.g., the federal funds rate 10 or 30 years into the future. Thus, it could be rational to believe that long rates will move with expected changes in short rates if beliefs about the term premium or the short rate in the very long run comove with expected changes in the short rate.⁴

Given that any belief about changes in the long rate can be justified *in theory*, we show that it is difficult to rationalize a belief that long rates will move with expected changes in

⁴If people think that the short rate follows an AR(1) process (as in the Vasicek model), then a change in belief about the short rate next period would propagate to a change in the expected n -period ahead short rate of with a factor ρ^n , where ρ is the autoregressive coefficient. Consequently, if people expect a change in the short rate next period, their beliefs about short rates in the very long run will differ accordingly.

short rates based on publicly available historical data. We will directly examine data on beliefs about the short rate in the very long run, $\mathbb{E}_t(i_{t+n})$, in later tests. For now, we show that there is no reason to believe the long rates will move in tandem with expected changes in the short rate based on the historical data. Table 2 summarizes the results of regressions of the actual change in various long rates on the forecasted changes in the federal funds rate based on consensus forecasts from the BCFF. We control for debt market conditions by including the current short rate, inflation, term spread (the difference between 10-year Treasury yield and FFR), credit spreads, and credit term spread. The coefficients of the expected changes in FFR are negative across all five long rates and are statistically significant in four of them. That is, the long rate actually moves in the opposite direction of the expected changes in the short rate. This negative relationship is consistent with the notion that long rates exhibit significant “excess volatility,” i.e., they overreact to the news about the future path of the short rate and subsequently reverse. (e.g., [Stein, 1989](#); [Hanson and Stein, 2015](#); [Giglio and Kelly, 2018](#); [Hanson et al., 2021](#))

2.1 Long-short rate confusion

We hypothesize that people mistakenly believe that expected shifts in the short-rate forecast corresponding future movements in the long rate.

The intuition behind long-short rate confusion is depicted in Figure 1, which serves as a graphical representation of how investors’ expectations can diverge from rationality. The figure plots the policy rate, i , and the long rate, y , over time. We present the case in which y exceeds i , consistent with an upward sloping yield curve which is commonly featured in the historical data. At time t , news arrives that policy rates will increase gradually until some time T , as represented by the solid blue line. This could represent, for instance, an announcement by the Fed of planned rate hikes over the coming year. Note that actual policy rate changes would resemble a step function, which we approximate here with an upward sloping line. If investors are fully rational, the long rate would immediately adjust upwards

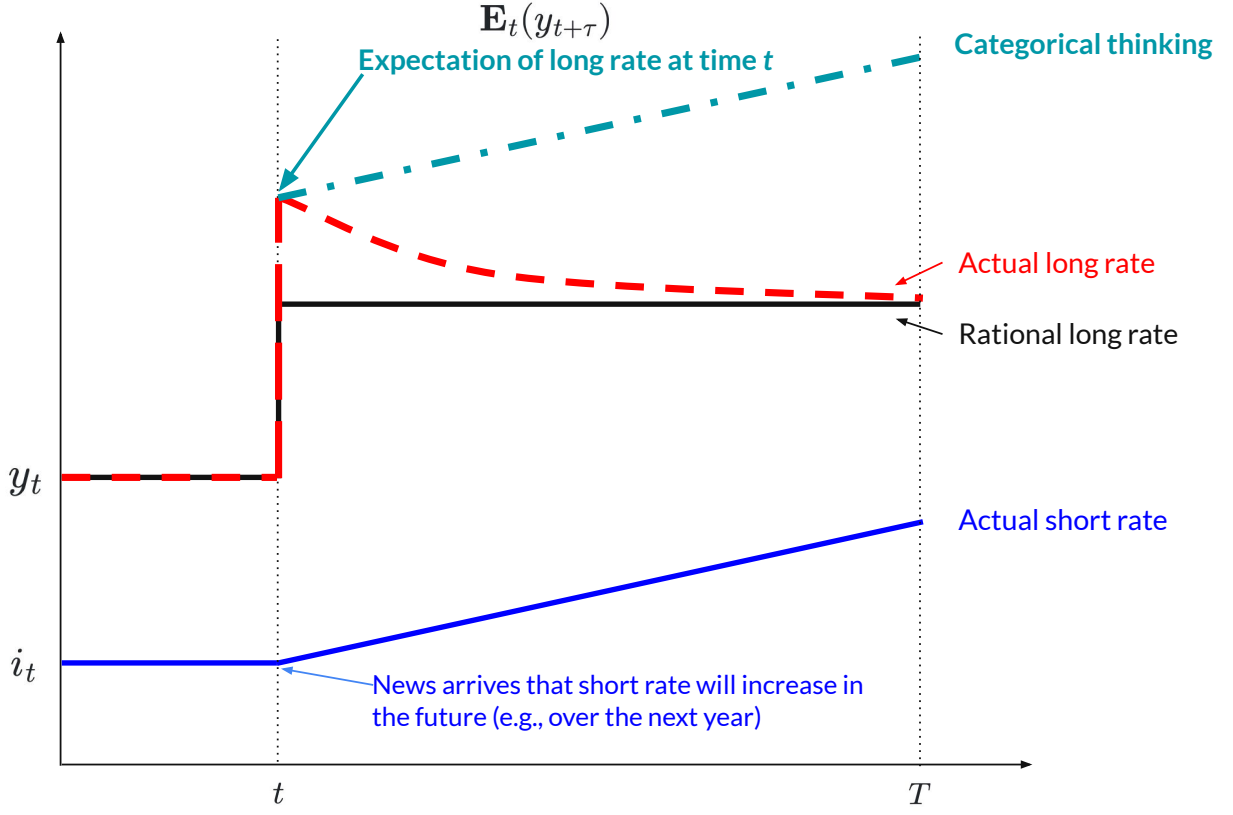


Figure 1 An illustration of long-short rate confusion

to reflect the expected higher short rates and then level off, as depicted by the solid black line in the figure.

However, empirical observations reveal an overshooting of long-term rates in response to news of expected changes in the short rate, followed by a reversion to the level predicted by rational expectations, a phenomenon encapsulated in Table 2. This path of the actual long rate, as seen in the historical data, is illustrated by the dashed red line.

The crux of the long-short rate confusion lies in how investors form beliefs $\mathbb{E}_t(y_{t+\tau})$ about the future path of long rates at time t . Rational expectations would dictate beliefs that align with the actual trajectory of the long rate. Alternatively, if investors recognize that the short rate path is already priced in the long rate but fail to account for empirical overshooting, beliefs about the future path of long rates should resemble a flat horizontal

line. However, investors who suffer from long-short rate confusion would erroneously expect that short and long rates move in tandem. Consequently, their forecasts for the long-term rate would erroneously track the trajectory of the short-term rate, as illustrated by the dot-dashed turquoise line.

The mistaken belief at time t that long rates will rise in the future generates an increase in the supply of long-term debt because households and firms believe they can benefit by borrowing long at time t to lock in the current long rate before it rises further. The mistaken belief at time t that long rates will rise also reduces demand for long-term debt, because investors reason that prices of long bonds will fall as yields are expected to rise. We explore these supply and demand implications in Section 4. The combined increase in supply and decrease in demand cause the price of the long bond to fall, and the long rate to rise beyond what would be expected under rational expectations. Thus, long-short rate confusion can help explain why actual long rates overreact to news and subsequently reverse, as illustrated in the dashed red line.

Building on this conceptual framework, our empirical strategy to test for long-short rate confusion is delineated as follows.

2.2 Forecasted changes over the next quarter

We begin by examining the relation between the forecasted next-quarter change in short and long rates.⁵

$$\underbrace{\mathbb{E}_t(y_{t+1q}^{(n)}) - y_t^{(n)}}_{\text{Expected changes}} = \alpha + \beta_1 [\mathbb{E}_t(i_{t+1q}) - i_t] + \gamma X_t + \epsilon_t \quad (3)$$

$$\underbrace{y_{t+1q}^{(n)} - y_t^{(n)}}_{\text{Actual changes}} = \alpha + \beta_2 [\mathbb{E}_t(i_{t+1q}) - i_t] + \gamma X_t + \epsilon_{t+1q} \quad (4)$$

$$\underbrace{y_{t+1q}^{(n)} - \mathbb{E}_t(y_{t+1q}^{(n)})}_{\text{Forecast errors}} = \alpha + \beta_3 [\mathbb{E}_t(i_{t+1q}) - i_t] + \gamma X_t + \epsilon_{t+1q} \quad (5)$$

We control for debt market conditions X_t across all three tests. Controls include the current short rate, inflation, term spread (the difference between the relevant long yield and FFR), credit spreads, and credit term spread. Equation (3) explores the contemporaneous comovement between expected changes in short and long rates. Equation (4) examines the relation between actual changes in the long rate and expected changes in the short rate. This is a direct test of whether there is any discernible positive relation between expected changes in the short rate and changes in the long rate. If forecasters are influenced by long-short rate confusion, we expect β_1 to be positive. If they are fully rational and understand that long rates overshoot in the data, we expect β_1 to match β_2 , which we estimate to be zero or negative.

The final specification in Equation (5) investigates forecast errors of long rates. Though the results can be anticipated from the previous two specifications, a test of predictability of forecast errors reveals whether long-short rate confusion constitutes a systematic bias in interest rate expectations. If forecasters suffer from long-short rate confusion, we expect β_3 to be negative, indicating a departure from rationality. In contrast, if forecasters are fully rational, their forecast errors should not be systematically predictable based on prior

⁵The subscript $t + 1q$ denotes forecasts for the next quarter, reflecting their quarterly horizon. Given the data availability, the regressions are estimated at a monthly frequency.

information, leading to $\beta_3 = 0$.

We can also directly test whether a positive β_1 in Equation (3) can be justified by beliefs about the short rate in the very long run rather than long-short rate confusion. Recall from Equation (2), that if the expectations hypothesis holds, $\mathbb{E}_t \left(y_{t+1}^{(n)} \right) - y_t^{(n)} = \frac{1}{n} [\mathbb{E}_t (i_{t+n}) - i_t]$. Thus, we can replace the dependent variable in Equation (3) with $\frac{1}{n} (\mathbb{E}_t (i_{t+n}) - i_t)$ and estimate the following regression:

$$\frac{1}{n} [\mathbb{E}_t (i_{t+n}) - i_t] = \alpha_1 + \beta_4 [\mathbb{E}_t (i_{t+1q}) - i_t] + \gamma X_t + \epsilon_t. \quad (6)$$

If beliefs under the expectations hypothesis explains our results, we expect β_4 in the above regression to equal β_1 . As we will show, we find that β_4 is very close to zero. In other words, the same people who forecast that long rates will move with expected changes in the short rate over the next quarter do not hold beliefs about the short rate in the very long run in a manner that is consistent with the expectations hypothesis.

2.3 Matching shapes over the next four quarters

We can also test the sharper prediction that long-short rate confusion should lead people to believe that the future path of the long rate will exhibit a similar shape to the expected path of the long rate. Let $s = 1, 2, 3, 4$ index the immediate next four quarters. Using data on long and short rate beliefs over each of the next four quarters, we estimate:

$$\begin{aligned} \mathbb{E}_t \left(y_{t+s}^{(n)} \right) - \mathbb{E}_t \left(y_{t+s-1}^{(n)} \right) &= \alpha + \beta_1 [\mathbb{E}_t (i_{t+1q}) - \mathbb{E}_t (i_t)] \\ &\quad + \beta_2 [\mathbb{E}_t (i_{t+2q}) - \mathbb{E}_t (i_{t+1q})] \\ &\quad + \beta_3 [\mathbb{E}_t (i_{t+3q}) - \mathbb{E}_t (i_{t+2q})] \\ &\quad + \beta_4 [\mathbb{E}_t (i_{t+4q}) - \mathbb{E}_t (i_{t+3q})] \\ &\quad + \gamma X_t + \epsilon_t. \end{aligned} \quad (7)$$

We regress the forecasted change in the long rate in quarter s on the forecasted change in the short rate in each of the next four quarters. Long-short rate confusion predicts that the forecasted change in the long rate in each of the next quarters is more closely related to the expected change in the short rate in the same quarter than in any of the other three quarters. In other words, we predict that for each quarter ahead s , β_s should be positive and larger than the other β 's. We regress the forecasted change in the long rate in quarter s on the forecasted change in the short rate in each of the next four quarters. Long-short rate confusion thinking predicts that the forecasted change in the long rate in each of the next quarters is more closely related to the expected change in the short rate in the same quarter than in any of the other three quarters. In other words, we predict that for each quarter ahead s , β_s should be positive and larger than the other β 's.

We also note that matching shapes in beliefs for the forecasted paths of the long and short rates is difficult to rationalize under the expectations hypothesis. Assuming a zero term premium, we can again iterate and express the forecasted change in long rates in each of the next s quarters in terms of beliefs about short rates in the very long run:

$$\mathbb{E}_t \left(y_{t+s}^{(n)} \right) - \mathbb{E}_t \left(y_{t+s-1}^{(n)} \right) = \frac{1}{n} \mathbb{E}_t (i_{t+n+s-1} - i_{t+s-1}) .$$

The above equation implies that people must hold very specific matching beliefs about short rates in the very long run to justify such forecasts under the expectations hypothesis. For example, in the case of the 10-year yield, if a person believes that the long and short rate will follow a similar V-shaped path over the next four quarters, she must believe that federal funds rate will move in a V-shape manner over a four quarter period starting exactly 10 years in the future.

3 Long-short rate confusion in forecasts

3.1 Professional forecasters

We begin by implementing the baseline tests outlined in equations (3)-(5) using consensus forecasts. For short-term rates, we focus on the federal funds rate (FFR), while for long-term rates, we examine both the 30-year Home Mortgage Rate (HMR) and the 10-year Treasury yield. Our analysis utilizes 1-quarter ahead forecasts of short and long rates at a monthly frequency. We control for the current short rate (FFR), the term spread, the current inflation rate, the Baa credit spread, and the Baa credit term spread.

The results from these regressions are summarized in Table 3. Beginning with Panel A which examines the 30-year Home Mortgage Rate, the first three columns report the results for equation 3. Across all three specifications in which we incorporate the control variables incrementally, β_1 estimates are all positive and significant at the 1% level. The point estimate in column (3) shows that when a 1 percentage point increase in the short rate is expected, forecasters also expect a 24 basis point increase in the long rate over the same horizon. These results reject the null of $\beta_1 < 0$, which matches the empirical relation between actual movements in the long rate and expected changes in the short rate. These results also reject the $1/n = 0.0083$ benchmark described in Section 2. The large estimate for β_1 indicates that the comovement between short and long rate expectations is excessive, supporting our hypothesis that forecasters bundle the short and long interest rates together in their expectations formation process and expect them to move in tandem in the future.

Columns (4)-(6) of Panel A estimate equation 4. They are slightly different from those in Table 2 because we now control for the term spread using the difference between HMR and FFR, which is more relevant to the pair of interest rates at hand. Despite this difference, the point estimates are all negative, albeit statistically insignificant. These results suggest that contrary to forecaster beliefs, expected changes in the short rate bear no positive predictive power for future changes in the long rate.

Columns (7)-(9) of Panel A report the results for the third equation testing the predictability of HMR forecast errors. Estimates of β_3 across all specifications are negative and significant at the 1% level; forecast errors in the long rate are negatively predicted by the short rate forecasts. The tendency for forecasters to overreact to expected hikes in the federal funds rate, especially against a backdrop where consensus forecasts typically exhibit underreaction to new information (Bordalo et al., 2020), is particularly striking. This pronounced predictability underscores a departure from rationality, consistent with long-short rate confusion.

Finally, Panel B repeats the analysis of Panel A but using 10-year treasury yields as the long rate measure. As can be seen, the results remain similar for 10-year yields; when forecasters expect the federal fund rate to increase the following quarter, they also tend to expect 10-year yields to increase. The magnitudes are, if anything, larger for 10-year yields, with a 1 percentage point increase in the short rate forecast associated with a 41 basis point increase in the long rate forecast in column (3). Columns (4)-(6) show again that these beliefs tend to be incorrect. In fact, when short rates are expected to increase, 10-year yields tend to decrease—in this case the negative relationship is statistically significant. As a result, we again find predictable forecast errors in columns (7)-(9).

While the comovement in forecasters’ expectations for short and long rates does not materialize in actual rate changes—suggesting the belief is mistaken—we further test whether this belief could nonetheless be rationalized. We consider two possibilities: (1) the expectations hypothesis, combined with specific beliefs about the short rate in the very distant future, and (2) standard no-arbitrage dynamic term structure models (DTSMs).

First, we test whether the strong relationship between expected changes in short and long rates can be explained by the expectations hypothesis. As shown in Equation (2), this would require that forecasters’ expectations about the short rate in the very long run ($\mathbb{E}_t(i_{t+n})$) move in tandem with their expectations for the short rate over the next quarter. We test this in Table 4 using semi-annual data on 10-year-ahead forecasts of the federal

funds rate from the BCFF survey. Under the expectations hypothesis, the expected change in the long rate is $\frac{1}{n}(\mathbb{E}_t(i_{t+n}) - i_t)$. We regress this term on the expected change in the short rate over the next quarter, as specified in Equation (6). The resulting coefficient, β_4 , is statistically indistinguishable from zero. This contrasts sharply with the large, significant coefficient ($\beta_1 > 0.6$) we find when regressing forecasters' expected long-rate changes on their expected short-rate changes (Columns 4-6). This shows that forecasters' beliefs about long-run short rates are inconsistent with an expectations-hypothesis-based explanation for their long-rate forecasts.

Second, we test whether a standard, no-arbitrage dynamic term structure model (DTSM) can rationalize the excessive comovement we observe in survey forecasts. For this, we use the canonical three-factor Gaussian DTSM of [Joslin, Singleton, and Zhu \(2011\)](#) (JSZ). We choose this model for its parsimony and its canonical representation of yield curve factors. While foundational, simpler one-factor models like those of [Vasicek \(1977\)](#) and [Cox, Ingersoll, and Ross \(1985\)](#) are often too simplistic to capture the empirical dynamics of the term structure. We use the JSZ model to generate model-implied forecasts for the 10-year Treasury yield over the next quarter, adhering to the exact timing and data conventions of the BCFF survey. Details on the model calibration and forecasting procedure are provided in [Appendix A](#).

As shown in [Table A.8](#) in the Appendix, regressing these model-generated forecasts on the survey's expected federal funds rate changes yields a coefficient of only 0.11 (Columns 1-3). This is significantly smaller than the coefficient of approximately 0.4 found using the actual survey forecasts for the 10-year yield (Columns 4-6). Furthermore, Panel B shows that the JSZ model's forecasts explain very little of the variation in the survey's long-rate forecasts (Column 4, $R^2 = 0.06$), and the comovement between expected short- and long-rate changes in the survey data remains strong even after controlling for the JSZ model's predictions (Column 6). Thus, the excessive comovement we document in survey forecasts cannot be rationalized by a standard term structure model.

For the remainder of our analysis, we focus on home mortgage rates as our primary measure of long-term interest rates. This choice is motivated by two key factors. First, the BCFF data for home mortgage rates offers the longest historical time series among our long-rate variables. Second, this focus allows us to draw parallels with how consumers form beliefs about long-term rates, as consumer surveys typically ask about expected changes in home mortgage rates rather than 10-year treasury yields.

A natural question at this point is whether the pattern we have documented differs when short rates are expected to increase versus decrease. In other words, when short rates are expected to decrease, do forecasters expect a concurrent decrease in long rates, or is it mainly when short rates are expected to increase that forecasters expect a concurrent increase? To examine this, we repeat the analysis of Table 3 (Panel A), partitioning the expected change in short rates into two variables—one representing expected increases (and equal to zero for decreases) and one representing expected decreases (and equal to zero for increases). The results are presented in Appendix Table A.2. We find evidence of long-short rate confusion around both expected increases and decreases in short rates, with roughly similar magnitudes. This approximate symmetry also helps to rule out a potential concern that forecasters may simply tend to forecast increases in all rates during our sample period—not due to long-short rate confusion.⁶

3.1.1 Forecasted paths of the long and short rates over the next four quarters

Our analysis thus far has concentrated on the relationship between 1-quarter ahead forecasts of short and long rates. The evidence suggests that forecasters systematically err by predicting increases in long rates when short rates are expected to rise. While this pattern aligns with long-short rate confusion, it could potentially be explained by other behavioral biases. Specifically, forecasters may tend to believe that long rates will increase during times when

⁶However, even if forecasters did tend to forecast increases in all rates during our sample period, that would not explain the results in Table 3, because the average forecasted increase in long rates would be absorbed by the constant.

short rates are expected to increase, but they may not believe that long rates will increase *because* short will increase. To further examine whether long rate beliefs are driven directly by short rate beliefs, we leverage the availability of rate forecasts for multiple future quarters. We have access to forecasts not only for one quarter ahead but also for two, three, and four quarters ahead. This allows us to examine whether forecasters predict similar *shapes* for the paths of short and long rates over the next 4 quarters. For instance, if forecasters expect short rates to rise and then fall, do they anticipate a matching pattern for long rates? Such a finding would provide more compelling evidence of long-short rate confusion.

Figure 2 shows the actual path of the short rate (FFR) and long rate (HMR) as dashed blue and red lines, respectively. Each solid blue line that branches off from the dashed blue line represents the consensus forecast of the path of the short rate over the next four quarters. Likewise, each solid red line that branches off from the dashed red line represents consensus forecasts of the path of the long rate over the next four quarters.

It is apparent from the graph that forecasted paths for short and long rates over the next four quarters tend to have matching shapes. When the short rate is expected to increase or decrease in a linear, concave, or convex manner, or exhibit a V-shape or N-shape, the long rate is often expected to move along a similarly-shaped path. Further, when the short rate was expected to rise in the mid 2000s and again in the late 2010s under clear Fed guidance, we see that professional forecasters believed that long rates would similarly rise over the next four quarters, leading to large deviations between forecasted levels (solid red lines) and actual long rates (dotted red line).

To complement the graphical evidence in Figure 2, we also statistically test whether professional forecasters report similar shapes for the expected paths of short and long rates over the next four quarters. We measure the time t forecasted change in an interest rate over some future quarter n as the difference between the consensus forecasted rate for quarter n and the consensus forecasted rate for quarter $n - 1$. Table 5 Panel A shows that a 1 percentage point change in the forecasted short rate in each of the next four quarters is

associated with an approximate 30 basis point forecasted change in the long rate over the same quarter.

In Panel B of Table 5, we show that such beliefs are not justified by the data. We regress the actual change in the long rate in each of the next four quarters on the forecasted change in the short rate for the same quarter. For each of the next four quarters, we find a negative insignificant relation. In other words, long rates do not move positively with expected changes in short rates in any of the next four quarters.

Finally, in Panel C of Table 5, we show that the forecasted change in long rates over some future quarter n is better predicted by the forecasted change in short rates over the same quarter than by the forecasted change in short rates over the other three quarters. In each column n of Panel C, we regress the forecasted change in long rates in quarter n on the forecasted changes in short rates over the next 1, 2, 3, and 4 quarters. We find the strongest statistical relation along the diagonal of the panel. The forecasted change in the long rate is best predicted by the forecast change in the short rate *in the same quarter*. Forecasted changes in the long rate are not consistently related to forecasted changes in the short rate in other future quarters. Altogether, Table 5 provides statistical evidence that forecasters predict similar shapes for the paths of future short and long rates over the next four quarters, consistent with long-short rate confusion.

3.1.2 Accuracy of actual forecasts versus a "no change" forecast

The evidence so far suggests that professional forecasters make systematic errors in predicting long-term interest rates due to long-short rate confusion. Next, we compare how these forecasts compare to a simple “no change” benchmark that assumes long rates will stay constant. Appendix Table A.3 compares the root mean-squared errors (RMSE) of the consensus forecasts against this naive “no change” forecast across different long-term rates.

The results are striking. For 1-quarter ahead forecasts (Panel A), the consensus forecasts consistently perform worse than the no-change benchmark across all long rates. For

example, for home mortgage rates (HMR), the RMSE of consensus forecasts is 0.51 compared to 0.47 for the no-change forecast. The Diebold-Mariano test statistics are all negative and highly significant, with p-values below 0.01, indicating that the no-change forecasts are statistically more accurate. The relative underperformance of professional forecasts is even more pronounced for 4-quarter ahead predictions (Panel B). For HMR, the RMSE gap widens to 1.05 versus 0.91. Similar patterns hold for Treasury yields and corporate bond rates.

These results remain robust when we explicitly test whether the poor forecast accuracy could be explained by forecasters simply having an upward bias—that is, consistently overestimating the probability of rate increases. Even after adjusting for any systematic bias in the mean level of consensus forecasts (Panels C and D), we continue to find that professional forecasts significantly underperform the naive no-change benchmark.

3.1.3 Potential alternative explanations

In this section we discuss some potential alternative explanations for the patterns we have documented.

Conflicts of interest among forecasters. It is possible that the forecasters surveyed may not report their true beliefs due to conflicts of interest. Professional forecasters in our data tend to hold high level positions such as “chief economist” within large banks, asset management firms, and independent economics research institutions. See Appendix Table [A.1](#) for details. Forecasts are public information that can be tied to the identities of each forecaster. Conversations with professional forecasters suggest that participation in the BCFF survey is considered highly prestigious. BCFF forecasters are motivated to provide accurate forecasts by a combination of intrinsic preferences, awards for accuracy, and public recognition. They are not directly monetarily compensated for their forecasts.

Nonetheless, it remains possible that those who work for banks have an incentive to predict that long rates will increase when short rates are expected to rise, as these predic-

tions would cause potential borrowers to rush to borrow long before long rates rise further. However, as shown earlier in Appendix Table A.2, forecasters also predict that long rates will decline when short rates are expected to decline. It is unclear why conflicted forecasters would make such predictions, as they would lead to delayed long-term borrowing. In addition, Appendix Table A.5 shows that we find similar results when we limit the analysis to forecasters from independent research firms who are not affiliated with any financial institution.

Forecasters believe that long rates respond sluggishly to policy rate news. One way in which long-short rate confusion might arise is that forecasters might mistakenly believe that policy rate news is slow to be priced into long rates. Under this view, forecasters might predict long rates will rise alongside short rates, even when the policy rate increases are expected in advance, because the long-term bond market had not yet fully priced in the anticipated short rate changes.

To explore this possibility, we repeat our baseline analysis but now lag the independent variables by one month. The idea is that forecasters are less likely to believe that information in the consensus short rate forecast from the *previous* month is still yet to be priced into long rates. The results are shown in Appendix Table A.6. Even with a 1-month lag, the coefficient estimates remain close in magnitude to those in the baseline regressions and significant at the 1% level.

In addition, we also control directly for news about short rates as proxied for by short rate forecast revisions.⁷ If the results were driven by a belief of slow information dispersion, we should find that short rate *news* matters more than the expected change in the short rate. For example, if there was a coming increase in the short rate that was known long in advance (no news), forecasters would not predict a simultaneous increase in the long rate.

⁷In seminal work by Coibion and Gorodnichenko (2015), forecast revisions, i.e., changes in forecasters' beliefs about the same quantity across different periods, are used as a measure of how forecasters update their beliefs in response to new information. Researchers often use the forecast revision as a proxy for news about the underlying variable.

Whereas if the planned rate increase was only recently communicated by the Fed (news), forecasters would predict a simultaneous increase in the long rate.

In Table 6, Panel A, we re-estimate our baseline tests by running a horse race between expected changes in short rates and forecast revisions. When introduced separately in columns (1) and (2), both expected changes in short rates and forecast revisions positively predict expected changes in long rates, with the former exhibiting greater predictive power. When controlling for both variables in column (3), only expected changes in short rates predict expected changes in long rates. Overall, this evidence suggests that long-short rate confusion is not driven by a belief in slow information dispersion.

Forecasters have extrapolative beliefs about long rates. Another possibility, distinct from long-short rate confusion, is that forecasters form their beliefs about long rate movements separately from their beliefs about policy rate movements, but the two just happen to coincide. As already discussed, this seems unlikely given that forecasters also predict similar *shapes* in the paths of policy rate and long rates over the next 4 quarters. Nonetheless, we explore this possibility further.

Perhaps the most likely way in which forecasters may form beliefs about long rate movements separately from their beliefs about policy rate movements is by extrapolating from recent past long rate movements. That is, forecasters may tend to predict increases in long rates following recent past increases in long rates, and such times may also happen to be times when the policy rate is expected to increase. In that case, expected short rate increases would correlate with forecasts of long rate increases without long-short rate confusion.

In Table 6, Panel B, we re-estimate our baseline tests by running a horse race between expected changes in short rates and recent changes in long rates. Again, we find that, when introduced separately in columns (1) and (2), both expected changes in policy rates and recent changes in long rates predict expected changes in long rates. When controlling for both variables in column (3), both significantly predict expected changes in long rates, with

expected changes in short rates having a stronger and more significant effect. These results are again consistent with an important role for long-short rate confusion. Controlling for recent trends in long rates and allowing for extrapolation of recent trends does not diminish the relation between the expected changes in short and long rates.

3.1.4 Additional robustness

Influential dates. [Bauer and Swanson \(2023\)](#) find that certain FOMC dates feature significant new information about future short rates and these dates appear especially influential in shaping forecasters’ beliefs about future monetary policy and macroeconomic conditions. A potential concern is that expected changes in the short rate may forecast changes in the long rate following these influential FOMC dates, even if the predictability does not hold in the full sample. If so, it would be rational to predict that long rates move with expected changes in short rates following these influential FOMC dates.

Following [Bauer and Swanson \(2023\)](#), we categorize months by the size of monetary policy shocks, which we obtain from [Swanson \(2021\)](#).⁸ We label a month as influential with a large FFR shock if the shock in absolute value is greater than the median, and non-influential if it is lower or there is no monetary shock during that month. We then re-estimate our second tests separately for the two subsamples. The results are reported in Appendix Table [A.7](#). Across both samples, the coefficient estimates (β_2) are always negative, refuting the possibility that short rate expectations can positively predict future long rates following influential monetary policy dates. Moreover, in the sample where the current month contains the influential FOMC date, the coefficient estimates are even more negative and significant at the 1% level with a full set of control variables, suggesting that the long rate overshooting is even more pronounced in months containing these influential dates.

Economist-level forecasts. [Bordalo et al. \(2020\)](#) have highlighted the crucial differences

⁸We thank Eric Swanson for sharing the monetary policy shocks data. We focus on Swanson’s shocks, instead of those from [Nakamura and Steinsson \(2018\)](#), because of their longer time series.

between individual and consensus forecasts. Because the consensus forecast is an average of individual forecasts and private information embedded in these forecasts, it can behave differently from the individual forecasts in tests of under- and overreaction. In particular, the consensus forecast is less likely to overreact to new information.

To ensure that our results are not driven by this specific feature of consensus forecasts, we compile economist-level forecasts from BCFF. We plot the cross-sectional dispersion of the 1-quarter-ahead FFR and HMR forecasts in Figure 3. Though there is noticeable heterogeneity in short and long rate forecasts, especially in the earlier part of the sample, most of the individual forecasts are close to the consensus. We then re-estimate our baseline tests using these economist-level forecasts. The results are reported in Appendix Table A.4. Controlling for economist fixed effects, all previously documented patterns using consensus forecasts apply to the individual forecasts. The β_1 estimates of around 0.40 are larger in magnitude and deviate even more from the rational benchmarks, suggesting that the excessive co-movement between short and long rate expectations is not due to the use of consensus forecasts instead of individual forecasts in our main regressions.

3.2 Household beliefs

In this section, we explore whether there is evidence of a similar bias among households. We do this using the Fannie Mae National Housing Survey data described in Section 1.1.2. While the survey does not ask respondents to forecast future mortgage rates precisely, it does ask them whether they expect mortgage rates to increase, decrease, or remain about the same over the next 12 months.

Therefore, to test for long-short rate confusion, we examine whether households are more likely to expect an increase in mortgage rates over the next 12 months during times when the consensus forecast is for the federal funds rate to increase over the same time period (based on the professional forecasters). Again, to the extent that there is public information suggesting that the Fed will increase the federal funds rate over the next 12 months, that

information should already be reflected in current mortgage rates. Therefore, households should not expect future mortgage rate increases during such times.

Following this logic, we begin by estimating equations of the form:

$$\mathbb{1}(\mathbb{E}_{it}(HMR_{t+12m}) - HMR_t > 0) = \beta \mathbb{1}(\mathbb{E}_t(FFR_{t+12m}) - FFR_t > 0) + \text{Controls} + \epsilon_{it}, \quad (8)$$

Where $\mathbb{E}_{it}^{HH}(HMR_{t+12m}) - HMR_t$ is household i 's expected change in mortgage rates over the next 12 months and $\mathbb{E}_t(FFR_{t+12m}) - FFR_t$ is the consensus expected change in the federal funds rate over the next 12 months among professional forecasters. The results are shown in Table 7. As can be seen, we estimate β to be positive and statistically significant. The magnitudes in column (2) suggest that, on average, households are 19 percentage points more likely to expect increases in mortgage rates over the next 12 months during times when the consensus forecast is for the federal funds rate to increase over the same time period.

Next, we explore whether there is heterogeneity in long-short rate confusion across different types of households. On the one hand, one might think that more sophisticated individuals would be less subject to this type of bias. On the other hand, a certain amount of sophistication is likely necessary for one to be subject to this bias at all. In particular, one needs to have at least some knowledge about short-term interest rate expectations in order to conflate short-term interest rate expectations with long-term interest rate expectations.

In Figure 4, we re-estimate Table 7 by interacting our main independent variable of interest with a series of education level indicator variables. The marginal effects for each education level are displayed (i.e., the sum of the main effect and interaction). We find that long-short rate confusion becomes monotonically stronger with education. In particular, those without a high school degree are only 5.7 percentage points more likely to expect increases in mortgage rates over the next 12 months during times when the consensus forecast is for the federal funds rate to increase. In contrast, those with a graduate degree are 26.3 percentage points more likely to expect increases in mortgage rates.

Figure 5 similarly explores heterogeneity by income. Long-short rate confusion becomes monotonically stronger with income as well. In particular, those earning less than \$10,000 annually are only 2.4 percentage points more likely to expect an increase in mortgage rates when an increase in the federal funds rate is expected, whereas those earning over \$200,000 are 33.1 percentage points more likely. Thus, the bias that we document in this paper is fairly unusual relative to the literature. It does not diminish with education and income but rather becomes stronger with these proxies for financial sophistication.

Note that our heterogeneity results cannot be explained by less sophisticated households being more likely to respond “don’t know” to the question of what will happen to the home mortgage rate over the next 12 months. While less educated and wealthy households are indeed slightly more likely to choose this response, this pattern would not explain why they are less likely to predict that the home mortgage rate will increase when short rates are expected to increase over the same window. We also find similarly significant variation by household sophistication if we remove the “don’t know” responses from our sample.

3.2.1 Discussion of potential mechanisms underlying beliefs

So far, we have presented evidence that both professional forecasters and households mistakenly believe that long rates will move with expected changes in short rates. Both groups exhibit long-short rate confusion.

However, we caution that the exact form of long-short rate confusion may differ across groups. Interviews with a professional forecaster suggest the following mechanism may be at play. While these professionals understand theoretically that the long rate equals the average of expected short rates over the life of the long bond plus a term premium, they make forecasts based on complex statistical models trained on historical data encompassing a large set of interest rates and macroeconomic variables. These models inevitably detect the strong positive correlation between contemporaneous short and long rates. When predictions of future changes in short rates are input, the models output correlated predictions for future

changes in long rates. The key error lies in failing to program the models to distinguish between expected versus unexpected changes in interest rates. This suggests a mechanism in which professional forecasters grasp the theoretical relationship between rates, but they build and use statistical models that exhibit long-short rate confusion.

A slightly different mechanism may apply to households. Some households may reason that different interest rates move together, while others may follow guidance from sources (financial media or professional forecasters) that display long-short rate confusion.

Finally, we do not claim that this bias extends to all finance professionals. In contrast to the professional forecasters in the BCFF who typically occupy high level positions such as chief economist, bond traders interact directly with detailed, high-frequency bond pricing data. Because they receive frequent feedback through exposure to data and trading, we do not expect them to exhibit the same errors in beliefs. Indeed, in preliminary analysis of bond futures markets, we do not find evidence that bond traders price long term bond futures in a way consistent with long-short rate confusion.

Investigating the exact mechanism and extent of long-short rate confusion in each type of person is beyond the scope of this paper. Instead, in the remainder of this paper, we examine how long-short rate confusion can affect real behavior and how these behaviors can impact asset markets and the macroeconomy.

4 Supply and demand for long-term debt

Having shown direct evidence of long-short rate confusion by both professional forecasters and households, our next objective is to explore how this bias may affect equilibrium market outcomes. In our context, we explore whether long-short rate confusion affects the supply and demand for long-term debt.

On the supply side, we hypothesize that expectations of rising policy rates will drive borrowers (i.e., firms and households) to rush to lock in long-term debt as they anticipate

that long-term rates will rise simultaneously with short-term rates in the future. This will lead to an increase in the supply of long-term debt. On the demand side, we hypothesize that expectations of rising short rates will lead investors to be reluctant to buy or hold long-term debt instruments, as they also anticipate that long-term rates will rise and prices will fall. This will lead to a decrease in the demand for long-term debt.

Such changes in the supply and demand for long-term debt could then amplify the response of long rates to news about short rates, as in [Hanson, Lucca, and Wright \(2021\)](#). In other words, these supply and demand effects could help explain why the long rate overreacts to news about future changes in short rates as in [Figure 1](#). In that case, long-short rate confusion would help to explain the puzzle of excessive movement and reversals in the prices of long-maturity claims ([Stein, 1989](#); [Cochrane and Piazzesi, 2005](#); [Gürkaynak et al., 2005](#); [Hanson and Stein, 2015](#); [Giglio and Kelly, 2018](#)).

To investigate whether long-short rate confusion affects supply and demand in the way that we hypothesize, we estimate equations of the form:

$$Z_{i,t+1} = \alpha + \theta \times [\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t] + \gamma X_t + \epsilon_{i,t+1}, \quad (9)$$

where Z_{t+1} is a measure of the supply or demand for long-term debt, $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$ is the expected change in short-term interest rates based on the consensus forecast, and $X_{i,t}$ is a vector of control variables. We expect θ to be positive for supply-related outcomes and negative for demand-related outcomes.

Note, we forward the dependent variable Z_{t+1} by one period (depending on the frequency of the data). There is likely to be a lag in timing between when beliefs about long-term rates are formed and when subsequent borrowing or investing activities are realized. This choice of timing accounts for the lag, ensuring that the actions can be taken based on expectations of future interest rates.

4.1 Supply: Firms' long-term borrowing

For firms' long-term borrowing, we use the following measures of long-term debt supply: an indicator for long-term borrowing, $\mathbb{1}(\text{LT Issues}_t > 0)$, the ratio of long-term borrowing to total assets, $\text{LT Issues}_t/\text{AT}_{t-1}$, the ratio of long-term borrowing to total debt, $\text{LT Issues}_t/\text{Total Debt}_{t-1}$, and the long-term issuance share, LT Share_t . The data are available at the quarterly frequency, so we link the consensus forecasts in the last month of each quarter to the borrowing decisions for the subsequent quarter.

We expect the coefficients on $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$ to be positive for all measures, consistent with the prediction that firms will rush to lock in their long-term borrowing in (mistaken) anticipation of rising long-term borrowing rates. Based on detailed issue-level information from the Mergent FISD database, we find that the average maturity of the long-term borrowing is around 5 years. Therefore, in the firm-level regressions, we control for the term spread as the difference between the 5-year Treasury yield and FFR. We double cluster the standard errors by firm and year-quarter to account for the potential correlation of the borrowing decisions within the same firm and in the same quarter.

Table 8, Panel A, reports the results from the firm-level regressions with each column corresponding to one of our measures of long-term borrowing. These regressions include a number of controls as well as firm fixed effects. We estimate the θ coefficient to be positive and statistically significant at the 1% level for all measures of long-term borrowing and for all specifications. This positive relationship confirms the prediction from long-short rate confusion that firms rush to lock in their long-term borrowing when they anticipate the long-term borrowing rate to rise in the future. The coefficients on the control variables go in the direction we would expect as well. In particular, firms issue less long-term debt when short-term rates are high, when the yield curve is steep, and when credit spreads are wide, consistent with known determinants of corporate debt issuance decisions.

Despite our controls, it remains possible that times when the short rate is expected to rise are also times when the economy is booming, and therefore firms may be borrowing as a

result of the boom rather than long-short rate confusion. However, we note that our results in column (4) show that not only is borrowing increasing during these times but the *share* of borrowing that is long-term is increasing. This is more consistent with long-short rate confusion, as when firms believe that both short and long term rates will rise, they have an extra incentive to borrow long rather than short, because borrowing short implies they will have to keep rolling over short-term loans at rising rates.

To put the economic magnitudes of the findings in perspective, a one percentage point expected increase in next-quarter’s policy rate is associated with a 3.5 percentage point increase in the likelihood of issuing long-term debt (mean likelihood of 38%), a 0.5 percentage point increase in the ratio of long-term borrowing to total assets (mean ratio of 3%), and a 5 percentage point increase in the long-term issuance share (mean share of 60%). This is a substantial effect, given that the size of the long-term borrowing induced by categorical thinking is usually around 10% of the mean level of long-term borrowing.

Finally, we aggregate the firm-level long-term borrowing measures to the economy level and estimate the same regressions. The results, reported in Table 8, Panel B, are consistent with the firm-level results, suggesting that the documented effect is widespread and not driven by a few smaller firms.

Intuitively, we expect the long-short rate confusion effect on real borrowing to be strongest at turning points in the interest rate cycle. When long rates have been low and the Fed communicates that a hiking cycle is coming, that may trigger an especially strong increase in long-term borrowing, as borrowers rush to lock in favorable rates. Similarly, when long rates have been high and the Fed communicates that a cutting cycle is coming, that may trigger an especially strong decrease in long-term borrowing, as borrowers wait for more favorable rates to materialize. This is exactly what we find in Appendix Table A.12, where we interact our main variable of interest with an indicator variable (“FirstChange”) equal one if the current quarter is the quarter after the first rate change in a hiking/cutting cycle, and zero otherwise. As can be seen, the rate confusion effect is approximately 2–7 times

larger at these turning points.

A potential concern is that firms borrow long because of a change in investment opportunities rather than because of beliefs about interest rates. To address this concern, we replace the long-term borrowing measures with the subsequent one- to four-quarter capital expenditures (CAPX). The results, reported in Table A.13 in the Appendix, reveal no significant relationship between future investments and expected short-rate changes. This implies that the relation between long-term debt issuance and expected changes in short rates is not driven investment needs, and is instead consistent with a (mistaken) desire to strategically time long term debt issuance.

We also explore whether firms may issue long-term debt to hedge against uncertainty in interest rate policy that may be correlated with expected changes in short rates. In Appendix Table A.14, we control for uncertainty using forecast dispersion across professional forecasters and the VIX. Controlling for these proxies of interest rate uncertainty does not substantially alter the relationship we estimate between expected changes in the short rate and long term corporate issuance.

4.2 Supply: Household mortgage decisions

Our second analysis on the supply side explores household mortgage choices, leveraging the FHFA’s comprehensive mortgage data outlined in Section 1.2.2. We use the logarithmic value of the total new mortgage volume initiated in the month subsequent to the forecasts as the dependent variable.

We conduct analysis using observations at the loan type (conforming or jumbo) by month level. Conforming mortgages are for loans under the Federal Housing Finance Agency’s conforming limit, which is between \$7,66K and \$1,450K in 2024, whereas jumbo loans exceed the limit. The results, reported in Table 9, indicate that expectations of rising short rates are associated with a large increase in the volume of mortgages. We find a significantly stronger effect for jumbo mortgages (larger loans typically taken by wealthier

households) compared to conforming mortgages. These patterns for the household supply of long-term debt are consistent with our earlier findings related to sophistication. Wealthier households associated with jumbo mortgages are more likely to have the flexibility to engage in market timing and to be aware of publicly available information about the path of short rates.

We also find again in Appendix Table [A.15](#) that the rate confusion effect for real mortgage borrowing is strongest at turning points in the interest rate cycle.

4.3 Supply: Aggregate Evidence from Flow of Funds

To complement our micro-level evidence on firm and household borrowing behavior, we examine aggregate evidence from the Fed’s Flow of Funds data. This allows us to analyze both household and corporate borrowing in a unified framework while validating our earlier findings using an alternative data source, which should be more comprehensive. Appendix Table [A.16](#) presents these results. Whether examining household mortgage issuance or corporate long-term debt issuance (measured both directly and following ([Greenwood, Hanson, and Stein, 2010](#))), we continue to find that expected increases in short rates predict significant increases in long-term borrowing. The effects are generally stronger in the post-2000 period.⁹ These aggregate results provide corroborating evidence for our earlier findings using microdata—both households and firms increase their long-term borrowing when short rates are expected to rise.

4.4 Supply: Implications for monetary policy

US monetary policy since in the early 2000s has been characterized by gradualism (where the Federal Funds Rate is adjusted gradually over time) and forward guidance (where the

⁹The stronger long-term borrowing response to expectations of changes in short rates in the post-2000 period could be associated with the rise of forward guidance and gradualism in monetary policy. After the early 2000’s firms and households are likely to be more aware of the Fed’s intended path for short rates. See our discussion in the next section for details.

Fed communicates the likely future path of the Federal Funds Rate). Many central banks outside of the US have adopted similar policies. Our results on aggregate firm and household borrowing imply that forward guidance of gradual monetary policy can have perverse effects in the short run in the opposite direction relative to the Fed’s intended effect.

Our analysis implies the net impact of forward guidance from the Fed that it intends to gradually increase short rates, is likely to be an increase in long term borrowing (at least in the short run), instead of the intended reduction in borrowing. Empirically, when news arrives that the short rate will increase by 1 percentage point, the long rate typically rises by less than 1 percentage point. The direct effect of this increase in the long rate is a reduction in long term borrowing. This effect is captured by the negative coefficient on the term spread (the difference between the long and short rate). We generally find that this coefficient is on the order of half as large in absolute magnitude as the positive coefficient on the expected change in the short rate (see Tables 8 and 9 and Appendix Table A.16). Therefore, our estimates indicate that the rush to borrow before long rates increase further dominates the direct dampening effect of higher long rates. Thus, the net effect of forward guidance of a gradual increase in the short rate is predicted to be an increase in long-term borrowing. Symmetrically, the net effect of forward guidance of a gradual *decrease* in the short rate is predicted to be a decrease in long-term borrowing. These shifts in long-term borrowing and associated shifts in home purchases (which can contribute to aggregate house price inflation) occur in the opposite of the Fed’s intended directions for monetary tightening and loosening.

Note that the above discussion does not imply that monetary policy will be ineffective in the presence of long-short rate confusion—only that the predictable component of monetary policy may have perverse effects in the short run. In other words, when long-term interest rates are high, that will indeed lead to lower levels of long-term borrowing, as the Fed intends; however, if long rates are expected to go even higher due to a misunderstanding of predictable monetary policy, that will lead to more long-term borrowing than there would be otherwise. Thus, long-short rate confusion can help explain the forward guidance puzzle,

in which forward guidance has been less effective than predicted by macroeconomic models (see, e.g., [Del Negro et al. \(2023\)](#); [McKay et al. \(2016\)](#); [Campbell et al. \(2019\)](#); [Angeletos and Lian \(2018\)](#)).

4.5 Demand: Bond mutual fund investment

In the final segment of our analysis, we turn to the demand for long-term debt, specifically focusing on mutual fund investors' allocation decisions in long-term bond funds.

The dependent variable is monthly mutual fund flows at the share class level, expressed as a percentage of the previous month's total net assets. This measure is evaluated in the month immediately following the forecast of the short rate. We run the tests separately for the full sample, institutional share classes, and retail share classes. Because previous research has shown that fund flows also depend on past returns and the relative performance of stocks versus bonds, we also include detailed controls for the fund's past returns, past flows, and the performance of the stock market and bond market over the past one, two and three months.

Long-short rate confusion should prompt investors to sell off long-term bond mutual funds when they anticipate rising short rates, leading to a negative sign for the coefficient θ . The findings, as shown in [Table 10](#), corroborate this prediction: When short rates are expected to rise by 1 percentage point, bond funds experience average outflows of approximately 1-2% of AUM. Additionally, we find similar substantial outflows for bond funds targeted at retail and institutional investors.

Overall, the evidence across multiple settings indicates that long-short rate confusion translates to distortions in the supply and demand for long-term debt. In times when short rates are expected to rise, rate confusion leads the supply of long-term debt to increase and the demand to decrease. This interplay can contribute to the excess volatility and subsequent reversals observed in long-term interest rates.

Note that it is easier for non-institutional investors to trade long-term treasuries than

to trade mortgages. This difference in ease of trading for different types of long-term debt may help explain why we find evidence of significant reversals in long-term Treasury yields but not mortgages (compare columns 4-6 of Panels A and B of Table 3). Changes in the demand for long term debt from bond investors may have a stronger effect on Treasury yields compared to the 30-year home mortgage rate.

5 Conclusion

We show that there is a widespread misconception that expected future shifts in the short-term policy rate predict corresponding future movements in long-term interest rates. This misconception, which we term “long-short rate confusion,” leads people to expect long rates to move in tandem with policy rates in the future, failing to recognize that current long rates already reflect future expected changes in policy rates.

This confusion can arise from various cognitive mechanisms: some individuals may mentally lump different interest rates into a common category, others may incorrectly generalize from the observation that surprise policy rate changes do move long rates contemporaneously, while still others may understand the theoretical relationship but fail to account for the public nature of their information about future policy rates.

We demonstrate that long-short rate confusion is evident even among professional forecasters, who forecast similar shapes for the paths of short and long rates over the next four quarters. We also show that this confusion distorts the real behavior of borrowers and investors. Expectations of rising policy rates prompt households and firms to rush to lock in long-term debt before anticipated increases in long rates. The resulting increase in household and firm borrowing during monetary tightening cycles reduces the effectiveness of monetary policy and can help explain the forward guidance puzzle of why forward guidance has been less effective than predicted by macroeconomic models. Expectations of rising policy rates also prompt investors to be less willing to hold long-term bonds because they anticipate

future increases in long yields. The combined increase in supply and decrease in demand for long-term debt cause long rates to overreact to changes in policy rates, helping to explain the puzzle of excess movement and reversals in long rates.

Our focus on long-short rate confusion highlights a relatively under-explored behavioral mechanism that can drive large belief errors in financial and macroeconomic forecasts and affect real borrower and investor behavior. Whereas much of the existing behavioral finance literature has focused on mistaken beliefs about the persistence of shocks or over- and under-reaction to news, we explore a different mechanism in which people can have accurate forecasts of one variable (policy rates) that lead to incorrect forecasts of a related variable (long-term interest rates) due to a failure to fully understand or account for how information about future policy rates should be reflected in current long-term rates.

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Tables and Figures

Table 1 Summary statistics of main time-series and firm-level variables

This table presents summary statistics for key variables as detailed in Section 1. Panel A includes the number of observations (n), mean, standard deviations (sd), and key percentiles (p5, p25, median, p75, p95) for each variable. Panel B reports correlations between the main time-series variables. Interest rate and macroeconomic variables, along with their forecasts, are reported on a monthly basis in percentage points. Corporate variables are reported on a quarterly basis.

Panel A: Summary Statistics								
	n	mean	sd	p5	p25	median	p75	p95
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	465	0.04	0.30	-0.52	-0.06	0.03	0.20	0.52
$\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$	465	0.08	0.22	-0.31	-0.07	0.10	0.24	0.39
$\overline{HMR}_{t+1q} - HMR_t$	465	-0.08	0.46	-0.85	-0.34	-0.12	0.21	0.74
$\overline{HMR}_{t+1q} - \mathbb{E}_t(\overline{HMR}_{t+1q})$	465	-0.15	0.49	-0.89	-0.48	-0.21	0.12	0.73
$\mathbb{E}_t(\overline{y}_{t+1q}^{(10)}) - y_t^{(10)}$	417	-0.02	0.29	-0.51	-0.20	0.02	0.19	0.38
$\overline{y}_{t+1q}^{(10)} - y_t^{(10)}$	417	-0.03	0.45	-0.73	-0.34	-0.03	0.24	0.72
$\overline{y}_{t+1q}^{(10)} - \mathbb{E}_t(\overline{y}_{t+1q}^{(10)})$	417	-0.01	0.54	-0.82	-0.37	-0.07	0.35	0.95
Control Variables								
FFR_t	465	3.71	3.06	0.09	0.41	3.30	5.82	9.10
$y_t^{(5)} - FFR_t$	465	1.03	0.96	-0.63	0.34	1.03	1.72	2.59
π_t	465	2.68	1.35	0.48	1.74	2.64	3.53	4.95
Baa credit spread _t	465	1.89	0.57	1.20	1.48	1.81	2.19	2.73
Baa credit term spread _t	465	1.54	0.64	0.68	1.08	1.47	1.96	2.53
Other Long Rates								
$\overline{y}_{t+1q}^{(10)} - y_t^{(10)}$	417	-0.03	0.45	-0.73	-0.34	-0.03	0.24	0.72
$\overline{y}_{t+1q}^{(30)} - y_t^{(30)}$	384	-0.04	0.45	-0.75	-0.28	0.01	0.22	0.64
$\overline{Aaa}_{t+1q} - Aaa_t$	456	-0.14	0.46	-0.92	-0.41	-0.15	0.15	0.60
$\overline{Baa}_{t+1q} - Baa_t$	276	-0.19	0.54	-1.18	-0.45	-0.13	0.14	0.53
Firm-level Issuance								
$\mathbb{1}(\text{LT Issues}_{i,t} > 0)$	750,698	0.38	0.48	0	0	0.00	1.00	1.00
$\text{LT Issues}_{i,t}/\text{AT}_{i,t-1}$	746,807	0.03	0.08	0	0	0.00	0.01	0.17
$\text{LT Issues}_{i,t}/\text{Total Debt}_{i,t-1}$	588,700	0.16	0.53	0	0	0.00	0.07	0.84
$\text{LT Share}_{i,t}$	382,391	0.60	0.48	0	0	0.93	1.00	1.00
Aggregate-level Issuance								
Log LT Issues_t	155	12.91	1.42	10.75	11.85	13.13	13.96	14.88
$\text{LT Issues}_t/\text{AT}_{t-1}$	155	0.02	0.01	0.01	0.01	0.01	0.02	0.04
$\text{LT Issues}_t/\text{Total Debt}_{t-1}$	155	0.07	0.04	0.03	0.04	0.06	0.07	0.17
LT Share_t	155	0.64	0.13	0.46	0.57	0.64	0.73	0.83
Bond Mutual Fund Flows								
$\text{flow}_{i,t}$, Full sample	324,739	1.52	12.48	-7.17	-1.56	-0.16	1.63	13.37
$\text{flow}_{i,t}$, Retail funds	177,610	1.06	11.61	-7.09	-1.86	-0.40	1.30	11.96
$\text{flow}_{i,t}$, Institutional funds	147,129	2.08	13.43	-7.32	-1.17	0.05	2.04	15.08

Panel B: Correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$								
(2) $\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$	.40							
(3) $\overline{HMR}_{t+1q} - HMR_t$	-.10	.10						
(4) $\overline{HMR}_{t+1q} - \mathbb{E}_t(\overline{HMR}_{t+1q})$	-.27	-.35	.90					
(5) FFR_t	-.20	-.44	-.10	.10				
(6) $y_t^{(5)} - FFR_t$	.43	.10	-.14	-.17	-.20			
(7) π_t	-.14	-.25	-.10	.02	.58	-.12		
(8) Baa credit spread _t	-.18	-.14	-.05	.01	-.22	.04	-.34	
(9) Baa credit term spread _t	-.06	.06	.04	.01	-.50	.15	-.52	.88

Table 2 Overreaction in long rates to expected changes in short rates

This table presents OLS regressions of future long rate changes on the expected short rate changes. The dependent variables are the differences between the next quarter's daily average long rates and current long rates for 10-year and 30-year Treasury yields ($y^{(10)}$ and $y^{(30)}$), Aaa and Baa corporate bond yields (Aaa and Baa), and the 30-year home mortgage rate (HMR). The main independent variable is the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. The regressions include a full set of control variables, including the current Federal Funds Rate (FFR), the term spread ($y_t^{(10)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following [Newey and West \(1994\)](#) are reported in parentheses. The constant term is omitted for brevity. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\overline{y}_{t+1q}^{(10)} - y_t^{(10)}$	$\overline{y}_{t+1q}^{(30)} - y_t^{(30)}$	$\overline{Aaa}_{t+1q} - Aaa_t$	$\overline{Baa}_{t+1q} - Baa_t$	$\overline{HMR}_{t+1q} - HMR_t$
	(1)	(2)	(3)	(4)	(5)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	-0.25** (0.13)	-0.20* (0.11)	-0.22* (0.12)	-0.19 (0.13)	-0.22* (0.13)
FFR_t	0.01 (0.02)	0.01 (0.02)	0.02 (0.02)	0.11** (0.04)	-0.004 (0.02)
$y_t^{(10)} - FFR_t$	-0.04 (0.03)	-0.03 (0.03)	0.02 (0.04)	0.14*** (0.05)	-0.04 (0.03)
π_t	-0.05 (0.03)	-0.09** (0.04)	-0.07** (0.03)	0.01 (0.07)	-0.02 (0.03)
Baa credit spread _t	-0.20 (0.15)	0.004 (0.14)	-0.07 (0.15)	-0.06 (0.25)	-0.34** (0.14)
Baa credit term spread _t	0.25 (0.16)	0.10 (0.14)	0.02 (0.16)	-0.12 (0.28)	0.27* (0.16)
R^2	0.08	0.12	0.04	0.15	0.06
Observations	417	384	456	276	465

Table 3 Long-short rate confusion in consensus forecasts: Main specification

This table presents OLS regression coefficients from equations (3)-(5). In Panel A, the dependent variables are expected one-quarter changes in home mortgage rate ($\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$), the actual one-quarter changes in home mortgage rate ($\overline{HMR}_{t+1q} - HMR_t$), and the forecast error of the one-quarter-ahead home mortgage rate, respectively. In Panel B, the dependent variables are expected one-quarter changes in 10-year Treasury yield ($\mathbb{E}_t(\overline{y}^{(10)}_{t+1q}) - y^{(10)}_t$), the actual one-quarter changes in 10-year Treasury yield ($\overline{y}^{(10)}_{t+1q} - y^{(10)}_t$), and the forecast error of the one-quarter-ahead 10-year Treasury yield, respectively. The main independent variable is the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. The regressions include the following control variables: the current Federal Funds Rate (FFR_t), the term spread ($HMR_t - FFR_t$ or $y^{(10)}_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: Home mortgage rate									
	$\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$			$\overline{HMR}_{t+1q} - HMR_t$			$\overline{HMR}_{t+1q} - \mathbb{E}_t(\overline{HMR}_{t+1q})$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.29*** (0.05)	0.27*** (0.05)	0.24*** (0.05)	-0.15 (0.12)	-0.14 (0.12)	-0.19 (0.13)	-0.45*** (0.12)	-0.41*** (0.12)	-0.43*** (0.12)
FFR_t		-0.03*** (0.00)	-0.03*** (0.01)		-0.03* (0.02)	-0.01 (0.02)		0.00 (0.02)	0.02 (0.02)
$HMR_t - FFR_t$		-0.04*** (0.01)	-0.03*** (0.01)		-0.07** (0.03)	-0.07* (0.04)		-0.03 (0.04)	-0.03 (0.04)
π_t			0.00 (0.01)			-0.02 (0.03)			-0.02 (0.03)
Baa credit spread _t			-0.10 (0.06)			-0.32** (0.14)			-0.22* (0.13)
Baa credit term spread _t			0.05 (0.06)			0.28* (0.16)			0.23 (0.16)
Standard-Errors					NW				
R^2	0.164	0.338	0.354	0.010	0.052	0.079	0.074	0.081	0.096
Observations	465	465	465	465	465	465	465	465	465
Panel B: 10-Year Treasury yield									
	$\mathbb{E}_t(\overline{y}^{(10)}_{t+1q}) - y^{(10)}_t$			$\overline{y}^{(10)}_{t+1q} - y^{(10)}_t$			$\overline{y}^{(10)}_{t+1q} - \mathbb{E}_t(\overline{y}^{(10)}_{t+1q})$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.38*** (0.06)	0.46*** (0.05)	0.41*** (0.05)	-0.25** (0.12)	-0.26** (0.12)	-0.25** (0.13)	-0.63*** (0.13)	-0.71*** (0.13)	-0.66*** (0.14)
FFR_t		-0.04*** (0.01)	-0.05*** (0.01)		-0.02 (0.02)	0.01 (0.02)		0.02 (0.02)	0.06*** (0.02)
$y^{(10)}_t - FFR_t$		-0.14*** (0.01)	-0.14*** (0.01)		-0.04 (0.03)	-0.04 (0.03)		0.10*** (0.04)	0.10*** (0.04)
π_t			0.01 (0.01)			-0.05 (0.03)			-0.06 (0.04)
Baa credit spread _t			-0.06 (0.08)			-0.20 (0.15)			-0.13 (0.14)
Baa credit term spread _t			-0.02 (0.08)			0.25 (0.16)			0.28* (0.15)
Standard-Errors					NW				
R^2	0.146	0.463	0.494	0.027	0.042	0.080	0.116	0.165	0.217
Observations	417	417	417	417	417	417	417	417	417

Table 4 Benchmark of β_1 under Expectations Hypothesis

This table tests whether the relationship between expected changes in short and long rates can be rationalized by the Expectations Hypothesis. Panel A presents results from Equations (6) and (3). The dependent variable in Columns 1-3 is $1/n$ of the expected changes of the federal funds rate 10 years from now, $\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$, based on the consensus from the BCFF long range survey ($n = 40$). The dependent variable in Columns 4-6 is the 1-quarter-ahead forecasted change in the 10-year Treasury yield, $\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$, from BCFF consensus forecasts. Panel B compares how well two different measures of short-rate expectations explain forecasted changes in the long rate. The dependent variable in all regressions in Panel B is the expected change in the 10-year Treasury yield over the next quarter, $\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$. The independent variables include: the expected change in the federal funds rate 10 years from now, scaled by maturity, $\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$, which represents the prediction from the expectations hypothesis; and the expected change in the federal funds rate over the next quarter, $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$. All expectations are from BCFF consensus forecasts. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following [Newey and West \(1994\)](#) are reported in parentheses. The constant term is omitted for brevity. The sample period is semi-annual from 1997:06 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:						
	$\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$			$\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$		
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.00 (0.03)	-0.01 (0.01)	-0.01 (0.01)	0.61*** (0.15)	0.62*** (0.09)	0.61*** (0.09)
FFR_t		-0.01*** (0.00)	-0.01*** (0.00)		-0.08*** (0.02)	-0.10*** (0.03)
$HMR_t - FFR_t$		0.01*** (0.00)	0.01*** (0.00)		-0.17*** (0.02)	-0.16*** (0.03)
π_t			0.00 (0.00)			0.01 (0.03)
Baa credit spread _t			0.00 (0.01)			0.12 (0.17)
Baa credit term spread _t			-0.01 (0.01)			-0.21 (0.25)
R^2	0.000	0.949	0.951	0.166	0.426	0.466
Observations	50	50	50	50	50	50
Panel B:						
	$\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$					
$\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$	-0.37 (1.06)		-0.43 (1.07)			
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$		0.61*** (0.15)	0.61*** (0.15)			
R^2	0.003	0.166	0.170			
Observations	50	50	50			

Table 5 Long-short rate confusion in consensus forecasts: Across forecast horizons

This table presents the OLS regression coefficients of expected changes in the home mortgage rate on the expected changes in the federal funds rate across different forecast horizons. In Panels A and C, the dependent variables are expected changes in home mortgage rate between two future quarters $\mathbb{E}_t(\overline{HMR}_{t+nq}) - \mathbb{E}_t(\overline{HMR}_{t+(n-1)q})$. In Panel B, the dependent variable is the actual changes in home mortgage rate between two future quarters $\overline{HMR}_{t+nq} - \overline{HMR}_{t+(n-1)q}$. The main independent variables are the expected changes in the federal funds rate between the two future quarters ($\mathbb{E}_t(\overline{FFR}_{t+nq}) - \mathbb{E}_t(\overline{FFR}_{t+(n-1)q})$) based on the consensus forecasts. We consider forecast horizons n of 0, 1, 2, 3, 4 quarters, among which 0-quarter forecast is the nowcast. All panels include the following control variables: the current Federal Funds Rate (FFR_t), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following [Newey and West \(1994\)](#) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$n = 1$	$n = 2$	$n = 3$	$n = 4$
	(1)	(2)	(3)	(4)
Panel A:				
	$\mathbb{E}_t(\overline{HMR}_{t+nq}) - \mathbb{E}_t(\overline{HMR}_{t+(n-1)q})$			
$\mathbb{E}_t(\overline{FFR}_{t+nq}) - \mathbb{E}_t(\overline{FFR}_{t+(n-1)q})$	0.33*** (0.03)	0.36*** (0.04)	0.37*** (0.04)	0.35*** (0.03)
FFR_t	-0.02*** (0.00)	-0.02*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
$HMR_t - FFR_t$	-0.01* (0.00)	-0.01** (0.00)	-0.02*** (0.01)	-0.01* (0.00)
π_t	0.00 (0.00)	0.01 (0.00)	0.00 (0.00)	0.01* (0.00)
Baa credit spread _t	0.00 (0.03)	-0.01 (0.02)	0.00 (0.02)	0.00 (0.02)
Baa credit term spread _t	-0.02 (0.03)	0.03 (0.02)	0.02 (0.02)	0.02 (0.02)
R^2	0.589	0.587	0.658	0.723
Observations	465	465	465	465
Panel B:				
	$\overline{HMR}_{t+nq} - \overline{HMR}_{t+(n-1)q}$			
$\mathbb{E}_t(\overline{FFR}_{t+nq}) - \mathbb{E}_t(\overline{FFR}_{t+(n-1)q})$	-0.15 (0.13)	-0.21 (0.20)	-0.22 (0.24)	-0.31 (0.25)
FFR_t	-0.01 (0.02)	-0.04* (0.02)	-0.03 (0.02)	-0.04 (0.02)
$HMR_t - FFR_t$	-0.05* (0.03)	-0.04 (0.03)	-0.03 (0.04)	-0.02 (0.04)
π_t	-0.01 (0.03)	0.00 (0.04)	-0.01 (0.04)	0.01 (0.03)
Baa credit spread _t	-0.21* (0.12)	0.00 (0.11)	-0.02 (0.13)	-0.03 (0.12)
Baa credit term spread _t	0.18 (0.14)	-0.05 (0.12)	-0.02 (0.14)	0.04 (0.15)
R^2	0.058	0.070	0.060	0.060
Observations	465	465	462	459

	$n = 1$	$n = 2$	$n = 3$	$n = 4$
	(1)	(2)	(3)	(4)
Panel C:				
	$\mathbb{E}_t(\overline{HMR}_{t+nq}) - \mathbb{E}_t(\overline{HMR}_{t+(n-1)q})$			
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - \mathbb{E}_t(\overline{FFR}_{t+0q})$	0.32*** (0.05)	0.04 (0.03)	-0.06* (0.03)	-0.06*** (0.02)
$\mathbb{E}_t(\overline{FFR}_{t+2q}) - \mathbb{E}_t(\overline{FFR}_{t+1q})$	0.11 (0.08)	0.26*** (0.06)	0.05 (0.04)	0.00 (0.04)
$\mathbb{E}_t(\overline{FFR}_{t+3q}) - \mathbb{E}_t(\overline{FFR}_{t+2q})$	-0.09 (0.07)	0.08 (0.06)	0.26*** (0.06)	0.08* (0.04)
$\mathbb{E}_t(\overline{FFR}_{t+4q}) - \mathbb{E}_t(\overline{FFR}_{t+3q})$	0.13** (0.05)	0.08 (0.05)	0.13*** (0.05)	0.28*** (0.03)
FFR_t	-0.02*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01*** (0.00)
$HMR_t - FFR_t$	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.00)	-0.01 (0.00)
π_t	0.00 (0.00)	0.01 (0.00)	0.00 (0.00)	0.00 (0.00)
Baa credit spread _t	0.00 (0.03)	0.00 (0.02)	-0.01 (0.02)	0.00 (0.02)
Baa credit term spread _t	-0.02 (0.03)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
R^2	0.603	0.603	0.683	0.734
Observations	465	465	465	465

Table 6 Long-short rate confusion in consensus forecasts: Controlling for forecast revisions of the short rate and recent changes of the long rate

This table presents OLS regression coefficients from equations (3)-(5), controlling for forecast revision of the short rate and recent changes of the long rate. The dependent variables are expected one-quarter changes in home mortgage rate ($\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$), the actual one-quarter changes in home mortgage rate ($HMR_{t+1q} - HMR_t$), and the forecast error of the one-quarter-ahead home mortgage rate, respectively. The main independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. We control for the 3-month revision in the forecast of the federal funds rates ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - \mathbb{E}_{t-1}(\overline{FFR}_{t+1q})$) in Panel A, and the 3-month changes in the home mortgage rate ($HMR_t - HMR_{t-1q}$) in Panel B. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$			$\overline{HMR}_{t+1q} - HMR_t$			$\overline{HMR}_{t+1q} - \mathbb{E}_t(\overline{HMR}_{t+1q})$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Controlling for forecast revisions of the short rate									
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.24*** (0.05)		0.24*** (0.05)	-0.19 (0.13)		-0.31** (0.14)	-0.43*** (0.12)		-0.55*** (0.13)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - \mathbb{E}_{t-1}(\overline{FFR}_{t+1q})$		0.06* (0.03)	0.00 (0.03)		0.07 (0.06)	0.16** (0.07)		0.01 (0.07)	0.15** (0.07)
FFR_t	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.02 (0.02)	0.03 (0.02)	0.02 (0.02)
$HMR_t - FFR_t$	-0.03*** (0.01)	-0.02 (0.01)	-0.03*** (0.01)	-0.07* (0.04)	-0.08** (0.03)	-0.06* (0.03)	-0.03 (0.04)	-0.07* (0.04)	-0.02 (0.04)
π_t	0.00 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.02 (0.03)	-0.01 (0.03)	-0.02 (0.03)	-0.02 (0.03)	0.00 (0.03)	-0.02 (0.03)
Baa credit spread _t	-0.10 (0.06)	-0.12** (0.06)	-0.10 (0.06)	-0.32** (0.14)	-0.27* (0.14)	-0.30** (0.13)	-0.22* (0.13)	-0.15 (0.14)	-0.20* (0.12)
Baa credit term spread _t	0.05 (0.06)	0.05 (0.06)	0.05 (0.06)	0.28* (0.16)	0.29* (0.16)	0.29* (0.15)	0.23 (0.16)	0.23 (0.17)	0.23 (0.14)
R^2	0.354	0.284	0.354	0.079	0.073	0.100	0.096	0.041	0.114
Observations	465	465	465	465	465	465	465	465	465
Panel B: Controlling for recent changes in the long rate									
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.24*** (0.05)		0.32*** (0.05)	-0.19 (0.13)		-0.18 (0.13)	-0.43*** (0.12)		-0.50*** (0.12)
$HMR_t - HMR_{t-1q}$		-0.17*** (0.03)	-0.22*** (0.02)		-0.04 (0.06)	-0.01 (0.06)		0.13* (0.07)	0.20*** (0.07)
FFR_t	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.02 (0.02)	0.03 (0.02)	0.03 (0.02)
$HMR_t - FFR_t$	-0.03*** (0.01)	0.00 (0.01)	-0.02** (0.01)	-0.07* (0.04)	-0.08** (0.03)	-0.07* (0.04)	-0.03 (0.04)	-0.08* (0.04)	-0.04 (0.04)
π_t	0.00 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.02 (0.03)	-0.01 (0.03)	-0.02 (0.03)	-0.02 (0.03)	0.00 (0.03)	-0.02 (0.03)
Baa credit spread _t	-0.10 (0.06)	-0.13** (0.06)	-0.07 (0.06)	-0.32** (0.14)	-0.28* (0.15)	-0.32** (0.14)	-0.22* (0.13)	-0.15 (0.13)	-0.24** (0.12)
Baa credit term spread _t	0.05 (0.06)	0.00 (0.06)	-0.01 (0.06)	0.28* (0.16)	0.27 (0.17)	0.28* (0.17)	0.23 (0.16)	0.27* (0.16)	0.29* (0.15)
R^2	0.354	0.370	0.516	0.079	0.069	0.079	0.096	0.052	0.123
Observations	465	466	465	465	466	465	465	466	465

Table 7 Long-short rate confusion in household beliefs: Baseline results

This table presents OLS regression of expected long rate changes on the expected short rate changes in household beliefs. The dependent variable is an indicator variable that equals one if the household expects an increase in mortgage rates over the next year ($\mathbb{1}(\text{Consumer Expected Change in Mortgage Rate} > 0)$), based on Fannie Mae National Housing Survey data. The main independent variable is an indicator variable that equals one if the professional economists expect an increase in the federal funds rate over the next year ($\mathbb{1}(\text{Analyst Expected Change in FF Rate} > 0)$), based on BCFF consensus forecasts. Control variables include the current Federal Funds Rate (FFR) and the current home mortgage rate (HMR). The constant term is omitted for brevity. The sample period is from 2010:01 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_{it}^{HH}(HMR_{t+12m}) - HMR_t > 0$	
	(1)	(2)
$\mathbb{E}_t(FFR_{t+12m}) - FFR_t > 0$	0.162*** (0.0104)	0.194*** (0.0207)
FFR_t		0.0718*** (0.0113)
$HMR_t - FFR_t$		0.0530*** (0.0139)
π_t		0.000215 (0.00719)
Baa credit spread _t		-0.121** (0.0577)
Baa credit term spread _t		0.0161 (0.0708)
R^2	0.007	0.021
Observations	119,278	119,278

Table 8 Corporate long-term issuance: Firm and aggregate-level evidence

This table presents OLS regression of firms' long-term debt issuance on the expected short rate changes. Panel A reports evidence using quarterly firm-level Compustat data. The dependent variables include an indicator variable that equals one if a firm issues a long-term debt in the subsequent quarter ($\mathbb{1}(\text{LT Issues}_{i,t+1} > 0)$), long-term debt issue in the subsequent quarter normalized by total assets in the current quarter ($\frac{\text{LT Issues}_{i,t+1}}{\text{AT}_{i,t}}$), long-term debt issue in the subsequent quarter normalized by total debt in the current quarter ($\frac{\text{LT Issues}_{i,t+1}}{\text{Total Debt}_{i,t}}$), and long-term share of total new debt issues in the subsequent quarter ($\text{LT Share}_{i,t+1}$), respectively. Panel B aggregates the firm-level measures to the economy level. The dependent variables are the logarithm of the total long-term debt issues ($\log(\text{LT Issues}_{t+1})$) in the subsequent quarter, total long-term debt issue in the subsequent quarter normalized by total assets in the current quarter ($\frac{\text{LT Issues}_{t+1}}{\text{AT}_t}$), total long-term debt issue in the subsequent quarter normalized by total debt in the current quarter ($\frac{\text{LT Issues}_{t+1}}{\text{Total Debt}_t}$), and long term share of total new debt issues in the subsequent quarter (LT Share_{t+1}). The main independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$), based on the consensus forecast. Control variables include the current Federal Funds Rate (FFR), the term spread ($y_t^{(5)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Standard errors are double clustered by firm and year-quarter in Panel A and are Newey-West standard errors with the automatic bandwidth selection in Panel B. Firm fixed effects are included in all regressions in Panel A. The sample period is from 1983:Q2 to 2021:Q4. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: Firm-level long-term debt issuance				
	$\mathbb{1}(\text{LT Issues}_{i,t+1} > 0)$	$\frac{\text{LT Issues}_{i,t+1}}{\text{AT}_{i,t}}$	$\frac{\text{LT issues}_{t+1}}{\text{Total debt}_t}$	$\text{LT Share}_{i,t+1}$
	(1)	(2)	(3)	(4)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.0348*** (0.0096)	0.0049*** (0.0009)	0.0315*** (0.0068)	0.0494*** (0.0120)
FFR_t	0.0040*** (0.0013)	-0.0005*** (0.0002)	-0.0013 (0.0013)	-0.0123*** (0.0020)
$y_t^{(5)} - FFR_t$	-0.0122*** (0.0024)	-0.0027*** (0.0003)	-0.0086*** (0.0023)	-0.0264*** (0.0033)
π_t	-0.0061*** (0.0019)	-0.0013*** (0.0003)	-0.0058** (0.0022)	-0.0026 (0.0022)
Baa credit spread _t	0.0102 (0.0090)	-0.0027*** (0.0008)	-0.0083 (0.0076)	-0.0098 (0.0096)
Baa credit term spread _t	-0.0152* (0.0089)	-0.0017* (0.0009)	-0.0160* (0.0084)	0.0076 (0.0110)
R^2	0.359	0.221	0.153	0.483
Observations	750,698	746,807	588,700	382,391
Firm FE	✓	✓	✓	✓

Panel B: Aggregate long-term debt issuance

	Log(LT Issues) _{t+1}	$\frac{\text{LT Issues}_{t+1}}{\text{AT}_t}$	$\frac{\text{LT Issues}_{t+1}}{\text{Total Debt}_t}$	LT Share _{t+1}
	(1)	(2)	(3)	(4)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	1.1027*** (0.2271)	0.0075*** (0.0026)	0.0332*** (0.0125)	0.1012*** (0.0338)
FFR_t	-0.4202*** (0.0451)	-0.0011*** (0.0002)	-0.0055*** (0.0011)	-0.0273*** (0.0077)
$y_t^{(5)} - FFR_t$	-0.6547*** (0.0801)	-0.0037*** (0.0011)	-0.0166*** (0.0052)	-0.0482*** (0.0119)
π_t	0.0361 (0.0446)	-0.0002 (0.0006)	0.0000 (0.0023)	-0.0102 (0.0083)
Baa credit spread _t	-0.0753 (0.2902)	-0.0024 (0.0027)	-0.0162 (0.0118)	0.0304 (0.0615)
Baa credit term spread _t	-0.2569 (0.3412)	-0.0006 (0.0028)	0.0062 (0.0127)	-0.0501 (0.0642)
R^2	0.821	0.306	0.359	0.486
Observations	155	155	155	155
Dep. Var. Mean	12.91	0.02	0.07	0.64

Table 9 Aggregate mortgage issuance: Home purchase loans

This table presents OLS regression of aggregate home purchase mortgage loan origination on the expected short rate changes, using the quarterly FHFA NMDB Aggregate Statistics. The dependent variable is the logarithm of the total dollar volume of new mortgages originated in the subsequent quarter (Log Total Loan_{t+1}). The main independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$), based on the consensus forecast. We include an interaction term between the expected changes in the federal funds rate and a binary indicator for jumbo mortgages, which represent larger loans typically exceeding \$750K. Control variables include the current Federal Funds Rate (FFR_t), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Standard errors are clustered by loan type, which includes conventional and jumbo loans. The constant term is omitted for brevity. The sample period is from 1983:Q2 to 2021:Q4. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	Log Total Loan _{t+1}	
	(1)	(2)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.4228** (0.0193)	0.8025 (0.1775)
Jumbo	-1.4207*** (0.0000)	-1.4207*** (0.0000)
FFR_t	-0.0337 (0.0222)	-0.0016 (0.0415)
$HMR_t - FFR_t$	-0.2149* (0.0254)	-0.1848* (0.0153)
$[\mathbb{E}_t(\overline{FFR}_{t+1}) - FFR_t] \times \text{Jumbo}$	0.3941*** (0.0000)	0.3941*** (0.0000)
π_t		0.0552** (0.0019)
Baa credit spread _t		-0.9530 (0.3808)
Baa credit term spread _t		0.6925 (0.2875)
R^2	0.690	0.786
Observations	192	192

Table 10 Long-term bond mutual fund flows

This table presents OLS regression of long-term bond mutual fund flows on the expected short rate changes, using the monthly data from the CRSP Mutual Fund Database. The dependent variables are share-class level mutual fund flows in the subsequent month, scaled by the lagged total net asset of the fund ($flow_{i,t+1}$). The main independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$), based on the consensus forecast. We define long-term bond funds as those with a Lipper objective code in the following categories: IUG, GUS, GUT, A, BBB, and IID. Control variables include the current Federal Funds Rate (FFR), the term spread ($y_t^{(5)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. We additionally control for lagged fund returns, fund flows, stock market excess returns (from Fama-French) and the 10-Year Treasury returns (from CRSP US Treasury Database Fixed Term Indexes) in the past three months. Standard errors are clustered by fund and date. Mutual fund (share class) fixed effects are included in all columns. The constant term is omitted for brevity. The sample period is from 1997:01 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

Share class	$flow_{i,t+1m}$					
	Full sample		Institutional		Retail	
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	-1.6022*** (0.4221)	-1.8958*** (0.4217)	-1.9787*** (0.3364)	-1.9550*** (0.3419)	-1.1587* (0.6282)	-1.6428*** (0.6039)
FFR_t	0.6649*** (0.0609)	0.7151*** (0.0636)	0.6220*** (0.0662)	0.6848*** (0.0689)	0.6719*** (0.0841)	0.7083*** (0.0846)
$y_t^{(5)} - FFR_t$	0.9932*** (0.0976)	1.0885*** (0.0971)	1.1306*** (0.1031)	1.2406*** (0.1036)	0.9165*** (0.1326)	0.9903*** (0.1301)
π_t	0.0488 (0.0624)	-0.0105 (0.0654)	-0.0261 (0.0611)	-0.0282 (0.0631)	0.1155 (0.0815)	0.0074 (0.0858)
Baa credit spread _t	0.9942** (0.3978)	0.4689 (0.4411)	0.7290** (0.3325)	0.5893 (0.3652)	1.2769** (0.5408)	0.5588 (0.5720)
Baa credit term spread _t	-0.2860 (0.4719)	0.0410 (0.4764)	-0.3943 (0.3589)	-0.2770 (0.3753)	-0.3430 (0.6466)	0.0429 (0.6225)
Fund return _{i,t-1m}	20.6435*** (5.5747)	16.4313*** (6.1148)	12.5256** (5.1867)	8.4947* (4.7145)	33.0838*** (6.1324)	30.6836*** (7.1298)
Fund return _{i,t-2m}	13.0410*** (3.9031)	6.3276* (3.3480)	8.2588** (3.5655)	3.3579 (2.7111)	19.4536*** (5.7508)	9.9078 (6.2253)
Fund return _{i,t-3m}	12.9504*** (4.1687)	7.8536** (3.6673)	8.5155** (3.8671)	6.0622* (3.5344)	19.5594*** (5.6957)	10.2529* (5.6248)
$flow_{i,t-1m}$	0.0956*** (0.0078)	0.0945*** (0.0078)	0.0976*** (0.0082)	0.0972*** (0.0082)	0.0888*** (0.0128)	0.0857*** (0.0127)
$flow_{i,t-2m}$	0.0796*** (0.0055)	0.0792*** (0.0055)	0.0624*** (0.0061)	0.0621*** (0.0061)	0.0960*** (0.0089)	0.0955*** (0.0088)
$flow_{i,t-3m}$	0.0669*** (0.0050)	0.0669*** (0.0050)	0.0497*** (0.0057)	0.0496*** (0.0057)	0.0841*** (0.0080)	0.0849*** (0.0079)
r_{t-1m}^{Stock}		-0.0489** (0.0201)		0.0086 (0.0170)		-0.0979*** (0.0261)
r_{t-2m}^{Stock}		-0.0053 (0.0159)		0.0244 (0.0166)		-0.0267 (0.0203)
r_{t-3m}^{Stock}		0.0063 (0.0180)		0.0119 (0.0166)		0.0080 (0.0228)
r_{t-1m}^{Treas}		0.0862** (0.0424)		0.0920** (0.0433)		0.0545 (0.0452)
r_{t-2m}^{Treas}		0.1206*** (0.0330)		0.1056*** (0.0359)		0.1330*** (0.0421)
r_{t-3m}^{Treas}		0.0927*** (0.0350)		0.0739** (0.0363)		0.1119** (0.0438)
R^2	0.087	0.088	0.070	0.070	0.108	0.110
Observations	315,760	315,760	142,684	142,684	173,076	173,076
Fund FE	✓	✓	✓	✓	✓	✓

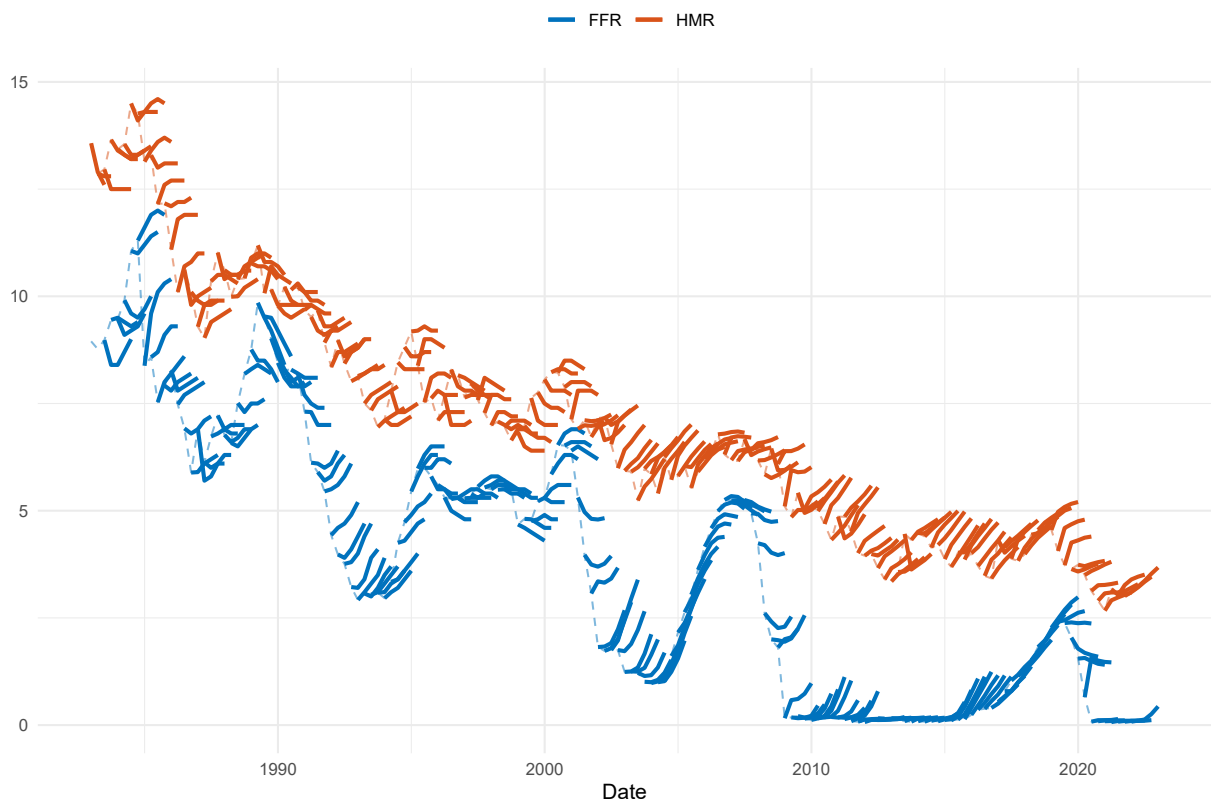
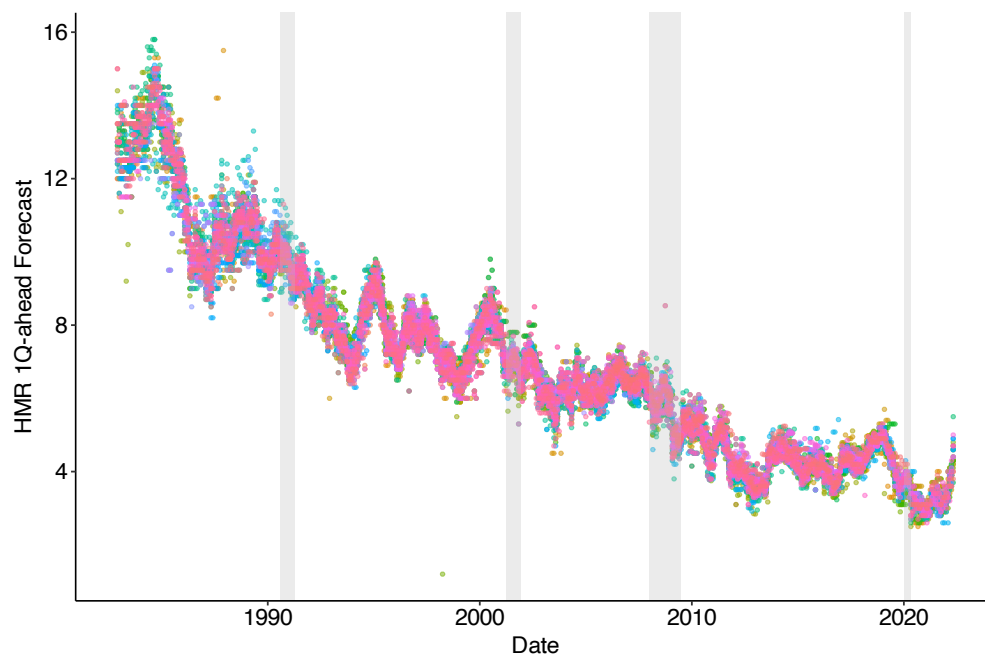


Figure 2 Term structure of FFR and HMR expectations across forecast horizons

The dotted red and blue lines show the realized paths of the home mortgage rate and federal funds rate over time, respectively. The solid-colored “hairlines” leading away from the dotted lines represent the consensus forecast by professional forecasters in the Blue Chip Financial Forecasts (BCFF) of the home mortgage rate and federal funds rate over the next four quarters.



A. FFR Forecasts



B. HMR Forecasts

Figure 3 Economist-level forecasts of 1-quarter-ahead FFR and HMR

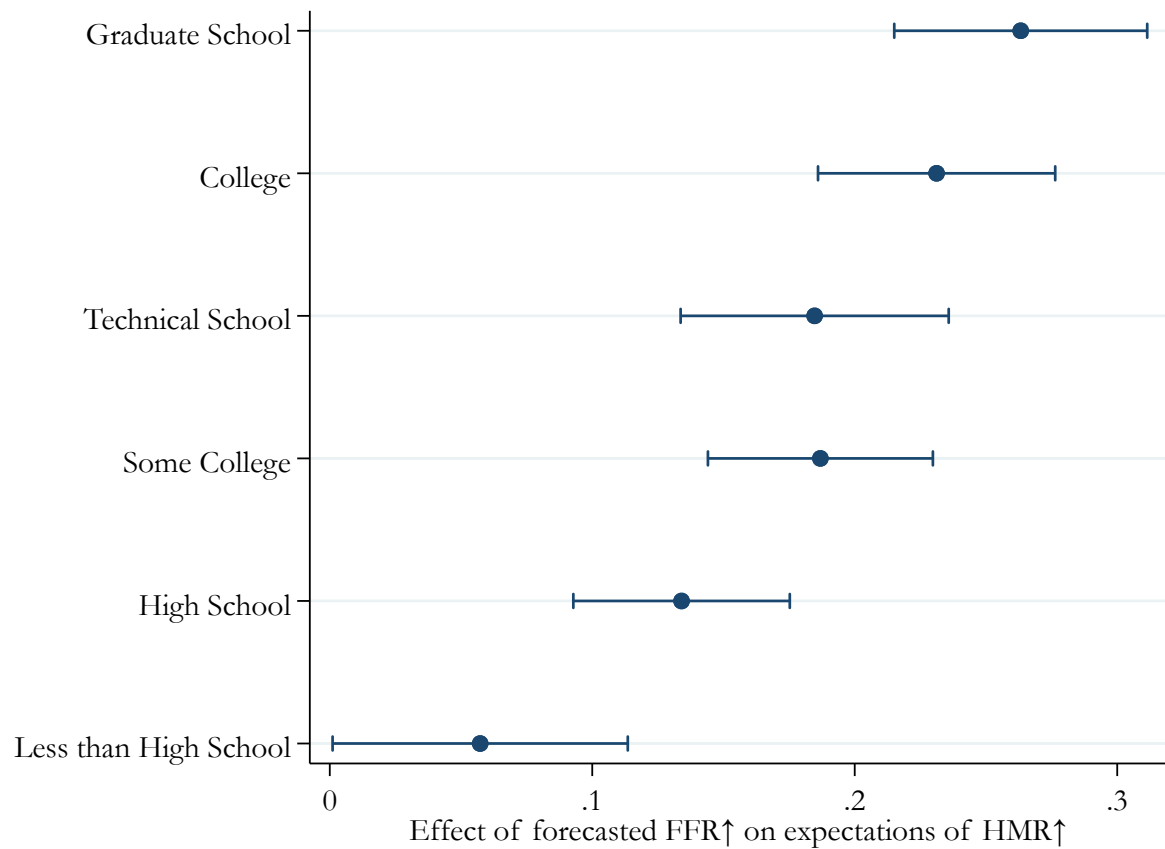


Figure 4 Long-short interest rate confusion in household beliefs: Heterogeneity by education

In this figure, we re-estimate Table 7 (column 2) interacting our main independent variable of interest with a series of education level indicator variables. The marginal effects for each education level are displayed (i.e., the sum of the main effect and interaction).

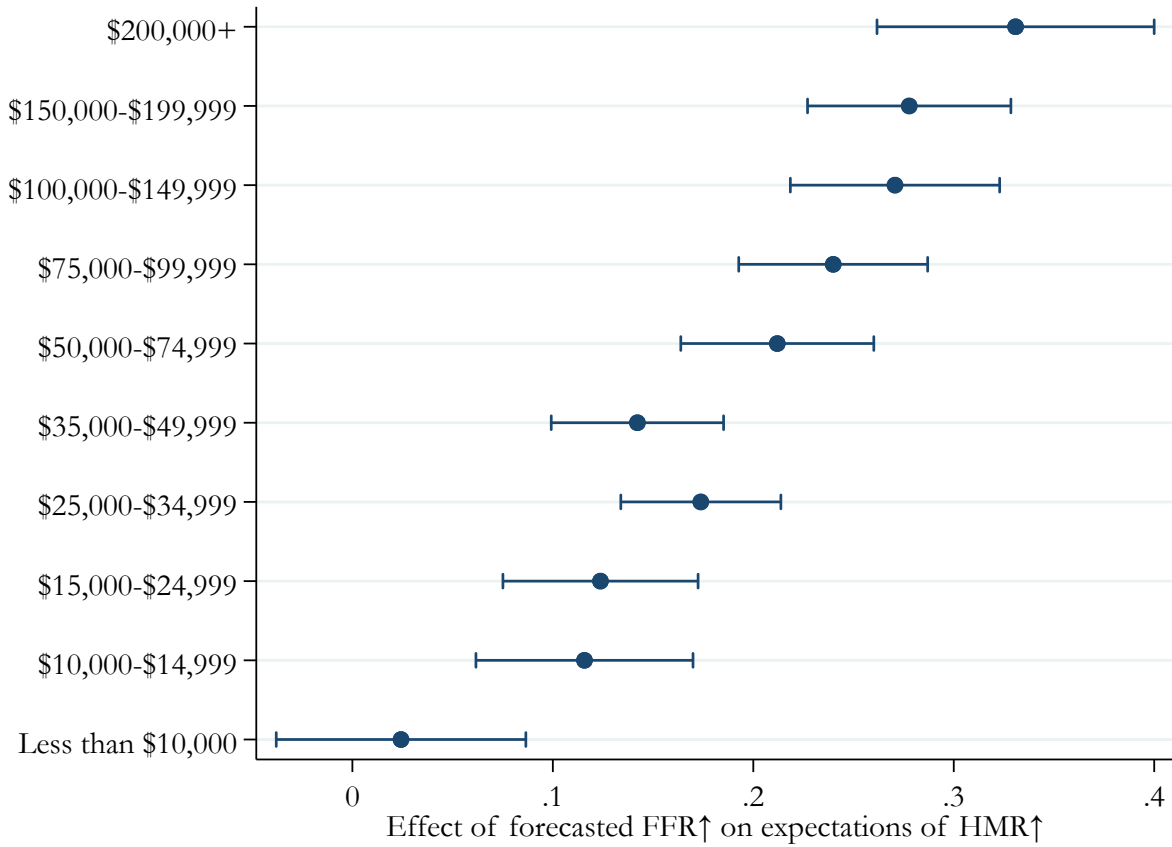


Figure 5 Long-short interest rate confusion in household beliefs: Heterogeneity by income

In this figure, we re-estimate Table 7 (column 2) interacting our main independent variable of interest with a series of income level indicator variables. The marginal effects for each education level are displayed (i.e., the sum of the main effect and interaction).

Online Appendix for

Long-Short Interest Rate Confusion

A Details on Term Structure Model Calibration

While one-factor term structure models, such as those of [Vasicek \(1977\)](#) and [Cox, Ingersoll, and Ross \(1985\)](#), are foundational, they are often too simplistic to capture the empirical dynamics of the term structure. We therefore turn to a multi-factor dynamic term structure model (DTSM). Specifically, we use the canonical Gaussian DTSM of [Joslin, Singleton, and Zhu \(2011, JSZ\)](#), where the term structure is driven by three pricing factors that are observable portfolios of yields (i.e., the factors are spanned by yields).

We opt for the JSZ model due to its parsimony and its canonical representation of the yield curve through factors that closely resemble the level, slope, and curvature identified by [Litterman and Scheinkman \(1991\)](#). While more complex models incorporating features such as unspanned factors ([Duffee, 2011](#); [Joslin, Priebsch, and Singleton, 2014](#)), monetary policy rules ([Ang, Boivin, and Dong, 2011](#)), or learning from disagreement ([Giacoletti, Laursen, and Singleton, 2021](#)) may offer better empirical performance, the JSZ model provides a standard and tractable benchmark for our analysis.

In JSZ, the pricing factors (state vector) X_t are governed by the following equations:

$$\Delta X_t = K_{0X}^{\mathbb{Q}} + K_{1X}^{\mathbb{Q}} X_{t-1} + \Sigma_x \varepsilon_t^{\mathbb{Q}} \quad (10)$$

$$\Delta X_t = K_{0X}^{\mathbb{P}} + K_{1X}^{\mathbb{P}} X_{t-1} + \Sigma_x \varepsilon_t^{\mathbb{P}} \quad (11)$$

$$r_t = \iota \cdot X_t, \quad (12)$$

where $\mathbb{Q}$ and $\mathbb{P}$ denote the risk-neutral and physical measures, respectively; r_t is a one-period interest rate; ι is a vector of ones; Σ_x is lower triangular with positive diagonal; $K_{1X}^{\mathbb{Q}}$ is in ordered real Jordan form, $K_{0X,1}^{\mathbb{Q}} = k_{\infty}^{\mathbb{Q}}$ and $K_{0X,i}^{\mathbb{Q}} = 0$ for $i > 1$, and $\varepsilon_t^{\mathbb{Q}}, \varepsilon_t^{\mathbb{P}} \sim N(0, I_n)$.

Specifically, we use the “RY” version of the JSZ model, which assumes three yields (6-month, 2-year, and 10-year) are observed without measurement errors. The model-implied yield for maturity τ is given by

$$y_t^{(\tau)} = -\frac{A(\tau)}{\tau} - \frac{B(\tau)}{\tau} \cdot X_t, \quad (13)$$

where $A(\tau)$ and $B(\tau)$ are solutions to the following first-order difference equations:

$$A(\tau+1) - A(\tau) = K_{0X}^{\mathbb{Q}\top} B(\tau) + \frac{1}{2} B(\tau)^{\top} H_0 B(\tau), \quad A(0) = 0, \quad (14)$$

$$B(\tau+1) - B(\tau) = K_{1X}^{\mathbb{Q}\top} B(\tau) - \rho_1, \quad B(0) = 0. \quad (15)$$

We apply the JSZ model using the parameters estimated by [Joslin, Singleton, and Zhu \(2011\)](#). Though their original estimation was based on monthly yields from 1990 to 2007, we use their parameters and apply the model to our extended sample period from 1988 to

2021.¹⁰ Specifically, the parameter values for dynamics under the risk-neutral ($\mathbb{Q}$) measure are:

$$\begin{aligned}\lambda_1^{\mathbb{Q}} &= -0.00196 \\ \lambda_2^{\mathbb{Q}} &= -0.0404 \\ \lambda_3^{\mathbb{Q}}/\text{im}(\lambda_2^{\mathbb{Q}}) &= -0.0897 \\ r_{\infty}^{\mathbb{Q}} &= 9.37,\end{aligned}$$

and the following parameter values for dynamics under the physical ($\mathbb{P}$) measure:

$$K_{1X}^{\mathbb{P}} = \begin{pmatrix} -0.25 & 0.11 & 5.5 \\ 0.037 & -0.31 & 4.1 \\ -0.03 & -0.034 & -1.8 \end{pmatrix} \quad (16)$$

$$\theta_1^{\mathbb{P}} = -0.11 \quad (17)$$

$$\theta_2^{\mathbb{P}} = 0.026 \quad (18)$$

$$\theta_3^{\mathbb{P}} = -0.0061. \quad (19)$$

Using the full-sample parameter values, this calibrated model allows us to generate model-implied expected interest rates for various future horizons (in months) at each point in time. To establish a model-generated benchmark for our main empirical analysis, we generate a time series of 1-quarter-ahead forecasts of 10-year Treasury yields, adhering to the precise timing convention of the Blue Chip forecasts. We denote these model-generated expectations as $\mathbb{E}_t^{JSZ}(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$.

¹⁰See [Joslin, Singleton, and Zhu \(2011\)](#) and the associated MATLAB code for details on parameter values and the calibration procedure.

B Additional Tables and Figures

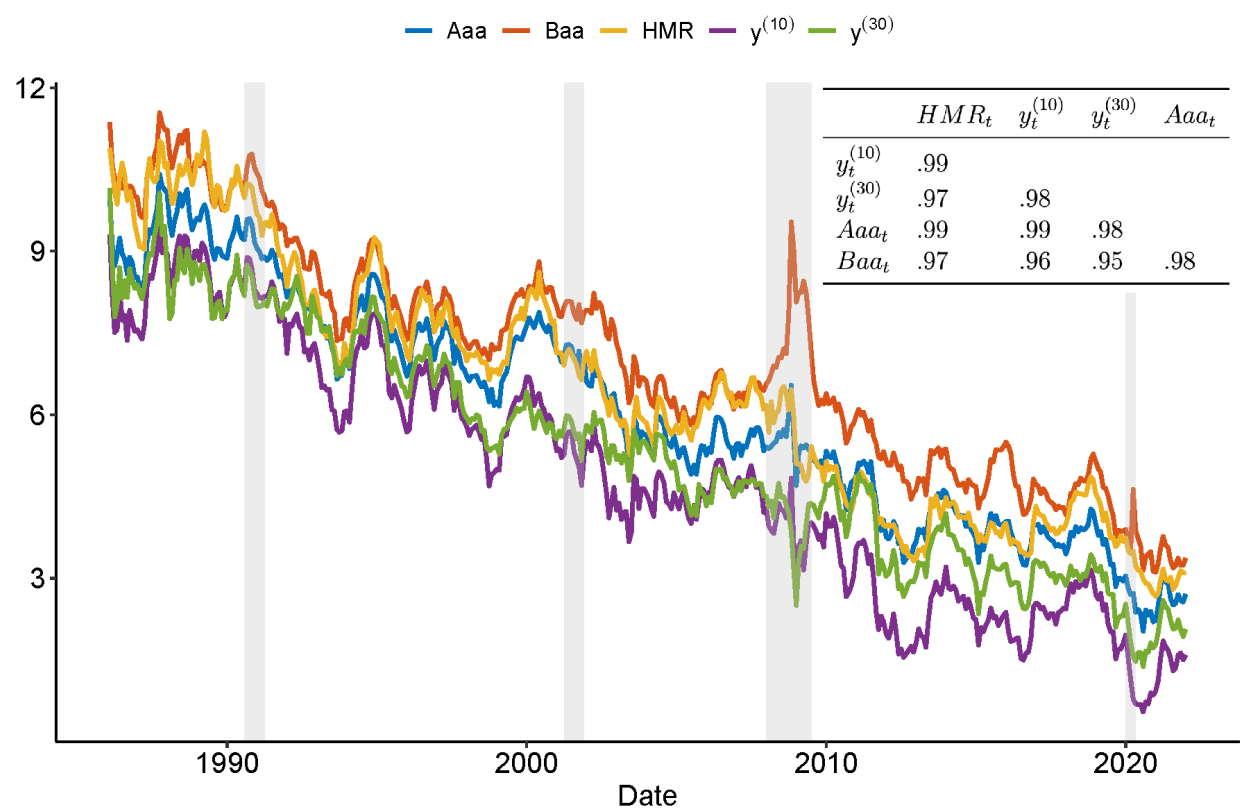


Figure A.1 Various realized long rates

/* Q20b */ During the next 12 months, do you think home mortgage interest rates will go up, go down, or stay the same as where they are now?

- 1) Rates will go up
- 2) Rates will go down
- 3) Rates will remain about the same
- 4) Don't know **VOL**

Figure A.2 An example question from Fannie Mae National Housing Survey Questionnaire, Q1 2019

Table A.1 Blue Chip Financial Forecasts participants, grouped by institution types

Firms' commonly used names are reported, which may slightly differ from their legal names. We manually check the name changes of the forecasters—due to mergers and acquisitions or other reasons—using the information provided by the Federal Financial Institutions Examinations Council (FFIEC) and concatenate the observations that belong to the same entity. Only participants with more than 60 months of observations are reported. For institutions with multiple classifications, we report its primary type.

	Count	Institution Names
Asset Manager	13	ASB Capital Management, Sanford C. Bernstein, J.W. Coons, ING Aeltus, JPMorgan Chase Wealth Management, Loomis Sayles, Mesirow, Northern Trust, RidgeWorth, Stone Harbor, US Trust Company, Wayne Hummer, Wells Capital
Bank	26	Banc One Corp, Bankers Trust, First National Bank of Chicago/Bank One (Chicago), Barnett Banks, Bank of America, Comerica Bank, CoreStates Financial, First Fidelity Bancorp, First Interstate Bank, Fleet Financial Group, Huntington National Bank, JPMorgan, LaSalle National Bank, MUFG Bank, National City Bank of Cleveland, PNC Financial Corp, Bank of Nova Scotia, SunTrust, Tokai Bank, Valley National Bank, Wachovia, Wells Fargo
Broker/Dealer	15	Amherst Pierpont, Barclays, Bear Stearns, BMO, Chicago Capital, Daiwa, Deutsche Bank, Goldman Sachs, Lanston, Merrill Lynch, Nomura Securities, Prudential Securities, RBS, Societe Generale, UBS
Mortgage	2	Fannie Mae, Mortgage Bankers Association
Insurance	5	Kemper, Metropolitan Insurance Companies, New York Life, Prudential Insurance, Swiss Re
Rating	2	Moody's, Standard & Poor's
Research	21	Action Economics, Investor's Briefing, Chmura Economics & Analytics, ClearView, Cycldata, DePrince & Associates, Economist Intelligence Unit, Genetski & Associates, GLC Financial Economics, Independent Econ Advisory, Kellner Economic Advisers, MacroFin Analytics, MMS International, Moody's Economy.com, Naroff Economic Advisors, Oxford Economics, Maria Fiorini Ramirez, RDQ Economics, Technical Data, Thredgold Economic, Woodworth Holdings
Others	3	National Association of Realtors, US Chamber of Commerce, Georgia State University

Table A.2 Long-short rate confusion in consensus forecasts: Asymmetry in FFR forecasts

This table presents OLS regression coefficients from equations (3)-(5). The dependent variables are expected one-quarter changes in home mortgage rate ($\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$), the actual one-quarter changes in home mortgage rate ($\overline{HMR}_{t+1q} - HMR_t$), and the forecast error of the one-quarter-ahead home mortgage rate, respectively. The independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast, interacted with whether the expected change is positive or negative. The regressions include the following control variables: the current Federal Funds Rate (FFR_t), the term spread ($y_t^{(10)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$			$\overline{HMR}_{t+1q} - HMR_t$			$HMR_{t+1} - \mathbb{E}_t(\overline{HMR}_{t+1q})$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t \times \mathbb{1}_{\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t \geq 0}$	0.22** (0.10)	0.28*** (0.08)	0.26*** (0.07)	-0.10 (0.22)	-0.04 (0.21)	-0.05 (0.20)	-0.31 (0.20)	-0.32 (0.20)	-0.31 (0.20)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t \times \mathbb{1}_{\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t < 0}$	0.37*** (0.08)	0.25*** (0.08)	0.22** (0.09)	-0.21 (0.18)	-0.26 (0.19)	-0.34* (0.20)	-0.58*** (0.16)	-0.51*** (0.17)	-0.55*** (0.18)
FFR_t		-0.03*** (0.00)	-0.03*** (0.01)		-0.03* (0.02)	-0.01 (0.02)		0.00 (0.02)	0.02 (0.02)
$HMR_t - FFR_t$		-0.04*** (0.01)	-0.03*** (0.01)		-0.07** (0.03)	-0.07* (0.03)		-0.03 (0.04)	-0.03 (0.04)
π_t			0.00 (0.01)			-0.02 (0.03)			-0.02 (0.03)
Baa credit spread _t			-0.10 (0.06)			-0.33** (0.14)			-0.23* (0.13)
Baa credit term spread _t			0.05 (0.06)			0.29* (0.16)			0.23 (0.16)
R^2	0.169	0.338	0.354	0.011	0.054	0.083	0.077	0.082	0.098
Observations	465	465	465	465	465	465	465	465	465

Table A.3 Accuracy of consensus versus “no change” forecasts of long rates

This table compares the root mean-squared errors (RMSE) of the consensus forecasts and the “no change” forecasts of the main long rates. The “no change” forecasts are the current realized rates. Panels A and B use 1 and 4-quarter ahead forecasts, respectively. Last rows in each panel report the [Diebold and Mariano \(1995\)](#) statistics and the corresponding one-sided p-values for testing the null hypothesis of equal forecast accuracy against the alternative that “no change” forecasts are more accurate.

	<i>HMR</i>	$y^{(10)}$	$y^{(30)}$	<i>Aaa</i>	<i>Baa</i>
Panel A: $h = 1q$					
Consensus forecast	0.51	0.54	0.55	0.49	0.54
“No change” forecast	0.47	0.45	0.45	0.41	0.42
DM statistic	-2.69	-3.84	-2.71	-3.94	-4.35
<i>p</i> -value	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)
Panel B: $h = 4q$					
Consensus forecast	1.05	0.96	0.91	1.02	1.00
“No change” forecast	0.91	0.84	0.71	0.83	0.78
DM statistic	-2.49	-2.04	-2.24	-3.76	-2.30
<i>p</i> -value	(0.01)	(0.04)	(0.03)	(0.00)	(0.02)
Panel C: $h = 1q$, adjusted for bias in the mean of consensus forecasts					
Consensus forecast	0.51	0.54	0.55	0.49	0.54
“No change” forecast	0.46	0.45	0.45	0.41	0.42
DM statistic	-2.77	-3.96	-2.89	-3.77	-4.12
<i>p</i> -value	0.01	0.00	0.00	0.00	0.00
Panel D: $h = 4q$, adjusted for bias in the mean of consensus forecasts					
Consensus forecast	1.05	0.96	0.91	1.02	1.00
“No change” forecast	0.87	0.83	0.69	0.79	0.75
DM statistic	-2.31	-1.69	-2.07	-3.13	-2.21
<i>p</i> -value	0.02	0.09	0.04	0.00	0.03

Table A.4 Long-short rate confusion in economist-level forecasts

This table presents OLS regression coefficients from equations (3)-(5), using economist-level forecasts. The dependent variables are expected one-quarter changes in the home mortgage rate based on economist j 's forecast, $\mathbb{E}_t^j(\overline{HMR}_{t+1q}) - HMR_t$; the actual one-quarter changes in home mortgage rate $\overline{HMR}_{t+1q} - HMR_t$, and economist j 's forecast error of the one-quarter-ahead home mortgage rate, $\overline{HMR}_{t+1q} - \mathbb{E}_t^j(\overline{HMR}_{t+1q})$, respectively. The main independent variable is the expected changes in the federal funds rate ($\mathbb{E}_t^j(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Driscoll-Kraay standard errors with optimal lag lengths are reported in parentheses. All regressions include economist fixed effects. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_t^j(\overline{HMR}_{t+1q}) - HMR_t$			$\overline{HMR}_{t+1q} - HMR_t$			$\overline{HMR}_{t+1q} - \mathbb{E}_t^j(\overline{HMR}_{t+1q})$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathbb{E}_t^j(\overline{FFR}_{t+1q}) - FFR_t$	0.40*** (0.03)	0.41*** (0.03)	0.40*** (0.03)	-0.06 (0.06)	-0.04 (0.06)	-0.07 (0.06)	-0.48*** (0.07)	-0.46*** (0.06)	-0.47*** (0.06)
FFR_t		-0.04*** (0.01)	-0.04*** (0.01)		-0.07*** (0.01)	-0.05*** (0.02)		-0.03* (0.02)	-0.01 (0.02)
$HMR_t - FFR_t$		-0.06*** (0.01)	-0.06*** (0.01)		-0.13*** (0.03)	-0.12*** (0.03)		-0.07** (0.03)	-0.07* (0.04)
π_t			0.00 (0.01)			-0.02 (0.03)			-0.03 (0.03)
Baa credit spread _t			-0.11** (0.05)			-0.27** (0.13)			-0.15 (0.12)
Baa credit term spread _t			0.08 (0.05)			0.23* (0.14)			0.15 (0.14)
Standard-Errors	Driscoll-Kraay								
R^2	0.320	0.346	0.351	0.029	0.099	0.119	0.180	0.190	0.196
Observations	23,768	23,768	23,768	26,434	26,434	26,434	23,768	23,768	23,768
Economist FE	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table A.5 Long-short rate confusion in economist-level forecasts, by economist groups

This table presents OLS regression coefficients from equations (3)-(5), using economist-level forecasts and separately for different groups of forecasters. The dependent variables are expected one-quarter changes in home mortgage rate, $\mathbb{E}_t^j(\overline{HMR}_{t+1q}) - HMR_t$ (columns 1, 4 and 7); the actual one-quarter changes in home mortgage rate $\overline{HMR}_{t+1q} - HMR_t$ (columns 2, 5, and 8), and the forecast error of the one-quarter-ahead home mortgage rate, $\overline{HMR}_{t+1q} - \mathbb{E}_t^j(\overline{HMR}_{t+1q})$ (columns 3, 6, and 9), respectively. The main independent variable is the expected changes in the federal funds rate ($\mathbb{E}_t^j(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Economists are grouped by their employer types: asset managers, banks, insurance companies, mortgage-related firms, independent research firms, and others. Driscoll-Kraay standard errors with optimal lag lengths are reported in parentheses. All regressions include economist fixed effects. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Asset Manager			Bank			Insurance		
$\mathbb{E}_t^j(\overline{FFR}_{t+1q}) - FFR_t$	0.48*** (0.06)	-0.03 (0.08)	-0.51*** (0.09)	0.36*** (0.03)	-0.09 (0.06)	-0.46*** (0.06)	0.29*** (0.05)	-0.03 (0.07)	-0.34*** (0.08)
FFR_t	-0.06*** (0.01)	-0.06*** (0.02)	0.00 (0.03)	-0.04*** (0.01)	-0.07*** (0.02)	-0.03 (0.02)	-0.07*** (0.02)	-0.11*** (0.03)	-0.05 (0.04)
$HMR_t - FFR_t$	-0.10*** (0.02)	-0.14*** (0.03)	-0.04 (0.04)	-0.05*** (0.01)	-0.14*** (0.03)	-0.09** (0.04)	-0.13*** (0.03)	-0.20*** (0.04)	-0.07 (0.06)
π_t	-0.03* (0.02)	-0.04 (0.03)	-0.01 (0.03)	0.01 (0.02)	-0.02 (0.03)	-0.03 (0.03)	0.01 (0.02)	0.00 (0.03)	0.00 (0.04)
Baa credit spread _t	-0.12** (0.06)	-0.31** (0.14)	-0.19 (0.13)	-0.12** (0.06)	-0.26** (0.12)	-0.12 (0.12)	-0.12 (0.10)	-0.16 (0.14)	-0.04 (0.15)
Baa credit term spread _t	0.04 (0.06)	0.24 (0.15)	0.20 (0.15)	0.08 (0.05)	0.22* (0.13)	0.14 (0.14)	0.22** (0.10)	0.19 (0.15)	-0.04 (0.18)
R^2	0.405	0.140	0.202	0.367	0.127	0.219	0.262	0.139	0.117
Observations	3,394	3,494	3,394	10,647	13,009	10,647	1,194	1,259	1,194
Economist FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Mortgage-Related Firm			Other			Independent Research Firm		
$\mathbb{E}_t^j(\overline{FFR}_{t+1q}) - FFR_t$	0.29*** (0.05)	-0.01 (0.10)	-0.30*** (0.10)	0.31*** (0.05)	-0.05 (0.09)	-0.36*** (0.10)	0.50*** (0.04)	-0.03 (0.06)	-0.53*** (0.06)
FFR_t	-0.04** (0.02)	-0.18*** (0.04)	-0.14*** (0.05)	-0.03** (0.01)	-0.06*** (0.02)	-0.04 (0.03)	-0.05*** (0.01)	-0.06*** (0.02)	-0.01 (0.02)
$HMR_t - FFR_t$	-0.04 (0.03)	-0.23*** (0.04)	-0.20*** (0.05)	-0.07*** (0.02)	-0.16*** (0.03)	-0.09** (0.04)	-0.07*** (0.02)	-0.14*** (0.03)	-0.07* (0.04)
π_t	0.00 (0.01)	-0.05 (0.03)	-0.04 (0.04)	-0.01 (0.02)	0.00 (0.03)	0.01 (0.03)	0.00 (0.01)	-0.02 (0.03)	-0.02 (0.03)
Baa credit spread _t	-0.10 (0.07)	-0.06 (0.12)	0.03 (0.14)	-0.18** (0.07)	-0.35** (0.15)	-0.18 (0.17)	-0.03 (0.06)	-0.27** (0.13)	-0.24** (0.12)
Baa credit term spread _t	0.10 (0.08)	0.02 (0.14)	-0.08 (0.16)	0.14* (0.08)	0.41** (0.18)	0.27 (0.21)	-0.01 (0.07)	0.22 (0.14)	0.23 (0.14)
R^2	0.469	0.208	0.246	0.403	0.167	0.221	0.361	0.133	0.209
Observations	774	774	774	2,179	2,193	2,179	5,580	5,705	5,580
Economist FE	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table A.6 Long-short rate confusion in consensus forecasts: Alternative timing

This table presents OLS regression coefficients from equation (3) with alternative dependent variables allowing for delays in information incorporation. The dependent variable is expected one-quarter changes in home mortgage rate from month $t + 1m$ ($\mathbb{E}_{t+1m}(\overline{HMR}_{t+1q}) - HMR_{t+1m}$). The main independent variable is the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_t(\overline{HMR}_{t+1q}) - HMR_t$		
	(1)	(2)	(3)
$\mathbb{E}_{t-1}(\overline{FFR}_{t+1q}) - FFR_{t-1}$	0.34*** (0.07)	0.29*** (0.07)	0.27*** (0.07)
FFR_{t-1}		-0.02*** (0.01)	-0.03*** (0.01)
$HMR_{t-1} - FFR_{t-1}$		0.01 (0.02)	0.02 (0.02)
π_{t-1}			0.00 (0.02)
Baa credit spread $_{t-1}$			0.06 (0.07)
Baa credit term spread $_{t-1}$			-0.11 (0.08)
R^2	0.105	0.151	0.164
Observations	464	464	464

Table A.7 Expected changes in short rates and actual changes in long rates: Subsamples by monetary policy surprises

This table presents OLS regression coefficients from equation (4), estimated separately for subsamples divided by the magnitude of monetary policy shocks from Swanson (2021). The full sample is split at the median of the FFR shocks. The dependent variable is the actual one-quarter changes in home mortgage rate ($\overline{HMR}_{t+1q} - HMR_t$). The main independent variable is the expected changes in the federal funds rate ($E_t(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:04 to 2021:12. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\overline{HMR}_{t+1q} - HMR_t$								
	Full Sample			Small FFR Shocks			Big FFR Shocks		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$E_t(\overline{FFR}_{t+1q}) - FFR_t$	-0.14 (0.14)	-0.08 (0.13)	-0.19 (0.14)	-0.02 (0.15)	0.06 (0.14)	-0.03 (0.15)	-0.29* (0.15)	-0.24* (0.12)	-0.40*** (0.14)
FFR_t		-0.04 (0.03)	-0.04 (0.03)		-0.03 (0.03)	-0.03 (0.03)		-0.06 (0.04)	-0.08* (0.04)
$HMR_t - FFR_t$		-0.08* (0.05)	-0.07 (0.04)		-0.09** (0.05)	-0.08* (0.05)		-0.08 (0.08)	-0.08 (0.07)
π_t			-0.03 (0.03)			-0.02 (0.03)			-0.08 (0.06)
Baa credit spread _t			-0.30** (0.15)			-0.32** (0.13)			-0.31* (0.16)
Baa credit term spread _t			0.15 (0.17)			0.18 (0.18)			0.10 (0.19)
Standard-Errors					NW				
R^2	0.009	0.044	0.099	0.000	0.042	0.085	0.056	0.091	0.200
Observations	348	348	348	252	252	252	96	96	96

Table A.8 Benchmark of β_1 under the Dynamic Term Structure Model (JSZ)

This table tests whether the relationship between expected changes in short and long rates can be rationalized by a dynamic term structure model. Panel A presents OLS regressions of expected changes in the 10-year Treasury yield on expected changes in the federal funds rate. The dependent variable in Columns (1)-(3) is the 1-quarter-ahead expected change in the 10-year Treasury yield generated from the [Joslin, Singleton, and Zhu \(2011\)](#) (JSZ) model, $\mathbb{E}_t^{JSZ}(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$. In Columns (4)-(6), the dependent variable is the corresponding survey forecast from BCFF, $\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$. For Columns (4)-(6), we also report p -values for a one-sided test of the null hypothesis that the coefficient on expected FFR changes is less than or equal to 0.11. Panel B compares how well the JSZ model forecasts and expected short-rate changes explain survey forecasts of long-rate changes. The dependent variable is the survey-forecasted change in the 10-year Treasury yield. Across the two panels, the main independent variable is the expected change in the federal funds rate, $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$, from BCFF consensus forecasts. Control variables include the current Federal Funds Rate (FFR), the term spread ($y_t^{(10)} - FFR_t$), inflation rate (π_t), Baa credit spread, and Baa credit term spread. Newey-West standard errors with automatic bandwidth selection are in parentheses. The constant term is omitted for brevity. The sample period is from 1988:01 to 2021:12. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_t^{JSZ}(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$			$\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:						
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.11*** (0.01)	0.10*** (0.01)	0.10*** (0.01)	0.36*** (0.06)	0.47*** (0.05)	0.42*** (0.05)
FFR_t		-0.02*** (0.00)	-0.02*** (0.00)		-0.04*** (0.01)	-0.06*** (0.01)
$y_t^{(10)} - FFR_t$		-0.01*** (0.00)	-0.01*** (0.00)		-0.14*** (0.01)	-0.15*** (0.01)
π_t			-0.01** (0.00)			0.01 (0.01)
Baa credit spread _t			0.02 (0.02)			-0.02 (0.08)
Baa credit term spread _t			-0.02 (0.02)			-0.10 (0.08)
$H_0: \beta_{\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t} \leq 0.11$	—	—	—	$p < 0.01$	$p < 0.01$	$p < 0.01$
R^2	0.266	0.561	0.576	0.137	0.448	0.491
Observations	408	408	408	408	408	408
Panel B:						
$\mathbb{E}_t^{JSZ}(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$				1.11*** (0.35)		0.34 (0.41)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$					0.36*** (0.06)	0.33*** (0.07)
R^2				0.060	0.137	0.141
Observations				408	408	408

Table A.9 Long-short rate confusion in consensus forecasts: Main specification with CMT 10-year Treasury yields

This table presents OLS regression coefficients from equations (3)-(5). The dependent variables are expected one-quarter changes in 10-year Treasury yield ($\mathbb{E}_t(\bar{y}_{t+1q}^{(10)} - y_t^{(10)})$), the actual one-quarter changes in 10-year Treasury yield ($\bar{y}_{t+1q}^{(10)} - y_t^{(10)}$), and the forecast error of the one-quarter-ahead 10-year Treasury yield, respectively. The main independent variable is the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$) based on the consensus forecast. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($y_t^{(10)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:04 to 2021:12. Realized 10-year Treasury yields are the Constant Maturity Treasury (CMT) 10-year yield series from the Federal Reserve H.15 release. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$			$\bar{y}_{t+1q}^{(10)} - y_t^{(10)}$			$\bar{y}_{t+1q}^{(10)} - \mathbb{E}_t(\bar{y}_{t+1q}^{(10)})$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.33*** (0.06)	0.31*** (0.04)	0.29*** (0.04)	-0.22* (0.13)	-0.24* (0.13)	-0.23* (0.14)	-0.55*** (0.14)	-0.55*** (0.14)	-0.51*** (0.14)
FFR_t		-0.04*** (0.01)	-0.06*** (0.01)		-0.02 (0.02)	0.02 (0.02)		0.02 (0.02)	0.07*** (0.03)
$y_t^{(10)} - FFR_t$		-0.07*** (0.01)	-0.07*** (0.01)		-0.02 (0.04)	-0.03 (0.04)		0.05 (0.05)	0.04 (0.04)
π_t			0.00 (0.01)			-0.05 (0.04)			-0.06 (0.04)
Baa credit spread _t			0.11* (0.06)			-0.17 (0.17)			-0.28* (0.16)
Baa credit term spread _t			-0.16** (0.06)			0.25 (0.18)			0.41** (0.19)
Standard-Errors					NW				
R^2	0.151	0.347	0.372	0.018	0.031	0.071	0.088	0.101	0.157
Observations	417	417	417	417	417	417	417	417	417

Table A.10 Benchmark of β_1 under Expectations Hypothesis: CMT 10-year Treasury yields

This table tests whether the relationship between expected changes in short and long rates can be rationalized by the Expectations Hypothesis. Panel A presents results from Equations (6) and (3). The dependent variable in Columns 1-3 is $1/n$ of the expected changes of the federal funds rate 10 years from now, $\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$, based on the consensus from the BCFF long range survey ($n = 40$). The dependent variable in Columns 4-6 is the 1-quarter-ahead forecasted change in the 10-year Treasury yield, $\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$, from BCFF consensus forecasts. Panel B compares how well two different measures of short-rate expectations explain forecasted changes in the long rate. The dependent variable in all regressions in Panel B is the expected change in the 10-year Treasury yield over the next quarter, $\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$. The independent variables include: the expected change in the federal funds rate 10 years from now, scaled by maturity, $\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$, which represents the prediction from the expectations hypothesis; and the expected change in the federal funds rate over the next quarter, $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$. All expectations are from BCFF consensus forecasts. The regressions include the following control variables: the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is semi-annual from 1997:06 to 2021:12. Realized 10-year Treasury yields are the Constant Maturity Treasury (CMT) 10-year yield series from the Federal Reserve H.15 release. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:						
	$\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$			$\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$		
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.00 (0.03)	-0.01 (0.01)	-0.01 (0.01)	0.42*** (0.10)	0.41*** (0.10)	0.42*** (0.09)
FFR_t		-0.01*** (0.00)	-0.01*** (0.00)		-0.03* (0.02)	-0.06** (0.03)
$HMR_t - FFR_t$		0.01*** (0.00)	0.01*** (0.00)		-0.02 (0.02)	-0.03 (0.03)
π_t			0.00 (0.00)			0.02 (0.02)
Baa credit spread _t			0.00 (0.01)			0.27 (0.18)
Baa credit term spread _t			-0.01 (0.01)			-0.30 (0.23)
R^2	0.000	0.949	0.951	0.127	0.167	0.254
Observations	50	50	50	50	50	50
Panel B:						
	$\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$					
$\frac{1}{n}(\mathbb{E}_t FFR_{t+n} - FFR_t)$	0.90 (0.60)		0.86 (0.58)			
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$		0.42*** (0.10)	0.41*** (0.10)			
R^2	0.003	0.127	0.153			
Observations	50	50	50			

Table A.11 Benchmark of β_1 under the Dynamic Term Structure Model (JSZ): CMT 10-year Treasury yields

This table tests whether the relationship between expected changes in short and long rates can be rationalized by a dynamic term structure model. Panel A presents OLS regressions of expected changes in the 10-year Treasury yield on expected changes in the federal funds rate. The dependent variable in Columns (1)-(3) is the 1-quarter-ahead expected change in the 10-year Treasury yield generated from the [Joslin, Singleton, and Zhu \(2011\)](#) (JSZ) model, $\mathbb{E}_t^{JSZ}(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$. In Columns (4)-(6), the dependent variable is the corresponding survey forecast from BCFF, $\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$. For Columns (4)-(6), we also report p -values for a one-sided test of the null hypothesis that the coefficient on expected FFR changes is less than or equal to 0.11. Panel B compares how well the JSZ model forecasts and expected short-rate changes explain survey forecasts of long-rate changes. The dependent variable is the survey-forecasted change in the 10-year Treasury yield. Across the two panels, the main independent variable is the expected change in the federal funds rate, $\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$, from BCFF consensus forecasts. Control variables include the current Federal Funds Rate (FFR), the term spread ($y_t^{(10)} - FFR_t$), inflation rate (π_t), Baa credit spread, and Baa credit term spread. Newey-West standard errors with automatic bandwidth selection are in parentheses. The constant term is omitted for brevity. The sample period is from 1988:01 to 2021:12. Realized 10-year Treasury yields are the Constant Maturity Treasury (CMT) 10-year yield series from the Federal Reserve H.15 release. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	$\mathbb{E}_t^{JSZ}(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$			$\mathbb{E}_t(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A:						
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.11*** (0.01)	0.10*** (0.01)	0.10*** (0.01)	0.29*** (0.06)	0.30*** (0.04)	0.29*** (0.04)
FFR_t		-0.02*** (0.00)	-0.02*** (0.00)		-0.04*** (0.01)	-0.05*** (0.01)
$y_t^{(10)} - FFR_t$		-0.01*** (0.00)	-0.01*** (0.00)		-0.06*** (0.01)	-0.06*** (0.01)
π_t			-0.01** (0.00)			0.00 (0.01)
Baa credit spread _t			0.02 (0.02)			0.08 (0.06)
Baa credit term spread _t			-0.02 (0.02)			-0.12 (0.07)
$H_0: \beta_{\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t} \leq 0.11$	—	—	—	$p < 0.01$	$p < 0.01$	$p < 0.01$
R^2	0.266	0.561	0.576	0.137	0.274	0.284
Observations	408	408	408	408	408	408
Panel B:						
$\mathbb{E}_t^{JSZ}(\bar{y}_{t+1q}^{(10)}) - y_t^{(10)}$				0.93*** (0.26)		0.31 (0.25)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$					0.29*** (0.06)	0.26*** (0.06)
R^2				0.065	0.137	0.143
Observations				408	408	408

Table A.12 Corporate long-term issuance: Firm and aggregate-level evidence conditional on the first FFR change in a rate change cycle

This table presents OLS regression of firms' long-term debt issuance on the expected short rate changes, conditional on the first Fed Rate change in a rate hike/cut cycle. The table reports evidence using quarterly firm-level Compustat data. The dependent variable include an indicator variable that equals one if a firm issues a long-term debt in the subsequent quarter ($\mathbb{1}(\text{LT Issues}_{i,t+1} > 0)$), long-term debt issue in the subsequent quarter normalized by total assets in the current quarter ($\frac{\text{LT Issues}_{i,t+1}}{\text{AT}_{i,t}}$), long-term debt issue in the subsequent quarter normalized by total debt in the current quarter ($\frac{\text{LT Issues}_{i,t+1}}{\text{Total Debt}_{i,t}}$), and long-term share of total new debt issues in the subsequent quarter ($\text{LT Share}_{i,t+1}$), respectively. The main independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$), based on the consensus forecast. The indicator variable FirstChange equals one if the current quarter is the quarter after the first rate change in a rate hike/cut cycle, and zero otherwise. Control variables include the current Federal Funds Rate (FFR), the term spread ($y_t^{(5)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Standard errors are double clustered by firm and year-quarter and firm fixed effects are included in all regressions. The sample period is from 1983:Q2 to 2021:Q4. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	$\mathbb{1}(\text{LT Issues}_{t+1} > 0)$	$\frac{\text{LT issues}_{t+1}}{\text{AT}_t}$	$\frac{\text{LT issues}_{t+1}}{\text{Total debt}_t}$	LT share (imputed)
	(1)	(2)	(3)	(4)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.0119 (0.0080)	0.0039*** (0.0013)	0.0241*** (0.0092)	0.0553*** (0.0110)
FirstChange	-0.0108** (0.0051)	-0.0020*** (0.0006)	-0.0152*** (0.0052)	-0.0137* (0.0081)
FirstChange $\times \mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.0920*** (0.0236)	0.0087*** (0.0024)	0.0561** (0.0243)	0.0592** (0.0280)
FFR_{t-1}	0.0036** (0.0015)	-0.0006*** (0.0002)	-0.0018 (0.0013)	-0.0133*** (0.0021)
$y_t^{(5)} - FFR_t$	-0.0120*** (0.0025)	-0.0029*** (0.0003)	-0.0093*** (0.0023)	-0.0284*** (0.0029)
π_t	-0.0057*** (0.0019)	-0.0012*** (0.0003)	-0.0052** (0.0022)	-0.0010 (0.0022)
Baa credit spread _t	0.0163 (0.0114)	-0.0017* (0.0009)	-0.0017 (0.0078)	-0.0014 (0.0111)
Baa credit term spread _t	-0.0198* (0.0114)	-0.0023** (0.0011)	-0.0202** (0.0088)	0.0056 (0.0122)
Standard-Errors		Firm & Year-Quarter		
R^2	0.358	0.221	0.153	0.483
Observations	750,698	746,807	588,700	382,391
Firm FE	✓	✓	✓	✓

Table A.14 Firm long-term issuance: Controlling for uncertainty

This table presents OLS regression of firms' long-term debt issuance on the expected short rate changes, controlling for measures of uncertainty. The dependent variables include an indicator variable that equals one if a firm issues a long-term debt in the subsequent quarter ($\mathbb{1}(\text{LT Issues}_{i,t+1} > 0)$), long-term debt issue in the subsequent quarter normalized by total assets in the current quarter ($\frac{\text{LT Issues}_{i,t+1}}{\text{AT}_{i,t}}$), and long-term share of total new debt issues in the subsequent quarter ($\text{LT Share}_{i,t+1}$), respectively. The main independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$), based on the consensus forecast. Control variables include the current Federal Funds Rate (FFR), the term spread ($y_t^{(5)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. We additionally control for uncertainty measured as forecast dispersion across professional forecasters (Dispersion_t) and the VIX. Standard errors are double clustered by firm and year-quarter, and firm fixed effects are included in all regressions. The sample period is from 1983:Q2 to 2021:Q4. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

[illegible]

Table A.15 Aggregate mortgage issuance: Home purchase loans conditional on the first FFR change in a rate change cycle

This table presents OLS regression of aggregate home purchase Jumbo mortgage loan origination on the expected short rate changes, conditional on the first Fed Rate change in a rate hike/cut cycle. The dependent variable is the logarithm of the total dollar volume of new mortgages originated in the subsequent quarter ($\text{Log Total Loan}_{t+1}$). The main independent variables are the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$), based on the consensus forecast. The indicator variable FirstChange equals one if the current quarter is the quarter after the first rate change in a rate hike/cut cycle, and zero otherwise. Control variables include the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Standard errors are clustered by loan type, which includes conventional and jumbo loans. The constant term is omitted for brevity. The sample contains only Jumbo mortgages (larger loans typically exceeding \$750K) from the quarterly FHFA NMDA Aggregate Statistics from 1983:Q2 to 2021:Q4. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	Log total amount	
	(1)	(2)
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.7196** (0.3024)	0.6483** (0.2971)
FirstChange		-0.0502 (0.1958)
FirstChange $\times \mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$		1.8089* (0.9759)
FFR_{t-1}	0.0162 (0.0630)	0.0152 (0.0641)
$HMR_t - FFR_{t-1}$	-0.1924* (0.1083)	-0.2094* (0.1100)
π_t	0.0535 (0.0660)	0.0564 (0.0660)
Baa credit spread _t	-0.9588*** (0.2373)	-0.9642*** (0.2389)
Baa credit term spread _t	0.6352** (0.2843)	0.6523** (0.2858)
Constant	11.5292*** (0.4334)	11.5569*** (0.4447)
R ²	0.480	0.492
Observations	96	96

Table A.16 Firm and household long-term borrowing: Evidence from Flow of Funds data

This table presents OLS regression of corporate and household long-term debt issuance on the expected short rate changes, using the quarterly Flow of Funds data. The dependent variables are household mortgage issues in the subsequent quarter (Household Mortgage Issue_{t+1}); long-term corporate debt issue, directly measured from quarterly transaction variables (Corp LT Issue_{t+1} (direct)); long-term corporate debt issue, imputed from long-term debt levels following Greenwood et al. (2010) (Corp LT Issue_{t+1} (GHS)); and long-term corporate debt share, imputed from long-term debt levels following Greenwood et al. (2010) (Corp LT Share_{t+1} (GHS)), respectively. The main independent variable is the expected changes in the federal funds rate ($\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$), based on the consensus forecast. Control variables include the current Federal Funds Rate (FFR), the term spread ($HMR_t - FFR_t$ and $y_t^{(5)} - FFR_t$), inflation rate (π_t), Baa credit spread and Baa credit term spread. Newey-West standard errors with the automatic bandwidth selection following Newey and West (1994) are reported in parentheses. The constant term is omitted for brevity. The sample period is from 1983:Q2 to 2021:Q4. *, **, and *** indicate statistical significance at 10%, 5%, and 1% levels, respectively.

	HH Mortgage Issue _{t+1}	Corp LT Issue _{t+1} (direct)	Corp LT Issue _{t+1} (GHS)	Corp LT Share _{t+1} (GHS)
	(1)	(2)	(3)	(4)
Panel A: Full sample				
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.0647* (0.0376)	0.0834** (0.0368)	0.1099** (0.0442)	0.0215 (0.0181)
FFR_t	-0.0029 (0.0036)	-0.0077** (0.0033)	-0.0286*** (0.0057)	-0.0021 (0.0016)
$HMR_t - FFR_t$	-0.0196** (0.0094)			
$y_t^{(5)} - FFR_t$		-0.0319*** (0.0060)	-0.0628*** (0.0112)	-0.0120*** (0.0043)
π_t	0.0116 (0.0078)	-0.0036 (0.0058)	0.0044 (0.0099)	-0.0075** (0.0034)
Baa credit spread _t	-0.0742*** (0.0264)	0.0155 (0.0341)	-0.0059 (0.0431)	0.0016 (0.0181)
Baa credit term spread _t	0.0555** (0.0255)	-0.0108 (0.0305)	0.0216 (0.0397)	0.0117 (0.0155)
R^2	0.192	0.409	0.656	0.323
Observations	155	155	155	155
Panel B: Post-2000				
$\mathbb{E}_t(\overline{FFR}_{t+1q}) - FFR_t$	0.1536** (0.0667)	0.2011** (0.0812)	0.2657*** (0.0884)	0.0685** (0.0337)
FFR_t	0.0262** (0.0125)	-0.0164** (0.0070)	-0.0478*** (0.0095)	-0.0015 (0.0035)
$HMR_t - FFR_t$	0.0058 (0.0168)			
$y_t^{(5)} - FFR_t$		-0.0547*** (0.0114)	-0.1074*** (0.0174)	-0.0146*** (0.0055)
π_t	0.0126 (0.0111)	-0.0074 (0.0074)	-0.0066 (0.0122)	-0.0075** (0.0035)
Baa credit spread _t	-0.1438*** (0.0347)	-0.0026 (0.0324)	-0.0397 (0.0343)	-0.0260* (0.0136)
Baa credit term spread _t	0.1078** (0.0435)	-0.0181 (0.0374)	0.0015 (0.0417)	0.0235 (0.0166)
R^2	0.400	0.449	0.595	0.226
Observations	89	89	89	89