Financial Market Effects of FOMC Communication: Evidence from a New Event-Study Database*

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Abstract

This paper introduces the U.S. Monetary Policy Event-Study Database (USMPD)—a novel, public, and regularly updated dataset of high-frequency monetary policy surprises around Federal Open Market Committee (FOMC) official communication events, including policy announcements, press conferences, and minutes releases. Based on the richer content of the USMPD, we document several new empirical findings. Monetary policy surprises are back, and larger that they have been over the past decade. And over time, press conferences have become at least as important as FOMC statements as a source of monetary policy news. Across FOMC events, tightening surprises significantly lower market-based inflation expectations. Similarly, risk assets—including stock prices, exchange rates, and dividend derivatives—respond significantly to news of tighter policy conveyed during policy announcements and the press conferences in a way that is consistent with the transmission of monetary policy shocks.

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1 Introduction

High-frequency market movements around central bank announcements can help identify the effects of unexpected changes in the monetary policy stance on interest rates, asset prices, and macroeconomic outcomes. These "monetary policy surprises" have been widely used in monetary economics and macro-finance to estimate the causal effects of monetary policy on financial markets, on economic beliefs and forecasts, and on the macroeconomy.[1]

Despite their widespread use in empirical analysis, a commonly accepted benchmark for monetary policy surprises around FOMC policy events does not exist. The first goal of this paper is therefore to establish the U.S. Monetary Policy Event-Study Database (USMPD)—a new, publicly available and regularly updated dataset of high-frequency asset price changes around major FOMC communication events. Thus allowing the same transparency and comparability across studies made possible for the European Central Bank (Altavilla, Brugnolini, Gürkaynak, Motto and Ragusa, 2019), the Bank of England (Braun, Miranda-Agrippino and Saha, 2025), and the Swedish Riksbank (Almerud, Krygier, Lundvall and Njie, 2024). The USMPD adopts and expands on best practices from the literature on monetary policy surprises (including Gürkaynak, Sack and Swanson, 2005b; Acosta, Brennan and Jacobson, 2024; Brennan, Jacobson, Matthes and Walker, 2024), includes a wide range of risk-free interest rates and risky asset prices, and is regularly updated using a transparent methodology. Our hope is that the USMPD will enable and foster robust empirical analysis of U.S. monetary policy by providing a reference database of easily available, extensive, and up-to-date high-frequency policy surprises.

The USMPD includes four different types of monetary policy surprises calculated around the three official FOMC communication events. As is standard, statement surprises are defined over a 30-minute window that brackets the public release of the policy statement that follows FOMC decision meetings, including both scheduled and unscheduled ones. Press conference surprises record market reactions around the press conferences that follow the

[1]See Kuttner (2001); Gürkaynak, Sack and Swanson (2005b); Bernanke and Kuttner (2005); Swanson (2021) for the effects on financial markets, Campbell, Evans, Fisher and Justiniano (2012); Nakamura and Steinsson (2018); Bauer and Swanson (2023b) for the effects on survey-based expectations, and Cochrane and Piazzesi (2002); Faust, Rogers, Swanson and Wright (2003); Faust, Swanson and Wright (2004); Gertler and Karadi (2015); Jarociński and Karadi (2020); Miranda-Agrippino and Ricco (2021); Bauer and Swanson (2023a) for the macroeconomics effects.

statement, over a 70-minute window. Press conferences were first introduced in 2011, and since 2019 have been held after every FOMC meeting. To account for the overall disclosure of monetary policy news on days where a statement release and a press conference are both scheduled, we include in the USMPD a third type of surprises calculated around the whole "monetary event". These are defined over a 100-minute window that goes from 10 minutes before the release of the statement until 60 minutes after the beginning of the press conference. Finally, we define minutes surprises over a 30-minute window that brackets the publication of the meetings' minutes. Each set of surprises includes intraday changes in money market futures rates (for Fed funds and Eurodollar/SOFR), Treasury and TIPS yields, as well as intraday returns on the stock market and the dollar exchange rate. The USMPD includes the high-frequency data needed to reproduce the monetary policy surprises most commonly used in the literature, including, among others, the target, path, and LSAP factors of Gürkaynak, Sack and Swanson (2005b) and Swanson (2021).

The second goal of this paper is to provide new evidence on the transmission of monetary policy to financial markets, enabled by the expanded coverage of FOMC communication events, the inclusion of a broader set of interest rates and asset prices, and the extended sample period relative to earlier empirical studies. With the exception of a few recent studies (Narain and Sangani, 2023; Cieslak, McMahon and Pang, 2024; Swanson and Jayawickrema, 2024), communication events beyond the statements have received little attention in the empirical literature, despite their importance for FOMC communication.

For the analysis in this paper, we follow Nakamura and Steinsson (2018) and Bauer and Swanson (2023a) and measure monetary policy news across FOMC events by taking the first principal component of rate changes in money market futures covering a horizon of about one year. Our sample covers all FOMC communication events from January 1994 to December 2024. For the FOMC statements and monetary event windows, the principal component corresponds to a level factor that loads with roughly equal weights on all included futures contracts, that is, it embeds surprise shifts in the level of the yield curve. As such, it captures surprises in both the current policy rate and forward guidance, as well as any signaling effects of QE announcements (Bauer and Rudebusch, 2014), and can be thought of as an average of the target and path factors of Gürkaynak et al. (2005b); Swanson (2021).

Conversely, the minutes and press conferences do not convey news about the current policy stance. As a result, the loadings are in these cases more similar to a path factor.

Our first set of results relates to the distribution of policy news both across time and across FOMC events. We establish five new facts. First, the quantitative importance of monetary policy news across FOMC events has visibly increased since the liftoff of March 2022 and the beginning of the latest tightening cycle. This return of volatility implies that the empirical analysis of the financial and macroeconomic effects of monetary policy surprises is both more promising and more relevant than it would have seemed before the pandemic. Second, the introduction of the press conferences in 2011, and more systematically in 2019, has not only reduced the relative amount of monetary policy news contained in the associated statements, but it has also introduced a novel and relevant source of monetary policy news in its own right. Third, since the 2022 liftoff, the press conferences have also become the dominant source of monetary policy news for market participants, and command market reactions that are about 40% larger than around the statements. Overall, when both are scheduled, the press conferences generate comparable but somewhat larger interest rate expectation revisions compared to the statements, suggesting that market participants perceive them to convey at least the same degree of policy news as the more traditional statements. Fourth, the relation between statement and press conference news has changed significantly over time. Until 2022, press conference news was typically in line with the content of the statement. Between 2022 and 2023, however, an important disconnect emerges between the policy path inferred by market participants during the statements, and the one communicated by the Chair during the subsequent press conferences. Overall, this makes the statement and press conference news uncorrelated over our sample, which implies that the press conferences also convey independent news about monetary policy. Finally, while informative for the future policy path, minutes news is generally the smallest, and generates half the amount of market volatility compared to the statements. This confirms that most of the relevant information is disclosed to market participants through other channels by the time the minutes are released to the public, in line with effective communication by the FOMC.

We next move to revisit the response of financial market to news about U.S. monetary policy.

Our second set of results pertains to the Treasury bond market. We document that statement surprises have a statistically and economically significant negative effect on the term structure of inflation compensation, with peak effects at intermediate maturities. The use of an extended sample is key to unveil these effects, which stand in contrast with earlier findings in Hanson and Stein (2015) and Nakamura and Steinsson (2018) estimated over periods characterized by limited variation in inflation expectations. In this sense, our results reconcile the financial market evidence with the well-established VAR evidence of disinflationary effects of monetary policy shocks (Gertler and Karadi, 2015; Miranda-Agrippino and Ricco, 2021; Bauer and Swanson, 2023a). Moving beyond FOMC statements, we show that tightening surprises embedded in the press conferences are also very effective at steering breakeven inflation rates. This holds true whether we consider press conference news by itself, or in conjunction with statement news in our novel monetary event surprises. In fact, we find that the latter—while placing more weight on news at medium maturities— delivers the sharpest estimates, by combining the most informative means of communication adopted by the FOMC.

Our third set of results establishes further novel evidence about the transmission of monetary policy to financial markets using event studies of risky asset prices. The response of stock prices, exchange rates, and other risk-sensitive indicators is strongly significant, quantitatively meaningful, and consistent with a positive response of discount rates and risk premia, and a negative response of expectations for future cash flows to monetary policy surprises. Again, including news from the press conferences reinforces these findings both in terms of size and significance. In the context of the response of risk assets to FOMC surprises, we present new results based on both dividend futures and dividend swaps, which capture (risk-adjusted) expectations of future stock market dividends. We show a significantly negative response of market-based dividend expectations to monetary event surprises for maturities beyond one year, consistent with monetary policy tightening lowering expectation of future growth, and with the typically sluggish response of dividends to news (Lintner, 1956; Leary and Michaely, 2011). Our use of an extended sample and a broader collection of FOMC events, coupled with the use of dividend futures and swaps that are less susceptible to measurement issues (Boguth, Carlson, Fisher and Simutin, 2022) are key to

our findings, which stand in contrast with earlier results based on dividend strips derived from option prices (Golez and Matthies, 2025; Gilchrist, Yang and Zhao, 2024).

Overall, our paper makes both methodological and empirical contributions to the macro-finance literature. On the methodological side, we establish a new, expanded reference database of monetary policy surprises measured across all official FOMC communication events. On the empirical side, we document new results for the effects of monetary policy on both Treasury markets and risky asset markets. Our results speak to significant open issues and current debates in the literature, including the sensitivity of breakeven inflation rates to monetary policy news, the risk-taking channel of monetary policy, and the response of market-based expectations about future dividends and hence growth. Our hope is that both our new database and our empirical results stimulate further research on these policy-relevant topics.

The paper is structured as follows: The reminder of this section discusses the related literature. Section 2 introduces the USMPD and its content, and we present new facts about monetary policy news for different FOMC communication events in Section 3. Section 4 presents results for Treasury markets, while Section 5 turns to risk assets, including stocks, exchange rates, corporate bond spreads, and dividend derivatives. Section 6 concludes.

Literature Review. From a methodological standpoint, our paper is most closely related to studies that have introduced new event-study databases of high-frequency monetary policy surprises for other central banks, namely Altavilla et al. (2019), Braun et al. (2025), and Almerud et al. (2024). Our approach for constructing high-frequency surprises around FOMC communication events builds on work going back to the seminal papers by Kuttner (2001) and Gürkaynak et al. (2005b) that introduced this type of analysis to monetary economics. We also incorporate the insights and best practices of recent work on FOMC policy surprises by Acosta et al. (2024) and Brennan et al. (2024).

A large and continuously growing literature investigates the effects of the Fed's monetary policy on financial markets both in the U.S. and abroad. Papers that are broadly related to ours include Bernanke and Kuttner (2005), Gilchrist, López-Salido and Zakrajšek (2015), Swanson (2021), Miranda-Agrippino and Nenova (2022), and Bauer and Swanson (2023a).

The influential studies by Hanson and Stein (2015) and Nakamura and Steinsson (2018) investigated the response of nominal and real Treasury yields to Fed surprises, and documented a strong response of long-term real rates. This "excess sensitivity" of long-term rates is also evident in the work of Gürkaynak, Sack and Swanson (2005a) and Hanson, Lucca and Wright (2021). We find that the excess sensitivity is explained in large part by the nature of the shock that both statement and press conference news embed.

Jarociński and Karadi (2020) and Gürkaynak, Kara, Kısacıkoğlu and Lee (2021) were first to document that both the stock market and the exchange rate can at times move in the "wrong" direction following monetary policy surprises, a result that we also confirm for dividend derivatives. Golez and Matthies (2025) and Gilchrist et al. (2024) showed that dividend strip prices respond positively to Fed monetary policy surprises. At the same time, Hanson and Stein (2015) and Nakamura and Steinsson (2018) found no response of breakeven inflation rates to monetary policy surprises. In contrast to these latter studies, and despite the occurrence of "wrong-signed" observations, our event study regressions estimate responses of risk assets and market-based expectations of both inflation and dividends that are generally in line with the theoretical transmission channels of monetary policy.

Only few papers have gone beyond FOMC statements and considered other FOMC communication events. In an early contribution, Rosa (2013) analyzed the financial market effects of FOMC meeting minutes between 2005 and 2011, and showed that they lead to elevated financial market volatility for a short time after the release. Narain and Sangani (2023) show that stock market volatility around post-meeting press conferences is elevated, and that under Chair Powell the stock market often moved in the opposite direction over the press conference than around the release of the FOMC statement. Swanson and Jayawickrema (2024) build an extensive database of policy-relevant speeches by the Fed Chair, and show that these speeches lead to higher market volatility than FOMC announcements. Bauer and Swanson (2023a) document the response of Treasury yields and the U.S. stock market to surprises around Chair speeches. Cieslak, McMahon and Pang (2024) study the Fed's monetary policy communication in the post-COVID episode, with detailed analysis of the intraday market responses to FOMC communication. Our work complements these earlier studies using a comprehensive new dataset of intraday market reactions to press conferences

and minutes, which yields new evidence on the response of Treasury markets and risk assets to FOMC communication.

2 The USMPD: A New Database for FOMC Events

The US Monetary Policy Event-Study Database (USMPD) collects high-frequency changes of interest rates and asset prices around FOMC communication events. It contains data on a wide range of instruments, including money market futures, OIS rates, Treasury and TIPS yields, the U.S. stock market, and U.S. dollar exchange rates. The USMPD is intended for public dissemination and will be updated at regular intervals going forward.

In this section, we describe the content of the USMPD. We start with some institutional background and the FOMC communication events. We then provide details on the construction of high-frequency rate changes and asset returns over different intradaily event windows and on the different instruments contained in the database.

2.1 FOMC Communication Events

The FOMC communicates through several channels following each of its eight annual regularly scheduled policy meetings, as well as after the unscheduled meetings that can take place during times of financial stress. The post-meeting *statement* describes the Committee's current economic assessment, policy decisions, and future outlook for the economy and monetary policy. At every other policy meeting, the statement is accompanied by the Summary of Economic Projections (SEP), which summarizes the economic forecasts of FOMC meeting participants. The policy statements are then followed by a *press conference* with the FOMC Chair and finally, three weeks after each meeting, the *minutes* of the FOMC meeting are released. The exact release timing and content of each of these communication types have changed in important ways over recent decades.

The FOMC statement has long been the FOMC's primary, and most timely, mode of communication with the public. The first statement was released following the February 1994 meeting. Those early statements tended to be short, factual statements of any change in monetary policy, and were issued only when policy was changed. Starting with the May

1999 meeting, the FOMC began issuing a statement after each meeting. The content and length of the statements has changed considerably over the years, ranging from one short paragraph about the economic outlook to the Committee's primary means of issuing forward guidance. Today, statements typically describe the FOMC's economic outlook (especially in relation to the Committee's dual mandate), the current stance of policy (including any changes), and the outlook for policy. Through all of the changes in content, the statement has continued to be the most closely watched FOMC communication.

The USMPD contains data for every FOMC statement starting in February 1994. It also includes in this category announcements of certain extraordinary measures, such as international dollar swap lines.[2] For the empirical analysis in the paper, we use a sample that ends in December 2024, which contains 265 FOMC statements.

The Fed Chair's post-meeting press conference allows media representatives to ask questions about the Committee's views and decisions. These press conferences begin with the Chair's opening remarks which are followed by a Q&A session during which the Chair addresses questions from reporters. Importantly, the Chair speaks on behalf of the FOMC during these press conferences. The first post-meeting press conference was held by Chair Bernanke in April 2011. Press conferences were then held after roughly every other meeting until June 2012, and after meetings with SEP releases through 2018. Starting with the January 2019 meeting, Chair Powell began holding them after every FOMC meeting. Over the period from 2011 to 2024, there were 81 post-meeting press conferences.

Almost since its inception in 1933, the FOMC has released summaries of its policy deliberations and the rationale behind its decisions in a relatively timely manner (Acosta, 2023a). The minutes of an FOMC meeting provide a detailed summary of the discussions at the meeting. They are released to the public with a delay, which has shortened over time. Before 2005, the minutes were not released until after the subsequent meeting, so they contained little new information about monetary policy. Starting with the December 2004 meeting, the FOMC began releasing the minutes three weeks after each meeting, with the first release in January 2005. Although the USMPD contains data for minutes releases

[2]An example is the announcement of the establishment of dollar swap lines on March 19, 2020, during the height of the COVID pandemic.

starting in 2001, our event studies focus on minutes released from 2005 onward to account for this change in timing and information content. During the period from 2005 to 2024, there were 160 releases of FOMC meeting minutes.

Another closely watched FOMC communication is the SEP, the content and timing of which have changed quite significantly over time.[3] In the early days of the SEP, the FOMC provided its projections alongside its semiannual Monetary Policy Report to Congress. Starting in November 2007, the scope and frequency of those projections increased. Between 2007 and the first press conference, the SEP was released quarterly with the minutes, three weeks after the meeting. Since April 2011, the SEP has been released quarterly, after every other FOMC meeting, along with the statement. The exact content of the SEP has also changed over time. Most notably, in 2012 the "dot plot" was introduced, which displays the assumptions of FOMC participants for the appropriate future path of the policy rate.

Speeches by Fed governors and Bank presidents are another important channel of communication about monetary policy. However, they are different in several ways from the FOMC communication events just described. First, speeches reflect the views of individual policy-makers and not those of the FOMC, as the usual disclaimer makes clear. Second, many speeches focus on other topics beyond monetary policy, including financial regulation, payment systems, or community engagement.[4] Third, the timing of speeches is often less clear and less suitable for financial market event studies, given that they can be long, delivered after trading hours, or lacking timestamp data. Because of these differences, we do not include speeches in our database of FOMC communication events, and refer interested readers to the important work by Swanson and Jayawickrema (2024) on this topic.

In sum, the USMPD contains event-study data for all FOMC statements, which started in 1994; all press conferences, which started in 2011; and releases of the minutes since 2001. While the sample used for the empirical analysis in this paper ends in 2024—with 265 FOMC announcements, 160 minutes releases, and 81 press conferences—the USMPD will be continuously updated to include new FOMC communication events.

[3] See https://www.federalreserve.gov/monetarypolicy/timeline-summary-of-economic-projections.htm.

[4] Swanson and Jayawickrema (2024) found that fewer than half of the speeches given by the Chair and Vice Chair over the period from 1988 to 2023 contained information about monetary policy.

2.2 Intraday Event Windows

Event studies of monetary policy announcements rely on the assumption that changes in asset prices during tight windows around the announcements are predominantly driven by newly revealed information about monetary policy (Bauer and Swanson, 2023a). If the event windows are too wide, many other factors may affect asset prices, making statistical inference more difficult. By contrast, if the windows are too narrow, market participants may not have enough time to fully digest the news, implying that prices may not fully incorporate the new information. In the following, we discuss the different event windows used in the USMPD.

The typical assumption in the empirical monetary economics literature is that a 30-minute window around FOMC statements is appropriate and sufficient to capture the relevant market reaction to the news contained in these monetary policy announcements. This tradition goes back to Gürkaynak et al. (2005b), who demonstrated the benefits of these tight intraday windows over the daily event windows employed by Kuttner (2001) and other earlier work. FOMC statements typically take the form of relatively concise press releases, with only limited changes relative to the previous release, and are distributed to reporters under embargo a few minutes before the official release. Therefore, market participants can arguably digest the FOMC statement and related news headlines fairly quickly. Indeed, Gürkaynak et al. (2005b) show that using either 30 or 60 minute windows for FOMC announcements yields largely equivalent results. We follow this convention and define the "statement window" as a 30-minute interval that starts 10 minutes before and ends 20 minutes after the release of each FOMC statement.

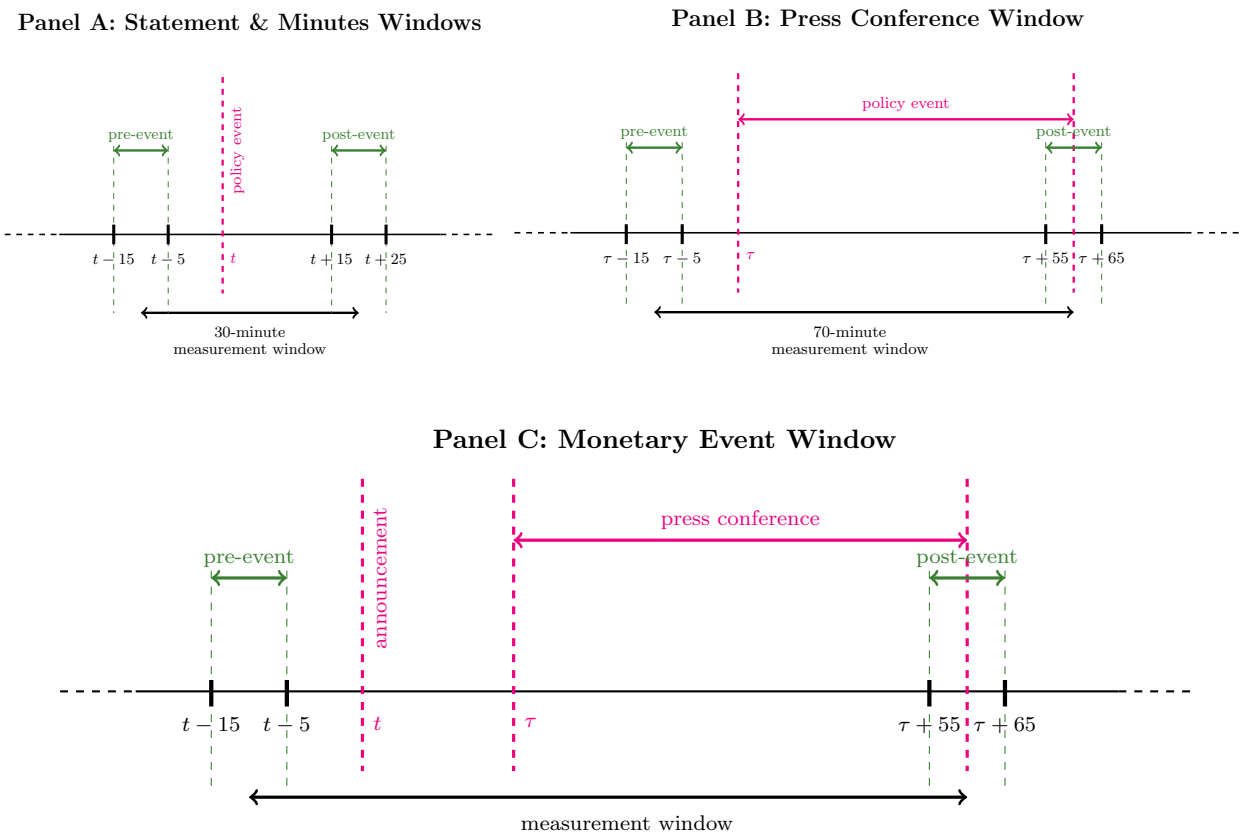
Conversely, there is no consensus view in the literature regarding the appropriate length of event windows for the release of the minutes and the post-meeting press conferences. Studies on the information content of the FOMC meeting minutes are limited. Rosa (2013) showed that market volatility increases substantially at the time of their release, and remained elevated for about 10-20 minutes thereafter, on average, and across different asset prices. This suggests that the market-relevant information in the minutes appears to be digested and processed in market prices very quickly after their public release. While the minutes are significantly longer than the FOMC statements, they are also released to reporters under

embargo ahead of the public release, so that headlines and summaries for the minutes are published in a timely fashion. Based on these observations, we use a similar tight window for the minutes, and define the "minutes window" as a 30-minute interval that starts 10 minutes before and ends 20 minutes after their release time.

The press conferences usually last around one hour. Cieslak et al. (2024) use a 120-minute window from the beginning of the FOMC press conference to capture the reaction of financial markets, but note that their conclusions are robust to considering shorter windows of either 60 or 90 minutes. For the ECB press conferences which are also about one hour long, Altavilla et al. (2019) opt for an 85-minute window, from 10 minutes before to 15 minutes after the end of the event. For the Bank of England, Braun et al. (2025) use a window that begins 15 minutes before the start to ends 10 minutes after the conclusion of the press conference. Against this rather heterogeneous backdrop, to decide on the appropriate length of the FOMC press conference window, we experimented with different window lengths, and found that markets seem to stop updating after the press conference ends. [MB: what exactly did we look at here? also, we don't have timestamp for when the press conference exactly ends? should probably add a footnote with details about the patterns we found across these different windows, all starting 10 minutes before and with duration ranging from 20 minutes to 2 hours] [SMA: Two exercises, one intentional one not. In one Caroline looked at the size of some monetary policy surprises over windows of duration from 30 min to 2 hours, and found that the updating stabilized after about 1 hour which is the typical duration of the PC. I don't think we have official time stamps for when it ends, but it is usually 1 hour. The second unintentional exercise we just did. Greg spotted that the PC window we had been using recently was actually larger (100 min from beginning of PC instead of 60). Don't ask me why. This has now been corrected and the numbers in the tables seem to be basically the same.] Based on this evidence, we define the "press conference window" as a 70-minute interval that starts 10 minutes before and ends 60 minutes after the beginning of the press conference.

Finally, we also include data in the USMPD for a "monetary event window" that combines information in the FOMC announcement and the post-meeting press conference. For announcements without a press conference, this window is identical to the 30-minute state-

Figure 1: Intraday windows around FOMC communication events



ment window. For FOMC meetings followed by a press conference, the monetary event window starts ten minutes before the release of the FOMC statement and ends 60 minutes after the beginning of the press conference.

The calculation of changes and returns around events requires the choice of specific pre-event and post-event price observations. To avoid interference from misquotes and possible outliers, we follow Altavilla et al. (2019) and Braun et al. (2025) and define the pre-event and post-event prices as the median price in ten-minute windows that bracket the start and end of each event window.[5]

Figure 1 illustrates the four different event windows in the USMPD, as well as the pre-event and post-event windows. In the figure, we use t to denote the time of the FOMC

[5]To deal with instances where the trading volumes on a certain instrument is so low that there are not at least three prices within one of the ten-minute windows, we search over extended time windows until three distinct consecutive prices are found. In practice, this exception is triggered only for a very small number of cases, all for near-term money market futures during ZLB periods. The resulting event changes are tiny, consistent with the lack of market-relevant information about the policy rate in those instances.

announcement and of the release of the minutes, whereas τ denotes the start of the press conference. We retrieve the timestamps for all historical FOMC events in our sample by combining Bloomberg data with Fed archives.

In extraordinary circumstances, the FOMC may convene an emergency meeting and make an announcement on weekends or holidays. One instance is the FOMC announcement made on Sunday March 15, 2020, at 5pm ET, in response to the widespread financial stress at the onset of the COVID pandemic. Being outside of market operating hours, this important announcement would not be picked up by our default search, resulting in a missing value. In this case, we defined the event window from the market close on Friday to the opening of futures markets at 6pm ET on Sunday, following Bauer and Swanson (2023a). Possible future announcements outside trading hours would be dealt with in a similar manner.

2.3 Interest Rates & Asset Prices in the USMPD

We now describe the various financial instruments included in the database. For the four different event windows just described, the USMPD contains high-frequency changes for various interest rates, stock market indices, and exchange rates. Our main source of intraday data is LSEG Tick History.[6]

The USMPD includes high-frequency *changes* for various interest rates: federal funds, Eurodollar and SOFR futures; OIS rates; and yields on Treasury and TIPS bonds. These are calculated as the simple difference in the pre- and post-event (implied) interest rates, in percentage points. For stock market indices and dollar exchange rates, the USMPD includes high-frequency *returns*, calculated as the relative price change, in percent, over each FOMC communication event window.

Federal funds futures and Eurodollar futures have long been used to gauge financial markets' expectations about current and future policy rates, starting with the seminal work of Kuttner (2001). Federal funds futures are monthly contracts that settle based on the average federal funds rate over the course of each month. Contracts are available for a number of

[6]Appendix Table A.1 contains a detailed description of the content of the USMPD. For more details on LSEG Tick History, formerly known as Reuters/Refinitiv Tick History, see https://www.lseg.com/en/data-analytics/market-data/data-feeds/tick-history. Historical data from LSEG Tick History starts in 1996; intraday data for 1994 and 1995 are from Tick Data and Gürkaynak et al. (2005b).

consecutive months, with declining liquidity as the maturity increases. The USMPD includes high-frequency changes for the first six contracts, FF1 to FF6. Fed funds futures give a sense of market participants' expectations for the average funds rate over the contract month. As shown by Gürkaynak et al. (2005b), it is straightforward to calculate the surprise change for the funds rate around the current or subsequent FOMC announcement based on changes in federal funds futures rates. We use this calculation to obtain MP1, the surprise rate change around the current FOMC meeting, and MP2, the implied change in the expected rate for the subsequent meeting, as detailed in Appendix A. These two implied rate surprises are commonly used in the construction of monetary policy news and are included in our database.

For market expectations about interest rates at longer maturities, the empirical literature typically used Eurodollar futures (Gürkaynak et al., 2005b; Nakamura and Steinsson, 2018). Eurodollar futures were quarterly contracts settled based on the 3-month LIBOR rate that prevailed at the expiration date. These highly liquid money market futures provided an estimate of market-based short rate expectations up to a horizon of several years. The USMPD includes data for eight quarterly Eurodollar futures contracts which expire at the end of each of the next eight quarters relative to the FOMC event date, denoted by ED1 to ED8.[7]

The phasing out of LIBOR rates, and consequent halting of trading in Eurodollar futures in 2023, posed the question of how to measure longer-term policy expectations going forward. We follow the recommendation of Acosta et al. (2024) and switch to futures on the Secured Overnight Financing Rate (SOFR) in January 2022.[8] SOFR and Eurodollar futures share

[7]For example, for a meeting scheduled in May, the first four Eurodollar futures have expiry date at the end of June, September and December of that same year, and at the end of March of the following year. As the settlement date approaches, liquidity in the front contract becomes very thin. Previous studies had devised rules to switch to the next set of quarterly contracts in these cases (e.g. Nakamura and Steinsson, 2018). LSEG automatically retires the front contract as the maturity approaches so that the adjustment is seamlessly incorporated in our data. [MB: when exactly, what is the LSEG rule?][SMA: we were not able to figure it out, but if I remember correctly the contracts are not there as we go beyond the 15th of the month. Greg may have some charts.]

[8]Following the LIBOR scandal in 2012, in 2014 the Federal Reserve convened private sector participants to recommend a new reference rate in place of LIBOR. SOFR was endorsed in June 2017 and first released in April 2018. A month later, SOFR futures began trading on the CME. In 2021, the CME announced that by April 14, 2023 all Eurodollar futures would be automatically converted to SOFR futures at a fixed spread. See Acosta et al. (2024).

some similarities, including their quarterly schedule and the reference rate being a 3-month rate. A key difference is that SOFR futures settle based on the compounded daily SOFR rate over the three-month period *before* the expiration date. Care must be taken to correctly align SOFR and Eurodollar contracts, because the LIBOR rate underlying a Eurodollar futures contract instead captures expectations for overnight rates for the three-month period *after* the contract's expiration, so that ED1 corresponds to the second SOFR futures contract, SFR2, and so on. SOFR futures have an important advantage for the purpose of measuring monetary policy expectations, because they are directly related to overnight interest rates in the repo market, which are closely related to the federal funds rate, the Fed's policy rate. By contrast, LIBOR rates and thus Eurodollar futures were affected by changes in credit risk, as reflected in the LIBOR-OIS spread that measured the difference with overnight rates and could spike during periods of financial stress. Fortunately for empirical monetary economists, these are issues of the past. To retain consistency with the data up to 2021, we include in the USMPD eight SOFR futures, SFR2 to SFR9, matching the maturity and expiration dates of the first eight quarterly Eurodollar futures.

The USMPD further contains high-frequency changes in several other interest rates: three- and six-month T-Bill rates, (nominal) Treasury yields with maturities of 2, 5, 10 and 30 years, TIPS yields with maturities of 5, 10 and 30 years, as well as one- and two-year OIS rates. [MB: let's emphasize advantages of on-the-run yields; should we include 5- and 10-year OIS rates? these are pretty common.] [SMA: I don't know what are the advantages of on-the-run yields, can someone pls chip in? Re adding more data, I think it would be cool but suggest we implement it directly as part of the SF production due to time constraints. One option could be to release USMPD 1.0 together with the working paper, and a USMPD 2.0 further down the line as we revise the paper.]

Besides interest rates, the database also includes high-frequency returns on several risk assets. For the stock market, we include returns in the S&P 500 index, the S&P 500 E-mini futures and the Wilshire 5000. [MB: Also, should we add Dow Jones, Nasdaq, VIX? Maybe easy and useful to add. Nasdaq may have been in Excel sheet a while back; Greg included the RIC in `data/USMPD/MPS_rics_years.xlsx`] [SMA: See comment above.] Finally, we include the dollar index DXY, and bilateral exchange rates of the U.S. dollar with the euro and the

Japanese yen.

3 Monetary Policy Surprises Across FOMC Events

In this section, we describe the construction of monetary policy surprises across the different FOMC communication events included in the USMPD. We document the properties of these policy surprises, including their loadings on rates across horizons and their changing behavior in recent years. We offer some guidance for the use of these measures in empirical research.

3.1 Construction of FOMC Surprises

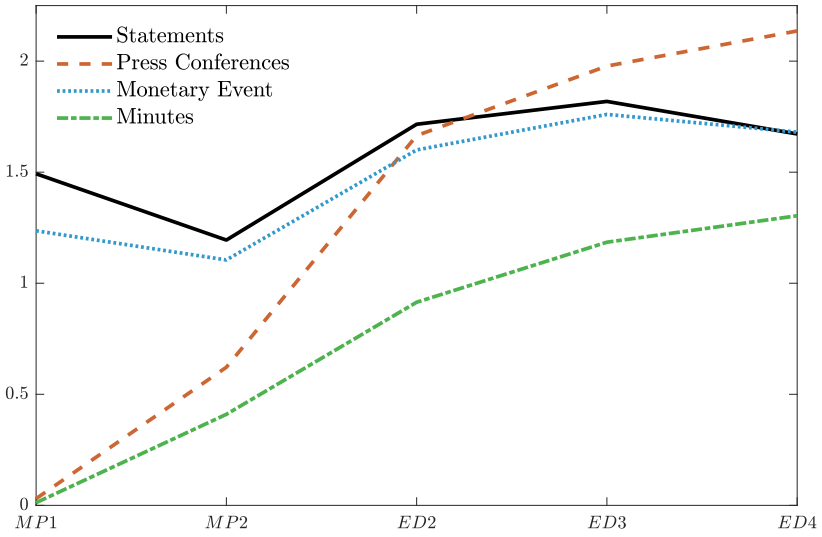
The empirical approach of constructing policy surprises as changes in money market futures rates around FOMC announcements goes back to Kuttner (2001), Bernanke and Kuttner (2005), and Gürkaynak et al. (2005b). The notion that these changes can be viewed as "surprises" is based on the assumption that over such short windows, interest rate changes are essentially unpredictable.[9] Empirical researchers have used various different choices and combinations of near-term interest rates to construct measures of monetary policy surprises.[10] The information included in the USMPD allows researchers to construct any measure of their choice, replicating earlier studies and extending the analysis to more recent samples.

In our analysis, we follow the approach that Nakamura and Steinsson (2018) used to construct FOMC announcement surprises and extend it to other communication events.

[9]Several recent studies have documented some predictability using economic news and financial data observed before the FOMC announcements, at least based on in-sample regressions (Miranda-Agrippino, 2016; Cieslak, 2018; Bauer and Swanson, 2023b). While this "ex post" predictability can have important consequences for high-frequency identification in monetary VARs, it does not seem to cause issues for financial market event studies for FOMC announcements (Bauer and Swanson, 2023a). In this paper, we follow common terminology and denote as "surprise" any high-frequency rate changes around FOMC events, and leave the issue of predictability to future research.

[10]Kuttner (2001) calculated the surprise component of the FOMC's policy rate decision using spot-month fed funds futures. Gürkaynak et al. (2005b) used information in short-term fed funds futures and Eurodollar futures to disentangle news about the current value of the policy rate (Target factor) and news about its expected future course (Path factor). Swanson (2021, 2024) extended this approach to also estimate a QE factor using surprises across the entire term structure of Treasury yields. Gertler and Karadi (2015) and Miranda-Agrippino and Ricco (2021) used variations of the fourth federal funds futures, while Jarociński and Karadi (2020) combined information in the fourth fed funds futures with that in the stock market to identify monetary policy shocks. Nakamura and Steinsson (2018); Bauer and Swanson (2023b) and Bu, Rogers and Wu (2021) have combined information in high-frequency surprises at different maturities, either with principal components or Fama-MacBeth regressions.

Figure 2: Loadings of monetary policy news on rate changes



Notes: Scaled loadings of the principal components on intraday rate changes over four different FOMC communication event windows. Sample: 1994-2024 for Statement and Monetary Event, 2011-2024 for Press Conferences, 2005-2024 for Minutes.

Specifically, for each event window, the monetary policy surprise is calculated as the first principal component of the five intraday rate changes in MP1, MP2, ED2, ED3, and ED4, which together cover a horizon from the upcoming policy meeting out to roughly one year ahead. To reiterate, MP1 and MP2 are based on fed funds futures and measure the policy rate surprise for the current and upcoming FOMC meeting (see Appendix A), while ED2–ED4 capture changes in short-rate expectations for two to four quarters ahead, based on Eurodollar futures up to 2021 and SOFR futures thereafter. A principal component is only defined up to a scaling factor, and to obtain an economically interpretable quantity, we normalize each surprise in the same manner as Nakamura and Steinsson so that it has a one percentage point effect on the one-year Treasury yield over the full sample available for each communication event.

Our procedure delivers four different measures of monetary policy surprises: for FOMC statements, press conferences, the combined monetary event, and the minutes. Figure 2 plots the loadings of each of these measures on the five underlying interest rate changes. Policy surprises for FOMC statements have fairly homogeneous loadings across horizons. Based on this observation, Nakamura and Steinsson (2018) interpret the principal component as

capturing news about the average expected policy rate up to a year ahead.

[MB: can we simplify or remove some of the following discussion, and maybe move the points about longer Treasury yields to Section 4? I think it's obvious that the policy surprise, which is a level factor, is strongly correlated with the level of the yield curve. We have the new Appendix Table A.3] SMA: I've simplified and shortened, agree that it is best dealt with in Section 4. But I still think we should flag it also here. It is obvious now that we know it, but it still tricked us into thinking we had found evidence of very long transmission lags, excess sensitivity and the like. A subtle but critical point to note is that this does not imply that the principal component is independent of news about monetary policy farther in the future. To see this, note that the procedure for the factor extraction is agnostic about the content of the FOMC statements: It treats all announcements equally, whether they are about changes in the FFR, forward guidance, QE, or some combination of them. In turn, this makes the principal component effectively an average of the Target and Path factors of Gürkaynak et al. (2005b); Swanson (2021).[11] Hence, statement news as defined in this paper should not be interpreted as conventional, short-run monetary policy surprises. Rather, as the combined effect of monetary policy statements that embed policy news that operates potentially also at very long horizons.

[MB: Not sure we really need this subsample analysis on the loadings because (a) it's clear that during a ZLB period the PC loadings would change, and (b) we don't use these "subsample factors" anywhere else in the paper.] [SMA: To clarify, this subsample analysis is done using the factors extracted over the full sample, so doing the exact same thing that we do running regressions on different samples in the sections that follow.] A further point worth mentioning is that the homogeneous loadings for monetary policy surprises up to a year ahead is not a general result. The pattern of loadings of the statement news can and does change over time—for example in periods where ZLB episodes constitute a larger

[11] In particular, note that the path factor significantly loads also on monetary policy surprises at maturities well beyond one year, and with coefficients that decay very slowly up to 10 years in the future (see Table 3 in Swanson, 2021). In principle, elements of the LSAP factor of Swanson (2021) are also picked up, to the extent that QE announcements also have effects that trickle down at shorter maturities (Bauer and Rudebusch, 2014), and affect the covariance of the five surprises we use for the extraction. While not a focus of our analysis, a separate investigation of the effects of short and medium term surprises as done in Gürkaynak et al. (2005b) can be useful in various applications. Similarly, we do not separately identify QE surprises, as effectively accomplished by Swanson (2021, 2024).

share of the sample, such as post global financial crisis—typically attributing more weight to longer-horizon expectations (see Appendix Figure A.1). When relevant, we will note exceptions to the baseline pattern when commenting on the results that follow.

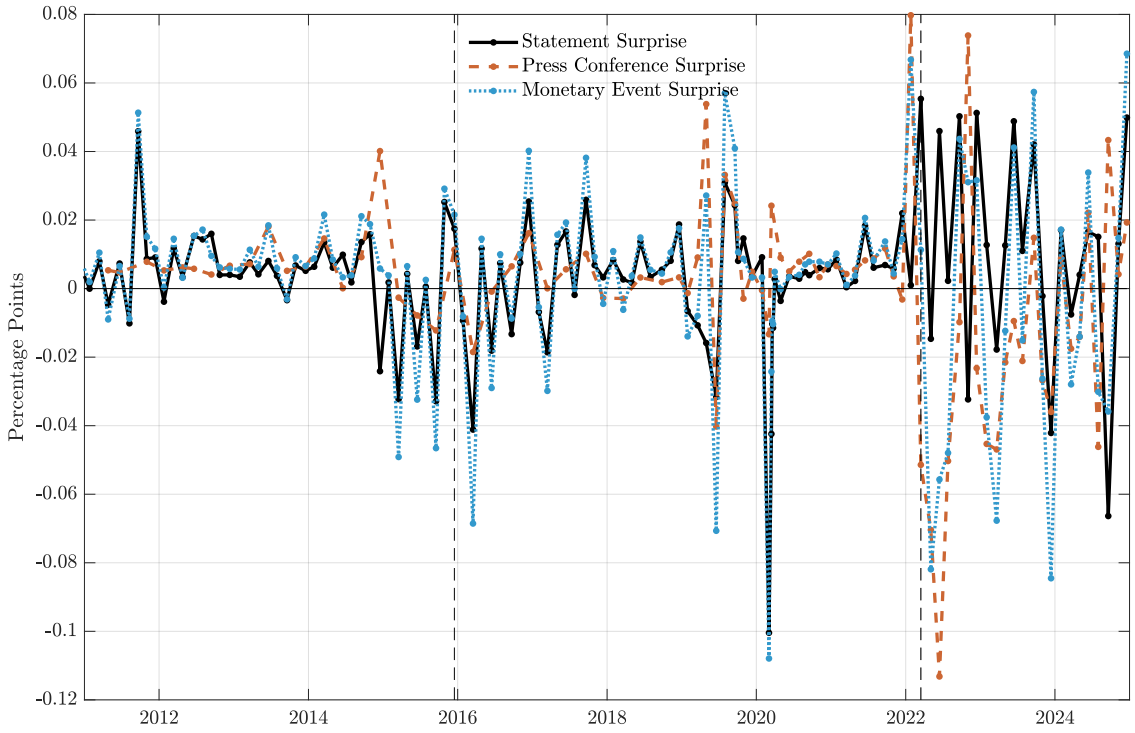
Figure 2 shows that the loadings for the surprises around minutes releases and press conferences increase monotonically and peak for the longest interest rate, ED4. They are essentially zero for the rate with the shortest maturity, MP1, although they are not imposed to be zero *a priori*. This shows that both communication events convey very little (if any) information around the current policy decision and are instead mostly informative about the future path of the policy rate. In other words, the surprises around the Chair's press conferences and minutes releases reveal unexpected changes in the implicit or explicit *forward guidance* of the FOMC. They mainly contain novel information about the future policy rate path relative to what can be inferred by market participants from the statement alone.

Lastly, Figure 2 reports the loadings of the monetary policy surprise around the monetary event window, which covers both the statements and the press conferences. The loadings are broadly similar to those for the statement surprise, loading positively on all five interest rates. The pattern is tilted somewhat more towards longer maturities, reflecting the additional information about the future rate outlook in the press conferences. However, the differences are small, given that there are only 81 press conferences on the 265 days with FOMC announcements. Going forward, with press conferences occurring after every FOMC meeting, the information revealed over the monetary event window will be tilted even more strongly towards forward guidance, downweighing the news about the current policy stance in favor of information about the rate outlook.

3.2 Five Facts About Monetary Surprises

[MB: there is lots of good stuff here but I'd suggest we organize it in a more linear fashion, and shorten it. How about organizing it around the points made on pages 19-21: First, MPS are back, larger since 2022 than before. Second, press conferences are now more important than they used to be, both in terms of higher volatility of PC surprises and lower correlation with statement surprises.] [SMA: Thanks for the suggestion. Agree it was a bit of a content dump (sorry). I also liked Miguel's idea about the 5 facts, which I have also repeated in the

Figure 3: Time series of monetary policy news across FOMC events



Monetary policy news around FOMC statements, press conferences, and monetary events (statements and press conferences) from 2014 to 2024. Vertical lines indicate liftoff dates December 16, 2015 and March 16, 2022.

intro. I've rewritten the whole thing. I actually don't know that we need mini titles for each fact, it's more for you to see if you agree with the content. But maybe they help the reader?]

In what follows, we discuss five facts about the behavior of monetary policy news both across policy events, and over time. To aid with the discussion, we report in Figure 3 the time series of the statements, press conferences, and monetary events news starting in 2011, the date at which the press conferences were first introduced. As a complement, we report in Table 1 the standard deviations and pairwise correlations among the three type of news since 2011, and across subsamples.

Fact I: Monetary policy surprises are back. Figure 3 shows that the quantitative importance of monetary policy news has visibly increased in size since the lift-off of March 2022 and the beginning of the latest tightening cycle. This holds true across FOMC events. Results in Table 1 show that statement news almost doubled in size post 2022, while press

Table 1: Evolution of Monetary Policy News Across Events and Over Time

	Standard Deviation			Pairwise Correlation		
	STMT	PC	ME	STMT & PC	STMT & ME	PC & ME
2011-2024	2.18	2.74	2.93	-0.12 (0.11)	0.69 (0.06)	0.63 (0.07)
2011-2022	1.82	1.31	2.31	0.31 (0.12)	0.91 (0.02)	0.67 (0.07)
2022-2024	3.18	4.35	4.60	-0.25 (0.20)	0.55 (0.15)	0.68 (0.12)

Notes: The table reports the standard deviation of news computed around FOMC statements (STMT), press conferences (PC) and monetary events (ME), as well as pairwise correlations among them. Standard errors of correlations (in parentheses) were calculated as $SE(r) = \sqrt{\frac{(1-r^2)^2}{n-2}}$, with r denoting the sample correlation and n the sample size. The 2022 sample break coincides with the most recent liftoff.

conferences have become more than three times as important. From a practical standpoint, the larger volatility of monetary policy news in the last few years of our sample means that these observations are particularly relevant for some of the empirical effects that we document in the next sections. More broadly, this return of volatility implies that empirical analysis of the financial and macroeconomic effects of monetary policy surprises is both more promising and more relevant than it would have seemed before the pandemic.[12]

Fact II: Press conferences have reduced the importance of statement news. Historically, monetary policy news conveyed during the statements has been the most informative. Not all statements are alike, however. In particular, and perhaps not surprisingly, statements that are not followed by a press conference command the largest market moves. The introduction of the press conferences in 2011, and more systematically in 2019, has significantly reduced the relative amount of monetary policy news contained in the associated statements. Consistently, Figure 3 shows that news calculated around the monetary event window tracks the statement news quite closely until 2022, and is instead more heavily influenced by the press conferences since then. This is confirmed by the numbers in Table 1. The correlation between the statement and monetary event news has effectively halved, going from 1 pre 2011 (i.e. before the introduction of the press conferences), to 90% between 2011 and 2022, to slightly above 50% thereafter.

[12]For example, Ramey (2016) noted at the time that "[m]onetary policy is being conducted more systematically, so true monetary policy shocks are now rare." The recent experience suggests that this may no longer be true.

Fact III: Press conferences have become the dominant source of monetary news. The increased importance of the press conferences has also made them the most relevant source of monetary policy news in the most recent sample. Table 1 shows that the ratio of the variance of press conference news relative to statement news has nearly doubled in the last three years of our sample. Overall, when both are scheduled, the press conferences generate comparable but somewhat larger expectation revisions compared to the statements, suggesting that market participants perceive them to convey at least the same degree of policy news as the more traditional statements. In other words, disregarding the information contained in the press conferences when analyzing the effects of monetary policy risks leaving out a significant chunk of relevant policy news. This observation suggests that combining the two sources of news in the broader monetary event window, as we do in the next sections, is generally desirable.[13]

Fact IV: Press conferences convey independent monetary policy news. Table 1 shows that the relation between statement and press conference news has changed significantly over time. This is also clearly visible in Figure 3. Up to 2022, press conference news was not only generally small, but also typically in line with the content of the statement. This holds true with the exception of the lead-up to the two lift-off episodes in 2015 and 2019 which were anticipated by market participants on the basis of the content of the press conferences. As a result, the correlation between the two types of news over the pre-2022 sample is small, but positive and significant (0.31, s.e. 0.12). The picture changes quite dramatically thereafter, when between the 2022 lift-off and the middle of 2023 the sequence of tightening statement news is accompanied by large easing news following the press conferences. To understand this pattern, note that over that period, with the exception of the first 75bps rate increase of June 2022, news about the current stance (MP1) is mildly negative. Therefore, the contrast between the statement and press conference news can be interpreted as markets systematically mis-characterizing the intentions of the FOMC based on the state-

[13] At the same time, it is important to be aware of the larger weight that this news variable places on long-horizon monetary policy news, as discussed earlier, as well as of how the statements and press conferences contribute to inform the monetary event news at different points in time when it comes to interpreting the results.

ment alone, and reverting course over the span of the press conferences.[14] This disconnect between statement and press conference news—or indeed between the inferred and communicated policy path—seems to have reverted since, such that the two news measures have returned to move mostly in the same direction. Nonetheless, it has been disruptive enough to flip the sign of the correlation between statement and press conference surprises, which is equal to -0.12 (s.e. 0.11) when calculated over the full sample.

[MB]: also make sure we have some possible explanations for large monetary policy surprises during 2022–2024, including uncertainty/learning about policy rule, could cite Bauer et al. (2024) in this context] [SMA: We had discussed this at length with Miguel. What seems to have happened is that based on the statement markets were repeatedly somewhat disappointed by the current decision (MP1 news mildly negative) and therefore thought the FOMC was going to raise rates rapidly from the next meeting onward (sequence of positive statement news which here are mostly driven by SOFR). The press conferences instead systematically corrected those expectations of a fast tightening pace, which led to large easing news. Hence the disconnect between the inferred and communicated policy path that we refer to in the text. It is possible that they were learning about FAIT in real time, but based on the scatter plots in the next section, they interpreted these points as deviations from some rule they had in mind (i.e. the Odyssean guidance), that is, as a standard monetary policy shock. **@MICHAEL:** what would you expect to happen to the stock market if they were learning about the rule? i.e. would the scatter plots be consistent with this interpretation?]

Fact V: FOMC conveys most of the relevant information on announcement days. As noted, the USMPD does not include the release of the minutes until when they started being published in a more timely manner in advance of the next decision meeting. Even so, the release of the minutes generates half the amount of market volatility compared to the statements, which in turn makes them the least informative among FOMC communication events (see Appendix Table A.2). This is a feature, rather than a bug, as successful commu-

[14] Narain and Sangani (2023) also document the same reversals in stock and Treasury market responses and use textual analysis to show that the valence of words chosen by the Chair during press conferences' Q&A systematically differs from those in the related statements, predicting the sign change in market responses.

nication would imply that all the relevant information has been disclosed through the other official channels available to the FOMC by the time the minutes are published. The small absolute footprint of the minutes releases will be important to keep in mind when comparing the response of financial markets to the different FOMC communication events in the next sections.[15]

4 Treasury Yields and Breakeven Inflation

The focus of this section is the sensitivity of nominal Treasury yields, TIPS yields, and breakeven inflation (BEI) rates to monetary policy news. Earlier research, going back to Kuttner (2001) and Gürkaynak et al. (2005b), has studied the effects of monetary policy on the Treasury market in detail, and provided many important insights. By extending the event-study analysis to other communication events beyond FOMC statements and updating it to include more recent monetary policy cycles and the post-COVID inflationary episode, we are able to add several novel results to this literature.

We use daily data for nominal Treasury yields from Gürkaynak, Sack and Wright (2007), and from Gürkaynak, Sack and Wright (2010) for TIPS yields, measured in percent.[16] BEI rates—also called inflation compensation rates—are differences of nominal and real (TIPS) yields, thus capturing market-based expectations of inflation over the maturity of the yields.[17] While data on Treasury yields extend back for many decades, the TIPS market did not come into existence until 1997, and exhibited low liquidity until the early 2000s. To accommodate for this, and for comparability across yields, we restrict our analysis in this section to estimation samples starting in 2004, when the TIPS market had clearly left its infancy and provided reliable information about real interest rates.[18] Our baseline sample ends in

[15]The normalization that we adopt to translate the different types of news into interpretable units means that the minutes news are scaled by a significantly larger factor to yield a 1 ppt daily change in the one-year nominal yield.

[16]Updated yield data is available at https://www.federalreserve.gov/data/yield-curve-models.htm.

[17]All these yields are based on smoothed zero-coupon curves, which flexibly capture the entire term structure of interest rates without being affected by idiosyncratic, instrument-specific variation and noise, including liquidity issues and on-the-run premia (Amihud and Mendelson, 1991), different behavior of T-bills (Duffee, 1996), or repo specialness spreads (D'Amico and Pancost, 2022).

[18]While the USMPD also includes high-frequency surprises for Treasury yields, this intraday data is

2024. To account for the collapse in TIPS market liquidity during the financial crisis, and following Nakamura and Steinsson (2018), we exclude the period from July 2008 to June 2009. The sample includes 171 FOMC announcements (both scheduled and unscheduled), 80 press conferences, and 152 minutes releases.

Our analysis relies on event-study regressions of the form

$$\Delta y_t = \alpha + \beta\, s_t + \varepsilon_t, \tag{1}$$

where t indexes days with FOMC communication events. $\Delta y_t = y_t - y_{t-1}$ denotes the daily change in a generic interest rate, such as nominal, real, and BEI yields or forward rates of a certain maturity. The yield data uses end-of-day bond prices, such that y_t is measured after the FOMC communication event (which takes place during market trading hours) and y_{t-1} is based on closing prices from the previous day. s_t denotes one of the high-frequency monetary policy news variables constructed in Section 3. The parameter β quantifies the effect of monetary policy news across FOMC events on the interest rate changes. Because the information in the news variable s_t is predetermined with respect to the financial market data on day t, this event-study regression provides causal estimates of the Treasury market effects of the Fed's monetary policy actions and communication (Bauer and Swanson, 2023a).

4.1 Effects of FOMC announcements on Treasury markets

We begin our analysis with the study of FOMC announcements. For this announcement window, the monetary policy news variable is the same as in Nakamura and Steinsson (2018). As discussed in Section 3, the principal component is normalized such that the results can be interpreted as the response to a monetary policy surprise that increases the one-year yield by one percentage point over the full sample (1994–2024).

Table 2 reports our baseline estimates for the two-year, five-year, and ten-year yields, and well as for 5-to-10-year forward rates for nominal, real, and breakeven inflation rates.

available only for a limited set of maturities of nominal bonds, and not for TIPS. In addition, the lower liquidity in the TIPS market (Andreasen, Christensen and Riddell, 2021) raises the possibility that new information about monetary policy is not immediately incorporated in these market prices, so daily event windows may be needed to fully capture the effects of monetary policy news on TIPS and BEI yields.

Table 2: Response of Treasury market to FOMC announcement surprises

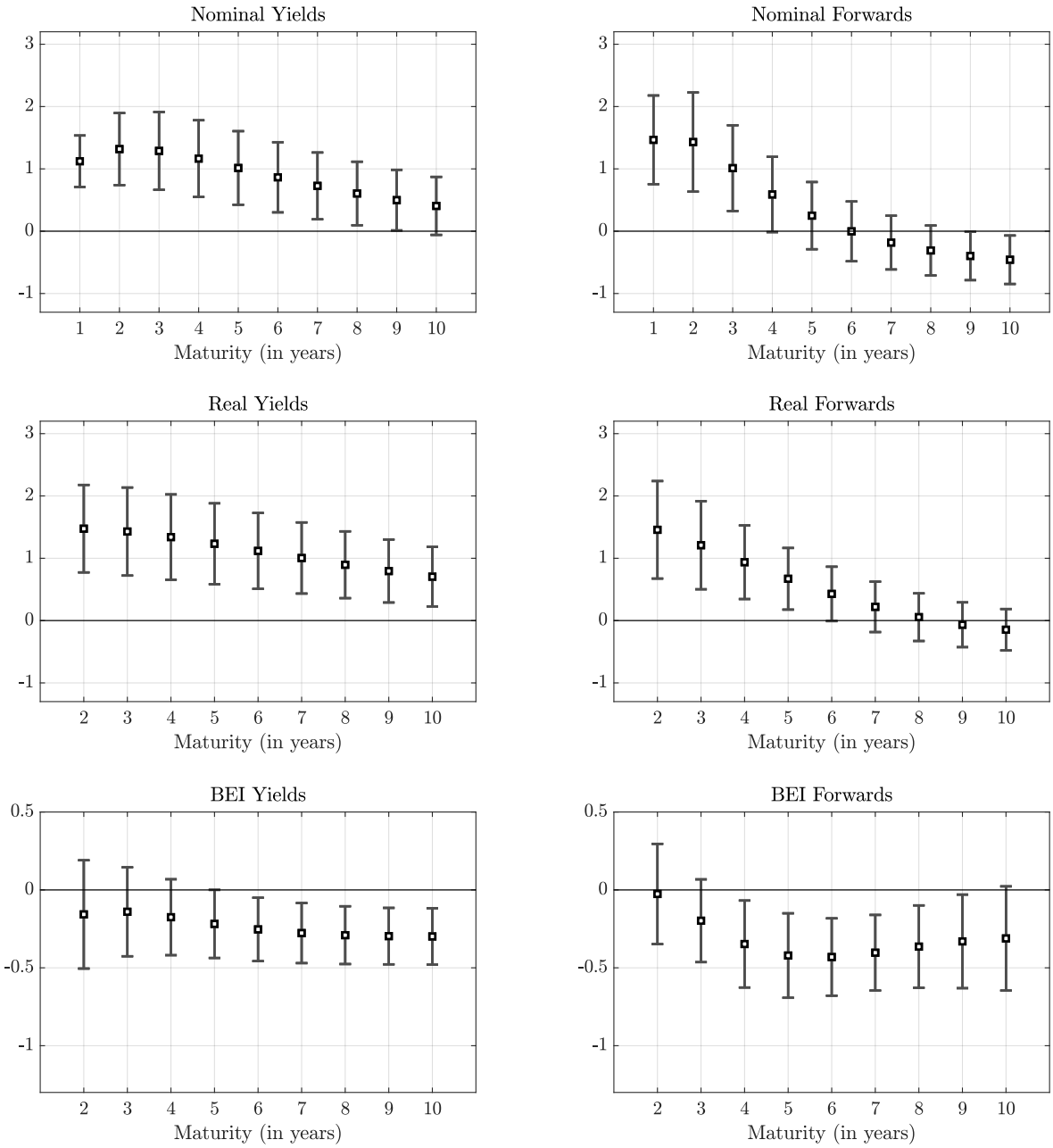
	2y yld	5y yld	10y yld	5-10y forw
(A) Nominal				
Coefficient	1.32	1.01	0.41	-0.20
SE	(0.30)	(0.30)	(0.24)	(0.21)
R^2	0.21	0.10	0.02	0.01
N	167	167	167	167
(B) Real				
Coefficient	1.47	1.23	0.70	0.18
SE	(0.36)	(0.33)	(0.24)	(0.20)
R^2	0.16	0.13	0.07	0.01
N	167	167	167	167
(C) Inflation				
Coefficient	-0.16	-0.22	-0.30	-0.38
SE	(0.18)	(0.11)	(0.09)	(0.12)
R^2	0.01	0.02	0.05	0.05
N	167	167	167	167

Event-study regressions of daily changes in Treasury rates around FOMC announcements on statement news, the scaled first principal component of 30-minute changes in near-term money market rates around the release of the FOMC statement. Response of nominal Treasury rates in panel (A), of real (TIPS) rates in panel (B), and of breakeven inflation rates in panel (C). Rates are 2-year, 5-year, and 10-year yields in the first three columns, and the 5-to-10-year forward rate in the last column. Sample: 171 FOMC announcements from 2004 to 2024, including both scheduled and unscheduled FOMC meetings, and excluding the crisis period from July 2008 to June 2009. White standard errors in parentheses.

The responses across the entire term structure of interest rates are reported in Figure 4: for the nominal term structure in the top panels, for the real term structure in the middle panels, and for the term structure of breakeven inflation in the bottom panels. The figure shows results both for zero-coupon yields (in the left panels) and for instantaneous forward rates (in the right panels).

Consistent with previous studies, FOMC statement news significantly affects both nominal and real yields across the curve. For nominal yields, the sensitivity is strongest for maturities of 2-3 years, with a coefficient around 1.3–1.4, and then it declines with maturity towards around 0.5. Real yields exhibit a strong and significant positive response to statement news that declines monotonically with maturities. Taken at face value, the response of TIPS yields is in line with the "excess sensitivity puzzle" documented by Hanson and Stein (2015) and Nakamura and Steinsson (2018). The response of nominal and real forward rates,

Figure 4: Term structure of interest rate sensitivity to FOMC announcement surprises



Event-study regressions of daily rate changes on FOMC statement news, the scaled first principal component of 30-minute changes in money market rates around the release of the FOMC statement. Response of nominal Treasury rates in top panels, of real (TIPS) rates in middle panels, and of breakeven inflation rates in bottom panels. Yield responses in left panels, and forward rate responses in right panels. Sample: 171 FOMC announcements between 2004 and 2024, including both scheduled and unscheduled FOMC meetings, and excluding the crisis period from July 2008 to June 2009. Error bars show 95% confidence intervals based on White standard errors.

however, declines more quickly and is significant only at shorter maturities.

The most novel evidence in Table 2 and Figure 4 is the negative impact of FOMC announcement surprises on market-based inflation expectations.[19] Both BEI yields and BEI forward rates at medium to long maturities decline very significantly. The magnitudes of the effects are also meaningful, with a peak effect on forward rates around -0.5, implying that a 10 basis point hawkish statement surprise (based on the one-year nominal yield normalization) leads to a roughly 5 basis point decline in inflation expectations for these horizons.[20]

These findings stand in contrast to earlier evidence in Hanson and Stein (2015) and Nakamura and Steinsson (2018), which found no response of breakeven inflation rates at most horizons.[21] These earlier results are puzzling from the perspective of standard results in New Keynesian models and monetary VARs, which estimate negative effects of monetary policy shocks on inflation (see e.g. Gertler and Karadi, 2015; Miranda-Agrippino and Ricco, 2021; Bauer and Swanson, 2023a, for recent contributions). Treasury market investors would be expected to price in the negative effects of monetary policy on future inflation, with market-based inflation expectations responding in a manner consistent with this channel. Owing to our extended and more recent sample, our new evidence resolves this puzzle, by documenting that there are in fact strong negative effects on inflation compensation, as we document more in detail below.

While our results are directionally consistent with a range of theoretical and empirical results in monetary economics, the significance of the responses of BEI rates at very long horizons may at first appear surprising, and at odds with the typical monetary policy transmission lags estimated in the literature. To contextualize our results, it is worth recalling that the statement news as defined in our paper can and does pick up monetary policy news acting potentially also at very long horizons, and should therefore not be interpreted as a

[19] In Appendix Table A.3 we include the high-frequency responses of the Treasury market to FOMC announcement surprises and find very similar results to the one-day window regressions. The response of inflation compensation is even slightly stronger than the estimated response for daily changes in Treasury yields.

[20] Note that, over this sample, a 10 basis point hawkish statement surprise based on the 1 year rate normalization is also a 5(2.5) basis point hawkish surprise in the 5(10) year rate. See Appendix Figure A.1.

[21] Hanson and Stein (2015) estimated a small positive response of forward inflation compensation (that is, forward breakeven inflation rates) at the very short end and obtained insignificant coefficients for other maturities. Nakamura and Steinsson (2018) also found mostly insignificant estimates for most breakeven rates, with the exception of a negative response for distant forward rates.

conventional or short-term monetary policy shock (see discussion of Section 3 and Appendix Table A.3). Indeed, it is the Path component of our statement news that is responsible for most of the long horizon responses in BEI rates, as well as that of nominal and TIPS yields and forward rates (see Appendix Figure B.1).[22]

BEI rates reflect market-based or "risk-adjusted" expectations, which include not only inflation expectations but also inflation risk premia and liquidity premia.[23] How might accounting for risk premia change our results? Direct evidence from New Keynesian macro-finance models and event studies (Hördahl and Tristani, 2012; Aronovich and Meldrum, 2025), as well as various empirical results in the macro-finance literature, suggest that inflation risk premia are positively related to monetary policy surprises.[24] [SMA: Why do we need to mention the literature on uncertainty if we have citations that speak directly to inflation risk premia? Can we get rid?]Similarly, other literature has shown that monetary policy contractions raise perceived inflation uncertainty, a channel that would also tend to cause inflation risk premia to rise.[25] Taken together, this evidence implies that the response of actual inflation expectations is likely more negative than our estimated response of market-based inflation expectations suggest.[26]

[22]The large footprint of the statement news on longer term policy expectations is attenuated monetary VARs that use these types of principal components as instrumental variables for the shock. Typically, in these cases a short-term rate is used in the VARs as the policy variable, and the effects of the shock decay very quickly. That is, the shock produces a one-off increase in the chosen policy variable. Conversely, in our case the statement news shifts the whole nominal curve upwards, with peak effects beyond the standard 1-2 years. Hence, care should be used when comparing our results with those based on VARs. [SMA: This is my intuition. Michael, do you have an example in your papers where you use the principal components in a VAR to see if indeed the shock is reabsorbed quickly in this case?]

[23]Christensen, Lopez and Rudebusch (2010); D'Amico, Kim and Wei (2018); Andreasen, Christensen and Riddell (2021) use term structure models to estimate risk premia in TIPS yields. Since estimates of risk premia in Treasury yields are highly uncertain and model-dependent (Kim and Orphanides, 2012; Bauer, 2018), event studies for inflation risk premia would substantially understate the true statistical uncertainty and give unreliable results. We therefore focus our event-study analysis on observable market rates and prices.

[24]The literature on the risk-taking channel of monetary policy speaks to the positive impact of monetary policy on many risk premia in financial markets (Bauer et al., 2023). Most estimates suggest that inflation risk premia tend to be positive (Christensen, Lopez and Rudebusch, 2010; Abrahams, Adrian, Crump, Moench and Yu, 2016), meaning that an increase in their magnitude due to a hawkish policy surprise would *increase* the risk premium component of BEI rates. [SMA: I don't understand this point.] See also Hanson and Stein (2015) and Gertler and Karadi (2015) for evidence on bond risk premia.

[25]See Mumtaz and Theodoridis (2020) for evidence on the effects of monetary policy on macro uncertainty; Wright (2011) on the positive relationship between inflation uncertainty and Treasury risk premia; and (Piazzesi and Schneider, 2006) for the determinants of inflation risk premia and role for monetary policy.

[26]Conversely, liquidity premia could influence our results in the other direction, as they increase TIPS yields and thus decrease BEI rates. However, during our sample period the TIPS liquidity premia are

Table 3: Breakeven inflation response to FOMC announcement surprises across subsamples

	2y yld	5y yld	10y yld	5-10y forw
(A) Sample: January 2004 to March 2014 (ex. GFC), N = 77				
Coefficient	0.36	0.08	-0.13	-0.34
SE	(0.15)	(0.10)	(0.12)	(0.19)
R^2	0.04	0.00	0.01	0.05
(B) Sample: April 2014 to December 2024, N = 90				
Coefficient	-0.65	-0.51	-0.46	-0.43
SE	(0.26)	(0.19)	(0.14)	(0.15)
R^2	0.08	0.10	0.11	0.06
(C) Sample: January 2004 to December 2019 (ex. GFC), N = 124				
Coefficient	-0.04	-0.19	-0.32	-0.46
SE	(0.22)	(0.13)	(0.12)	(0.15)
R^2	0.00	0.02	0.06	0.08
(D) Sample: January 2004 to December 2024, N = 176				
Coefficient	-0.63	-0.42	-0.37	-0.32
SE	(0.30)	(0.15)	(0.10)	(0.15)
R^2	0.06	0.07	0.08	0.04
(E) Sample: December 2015 to December 2018, N = 25				
Coefficient	-2.36	-1.39	-1.29	-1.19
SE	(0.49)	(0.29)	(0.21)	(0.29)
R^2	0.33	0.57	0.56	0.32

Event-study regressions of daily changes in breakeven inflation rates around FOMC announcements on high-frequency announcement surprises, the scaled first principal component of 30-minute changes in near-term money market rates around the release of the FOMC statement. Samples include both scheduled and unscheduled FOMC meetings. Samples (A) and (C) exclude the great financial crisis (GFC) period from July 2008 to June 2009. White standard errors are in parentheses.

[SMA: All that follows feels a bit like a distraction. We could just say what we say with (significantly) less words—one short paragraph—and put the table with the subsamples in the appendix.] A natural question about our estimates is what accounts for the stark differences with those of Hanson and Stein (2015) and Nakamura and Steinsson (2018). While Hanson and Stein (2015) used a different surprise measure, namely the two-day change in the two-year nominal Treasury yield, our measure is essentially identical to that of Nakamura and Steinsson (2018), suggesting that the differences are likely due to the different sample periods.

To investigate the robustness of our estimates and to reconcile them with earlier results

empirically much less important and, according to some estimates, of an order of magnitude smaller than inflation risk premia (Abrahams, Adrian, Crump, Moench and Yu, 2016).

in the literature, we estimate the event-study regressions for BEI rates over five different subsamples. Results are reported in Table 3. The first subsample ends in March 2014, same as in Nakamura and Steinsson (2018). The estimated response of BEI rates, shown in panel (A), is either positive (for the two-year yield) or statistically insignificant (for the other rates). That is, over the same sample, we confirm the absence of a negative response of BEI rates to FOMC statement news. Conversely, BEI rates decline strongly and significantly to tightening statement news over the period starting in April 2014 (panel (B)). Therefore, it is the different sample periods that are ultimately responsible for the different results.[27]

Panels (C) and (D) consider other samples for robustness. The sample for Panel (C) starts in 2004, as in our baseline, but ends in December 2019, before the onset of the COVID pandemic. Results confirm that the estimated negative responses of BEI rates are not driven by influential observations during either the pandemic or the post-pandemic tightening episode. Panel (D) adds the financial crisis episode to our baseline sample, and provides estimates over the full 2004–2024 period. The results show that adding the crisis does not materially affect the estimates.

We finally offer and additional observation regarding the response of long-maturity BEI rates noted earlier (Panel (E)). Besides the nature of the shock noted earlier, it turns out that a significant portion of these effects on distant forward rates can also be attributed to the monetary tightening episode between December 2015 and December 2018. After a long ZLB spell, the FOMC made a first attempt at policy normalization, despite core PCE inflation posting consistently below the 2 percent target. During this period, the Committee was highly attuned to signs of a perceived un-anchoring of longer-term inflation expectations, which were countered first by outcome-based forward guidance, later by revising the longer-run policy objectives, and ultimately by pausing rate hikes.[28] As a result, FOMC announcement surprises during the 2015-2018 tightening cycle had especially pronounced

[27] Other small discrepancies in the implementation details—such as our use of a more recent vintage of TIPS fitted yields, and our estimation of the principal components over a longer sample—lead to only minor changes in the estimated coefficients.

[28] In the January 2016 revision of the "Statement on Longer-Run Goals and Monetary Policy Strategy", the FOMC clarified that the 2 percent inflation target is symmetric and that policymakers would be "concerned if inflation were running persistently above or below this objective". The Committee's concerns favored an accommodative pivot in January 2019, and a later revision of the monetary policy framework to adopt average inflation targeting in August 2020.

negative effects on the 5-to-10-year forward BEI rate relative to the full-sample estimate, indeed suggesting that longer-term market expectations at the time were not fully anchored.[29]

4.2 Beyond FOMC announcements: press conferences and minutes

While empirical work on the effects of Fed communication on financial markets has mostly focused on the FOMC announcements and associated statements, we noted in Section 3 how other communication events, and particularly the press conferences, have become a very important source of monetary policy news in recent years. In what follows, we provide new estimates of the Treasury market effects of all the communication events in the USMPD. We use the same type of event-study regressions as in Eq. (1), where s_t now denotes the monetary news around press conferences (PC), minutes release (MIN), and monetary event (ME). Each news variable is scaled to yield a 1 ppt increase in the 1-year nominal rate over the full sample.

Table 4 reports the estimation results for these three additional monetary policy surprises—including the statement (STMT) surprises for reference—on the 5-year yield and 5-to-10-year forward rate for nominal, real and BEI rates. Consistently with what noted in Section 3, press conferences news causes substantial responses of both real and nominal rates. In most cases, the estimated coefficients are materially larger in magnitude, and the R^2 substantially higher, compared to the estimates for the statement news. Monetary news embedded in the press conferences have significantly positive effects on 5-to-10-year forward nominal and real rates, while statement news do not. A result that is reminiscent of the excess sensitivity of long-term rates to monetary policy surprises documented in earlier work by Hanson, Lucca and Wright (2021) and others. However, it is press conference news covering only information about the future path of policy that is the most likely determinant of this result.

BEI rates also respond more strongly to press conference news compared to statement news.[30] The negative response of the 5-year BEI rate becomes almost twice as large in

[29] See also Appendix Figure B.3, which shows that the sensitivity of forward BEI rates at longer horizons becomes statistically insignificant when the 2015-2018 tightening episode is excluded from the estimation sample.

[30] Note that the sample for press conference news starts in 2011. Based on results in Table 1, we expect

Table 4: Response of Treasury market to different monetary policy surprises

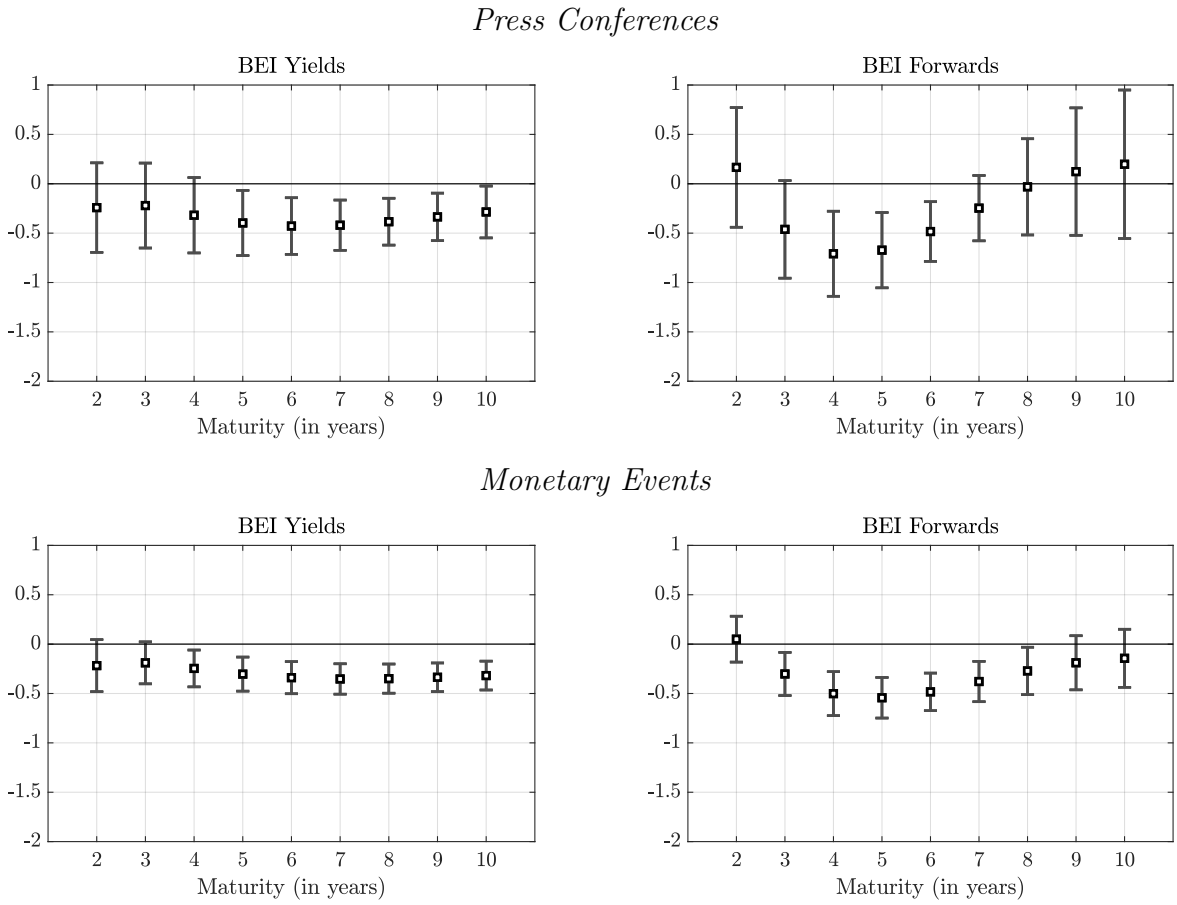
	5y yld				5-10y forw			
	STMT	PC	ME	MIN	STMT	PC	ME	MIN
				(A) Nominal				
Coefficient	1.01	1.64	1.36	0.93	-0.20	0.44	0.04	0.33
SE	(0.30)	(0.27)	(0.22)	(0.26)	(0.21)	(0.17)	(0.16)	(0.29)
R^2	0.10	0.32	0.29	0.09	0.01	0.05	0.00	0.01
N	167	80	167	142	167	80	167	142
				(B) Real				
Coefficient	1.23	2.04	1.67	1.06	0.18	0.63	0.38	0.47
SE	(0.33)	(0.37)	(0.24)	(0.23)	(0.20)	(0.21)	(0.15)	(0.27)
R^2	0.13	0.32	0.35	0.14	0.01	0.09	0.03	0.03
N	167	80	167	142	167	80	167	142
				(C) Inflation				
Coefficient	-0.22	-0.40	-0.30	-0.13	-0.38	-0.19	-0.34	-0.16
SE	(0.11)	(0.17)	(0.09)	(0.13)	(0.12)	(0.18)	(0.10)	(0.18)
R^2	0.02	0.07	0.07	0.01	0.05	0.02	0.06	0.00
N	167	80	167	142	167	80	167	142

Event-study regressions of daily changes in Treasury rates around FOMC communication events on high-frequency monetary policy surprise over different windows. STMT: 30-minute changes around FOMC statements. PC: changes around the post-meeting press conference. ME: changes over the monetary event window, that is, statements as well as press conferences when available. MIN: 30-minute changes around release of FOMC meeting minutes. Response of nominal Treasury rates in panel (A), of real (TIPS) rates in panel (B), and of breakeven inflation rates in panel (C). Rates are 5-year yields in the first four columns, and 5-to-10-year forward rate in the last five columns. Sample: for STMT and ME surprises, 171 FOMC announcements from 2004 to 2024, including both scheduled and unscheduled FOMC meetings; for PC surprises, 81 press conferences from April 2011 to December 2024; for MIN surprises, 152 releases of the minutes from January 2005 to December 2024; all sample periods excluding the crisis period from July 2008 to June 2009. White standard errors are in parentheses.

magnitude, while the R^2 rises from 2 to 7 percent. In contrast, the response of the 5-to-10-year forward BEI rate to press conference news is not significant. To help us understand the response of the BEI term structure more in detail, the two top panels of Figure 5 report the sensitivity of BEI yields and forward rates to press conference news (comparable to those shown in the bottom panels of Figure 4 for the FOMC statements). Monetary surprises in press conferences negatively affect all BEI yields (top left panel), with a response that is statistically significant at the five-percent level for maturities from 5 to 10 years. Conversely, the response of BEI forward rates (top right panel) peaks somewhat earlier compared to

the relevance of statement news to be even smaller over this period, compared to the 2004-2024 sample used in Table 4.

Figure 5: BEI rate sensitivity around FOMC announcements and press conferences



Event-study regressions of daily changes in breakeven inflation (BEI) rates around FOMC announcements on high-frequency monetary policy surprises that include the press conference. Top panel shows results for the press conference (PC) surprise, based on changes around only the press conference, with 81 observations from April 2011 to December 2024. Bottom panel shows results for the monetary event (ME) surprise that includes all FOMC statements as well as press conferences when available, with 171 observations from January 2004 to December 2024. BEI yield responses shown in left panels, and BEI forward rate responses in right panels. Error bars show 95% confidence intervals based on White standard errors.

FOMC statements, with the largest response at the 4-year horizon. This response then dies out and is statistically insignificant for forward rates from 7 to 10 years, in contrast with the long-lasting response to FOMC statements discussed earlier (Section 4.1). [SMA: could note that this may be due to news about QE being more a feature of statements than of PC] In sum, these estimates are consistent with our finding from FOMC statements that monetary policy news that places a large weight on forward guidance—and on the managing of policy expectations at longer horizons more broadly—leads to peak effects realized after a lag of several years.

The estimates based on the monetary event (ME) surprises combine policy news from both statements and press conferences. Table 4 shows that in most cases, the estimated coefficients are in between the estimates for the statement and press conference news. For the 5-year nominal, real and BEI yields, the explanatory power of the ME surprise, measured in terms of R^2, is as strong as for the PC surprise. While it is the effects of the press conference and statement news that deliver, respectively, the sensitivity of the 5-to-10-year real and BEI forward rates to ME surprises. Consistently, the bottom panels of Figure 5 show that the response of the BEI term structure to ME news is effectively a combination of the effects of the two sources of policy news. When considered jointly, these lead to peak responses in 4-6 year BEI forward rates, while longer maturities are unresponsive.

As noted in Section 3, by effectively combining the two main channels of FOMC communication, monetary event news are the most informative. This is confirmed by the coefficients for ME news being estimated more precisely than in either of the individual cases, and is a strong argument in favor of their use when estimating the effects of monetary policy communication on financial markets. It is understood, however, that the interpretation of the effects should take into account the large role that news about the future policy path plays, compared to more conventional news about the current policy stance.

Finally, Table 4 reports the response of the Treasury market to the release of the minutes. Results show that the minutes contribute significantly to revise expectations of the future policy stance, and thus that they embed additional medium-term policy news that is not disclosed on the days of policy announcements. In particular, both the explanatory power and the estimated coefficients for the 5-year nominal and real yields tend to be comparable to those of statement news at this horizon.[31]

In sum, we document several novel results for the Treasury market effects of FOMC surprises. Using longer and more recent samples, and in contrast to earlier results in the literature, we estimate significant negative effects on breakeven inflation, consistent with disinflationary effects of contractionary monetary policy shocks. Moreover, we show that policy news that effectively incorporate managing of longer term policy expectations leads to peak

[31]Recall that while all the surprises in the table are normalized to yield a unit effect on the one-year Treasury yield, in absolute terms the minutes release generally generates much smaller moves in money market rates relative to statement releases. See Section 3.

effects on forward rates at 4-5 years. Finally, other FOMC communication events—including the post-meeting press conferences and the release of the minutes—provide additional relevant information to financial markets about the future path of policy. Press conference news also exert a significant response of the BEI term structure.

5 Risk Assets

Monetary policy is known to materially affect the prices of risk assets, including stocks, exchange rates, and corporate bond spreads (e.g. Bernanke and Kuttner, 2005; Gilchrist, López-Salido and Zakrajšek, 2015; Jarociński and Karadi, 2020; Bauer and Swanson, 2023a). These effects result from three main channels: First, changes in monetary policy affect the risk-free rates at which expected future cash flows are discounted, meaning that the effects documented in Section 4 are relevant for risk assets as well. Second, policy changes affect expectations of the risky cash flows underlying these assets, such as dividends and corporate defaults. Third, policy changes influence the risk premia that investors demand to bear the risks surrounding future cash flows, according to the risk-taking channel of monetary policy (Bauer, Bernanke and Milstein, 2023). As an example, tighter policy would raise risk-free discount rates, lower dividend expectations and raise default expectations, and also lower the risk appetite of investors and financial intermediaries, thereby raising risk premia across a broad range of assets. All three of these channels would lead to lower prices of risk assets in response to tighter monetary policy, as captured by a hawkish monetary policy surprise. In addition to these "conventional" channels, monetary policy surprises could also lead to central bank information effects that would push in the opposite direction (Campbell et al., 2012; Nakamura and Steinsson, 2018). For example, a hawkish policy surprise may in part reflect a more benign economic outlook by the central bank, which could cause investors to revise their growth expectations upward. In the following analysis, we study the response of a broad set of risk asset prices to FOMC communication, using all communication events in our sample from 1994 to 2024.

5.1 Stocks, dollar, and other risk indicators

The first part of this analysis considers a range of assets and indicators that cover important markets, including stocks, exchange rates, corporate bonds, and mortgage rates. We include the following series: daily returns of the S&P 500 index, daily changes in the VIX, daily returns in the U.S. dollar index DXY, changes in an index of investor risk appetite, changes in the spread of the effective yield of the Bank of America BBB corporate bond index over the ten-year Treasury yield, changes in investment grade CDS spreads, and changes in an MBS yield and an option-adjusted MBS spread.[32] We use one-day changes/returns for the stock market and dollar series, and two-day changes for all other series to account for slower price responses due to lower liquidity in options, corporate bonds, and MBS markets. Returns are measured in percent, index changes in index points, and changes in yield and spreads in basis points.

Table 5 shows estimates from event-study regressions of these risk indicators on our four different monetary policy surprises. Around FOMC announcements, we find a strong and generally statistically significant response of all risk indicators. Stock prices and risk appetite respond negatively to policy surprises, while the VIX, the dollar, monetary-policy uncertainty, the BBB spread, the CDX index, and MBS yield and spread respond positively. These results are qualitatively consistent with earlier findings in the literature (Gürkaynak et al., 2005b; Bernanke and Kuttner, 2005; Gilchrist et al., 2015; Bauer et al., 2023). The estimates indicate a negative response of cash flow expectations and/or a positive response of risk premia to policy surprises, in addition to the response of risk-free discount rates.[33] The statistical significance of our estimates is especially strong for the response of the stock market, dollar, and risk appetite index. The magnitudes are economically meaningful, for example, the S&P 500 declines by close to one percentage point (-0.88) for a surprise corresponding to a 10 basis point increase in the one-year Treausury yield.

The estimated responses around press conferences are shown in the second panel of Table

[32]The risk appetite measure is from Bauer, Bernanke and Milstein (2023) and ends in May 2022. For CDS spreads we use the CDX-IG index. The MBS yield is the 30-year current-coupon MBS yield. The option-adjusted MBS spread is derived from Barclays' model and measures the spread of current-coupon MBS yields over Treasuries with comparable maturities.

[33]Notably, recent research by Nagel and Xu (2024) suggests that changes in risk-free discount rates alone may be sufficient to explain the stock market reaction to monetary policy surprises.

Table 5: Response of risk assets to monetary policy surprises

	S&P 500	VIX	Dollar Index	Risk Appetite	BBB Spread	CDX IG	MBS Yield	MBS OAS
(A) FOMC Statements								
Coefficient	-8.8	10.0	4.3	-13.8	20.5	80.6	103.5	16.2
SE	(3.6)	(4.5)	(1.3)	(4.1)	(11.7)	(36.5)	(26.2)	(17.0)
R^2	0.05	0.03	0.07	0.07	0.01	0.10	0.05	0.00
N	254	252	260	242	238	171	262	262
(B) Press Conferences								
Coefficient	-15.3	21.3	8.9	-10.0	2.0	19.6	240.0	100.9
SE	(4.9)	(6.9)	(2.1)	(14.4)	(26.0)	(19.9)	(60.2)	(40.7)
R^2	0.12	0.05	0.22	0.01	0.00	0.01	0.09	0.02
N	80	80	80	59	80	80	80	80
(C) Monetary Events								
Coefficient	-9.8	11.6	5.1	-12.7	20.0	64.9	123.0	27.9
SE	(3.0)	(4.1)	(1.3)	(3.5)	(9.7)	(28.5)	(26.4)	(15.9)
R^2	0.08	0.05	0.13	0.07	0.01	0.09	0.09	0.01
N	254	252	260	242	238	171	262	262
(D) Minutes								
Coefficient	-4.1	-2.8	8.0	6.4	22.9	-49.7	102.1	-2.6
SE	(7.9)	(6.4)	(2.3)	(12.2)	(37.5)	(34.1)	(52.8)	(35.7)
R^2	0.00	0.00	0.10	0.00	0.00	0.02	0.01	0.00
N	160	152	153	140	160	154	160	160

Event-study regressions of changes/returns in risk assets around FOMC communication events on high-frequency monetary policy surprises over different windows. Panel (A): 30-minute changes around FOMC statements. Panel (B): changes around post-meeting press conferences. Panel (C): changes around statements, and press conferences when available. Panel (D): 30-minute changes around release of FOMC meeting minutes. Risk assets: one-day return of S&P 500 (percent); one-day change in VIX; one-day return in dollar index DXY (percent); two-day change in risk appetite index; two-day change in BBB corporate bond spread (basis points); two-day change in investment-grade CDX index (basis points); two-day change in MBS yield and option-adjusted spread (OAS) (both basis points). Sample: all scheduled and unscheduled FOMC meetings from February 1994 to December 2024 for panels (A) and (C); all post-meeting press conferences from April 2011 to December 2024 for panel (B); all releases of the FOMC meeting minutes from January 2004 to December 2024 for panel (D). White standard errors in parentheses.

5. These tend to be even stronger than for FOMC statements, with larger coefficients and R^2 in most cases. The strong stock market response to PC surprises is consistent with the finding in Swanson and Jayawickrema (2024) that forward guidance surprises around Chair press conferences negatively impact the S&P 500.[34] The results for FOMC statements and press conferences in panels (A) and (B) are, however, not directly comparable because they

[34] Narain and Sangani (2023) document a change in the market reaction to press conferences by Chair Powell compared to those by Chairs Bernanke and Yellen.

use different sample periods, given that post-meeting press conferences by the Fed Chair started only in 2011. Appendix Table C.1 shows results for a multivariate regression with both statement and press conference surprises over the 2011–2024 period, from which it is clear that over this period the press conference surprises drive the majority of the response of most risk assets.

The responses to the "monetary event" surprises, covering both FOMC statements and press conferences, also tend to be stronger than for the FOMC statement surprises alone. The coefficients for these event-study regressions, shown in panel (C) of Table 5, are statistically significant at conventional levels, with the only exception being the response of the MBS OAS. Similarly to the results for the Treasury market, this evidence confirms that the press conferences contain information that is relevant for the prices of risk assets and goes beyond what was disclosed in the FOMC statements alone.

Around the release of the minutes of FOMC meetings, we find little systematic reaction of risk indicators to policy surprises. One exception is the dollar, which exhibits a substantial and significantly negative response. The MBS yield positively responds to the minutes surprise, but the statistical significance is marginal and the R^2 is small. The stock market and the various risk spreads do not seem affected by minutes surprises (similar to long-term nominal Treasury forward rates and inflation breakevens in Table 4). Overall, the evidence for the financial market response to minutes news is mixed, indicating that the information content of these surprises is somewhat limited, in line with what noted in Section 3.

The dependent variables in our event studies have so far been measured over one-day or two-day windows around FOMC communication events. But for some of the most important risk indicators, the USMPD contains high-frequency data, allowing us to use tight intraday windows for the dependent variables that match those for the monetary policy surprises. Table 6 reports the estimated response of the intraday returns on the S&P 500 (top panel) and the dollar index (bottom panel), with the four columns corresponding to the different monetary policy surprises and event windows. In these regressions, the explanatory power of the policy surprise is substantially stronger than when we use daily changes for the dependent variables. The stronger explanatory power is due to the elimination of other factors influencing asset prices on the event days, which naturally reduces the variance of

Table 6: Intraday response of risk assets to monetary policy surprises

	STMT	PC	ME	MIN
S&P 500				
Coefficient	-8.5	-18.7	-9.6	-3.0
SE	(1.8)	(5.0)	(1.5)	(1.8)
R^2	0.15	0.19	0.17	0.04
N	265	81	265	160
Dollar				
Coefficient	5.0	9.2	5.4	4.9
SE	(0.8)	(1.2)	(0.8)	(0.7)
R^2	0.24	0.52	0.28	0.30
N	265	81	265	160

Event-study regressions of high-frequency returns in the S&P500 and the dollar index on monetary policy surprises. STMT: 30-minute returns around FOMC statements. PC: returns around post-meeting press conferences. ME: returns around monetary events, that is around statements and press conferences when available. MIN: 30-minute returns around release of FOMC meeting minutes. Sample: all scheduled and unscheduled FOMC meetings from February 1994 to December 2024, for STMT and ME; all post-meeting press conferences from April 2011 to December 2024 for PC; all releases of the FOMC meeting minutes from January 2004 to December 2024 for MIN. White standard errors in parentheses.

the regression residual and brings the effects of FOMC communication into sharper relief. Consequently, the coefficients are also estimated much more precisely and tend to be larger in magnitude than the regressions with daily data in Table 5. For the FOMC meeting minutes, we again find no significant effect on the stock market, while the dollar index exhibits a highly significant response, similar to our earlier results.

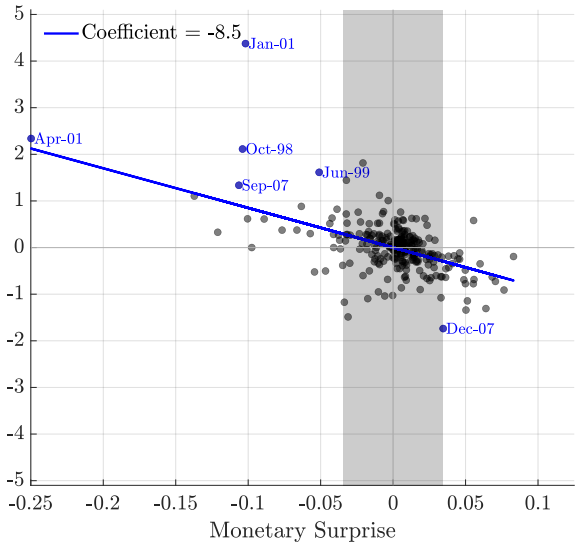
To help us better understand the effects of FOMC surprises on the stock market and the dollar, we visualize the data with scatter plots, focusing on the high-frequency regressions. Figure 6 plots the intraday S&P 500 returns against monetary policy surprises in the top panels, and the intraday dollar returns against the policy surprises in the bottom panels.[35] In each case, the left panel shows the responses around FOMC announcements, corresponding to the estimates in the first column of Table 6, and the right panel shows surprises around post-meeting press conferences, as in the second column of Table 6. Each panel also includes the estimated regression lines, highlights the six most influential observations, and shows shaded areas covering one standard deviation for the policy surprise.[36]

[35] Appendix Figure C.1 shows scatter plots for daily stock market and dollar returns, corresponding to the regressions in Table 5.

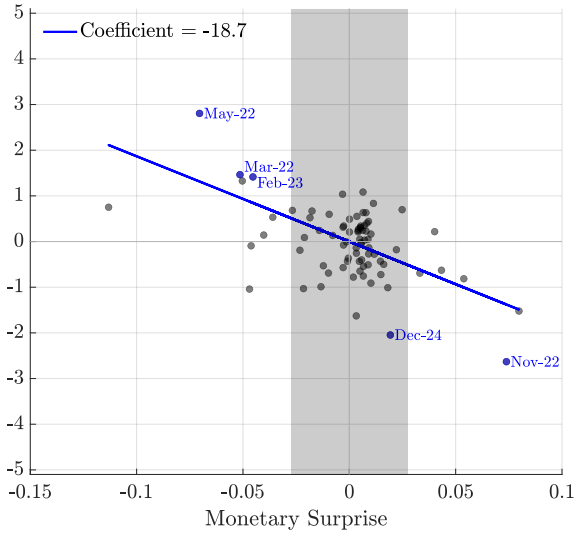
[36] The influential observations are determined using the $DFBETA$ influence statistic. For the stock

Figure 6: Intraday risk assets and monetary policy surprises

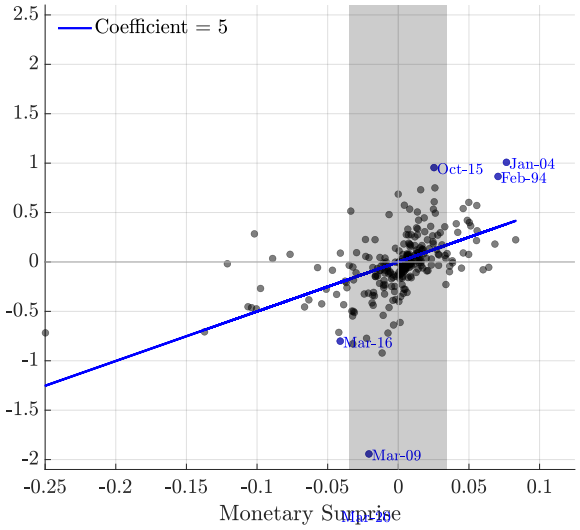
(A) S&P 500 around FOMC Statements



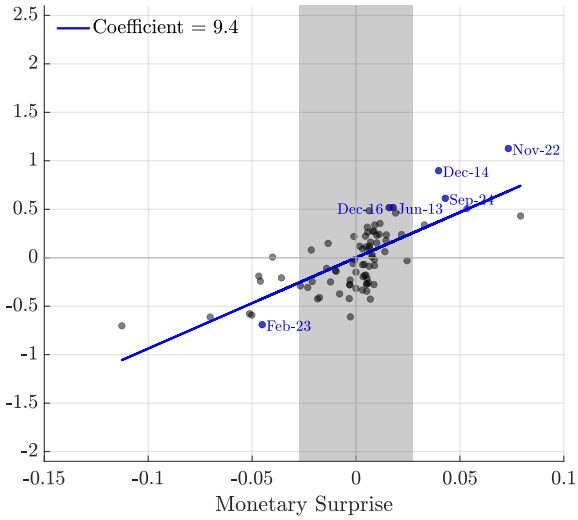
(B) S&P 500 around Press Conferences



(C) Dollar around FOMC Statements



(D) Dollar around Press Conferences



Intraday returns in risk assets and monetary policy surprise. Top panels show intraday S&P 500 returns on vertical axis, bottom panels show intraday dollar returns. Left panels show FOMC statement surprises for all FOMC statements from 1994 to 2024 (264 observations). Right panels show press conference surprises for all post-meeting press conferences from 2011 to 2024 (81 observations). Six most influential observations are highlighted and labeled: for the stock market (dollar) regressions, the most influential observations are those with the most negative (positive) $DFBETA$ statistic. Least squares regression lines correspond to estimates shown in first two columns of 6. Gray-shaded areas correspond to one standard deviation, above and below zero, for the monetary policy surprise.

market (dollar) regressions, these observations have the most negative (positive) $DFBETA$ and are thus most responsible for the negative (positive) slope coefficient.

The plots in Figure 6 visualize the strong negative (positive) correlation of FOMC statement and press conference surprises with S&P 500 returns (the dollar). The signs of these correlations are well-established in the empirical literature and in line with standard channels of monetary transmission. The scatter plots show that the estimated comovements are not driven by a small number of outliers. For FOMC statements, the most influential surprises are spread across different episodes and phases of the monetary policy cycle. For press conferences, the most important surprises all took place during the 2022–2024 period of monetary tightening.[37] As noted in Section 3.2, during this period, press conferences conveyed information about the policy rate path that was both substantial and largely independent from FOMC statement surprises. Figure 6 confirms the large effects on risk assets as a result of the forward guidance provided by the Chair during this episode, consistent with the effects of Odyssean forward guidance Campbell et al. (2012).

Figure 6 also shows that a significant share of FOMC surprises caused responses of the stock market and dollar that fall in the "wrong" quadrant, compared to the conventional sign of these correlations. The prevalence of these wrong-signed observations, originally documented by Jarociński and Karadi (2020) and Gürkaynak et al. (2021), could indicate the presence of Fed information effects.[38] We note that non-conventional risk asset responses typically occur for relatively small policy surprises that are within the gray-shaded areas in Figure 6 corresponding to one standard deviation above and below the mean.[39] While asset price responses to meaningfully large monetary policy surprises show little evidence for information effects, it is important to note that financial market event studies are insufficient to conclusively speak to the presence of information effects, which tend to play out in the estimated response of macroeconomic aggregates or survey forecasts at lower frequencies

[37] During this episode there were both large hawkish (Nov-22, Sep-24) and dovish (May-22, Feb-23) press conference surprises, and they all led to sizeable responses of the S&P 500 and dollar in line with the usual correlations.

[38] In the presence of central bank information effects, a positive response of dividend expectations to monetary policy surprises could dampen or even reverse the negative effects on stock prices from changes in risk-free discount rates and risk premia.

[39] Conventional wisdom might suggest that press conferences, which include detailed discussions of the Committee's economic outlook, are more likely to convey information effects. However, press conference surprises have hardly ever caused significant policy surprises with non-conventional responses of risk assets, as evident from the right panels in Figure 6.

(Miranda-Agrippino and Ricco, 2021; Acosta, 2023b).[40] Nevertheless, we view our intraday evidence as a useful addition to earlier event-study results in Jarociński and Karadi (2020) and Gürkaynak et al. (2021), as we extend the sample of FOMC commmunication events beyond the COVID pandemic and beyond FOMC statement surprises.

5.2 Dividend derivatives

Derivatives tied to future dividends can provide evidence on the reaction of dividend expectations to changes in monetary policy and can therefore yield new insights about the channels of monetary transmission. Dividend derivatives, such as dividend strips, swaps, and futures, are therefore particularly promising to analyze in event studies of FOMC communication.

Recent work using dividend strips has found puzzling effects of monetary policy on market-based dividend expectations. Golez and Matthies (2025) estimate a *positive* response of short-term equity claims to FOMC surprises, and similar evidence is documented by Gilchrist et al. (2024). However, the conventional effects of a monetary policy shock should lead to a *negative* response of dividend expectations. Intuitively, tighter policy slows future economic activity, putting downward pressure on earnings and dividends. In line with this intuition, Bilbiie and Känzig (2024) show that both in the data and in the standard New Keynesian model, corporate profits respond negatively to a contractionary monetary policy shock. One possibility for a positive response of expected dividends is if monetary policy surprises are driven by strong central bank information effects that dominate conventional channels of monetary transmission. The empirical evidence from dividend strips is also puzzling because it is strongest at very short horizons. Golez and Matthies (2025) focus on a claim to dividends over the next 180 days and Gilchrist et al. (2024) estimate positive responses that are strongest for 60 days and decline with horizon. However, a long corporate finance literature has shown that dividends are sticky as firms only adjust them only gradually and with a lag in response to changing business conditions (Lintner, 1956;

[40] In fact, it is typically the case that event study regressions with asset prices at daily or higher frequency recover average effects that are consistent with standard macroeconomic theory (Miranda-Agrippino and Nenova, 2022; Braun et al., 2025). And Jarociński and Karadi (2020) show that removing the "wrong-signed" observations, even though they may appear small, is sufficient to resolve the puzzling responses in VARs.

Leary and Michaely, 2011).

In light of these puzzles, we revisit the evidence on the effects of monetary policy on dividend expectations using data on dividend swaps and futures. These instruments have some advantages over dividend strips. First, they are tied directly to future dividends, while dividend strip prices are backed out from option prices and put-call parity, raising concerns about measurement error (Boguth et al., 2022). Second, they have annual expirations out to several years, which allows us to obtain term structure evidence about the response pattern of market-based dividend expectations. By contrast, reliable price data for option contracts and thus dividend strips is available only out to a horizon of a few months. Third, the prices of dividend swaps and futures are (essentially) forward prices of dividends, so we do not need to account for changes in risk-free interest rates to translate from spot prices to market-based dividend expectations, as in the case of dividend strips. Given these advantages, the literature on the term structure of equity risk premia has generally moved towards the use of dividend swaps and futures data (van Binsbergen and Koijen, 2017).

Dividend swaps and futures are very similar instruments in that their payoffs are tied directly to future dividends.[41] Swaps are over-the-counter derivatives between financial intermediaries, and dividend swaps have been used since the early 2000s. Futures have the advantage that they are standardized exchange-traded contracts, but for the U.S. they have only been trading since late 2015, resulting in a smaller sample size. In the following we focus on results for dividend swaps, motivated by the longer sample period, and show results for dividend futures in the appendix.

Our dividend swap data are from Goldman Sachs and consist of daily prices over a sample period starting in 2004. Dividend swap contracts for the U.S. are tied to dividends on the S&P 500 over each future calendar year.[42] This data has been used extensively in earlier research, e.g., by van Binsbergen and Koijen (2017) and Nagel and Xu (2024). We calculate two-day log returns (in percent) to account for the potentially slower transmission of policy surprise to the prices of assets with lower liquidity. We construct constant-maturity data by

[41] The terms "dividend futures" and "dividend swaps" are in fact sometimes used interchangeably in this context, because the small differences in institutional details between these derivatives are immaterial for most empirical research on market-based dividend expectations.

[42] For a detailed description of dividend swap markets, see Manley and Mueller-Glissmann (2008). We thank Christian Mueller-Glissman for providing the dividend swap data.

Table 7: Response of dividend swaps to monetary policy surprises

	1y	2y	3y	4y	5y	6y	7y
(A) FOMC Statements, $N = 124$							
Coefficient	2.5	-0.4	-7.7	-9.2	-13.3	-13.4	-11.8
SE	(2.3)	(3.4)	(5.4)	(4.7)	(5.2)	(4.9)	(4.6)
R^2	0.00	0.00	0.01	0.02	0.04	0.05	0.03
(B) Press Conferences, $N = 79$							
Coefficient	-2.6	-4.1	-5.1	-4.0	-4.9	-3.6	-6.8
SE	(1.7)	(3.0)	(3.1)	(3.3)	(4.4)	(4.1)	(3.8)
R^2	0.02	0.03	0.03	0.02	0.02	0.01	0.03
(C) Monetary Events, $N = 124$							
Coefficient	-0.7	-2.9	-7.2	-7.4	-10.1	-9.7	-10.4
SE	(1.2)	(1.6)	(2.6)	(2.4)	(3.2)	(3.3)	(3.2)
R^2	0.00	0.01	0.02	0.03	0.04	0.04	0.04
(D) Minutes, $N = 120$							
Coefficient	5.2	2.2	-3.1	-5.7	-4.1	-10.6	-10.0
SE	(4.6)	(4.5)	(4.7)	(4.9)	(5.5)	(5.2)	(6.3)
R^2	0.00	0.00	0.00	0.01	0.00	0.02	0.02

Event-study regressions of two-day returns in dividend swaps, for constant (interpolated) annual horizons, on high-frequency monetary policy surprises over different windows. Panel (A): 30-minute changes around FOMC statements. Panel (B): changes around post-meeting press conferences. Panel (C): changes around statements, and press conferences when available. Panel (D): 30-minute changes around release of FOMC meeting minutes. The sample includes all FOMC announcements from 2010 to 2024 for panels (A) and (C), and all press conferences and minutes releases for panels (B) and (D), respectively. White standard errors in parentheses.

linearly interpolating these returns.[43] We start our sample period in 2010 due to the lower liquidity during earlier years, especially during the financial crisis.

Table 7 reports the estimation results for event-study regressions of dividend swap returns on FOMC surprises. We consider annual horizons from one to seven years. The estimated response coefficients generally negative, the only exceptions being some short-horizon coefficients that are positive but statistically insignificant. For FOMC statements, panel (A) shows that the negative coefficients are statistically significant at conventional levels for horizons of four years and longer. The response coefficients for press conferences, shown in panel (B), are all negative, but generally not statistically significant. Nevertheless, the press con-

[43] Our method of interpolation is similar to that of van Binsbergen and Koijen (2017). For example, if t is the current trading day, F_{1t} is the return on the current-year contract with last trading day T at the end of December, F_{2t} is the return on the subsequent contract, and w is $T - t$ measured in years, then we construct the return on a one-year dividend contract as $w\,F_{1t} + (1 - w)\,F_{2t}$.

ferences materially strengthen the negative responses, with the result that the coefficients for monetary event surprises are strongly statistically significant for horizons of three years and longer, as shown in panel (C). Finally, the responses to minutes surprises, are negative for horizons of three years and longer, and of broadly similar magnitude as for other surprises, but aside from the six-year horizon not statistically significant.

Our estimates for dividend swaps are consistent with a negative response of dividend expectations to monetary policy surprises. Appendix Table C.3 shows qualitatively similar results for dividend futures. Our analysis has shown that while the strength of the estimated response depends somewhat on the sample period, the main finding is quite robust.[44]

The horizons at which prices of dividend swaps and futures respond negatively to monetary policy surprises are rather long. Indeed, the response coefficients tend to be most negative for horizons around 4-6 years. This is consistent with our surprise variables capturing mostly long-term monetary policy news over this sample (see also Appendix Figure A.1).

Our evidence raises the question what explains the differences with estimates based on dividend strips in Golez and Matthies (2025) and Gilchrist et al. (2024), which show pronounced positive effects of monetary policy surprises. There are several potentially important implementation details that could explain these differences, including the type of FOMC communication events, the frequency of the dividend derivative price data, measurement errors in dividend strips, and the precise measure of monetary policy surprises. But the most obvious candidate explanation is the difference in horizons: These earlier studies find positive effects on dividend strips at very short horizons, generally below six months, while we estimate negative effects for longer horizons. Indeed, at the shortest maturities, we estimate positive (though insignificant) response coefficients, indicating that the patterns in dividend

[44]Our results are generally robust to the choice of different sample periods. Appendix Table C.2 shows that for dividend swaps over the full 2004–2024 sample, almost all estimated coefficients are negative as well, though somewhat smaller in magnitude and statistical significance than in our main results. In additional unreported results, we have found that ending our sample in 2019 before the onset of the COVID pandemic, or using dividend swaps only over the 2016–2024 sample when dividend futures were also trading, leads to very similar results as in Table 7. Scatter plots in Appendix Figure C.2 visualize the response of the three-year dividend swap return to monetary policy surprises around FOMC statements and press conferences. The left panel shows an outlier with a very large positive response to the surprise on March 19, 2020. Excluding this event, an announcement of international swap lines, has no material impact on our estimation results.

strip and swap prices are not necessarily inconsistent. Taken together, the existing evidence suggests that the effects of monetary policy changes on dividend expectations may well be positive at very short horizons and then turns negative around 1-2 years, with substantial negative effects for longer horizons.

The negative effects on market-based dividend expectations in our estimates are consistent with conventional effects of monetary policy shocks. Our analysis of dividend swaps and futures shows no evidence for a positive response that would suggest an interpretation based on Fed information effects at longer horizons.[45] For now it remains an open question why very near-term dividend expectations might respond positively to changes in monetary policy. While Golez and Matthies (2025) view this pattern as evidence for information effects, there is a tension with the stylized fact from the corporate finance literature that companies adjust dividends only slowly and with delays. Further investigation of these questions is an important topic for future research.

6 Conclusion

This paper introduces the USMPD, a new public database of high-frequency monetary policy surprises around FOMC communication events. Different from other available sources, the USMPD includes data on a broader set of FOMC communication events—including statements, minutes and press conferences—and a wider range of risk-free rates and risk asset prices. The USMPD is intended for public dissemination, and will be updated regularly using a consistent and transparent methodology. Our hope is that the availability of this extensive, reliable data source of U.S. monetary policy surprises will further stimulate empirical research in monetary economics.

Based on the rich content of the USMPD, we establish new facts about monetary policy news. Importantly, monetary policy surprises have sensibly increased in magnitude over recent years, providing a renewed relevance on the use of high-frequency event studies and identification methods for the study of monetary policy. Additionally, press conferences con-

[45] Recall from our discussion in the previous section that event study regressions are generally not sufficient to reject the presence of information effects.

vey relevant and independent monetary news relative to the more traditional statements, suggesting that disregarding information in the press conferences risks overlooking an important source of information.

In the empirical applications of the paper, we document several novel empirical findings on the response of financial markets to monetary policy news.

In contrast to earlier studies, our estimates show that monetary policy news is effective at steering market-based expectations of both future inflation and dividends, and in a way that is generally consistent with the standard transmission channels of monetary policy shocks. Monetary policy news from press conferences—whether in isolation or in conjunction with the news in the associated statement—is particularly effective, with estimated coefficients that are typically larger than those of policy announcements.

References

Abrahams, Michael, Tobias Adrian, Richard K. Crump, Emanuel Moench, and Rui Yu, "Decomposing Real and Nominal Yield Curves," *Journal of Monetary Economics*, 2016, *84*, 182–200.

Acosta, Miguel, "A New Measure of Central Bank Transparency and Implications for the Effectiveness of Monetary Policy," *International Journal of Central Banking*, 2023, *19* (3), 49–97.

_ , "The Perceived Causes of Monetary Policy Surprises," mimeo, University of Wisconsin - Madison 2023.

_ **, Connor M. Brennan, and Margaret M. Jacobson**, "Constructing High-Frequency Monetary Policy Surprises from SOFR Futures," *Economics Letters*, 2024, *242*, 111873.

Almerud, Jakob, Dominika Krygier, Henrik Lundvall, and Mambuna Njie, "Measuring Riksbank Monetary Policy: Shocks and Macroeconomic Transmission," Discussion Working Paper 445, Sveriges Riksbank 2024.

Altavilla, Carlo, Luca Brugnolini, Refet S. Gürkaynak, Roberto Motto, and Giuseppe Ragusa, "Measuring Euro Area Monetary Policy," *Journal of Monetary Economics*, 2019, *108*, 162–179.

Amihud, Yahok and Haim Mendelson, "Liquidity, Maturity, and the Yields on U.S. Treasury Securities," *The Journal of Finance*, 1991, *46* (4), 1411–1425.

Andreasen, Martin M., Jens H. E. Christensen, and Simon Riddell, "The TIPS Liquidity Premium," *Review of Finance*, 10 2021, *25* (6), 1639–1675.

Aronovich, Alex and Andrew Meldrum, "High-Frequency Decompositions of Interest Rates Following Data Surprises and Monetary Policy Shocks," January 2025. unpublished working paper.

Bauer, Michael D, "Restrictions on Risk Prices in Dynamic Term Structure Models," *Journal of Business & Economic Statistics*, 2018, *36* (2), 196–211.

Bauer, Michael D. and Eric T. Swanson, "A Reassessment of Monetary Policy Surprises and High-Frequency Identification," *NBER Macroeconomics Annual*, 2023, *37* (1), 87–155.

_ **and** _ , "An Alternative Explanation for the 'Fed Information Effect'," *American Economic Review*, March 2023, *113* (3), 664–700.

_ **and Glenn D. Rudebusch**, "The Signaling Channel for Federal Reserve Bond Purchases," *International Journal of Central Banking*, 2014, *10* (3), 233–289.

_ **, Ben S. Bernanke, and Eric Milstein**, "Risk Appetite and the Risk-Taking Channel of Monetary Policy," *Journal of Economic Perspectives*, Winter 2023, *37* (1), 77–100.

_ **, Carolin E. Pflueger, and Adi Sunderam**, "Changing Perceptions and Post-Pandemic Monetary Policy," in "Proceedings of 2024 Jackson Hole Economic Symposium: Reassessing the Effectiveness and Transmission of Monetary Policy" Federal Reserve Bank of Kansas City 2024, pp. 285–336.

Bernanke, Ben and Kenneth Kuttner, "What Explains the Stock Market's Reaction to Federal Reserve Policy?," *Journal of Finance*, 06 2005, *60* (3), 1221–1257.

Bilbiie, Florin O and Diego R Känzig, "Greed? Profits, Inflation, and Aggregate Demand," Working Paper 31618, National Bureau of Economic Research May 2024.

Boguth, Oliver, Murray Carlson, Adlai Fisher, and Mikhail Simutin, "The Term Structure of Equity Risk Premia: Levered Noise and New Estimates," *Review of Finance*, 09 2022, *27* (4), 1155–1182.

Braun, Robin, Silvia Miranda-Agrippino, and Tuli Saha, "Measuring Monetary Policy in the UK: The UK Monetary Policy Event-Study Database," *Journal of Monetary Economics*, 2025, *149*, 103645.

Brennan, Connor M., Margaret Jacobson, Christian Matthes, and Todd B. Walker, "Monetary Policy Shocks: Data or Methods?," 2024. Available at SSRN: https://ssrn.com/abstract=4758815.

Bu, Chunya, John Rogers, and Wenbin Wu, "A Unified Measure of Fed Monetary Policy Shocks," *Journal of Monetary Economics*, 2021, *118*, 331–349.

Campbell, Jeffrey, Charles Evans, Jonas Fisher, and Alejandro Justiniano, "Macroeconomic Effects of Federal Reserve Forward Guidance," *Brookings Papers on Economic Activity*, Spring 2012, *2012*, 1–54.

Christensen, Jens H. E., Jose A. Lopez, and Glenn D. Rudebusch, "Inflation Expectations and Risk Premiums in an Arbitrage-Free Model of Nominal and Real Bond Yields," *Journal of Money, Credit and Banking*, 2010, *42* (s1), 143–178.

Cieslak, Anna, "Short-rate expectations and unexpected returns in treasury bonds," *Review of Financial Studies*, 2018, *31* (9), 3265–3306.

_ , Michael McMahon, and Hao Pang, "Did I Make Myself Clear? The Fed and the Market in the Post-2020 Framework Period," Discussion Paper 19360, CEPR 2024.

Cochrane, John H. and Monika Piazzesi, "The Fed and Interest Rates—A High-Frequency Identification," *American economic review*, 2002, *92* (2), 90–95.

Duffee, Gregory R., "Idiosyncratic Variation of Treasury Bill Yields," *The Journal of Finance*, 1996, *51* (2), 527–551.

D'Amico, Stefania and N. Aaron Pancost, "Special Repo Rates and the Cross-Section of Bond Prices: The Role of the Special Collateral Risk Premium," *Review of Finance*, 2022, *26* (1), 117–162.

_ , Don H. Kim, and Min Wei, "Tips from TIPS: The Informational Content of Treasury Inflation-Protected Security Prices," *Journal of Financial and Quantitative Analysis*, 2018, *53* (1), 395–436.

Faust, Jon, Eric T Swanson, and Jonathan H Wright, "Identifying VARs Based on High-Frequency Futures Data," *Journal of Monetary Economics*, 2004, *51* (6), 1107–1131.

_ , **John H. Rogers, Eric Swanson, and Jonathan H. Wright**, "Identifying the Effects of Monetary Policy Shocks on Exchange Rates Using High Frequency Data," *Journal of the European Economic Association*, 09 2003, *1* (5), 1031–1057.

Gertler, Mark and Peter Karadi, "Monetary Policy Surprises, Credit Costs, and Economic Activity," *American Economic Journal: Macroeconomics*, 2015, *7* (1), 44–76.

Gilchrist, Simon, David López-Salido, and Egon Zakrajšek, "Monetary Policy and Real Borrowing Costs at the Zero Lower Bound," *American Economic Journal: Macroeconomics*, January 2015, *7* (1), 77–109.

_ , **Ei Yang, and Guihai Zhao**, "Equity Price Responses and the Fed Information Effect," *Available at SSRN 4865794*, 2024.

Golez, Benjamin and Ben Matthies, "Fed Information Effects: Evidence from the Equity Term Structure," *Journal of Financial Economics*, 2025, *165*, 103988.

Gürkaynak, Refet S., A. Hakan Kara, Burçin Kısacıkoğlu, and Sang Seok Lee, "Monetary Policy Surprises and Exchange Rate Behavior," *Journal of International Economics*, 2021, *130*, 103443.

Gürkaynak, Refet S, Brian Sack, and Jonathan H Wright, "The US Treasury Yield Curve: 1961 to the Present," *Journal of monetary Economics*, 2007, *54* (8), 2291–2304.

_ , _ , **and** _ , "The TIPS Yield Curve and Inflation Compensation," *American Economic Journal: Macroeconomics*, 2010, *2* (1), 70–92.

Gürkaynak, Refet S., Brian Sack, and Eric Swanson, "The Sensitivity of Long-Term Interest Rates to Economic News: Evidence and Implications for Macroeconomic Models," *American Economic Review*, March 2005, *95* (1), 425–436.

_ , _ , **and Eric T. Swanson**, "Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements," *International Journal of Central Banking*, May 2005, *1* (1).

Hanson, Samuel and Jeremy Stein, "Monetary Policy and Long-Term Real Rates," *Journal of Financial Economics*, 2015, *115* (3), 429–448.

Hanson, Samuel G., David O. Lucca, and Jonathan H. Wright, "Rate-Amplifying Demand and the Excess Sensitivity of Long-Term Rates," *Quarterly Journal of Economics*, 2021, *136* (3), 1719–1781.

Hördahl, Peter and Oreste Tristani, "Inflation Risk Premia in the Term Structure of Interest Rates," *Journal of the European Economic Association*, 06 2012, *10* (3), 634–657.

Jarociński, Marek and Peter Karadi, "Deconstructing Monetary Policy Surprises—The Role of Information Shocks," *American Economic Journal: Macroeconomics*, 2020, *12* (2), 1–43.

Kim, Don H. and Athanasios Orphanides, "Term Structure Estimation with Survey Data on Interest Rate Forecasts," *Journal of Financial and Quantitative Analysis*, 2012, *47* (1), 241–272.

Kuttner, Kenneth N., "Monetary Policy Surprises and Interest Rates: Evidence from the Fed Funds Futures Market," *Journal of Monetary Economics*, June 2001, *47* (3), 523–544.

Leary, Mark T. and Roni Michaely, "Determinants of dividend smoothing: Empirical evidence," *The Review of Financial Studies*, 2011, *24* (10), 3197–3249.

Lintner, John, "Distribution of incomes of corporations among dividends, retained earnings, and taxes," *The American Economic Review*, 1956, *46* (2), 97–113.

Manley, Richard and Christian Mueller-Glissmann, "The Market for Dividends and Related Investment Strategies (corrected)," *Financial Analysts Journal*, 2008, *64* (3), 17–29.

Miranda-Agrippino, Silvia, "Unsurprising shocks: information, premia, and the monetary transmission," Bank of England working papers 626, Bank of England Nov 2016.

_ **and Giovanni Ricco**, "The Transmission of Monetary Policy Shocks," *American Economic Journal: Macroeconomics*, 2021, *13* (3), 74–107.

_ **and Tsvetelina Nenova**, "A Tale of Two Global Monetary Policies," *Journal of International Economics*, 2022, *136*, 103606. NBER International Seminar on Macroeconomics 2021.

Mumtaz, Haroon and Konstantinos Theodoridis, "Dynamic Effects of Monetary Policy Shocks on Macroeconomic Volatility," *Journal of Monetary Economics*, 2020, *114*, 262–282.

Nagel, Stefan and Zhengyang Xu, "Movements in Yields, Not the Equity Premium: Bernanke-Kuttner Redux," Working Paper 32884, National Bureau of Economic Research August 2024.

Nakamura, Emi and Jón Steinsson, "High-Frequency Identification of Monetary Non-Neutrality: The Information Effect," *The Quarterly Journal of Economics*, 2018, *133* (3), 1283–1330.

Narain, Namrata and Kunal Sangani, "The Market Impact of Fed Communications: The Role of the Press Conference," *Available at SSRN 4354333*, 2023.

Piazzesi, Monika and Martin Schneider, "Equilibrium Yield Curves," *NBER macroeconomics Annual*, 2006, *21*, 389–472.

Ramey, Valerie, "Macroeconomic Shocks and Their Propagation," in John B. Taylor and Harald Uhlig, eds., *Handbook of Macroeconomics, Vol. 2*, North-Holland, 2016, chapter 2, pp. 71–162.

Rosa, Carlo, "The Financial Market Effect of FOMC Minutes," *Economic Policy Review*, 2013, *19* (2).

Swanson, Eric T., "Measuring the Effects of Federal Reserve Forward Guidance and Asset Purchases on Financial Markets," *Journal of Monetary Economics*, March 2021, *118*, 32–53.

_ , "The Macroeconomic Effects of the Federal Reserve's Conventional and Unconventional Monetary Policies," *IMF Economic Review*, 2024, *72* (3), 1152–1184.

_ **and Vishuddhi Jayawickrema**, "Speeches by the Fed Chair Are More Important Than FOMC Announcements: An Improved High-Frequency Measure of U.S. Monetary Policy Shocks," 2024. working paper, available at https://sites.socsci.uci.edu/~swanson2/papers/hfdat.pdf.

van Binsbergen, Jules H. and Ralph S.J. Koijen, "The Term Structure of Returns: Facts and Theory," *Journal of Financial Economics*, 2017, *124* (1), 1–21.

Wright, Jonathan H, "Term Premia and Inflation Uncertainty: Empirical Evidence from an International Panel Dataset," *American Economic Review*, 2011, *101* (4), 1514–1534.

A Additional Details on USMPD and Monetary Policy Surprises

Federal funds futures in general combine expectations that pertain to multiple upcoming FOMC meetings. Moreover, if the upcoming FOMC meeting is scheduled towards the end of the month, the implied rate from the contract expiring in that month will be largely reflective of the Fed funds rate that had prevailed prior to the meeting, providing a distorted assessment on how market participants update their view following the FOMC decision. Gürkaynak, Sack and Swanson (2005b) show how to combine Fed funds futures at different maturities to isolate policy rate expectations related to particular FOMC meetings. We follow this approach to calculate changes in policy rate expectations—that is, monetary policy surprises—pertaining to the current and subsequent FOMC meeting, as follows:

$$MP1_s = \begin{cases} \frac{D^s}{D^s - d^s}(ff^1_{s,t} - ff^1_{s,t-\Delta t}) & \text{if } D^s - d^s > 7 \\ ff^2_{s,t} - ff^2_{s,t-\Delta t} & \text{otherwise} \end{cases} \tag{2}$$

$$MP2_s = \begin{cases} \frac{D^{s'}}{D^{s'} - d^{s'}} \left[(ff^j_{s',t} - ff^j_{s',t-\Delta t}) - \frac{d^{s'}}{D^{s'}} MP1_s \right] & \text{if } D^{s'} - d^{s'} > 7 \\ ff^{j+1}_{s,t} - ff^{j+1}_{s,t-\Delta t} & \text{otherwise,} \end{cases} \tag{3}$$

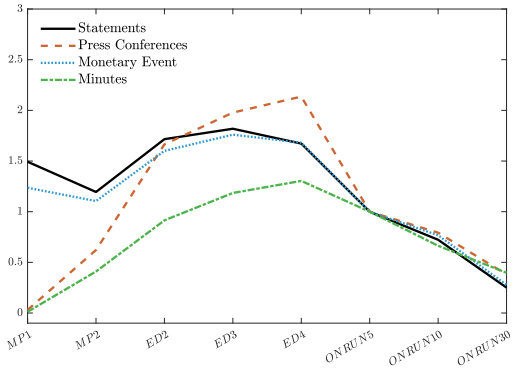
where $ff^j_{s,t}$ denotes the j^{th} Fed funds futures in month s traded at time t, D^s is the number of days in month s and d^s is the day the asset is traded. In Eq. (2), $MP1$ denotes the surprise around the next FOMC meeting. This is equal to the change in the price of the front contract if the FOMC meeting is scheduled within the first three weeks of the month, and to the change in price of the second contract if the meeting falls in the last week of the month. Similarly, $MP2$ in Eq. (3) denotes the surprise in the second upcoming FOMC meeting. $MP2$ uses a combination of longer maturity futures depending on the month in which the second meeting falls, and subtracts the surprise component relative to the upcoming one ($MP1$). For more discussion of this issue, see Brennan, Jacobson, Matthes and Walker (2024).

Table A.1: Content of USMPD

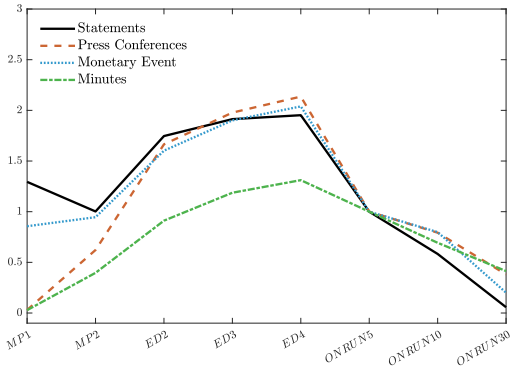
Label	LSEG RIC	Description	Start Date in USMPD
MP1		Surprise in the upcoming FOMC event calculated using FF futures	1994
MP2		Surprise in the second FOMC event calculated using FF futures	1994
FF1:FF6	FF	Federal Funds futures. First six contract from the date of the FOMC event	1994
ED1:ED8	ED	Eurodollar. Quarterly contracts with maturity at the end of quarter	ED1:4 1994, ED5:8 1997
	SRA	SOFR futures. Quarterly contracts with maturity at the end of quarter	2022
US3MT*	US3MT=RR	3-month T-Bill rate	1994
US6MT*	US6MT=RR	6-month T-Bill rate	1997
USD1YOIS*	USD1YOIS=	1-year OIS rate	2004
USD2YOIS*	USD2YOIS=	2-year OIS rate	2011
US2YT*	US2YT=RR	2-year Treasury yield	1994
US5YT*	US5YT=RR	5-year Treasury yield	1994
US10YT*	US10YT=RR	10-year Treasury yield	1994
US30YT*	US30YT=RR	30-year Treasury yield	1994
UST5YTIP*	UST5YTIP=RR	5-year TIPS yield	2005
UST10YTIP*	UST10YTIP=RR	10-year TIPS yield	2005
UST30YTIP*	UST30YTIP=RR	30-year TIPS yield	2005
SP500	.INX	S&P 500 market index	1996
SPFUT	ESc1	S&P E-mini futures. Front contract	1997
W5000	.FTW5000	Wilshire 5000 market index	2021
USDDXY	.DXY	Dollar index	1997
USDJPY	JPY=	Spot bilateral exchange rate	1997
USDEUR	EUR=	Spot bilateral exchange rate	1998

Notes: * Denotes yield on benchmark rates as calculated by LSEG (London Stock Exchange Group).

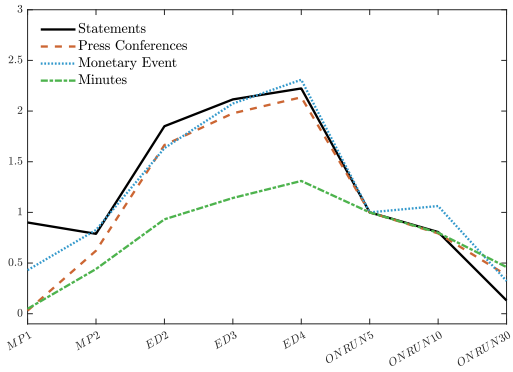
Figure A.1: Loadings of Monetary Policy News Across Subsamples



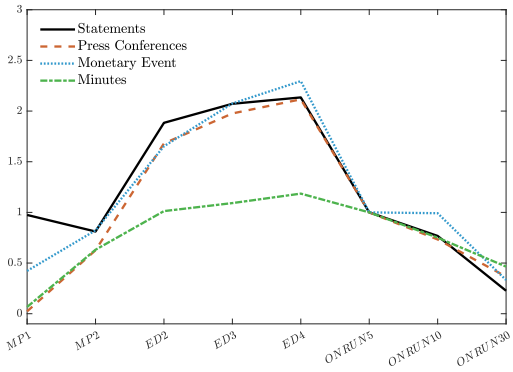
(a) 1994-2024



(b) 2004-2024 ex GFC



(c) 2010-2019



(d) 2016-2024

Table A.2: Standard deviations calculated over full sample over which each surprise is available

	STMT (all)	STMT (with PC)	STMT (without PC)	PC	ME	MIN
Standard Deviation	3.45	2.52	3.80	2.74	3.84	1.73

Table A.3: High-frequency response of Treasury market to different monetary policy surprises

	5y yld			10y yld			30y yld		
	STMT	PC	ME	STMT	PC	ME	STMT	PC	ME
(A) Nominal									
Coefficient	1.14	1.28	1.40	0.58	0.79	0.80	0.06	0.38	0.20
SE	(0.23)	(0.21)	(0.21)	(0.18)	(0.17)	(0.17)	(0.13)	(0.11)	(0.12)
R^2	0.40	0.30	0.41	0.19	0.19	0.24	0.00	0.17	0.03
N	171	81	171	171	81	171	171	81	171
(B) Real									
Coefficient	1.44	1.87	1.73	0.89	1.23	1.13	0.25	0.63	0.46
SE	(0.23)	(0.17)	(0.22)	(0.15)	(0.14)	(0.16)	(0.15)	(0.10)	(0.14)
R^2	0.47	0.57	0.50	0.35	0.40	0.36	0.05	0.33	0.14
N	163	81	163	163	81	163	163	81	163
(C) Inflation									
Coefficient	-0.35	-0.59	-0.36	-0.36	-0.44	-0.36	-0.21	-0.25	-0.26
SE	(0.06)	(0.09)	(0.06)	(0.06)	(0.06)	(0.05)	(0.07)	(0.05)	(0.06)
R^2	0.21	0.26	0.14	0.29	0.32	0.23	0.15	0.20	0.17
N	163	81	163	163	81	163	163	81	163

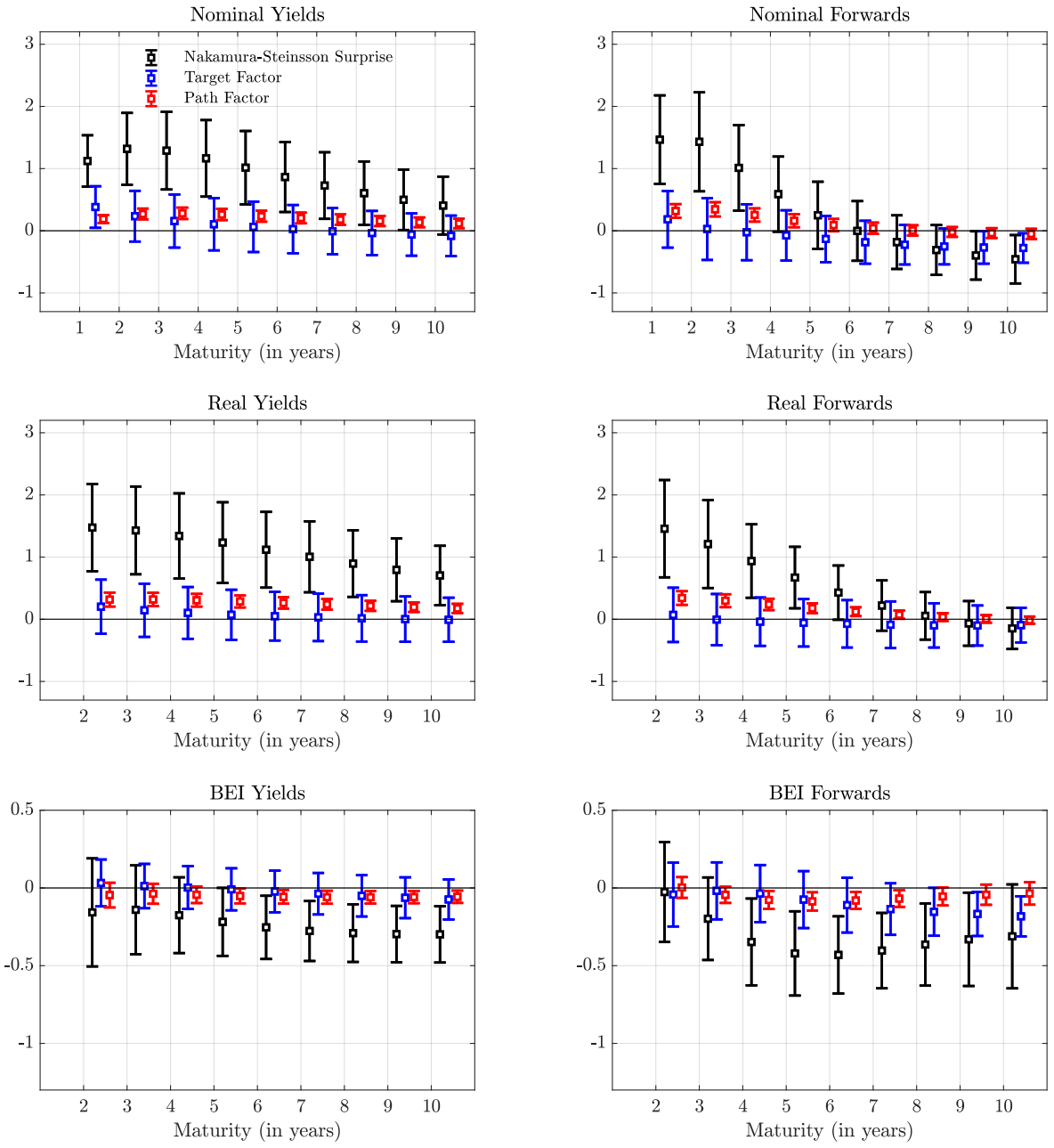
High-frequency regressions of changes in Treasury rates around FOMC communication events on high-frequency monetary policy surprise over different windows. STMT: 30-minute changes around FOMC statements. PC: changes around the post-meeting press conference. ME: changes over the monetary event window, that is, statements as well as press conferences when available. Response of nominal Treasury rates in panel (A), of real (TIPS) rates in panel (B), and of breakeven inflation rates in panel (C), constructed as the difference between nominal and real yields. Rates are 2-year, 5-year, and 10-year yields. Sample: 171 FOMC announcements from 2004 to 2024, including both scheduled and unscheduled FOMC meetings, and excluding the crisis period from July 2008 to June 2009. White standard errors in parentheses.

B Additional Results for Section 4

This Appendix shows additional figures and tables for the response of the Treasury market to FOMC announcement surprises, adding to the main exhibits in Section 4.1.

[TBC: add some discussion—do we need both table and figure?] Response to target and path factor: Figure B.1

Figure B.1: Term structure of interest rate sensitivity to FOMC announcement surprises, target and path factors.



Dependent variable are changes in one-day window around scheduled FOMC meetings ($t-1$ to t). Sample period is January 2004 to December 2024. 95% confidence intervals based on White standard errors.

Table B.1: Response of Treasury market to FOMC target and path surprises

	2y yld	5y yld	10y yld	5-10y forw
(A) Nominal, N = 167				
Nakamura-Steinsson Surprise				
Coefficient	1.32	1.01	0.41	-0.20
SE	(0.30)	(0.30)	(0.24)	(0.21)
R^2	0.21	0.10	0.02	0.01
Target Factor				
Coefficient	0.23	0.06	-0.08	-0.23
SE	(0.21)	(0.21)	(0.17)	(0.15)
R^2	0.01	0.00	0.00	0.02
Path Factor				
Coefficient	0.27	0.23	0.12	0.00
SE	(0.04)	(0.05)	(0.04)	(0.04)
R^2	0.24	0.15	0.06	0.00
(B) Real, N = 167				
Nakamura-Steinsson Surprise				
Coefficient	1.47	1.23	0.70	0.18
SE	(0.36)	(0.33)	(0.24)	(0.20)
R^2	0.16	0.13	0.07	0.01
Target Factor				
Coefficient	0.20	0.07	-0.01	-0.09
SE	(0.22)	(0.21)	(0.18)	(0.18)
R^2	0.01	0.00	0.00	0.00
Path Factor				
Coefficient	0.32	0.29	0.17	0.06
SE	(0.06)	(0.05)	(0.04)	(0.03)
R^2	0.20	0.19	0.11	0.02
(C) Inflation, N = 167				
Nakamura-Steinsson Surprise				
Coefficient	-0.16	-0.22	-0.30	-0.38
SE	(0.18)	(0.11)	(0.09)	(0.12)
R^2	0.01	0.02	0.05	0.05
Target Factor				
Coefficient	0.03	-0.01	-0.07	-0.14
SE	(0.08)	(0.07)	(0.07)	(0.08)
R^2	0.00	0.00	0.01	0.02
Path Factor				
Coefficient	-0.05	-0.05	-0.06	-0.06
SE	(0.04)	(0.02)	(0.02)	(0.03)
R^2	0.01	0.03	0.05	0.04

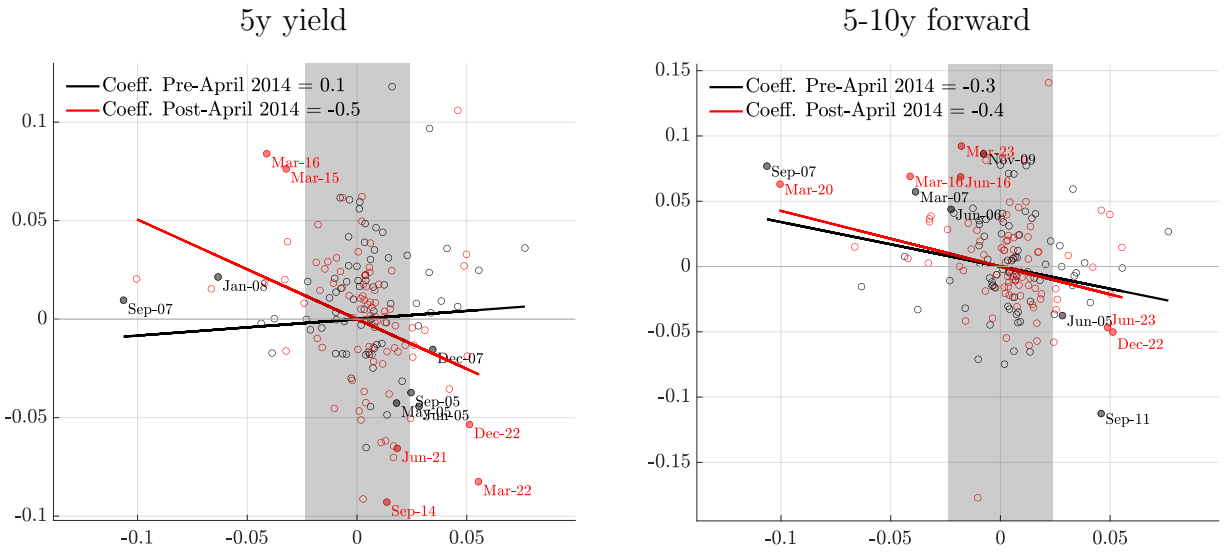
Event-study regressions of daily changes in Treasury rates around FOMC announcements ($t-1$ to t) on

[TBC: revise/shorten discussion] To further analyze which episodes or even individual announcements drive our results, Figure B.2 shows scatter plots of changes in the five-year BEI yield (left panel) and the 10-year BEI yield (right panel) against FOMC announcement surprises. Two different subperiods, corresponding to panels (A) and (B) in Table 3, are highlighted in the scatter plots: The red cloud of points corresponds to the sample from January 2004 to March 2014, whereas the black circles visualize the sample from April 2014 to December 2024. For each regression sample, the six most influential observations, as measured by the $DFBETA$ measure of influence, are highlighted as filled circles and labeled with the month of the FOMC announcement.

Figure B.2 shows that the sensitivity of BEI rates became (more) negative over the later sample period mainly because of two important episodes. First, the "Yellen liftoff" episode in 2015–2016 included several dovish FOMC announcements that led to substantial upward revisions in market-based inflation expectations. The most prominent example is the FOMC announcement on March 16, 2016, in which the Committee signaled patience in light of the "current shortfall of inflation from 2 percent" and expectations for the policy rate path declined in response to the announcement. This led to a significant increase in breakeven inflation rates across the curve. A similar dovish surprise was the March 2015 FOMC announcement, which pushed out liftoff expectations and materially raised breakevens. The second important episode is the period since liftoff from the ZLB in March 2022, which included both hawkish and dovish surprises with significant negative impact on BEI rates. The FOMC announcement on March 17, 2022, was a hawkish surprise due to both the size of the rate hike and the signaling for future rate hikes, and breakeven rates fell materially, at least for short maturities including the five-year yield. Dovish surprises included the announcements in March 2023 and September 2024, which raised breakeven rates. While it is difficult to pointpoint simple explanations for the increased sensitivity of BEI rates to FOMC surprises since 2015, the evidence suggests that FOMC announcement surprises around ZLB liftoff and during tightening cycles had especially pronounced effects on market-based inflation expectations.

[TBC: discuss] Table B.2 shows two-day response of Treasury rates to FOMC announcement surprises

Figure B.2: BEI rate changes and FOMC surprises across subsamples



BEI rate changes on days with FOMC announcements and monetary policy surprise calculated from 30-minute rate changes around the release of the FOMC statement, for the five-year BEI yield (left panel) and the five-to-ten-year forward BEI rate (right panel). Red circles for 78 FOMC announcements from January 2004 to March 2014 (excluding the crisis period from July 2008 to June 2009); black circles for 90 FOMC announcements from April 2014 to December 2024. Both scheduled and unscheduled FOMC meetings are included. Six most influential observations, as measured by the $DFBETA$ measure of influence, highlighted and labeled. Least squares regression lines correspond to estimates shown in panels (A) and (B) of Table 3.

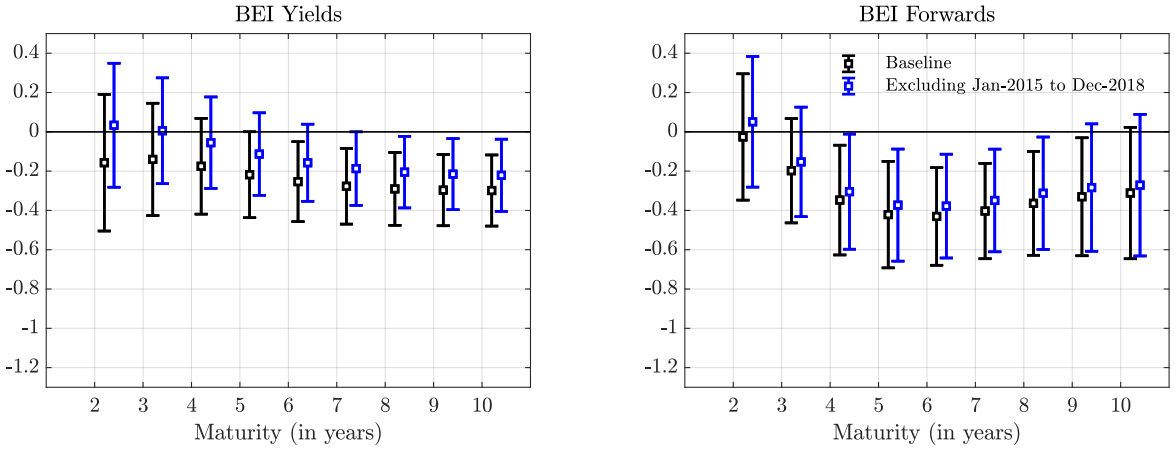
Figure B.3 plots the estimated term structure response of BEI rates to FOMC announcement surprises, both for the baseline sample and for a subsample that excludes the December 2015 to December 2018 tightening cycle. The estimates show that the sensitivity of forward BEI rates at longer horizons turns insignificant when we exclude the 2015-2018 tightening cycle from our full sample.

Table B.2: Response of two-day changes in Treasury rates to FOMC announcement surprises

	2y yld	5y yld	10y yld	5-10y forw
(A) Nominal				
Coefficient	1.35	1.08	0.46	-0.15
SE	(0.32)	(0.35)	(0.35)	(0.40)
R^2	0.14	0.07	0.01	0.00
N	165	165	165	165
(B) Real				
Coefficient	1.87	1.58	0.99	0.40
SE	(0.40)	(0.40)	(0.34)	(0.32)
R^2	0.15	0.11	0.06	0.01
N	165	165	165	165
(C) Inflation				
Coefficient	-0.52	-0.51	-0.52	-0.55
SE	(0.23)	(0.19)	(0.17)	(0.19)
R^2	0.03	0.04	0.05	0.04
N	165	165	165	165

Event-study regressions of two-day changes in Treasury rates around FOMC announcements ($t-1$ to $t+1$) on high-frequency announcement surprises, the scaled first principal component of 30-minute changes in near-term money market rates around the release of the FOMC statement, as well as its target and path factor. Response of nominal Treasury rates in panel (A), of real (TIPS) rates in panel (B), and of breakeven inflation rates in panel (C). Rates are 2-year, 5-year, and 10-year yields in the first three columns, and the 5-to-10-year forward rate in the last column. Sample: 171 FOMC announcements, including both scheduled and unscheduled FOMC meetings, and excluding the crisis period from July 2008 to June 2009. White standard errors are in parentheses.

Figure B.3: Term structure of breakeven inflation rates sensitivity to FOMC announcement surprises. Baseline and subsample results.



Event-study regressions of daily changes in Treasury rates around FOMC announcements on high-frequency announcement surprises, the scaled first principal component of 30-minute changes in near-term money market rates around the release of the FOMC statement. Response of breakeven inflation rates with yield responses in left panels, and forward rate responses in right panels. Baseline sample: 171 FOMC announcements, including both scheduled and unscheduled FOMC meetings, and excluding the crisis period from July 2008 to June 2009. Error bars show 95% confidence intervals based on White standard errors. Blue bars exclude January 2015 to December 2018 (TBC: should this be December 2015 to December 2018?).

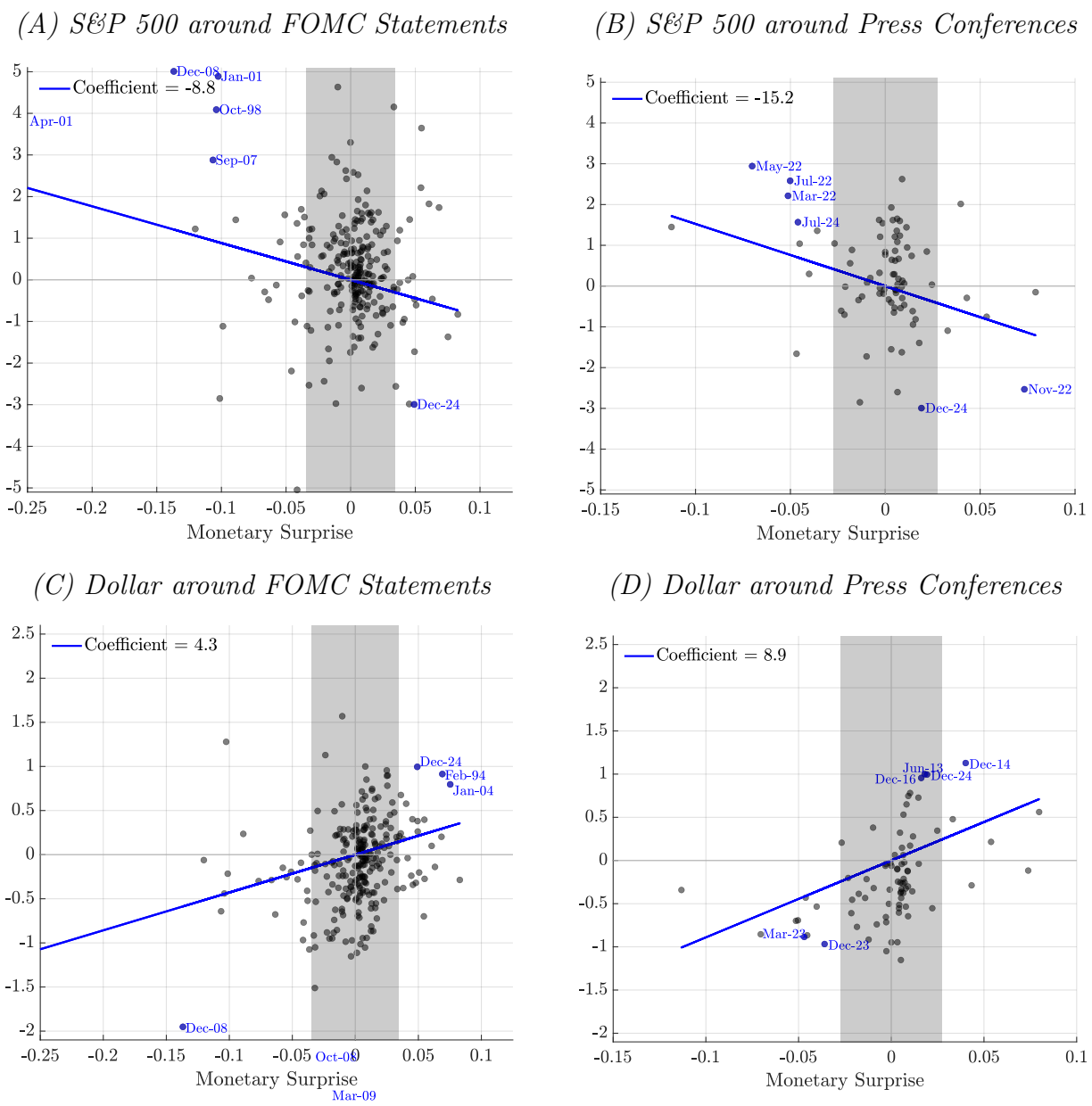
C Additional Results for Section 5

Table C.1: Response of risk assets to monetary policy surprises: multivariate regression

	S&P 500	VIX	Dollar Index	Risk Appetite	BBB Spread	CDX IG	MBS Yield	MBS OAS
STMT	-1.6	6.7	7.8	-4.4	43.2	41.4	75.7	8.9
	(8.9)	(16.1)	(2.5)	(13.1)	(20.7)	(18.9)	(73.6)	(51.2)
PC	-15.4	21.9	9.6	-9.3	6.1	23.5	247.1	101.8
	(5.1)	(7.7)	(1.7)	(16.5)	(23.4)	(19.3)	(61.1)	(41.5)
R^2	0.12	0.06	0.35	0.02	0.04	0.07	0.10	0.02
N	80	80	80	59	80	80	80	80

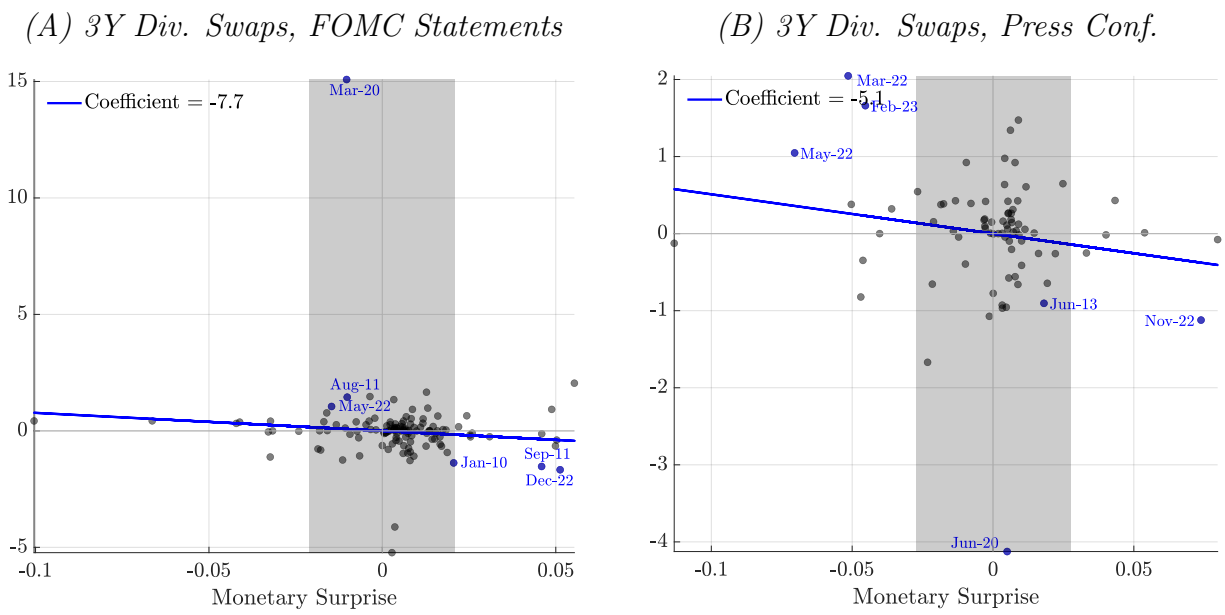
Event-study regressions of changes/returns in risk assets around FOMC communication events on high-frequency statement (STMT) and press conference (PC) surprises. Risk assets: one-day return of S&P 500 (percent); one-day change in VIX; one-day return in dollar index DXY (percent); two-day change in risk appetite index; two-day change in BBB corporate bond spread (basis points); two-day change in investment-grade CDX index (basis points); two-day change in MBS yield and option-adjusted spread (OAS) (both basis points). Sample: all scheduled and unscheduled FOMC meetings with post-meeting press conferences from April 2011 to December 2024. White standard errors in parentheses.

Figure C.1: Daily stock market/dollar returns and monetary policy surprises



Returns in risk assets on days with FOMC announcements and monetary policy surprise. Top panels show daily S&P 500 returns on vertical axis, bottom panels show two-day returns on broad nominal dollar index. Left panels show FOMC statement surprises for all FOMC statements from 1994 to 2024 (264 observations). Right panels show press conference surprises for all post-meeting press conferences from 2011 to 2024 (81 observations). Six most influential observations, as measured by the $DFBETA$ measure of influence, highlighted and labeled. Least squares regression lines correspond to estimates shown in panels (A) and (B) of Table 5. Gray-shaded areas correspond to one standard deviation, above and below zero, for the monetary policy surprise.

Figure C.2: Dividend swaps and monetary policy surprises



Two-day returns on dividend swaps with interpolated three-year horizon and high-frequency monetary policy surprises. Left panel: FOMC statement surprises for all scheduled and unscheduled FOMC meetings from January 2010 to December 2024. Right panel: press conference surprises for all post-meeting press conferences from April 2011 to December 2024. Six most influential observations, as measured by the $DFBETA$ measure of influence, highlighted and labeled. Least squares regression lines correspond to estimates shown in panels (A) and (B) of Table 7. Gray-shaded areas correspond to one standard deviation, above and below zero, for the monetary policy surprise.

Table C.2: Response of dividend swaps to monetary policy surprises: 2004–2024 sample

	1y	2y	3y	4y	5y	6y	7y
(A) FOMC Statements, $N = 169$							
Coefficient	0.5	-1.3	-1.4	-2.0	-2.6	-1.5	-2.2
SE	(3.1)	(2.1)	(3.9)	(3.1)	(3.7)	(4.1)	(3.5)
R^2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(B) Press Conferences, $N = 79$							
Coefficient	-2.6	-4.1	-5.1	-4.0	-4.9	-3.6	-6.8
SE	(1.7)	(3.0)	(3.1)	(3.3)	(4.4)	(4.1)	(3.8)
R^2	0.02	0.03	0.03	0.02	0.02	0.01	0.03
(C) Monetary Events, $N = 169$							
Coefficient	-0.7	-2.5	-2.7	-2.7	-3.7	-2.2	-3.6
SE	(2.2)	(1.5)	(3.0)	(2.3)	(2.8)	(3.1)	(2.8)
R^2	0.00	0.01	0.00	0.00	0.01	0.00	0.01
(D) Minutes, $N = 160$							
Coefficient	14.2	-8.3	-3.2	-5.9	-8.7	-7.9	-6.9
SE	(11.2)	(7.6)	(5.0)	(4.5)	(5.0)	(5.0)	(7.1)
R^2	0.03	0.01	0.00	0.01	0.02	0.02	0.01

Event-study regressions of two-day returns in dividend swaps, for constant (interpolated) annual horizons, on high-frequency monetary policy surprises over different windows. Panel (A): 30-minute changes around FOMC statements. Panel (B): changes around post-meeting press conferences. Panel (C): changes around statements, and press conferences when available. Panel (D): 30-minute changes around release of FOMC meeting minutes. Sample period: 2004–2024 (our full sample of dividend swap data). White standard errors in parentheses.

Table C.3: Response of dividend futures to monetary policy surprises

	1y	2y	3y	4y	5y	6y	7y
(A) FOMC Statements							
Coefficient	3.2	0.8	-6.7	-9.0	-8.8	-7.3	-9.0
SE	(2.7)	(3.8)	(6.2)	(6.6)	(6.5)	(4.4)	(3.5)
R^2	0.00	0.00	0.01	0.01	0.01	0.02	0.02
N	72	72	72	72	72	64	64
(B) Press Conferences							
Coefficient	-3.2	-5.9	-4.9	-3.9	-0.3	-2.2	-1.6
SE	(1.8)	(3.2)	(3.4)	(3.8)	(5.9)	(3.7)	(2.9)
R^2	0.03	0.06	0.03	0.02	0.00	0.00	0.00
N	72	72	72	72	72	64	64
(C) Monetary Events							
Coefficient	-1.0	-3.4	-6.1	-6.3	-4.1	-5.0	-5.3
SE	(1.1)	(1.6)	(2.6)	(2.8)	(3.7)	(2.5)	(2.3)
R^2	0.00	0.02	0.01	0.01	0.01	0.02	0.02
N	72	72	72	72	72	64	64
(D) Minutes							
Coefficient	2.6	3.2	0.7	-0.1	-0.5	-7.3	-1.3
SE	(5.4)	(6.2)	(5.9)	(5.1)	(5.7)	(5.9)	(2.0)
R^2	0.00	0.00	0.00	0.00	0.00	0.02	0.00
N	72	72	72	72	72	64	64

Event-study regressions of two-day returns in dividend futures, for constant (interpolated) annual horizons, on high-frequency monetary policy surprises over different windows. Panel (A): 30-minute changes around FOMC statements. Panel (B): changes around post-meeting press conferences. Panel (C): changes around statements, and press conferences when available. Panel (D): 30-minute changes around release of FOMC meeting minutes. Sample period: 2016–2024. White standard errors in parentheses.