Finance and Economics Discussion Series

Federal Reserve Board, Washington, D.C.
ISSN 1936-2854 (Print)
ISSN 2767-3898 (Online)

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2026-023

Please cite this paper as:
Knox, Benjamin, and Annette Vissing-Jorgensen (2026). "The Effect of the Federal Reserve on the Stock Market: Magnitudes, Channels and Shocks," Finance and Economics Discussion Series 2026-023. Washington: Board of Governors of the Federal Reserve System, https://doi.org/10.17016/FEDS.2026.023.

The Effect of the Federal Reserve on the Stock Market: Magnitudes, Channels and Shocks

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August 25, 2025

We survey and extend work on the Federal Reserve's effect on the stock market, focusing on three empirical findings: The effect of monetary policy surprises in a narrow window around announcements from the Federal Open Market Committee (FOMC), the pre-FOMC announcement drift, and the FOMC cycle in stock returns. We discuss the **magnitude** of the Fed's impact (directional effects or effects on average stock returns), the types of **shocks** coming from the Fed (pure monetary policy shocks, reaction function news, or information about the Fed's view of the economy), and the **asset pricing channels** through which effects emerge (an equity premia for news from the Fed, or changes to yields, equity premia, or expected dividends). We also consider the **information transmission (communication) channels**. The Fed's effect on the stock market is large, even for average stock returns earned over periods of several decades. Fed-induced changes to both yields and equity premia play substantial roles, with less direct evidence available regarding cash flows. For stocks, reaction function news appears to be more important than Fed information effects. Communication flows outside announcements windows are important.

1. Introduction

How much does the Federal Reserve affect the stock market? Through which mechanisms do effects emerge? These questions are classic issues in both monetary policy and asset pricing. While the ultimate objectives of the Federal Reserve are price stability and full employment, monetary policy works by affecting financial conditions, including the stock market, bond yields, borrowing conditions, and exchange rates. Understanding the strength of and mechanisms underlying these relations is at the heart of monetary policy transmission. Furthermore, any effect of policy on the stock market may be indicative of real effects of monetary policy (e.g., Thorbecke 1997). As for asset pricing, active investors benefit from an understanding of the risk-return properties of the market around announcements from the Federal Open Market Committee (FOMC) and the extent to which the Fed affects the stock market outside announcement windows. Investors will also be keen to know whether effects of the Fed on observed average returns are due to risk premia (in which case they may continue) or to unexpectedly good news from the Fed.

We organize our review around three empirical findings: (*a*) the effect of short-rate surprises on the market in a narrow half-hour window around FOMC announcements; (*b*) stock returns in the hours leading up to scheduled FOMC announcements (pre-FOMC announcement effects); and (*c*) patterns of stock returns between FOMC meetings (stock returns over the FOMC cycle). The literature on the narrow window is about directional effects of monetary policy surprises. The newer literature on facts (*a*) and (*b*) documents that monetary policy also appears to have had large positive effects even on average stock returns over long periods. To confine the task at hand, we focus on the effects of monetary policy on the overall stock market for the United States; there is also an active literature on cross-sectional effects across stocks and countries. We concentrate on conventional monetary policy and forward guidance. The literature on quantitative easing (QE) finds less consistent effects on stocks than on bonds.

2. Framework

Before turning to empirical evidence, we lay out a framework for understanding the Federal Reserve's potential effects on the stock market. We first explain the traditional approach to estimate the effect of monetary policy shocks on stock prices. We then discuss the potential sources of these shocks through a simple Taylor rule framework, the asset pricing channels through which stock prices can change, and the information channels through which the Fed can communicate monetary policy.

2.1 The Monetary Shock Multiplier

A common approach to estimating the effect of monetary policy shocks on the stock market is a high-frequency event study. Researchers study the effect of interest rate surprises on the market in a narrow window around FOMC announcements. The estimated regression is a version of the following:

$$r_t^m = a + b\Delta i_t^u + \varepsilon_t \tag{1}$$

where r_t^m is the realized market return, Δi_t^u measures the unexpected part of the interest rate change around the announcement, and b is what one could refer to as a monetary policy shock "multiplier." A positive monetary policy shock ($\Delta i_t^u > 0$) is predicted to lower the value of the stock market (b < 0). This could happen via the monetary policy shock inducing higher yields, higher equity premia, or lower expected dividends. The underlying premise is that prices are sticky in the short run, so a change in the nominal policy rate translates to a change in the short real rate.

2.2 Types of Monetary Policy Shocks

A simple Taylor rule framework implies that the monetary policy shock can take three forms: pure monetary policy shocks (Taylor rule error terms), news about the Fed's reaction function (including its inflation target), and news about the Fed's view of the economy (the output gap, inflation gap, or the natural real rate of interest r_t^*). Depending on the underlying type of monetary policy shock, the asset pricing channels and even the sign of the overall effect of a monetary policy shock on the market could differ. While a positive pure monetary policy shock is expected to unequivocally lower the market, this is not necessarily the case for a positive monetary policy shock due to news about the Fed's reaction function or news about the Fed's view of the economy.

To conceptualize the types of shocks, consider a standard Taylor rule for the short-term nominal policy rate [using the notation of Bauer, Pflueger & Sunderam (2024a)]:

$$i_t = r_t^* + \pi_t^* + \gamma_t x_t + \beta_t(\pi_t - \pi_t^*) + u_t \tag{2}$$

where π_t^* is the inflation target, r_t^* is the natural real rate of interest, x_t is the output gap (defined as actual output minus potential output), and u_t is a "pure" monetary policy shock which is typically assumed to be uncorrelated over time. Let I_t denote market participants' information set (data and models) before Fed news arrives, and let I_t^f denote the information set of the Fed. (r^*, x_t, π_t) is the economic state, and $(\pi_t^*, \gamma_t, \beta_t)$ the Taylor rule coefficients. Consider what drives shocks to i_t at policy announcements under various assumptions about what is known to market participants ahead of time.

Case 1 (Pure monetary policy shocks). The economic state and Taylor rule coefficients are known to both the Fed and the public, so the surprise component of the policy rate change at the announcement is

$$i_t - E(i_t\,|I_t) = u_t \tag{3}$$

Case 2 (also reaction function news). The economic state is known to both the Fed and the public while the Taylor rule coefficients are known to the Fed but not the public. Then, $I_t = (r_t^*, x_t, \pi_t)$ and $I_t^f = [(r_t^*, x_t, \pi_t), (\pi_t^*, \gamma_t, \beta_t)]$. The surprise policy rate change now has a second driver, the effects of the true Taylor rule coefficients being different from market expectations prior to the announcement:

$$i_t - E(i_t|I_t) = \left[\pi_t^* - E\left(\pi_t^{*g}|I_t\right)\right] + [\gamma_t - E(\gamma_t|I_t)]x_t + [\beta_t - E(\beta_t|I_t)](\pi_t - \pi_t^*) + u_t \tag{4}$$

Case 3 (also Fed information effects/Fed belief surprises). The economic state is not known to either the Fed or the public and they may have different information sets H_t and H_t^f. Taylor rule coefficients are known to the Fed but not the public. Then $I_t = H_t$ and $I_t^f = \left[H_t^f, (\pi_t^*, \gamma_t, \beta_t)\right]$. The Taylor rule becomes[1]

$$i_t = E\left(r_t^*|\, H_t^f\right) + \pi_t^* + \gamma_t E\left(x_t|H_t^f\right) + \beta_t E\left(\pi_t - \pi_t^*)|H_t^f\right) + u_t \tag{5}$$

Assuming that γ_t and $E\left(x_t|H_t^f\right)$ are independent with respect to the market's information and similarly for β_t and $E\left(\pi_t - \pi_t^*)|H_t^f\right)$, we get

$$E(i_t|H_t) = E\left(E\left(r_t^*|H_t^f\right) + \pi_t^*|H_t\right) + E(\gamma_t|H_t)E\left(E\left(x_t|H_t^f\right)|H_t\right) + E(\beta_t|H_t)E\left(E\left(\pi_t - \pi_t^*|\, H_t^f\right)|H_t\right). \tag{6}$$

The surprise policy rate change now has a third driver, differences between the Fed's actual expectations of r_t^*, x_t, and $\pi_t - \pi_t^*$ and the market's pre-announcement view of what those Fed expectations are:[2]

$$\begin{aligned} i_t - E(i_t|H_t) \approx\; & E\left(r_t^*|H_t^f\right) - E\left(E\left(r_t^*|\, H_t^f\right)|H_t\right) + \gamma_t\left[E\left(x_t|H_t^f\right) - E\left(E\left(x_t|\, H_t^f\right)|H_t\right)\right] \\ & + \beta_t\left[E\left(\pi_t - \pi_t^*|H_t^f\right) - E\left(E\left(\pi_t - \pi_t^*|\, H_t^f\right)|H_t\right)\right] + \pi_t^* - E(\pi_t^*|H_t) \\ & + [\gamma_t - E(\gamma_t|H_t)]E\left(E\left(x_t|\, H_t^f\right)|H_t\right) + [\beta_t - E(\beta_t|H_t)]E\left(E\left(\pi_t - \pi_t^*|\, H_t^f\right)|H_t\right) + u_t. \end{aligned} \tag{7}$$

[1] This assumes the Fed sets policy based on its own views only. As shown in Caballero and Simsek (2022), optimal policy would set the interest rates based on a weighted average of the Fed's and market participants' expectations. If that were the case in practice, shocks to the policy rate would still contain three types of information in case 3.

[2] To see this, note that $\gamma_t E\left(x_t|H_t^f\right) - E(\gamma_t|H_t)E\left(E\left(x_t|\, H_t^f\right)|H_t\right) = \gamma_t\left[E\left(E\left(x_t|\, H_t^f\right)|H_t\right) + E\left(x_t|H_t^f\right) - E\left(E\left(x_t|\, H_t^f\right)|H_t\right)\right] - E(\gamma_t|H_t)E\left(E\left(x_t|\, H_t^f\right)|H_t\right) = [\gamma_t - E(\gamma_t|H_t)]E\left(E\left(x_t|\, H_t^f\right)|H_t\right) + \gamma_t\left[E\left(x_t|H_t^f\right) - E\left(E\left(x_t|\, H_t^f\right)|H_t\right)\right]$.

2.3 Possible Asset Pricing Channels

Present value implies that the capital gain of the stock market is driven by changes to either real yields, equity premia or expected real dividends. Using the formulation of Knox and Vissing-Jorgensen (2024):

$$\begin{aligned}\frac{P_{t+1}}{P_t} \approx & \left[w_t^{(1)} G_{t+1}^{D,(1)} + w_t^{(2)} G_{t+1}^{D,(2)} + w_t^{(3)} G_{t+1}^{D,(3)} + \cdots\right] \\ & \times \left[1 - \left(\Delta f_{t+1}^{YC,1}\right)\right] \times \left[1 - \left(1 - w_t^{(1)}\right)\left(\Delta f_{t+1}^{YC,2}\right)\right] \times \left[1 - \left(1 - w_t^{(1)} - w_t^{(2)}\right)\left(\Delta f_{t+1}^{YC,3}\right)\right] \times \ldots \\ & \times \left[1 - \left(\Delta f_{t+1}^{EP,1}\right)\right] \times \left[1 - \left(1 - w_t^{(1)}\right)\left(\Delta f_{t+1}^{EP,2}\right)\right] \times \left[1 - \left(1 - w_t^{(1)} - w_t^{(2)}\right)\left(\Delta f_{t+1}^{EP,3}\right)\right] \times \ldots \end{aligned} \quad (8)$$

where $w_t^{(n)}$ is the weight of the dividend at time *t+n* in the value of the stock market at time *t* and $G_{t+1}^{D,(n)} = \frac{E_{t+1}[D_{t+n+1}]}{E_t[D_{t+n}]}$ is the (gross) growth rate of the expected dividend *n* years out (in a constant maturity sense). $f_t^{YC,n}$ is the riskless forward yield for year *n* and $f_t^{EP,n}$ is the forward equity premium for year *n*, with $\Delta f_{t+1}^{YC,n}$ and $\Delta f_{t+1}^{EP,n}$ denoting changes from *t* to *t+1*. This decomposition clarifies that the effect of a change to a given input (an expected dividend or a forward yield or forward equity premium) on the stock price depends on the fraction of market value that is impacted by the change, as captured by the dividend weights. For example, an increase in the forward yield for year 3 lowers the market value in proportion to $\left(1 - w_t^{(1)} - w_t^{(2)}\right)$ which is the weight of dividends at t+3 and later in today's stock price.

2.4 Possible Information Channels

Information from the Fed may arrive via formal communications channels, such as the post-FOMC statement and press conference, the FOMC minutes, or policy maker speeches, or via informal communications channels, such as newspaper articles written by reporters with access to Fed sources.

3. The Narrow Announcement Window Around FOMC Announcements

3.1 Estimates of the Monetary Policy Shock Multiplier in the Narrow Window

Bernanke & Kuttner (2005) estimate the monetary policy shock multiplier using an announcement window of 1 day. Following Kuttner (2001), the monetary policy shock used is calculated from the daily change in the federal funds futures contract that covers the announcement month. This contract is based on the average of the daily effective federal funds rate values over the month, but the change can be scaled up based on the number of remaining days in the month to calculate the change in the expected average value of the effective federal funds rate for the part of the month that remains after the event. These changes are referred to as Kuttner surprises. Bernanke and Kuttner's sample covers July 1989 to December 2002 and includes 76 scheduled FOMC meeting dates and 55 non-FOMC days with unscheduled changes to the federal funds target (excluding September 17, 2001). From February 1994, changes to the target are accompanied by an FOMC announcement, while changes prior to that are assumed to be inferred from open market operations done the day after the decision. Bernanke and Kuttner's baseline estimate is a multiplier of $b = -4.68$ ($t = 3.03$), meaning that a 20 bps (basis points) surprise increase would lead to about a 1% market loss.

Following Gürkaynak, Sack & Swanson (2005a), later work has refined the event-study approach and typically uses data for half-hour windows from 10 minutes before to 20 minutes after the announcement. A narrower window helps overcome omitted variables issues (other news may drive both the stock market and the policy decision) as well as endogeneity problems (in daily data, policy may be reacting to stock market news earlier in the day). Using data from scheduled FOMC meetings and unscheduled target changes from January 1990 to December 2004, Gürkaynak, Sack & Swanson (2005a) estimate a multiplier of $b = -4.03$ ($t = -3.63$). Use of half-hour windows prior to February 1994 is possible because the time of open market operations is known (taking place at 11:30 AM daily during that period).

Different monetary policy shock measures are used in the literature. Because monetary policy communication often contains forward guidance about the path of interest rates, the Kuttner surprise may not fully capture the policy shock. Gürkaynak, Sack & Swanson (2005a) construct two monetary policy shocks using the change in five yields as inputs, all with maturities of a year or less (the expected effective federal funds rates right after the first and second upcoming FOMC meetings based on fed funds futures contracts and the second-, third-, and fourth-quarter eurodollar futures yields). The second shock (*path*), which they construct to be orthogonal to the Kuttner surprise (*target*), affects long-dated yields but has little explanatory power for the stock market. Nakamura & Steinsson (2018) use the first principal component of the five yield changes listed as their monetary policy shock (scaled to have a unit effect on the 1-year Treasury yield), while Bauer & Swanson (2023a) use the first principal component of the first-, second-, third-, and fourth-quarter eurodollar futures yield changes (scaled to have a unit effect on the fourth-quarter eurodollar yield). Bauer and Swanson note that their single monetary policy shock (*mps*, for monetary policy surprise) parsimoniously captures news about both the *target* and *path* factors.

3.2 Asset Pricing Channels for the Monetary Policy Shock Multiplier in the Narrow Window

Bernanke & Kuttner (2005) assess the asset pricing channels underlying the monetary policy shock multiplier by estimating a vector autoregression (VAR) in monthly data and then projecting the VAR residuals on the Kuttner surprises. Using the two sets of coefficients, along with the Campbell-Shiller log-linearization, they can estimate the effect of Kuttner surprises on news about future real interest rates, future excess returns, and future cash flows. They find a large role for the latter two but little role for real interest rate news. Bernanke and Kuttner's excess return is relative to the 1-month T-bill rate, so their equity premium news includes term premium news.

As emphasized by Nagel & Xu (2024), the VAR-based approach assumes that when the Kuttner surprise moves the VAR predictors (notably the dividend price ratio), this has the same effect on future returns and cashflows as other movements in the VAR predictors. This may not be the case, so they suggest avoiding VARs. They use a method similar to that of Knox & Vissing-Jorgensen (2025) to decompose stock returns around announcements in data from 1994 to 2019. For the narrow window, the effect of various monetary policy shocks is mostly, fully, or more than fully explained by effects of these shocks on nominal forward yields. Columns 2 and 6 in **Table 1** show our estimated role for yield changes in explaining the effect of the shocks on the stock market over the full 1995–2023 (column 2) or 1994–2023 (column 6) sample using the Knox & Vissing- Jorgensen (2025) decomposition (done using nominal inputs here and throughout the article). Columns 3 and 7 show the role for cash flow and equity premium changes.[3] We use Bauer and Swanson's data, which provide narrow-window changes in nominal Treasury yields based on 2-, 5-, and 10-year Treasury futures as well as Treasury bond futures. The average duration of the underlying securities is 1.9, 4.4, 7.8, and 12.5 years over the 1994–2019 period.[4] We round the durations from Bauer and Swanson to 2, 4, 8, and 12 years and calculate forward yield changes from the available Treasury futures yield changes (assuming the same change in the forward yield for years 1–2, years 3–4, years 5–8, and years 9–12). We estimate that −1.1 of the Kuttner surprise multiplier of −3.3 works via (nominal) yield curve changes, while −3.6 of the *mps* multiplier of −4.8 works via the yield curve.[5]

These estimates imply that about one-third of the Kuttner surprise multiplier and about three-fourths of the *mps* multiplier is due to these shocks affecting the stock market via yield curve changes, with the remainder due to changes to the equity

[3] In Table 1, because the factors on the right-hand side of equation (8) are multiplicative, the regression coefficients in columns 2 and 3 may not exactly sum to those in column 1. The same comment applies to later tables.
[4] These durations are collected from Bloomberg by Bauer & Swanson (2023a) and used to calculate yield changes from futures price changes. We thank the authors for providing the additional information.
[5] While we agree with Nagel & Xu's (2024) general conclusion that changes to the yield curve provide an important channel for monetary policy shocks to affect the stock market, their results for the narrow announcement window may overstate the role of yield curve changes somewhat. They appear to assume durations of 2, 5, 10, and 30 years, leading to inaccurate forward rate estimates. The −1.1 number would be −2.4, while the −3.6 number would be −7.7 if one incorrectly assumed Treasury futures durations of 2, 5, 10, and 30 years.

premium or expected cash flows.[6] We do not have data on changes in equity premia or expected dividends over the narrow window. However, VIX (Volatility Index) changes are significantly positively related to both the Kuttner surprise and *mps* (**Table 1**, columns 4 and 8), consistent with an important role for a higher equity premium in explaining the market loss in response to positive rate surprises. VIX is closely correlated with the Martin lower bound for the equity premium that we use below in Section 5.4 (for information on options-based equity premium measures, see Martin 2025). Related, Bauer, Bernanke & Milstein (2023) provide evidence of "risk on" effects from expansionary monetary policy and show that a measure of risk appetite increases following expansionary policy news.

Our estimates may overstate or understate the role for yield curve changes. In terms of over- stating, the forward yield for years 9–12 falls in response to both positive Kuttner shocks and positive *mps* shocks. We assume no change in forward yields past year 12 (due to a lack of data), but it is possible that longer forward yields fall as well. If, for example, the forward yields for years 13–30 dropped by the same amount as the forward yield for years 9–12 in response to shocks, then the Kuttner shock does not work via yield curve changes (the coefficient is positive but insignificant), while for *mps* the −3.6 number changes to −2.1, i.e., less than half of the *mps* multiplier. In general, falling long forward yields in response to positive monetary policy shocks are common in the literature (see Gürkaynak, Sack & Swanson 2005b; Beechey & Wright 2009; Nakamura & Steinsson 2018).[7] In terms of understating the role for yield curve changes, this role would be larger if one used real yields, since contractionary policy shocks lower expected inflation (see the papers cited in this paragraph on falling long forward rates) so real rates go up relative to nominal rates.

3.3 Asset Pricing Channels for the Full Stock Return in the Narrow Window

A unifying feature of work on the narrow announcement window is that the fit of the regression in Equation 1 is modest. We obtain R^2 values of 0.06 for the Kuttner shock and 0.26 for the *mps* shock (**Table 1**, columns 1 and 4). **Figure 1** illustrates the relation between *mps* and the stock return in the narrow window. The negative relation is visible, but the fit is not great. Swanson (2021) adds measures of forward guidance and large-scale asset purchase (QE) surprises to the regression in Equation 1 and still only obtains an R^2 of 0.31. We argue next that the increase in variance during the event window is so large that the modest R^2 is unlikely to be driven simply by the presence of non-monetary policy noise during any time period. Consistent with that statement, for the narrow window, Nakamura & Steinsson (2018) find very similar monetary policy shock multipliers for bond yields when using OLS estimation and when using the heteroskedasticity-based estimation approach of Rigobon (2003) that allows for background noise. Instead, modest R^2 values suggest the presence of multiple types of policy shocks.

3.3.1 The modest R2 in the narrow window is probably not just due to nonmonetary policy noise.

Figure 2 illustrates the evolution of stock return volatility over time on days with scheduled FOMC announcements. Of the 239 such days over the 1994–2023 period, most had FOMC announcements at 2:15 PM (127 announcements) or 2:00 PM (86 announcements).[8] **Figure 2*a*** is for days with announcements at 2:15 PM and includes days between February 1995 and January 2013.[9] **Figure 2*b*** is for days with announcements at 2:00 PM, covering days between March 2013 and December 2023. Both charts show the standard deviation of 5-minute S&P 500 returns across FOMC announcement days. In both charts, there is a dramatic increase in the standard deviation just after the announcement. **Figure 2*b*** has a second volatility spike just after 2:30 PM, which lines up with the start of press conferences (held after every other FOMC meeting up to 2018 and then after every FOMC meeting). **Figure 2*c*** shows the standard deviations of 30-minute returns around

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[6] The larger role for yield curve changes when using *mps* is natural given that this shock is scaled to move 1-year rates one-for-one, so it captures shocks that affect forward rates out to a year.

[7] We note that the work documenting that positive monetary policy shocks increase long nominal and real rates studies the effects of changes to the 2-year yield (Gilchrist, López-Salido & Zakrajšek 2015; Hanson & Stein 2015), as opposed to Kuttner surprises or the 1-year *mps* shocks of Bauer & Swanson (2023a).

[8] The remainder had FOMC announcements at other times between 2:00 PM and 2:30 PM (15 meetings) or during the 11:00 AM, 12:00 PM or 1:00 PM hours (11 meetings). The announcement times are included in the Bauer & Swanson (2023a) dataset.

[9] We include three observations with announcements at 2:17 PM or 2:18 PM.

the announcements (−10 to +20 minutes) for each of the two samples, to match the half- hour event window typical in the literature. The chart speaks to the signal-to-noise ratio in the half-hour event window.

Suppose the stock return in the half-hour period s on announcement day t has a monetary policy component $r_{t,s}^{MP}$ and a nonmonetary policy component $r_{t,s}^{other}$:

$$r_{t,s}^{m} = r_{t,s}^{MP} + r_{t,s}^{other}. \quad (9)$$

Suppose that $r^{MP} = 0$ outside the event window, the variance of the nonmonetary policy component is the same in the event window and the period just before the event window, $V(r_{t,s}^{other}) = V(r_{t,s-1}^{other})$, and that $r_{t,s}^{other}$ and $r_{t,s}^{MP}$ are uncorrelated. Then, the ratio of the return variance for the event

$$\frac{V(r_{t,s}^{m})}{V(r_{t,s-1}^{m})} = \frac{V(r_{t,s}^{MP})+V(r_{t,s}^{other})}{V(r_{t,s}^{other})} \quad \rightarrow \quad sn = \frac{V(r_{t,s}^{MP})}{V(r_{t,s}^{other})} = \frac{V(r_{t,s}^{m})}{V(r_{t,s-1}^{m})} - 1. \quad (10)$$

From **Figure 2*c***, we obtain sn=12.3 for the 2:00 p.m. announcements and sn=20.3 for the 2:15 p.m. announcements. Mapping (3) to (1): $r_{t,s}^{MP} = b\Delta i_t^u$, $r_{t,s}^{other} = \varepsilon_t$, and $R^2 = sn/(sn+1)$, so *the R^2 would have been 92 to 95 pct* if all policy announcements only contained one underlying type of shock driving Δi_t^u which always had the same market impact, b. The modest R^2 could therefore indicate that the public learns different things from the unexpected short rate change Δi_t^u (and associated Fed communication) at different times in terms of the Fed conveying pure monetary policy shocks, Fed information effects, or reaction function news, and that b therefore is unlikely to be constant – and even to have the same sign – across FOMC announcements. b may also be time-varying for a given shock type.[10]

3.3.2 Estimating the asset pricing channels for the full stock return in the narrow window.

Given the high signal to noise ratio in the narrow announcement window, to fully understand the effect of the Fed on the stock market, we need to understand the total stock return over the narrow window. We pursue this in **Table 2**, using the Knox & Vissing-Jorgensen (2025) decomposition in Equation 8. From columns 1 and 2, when the stock capital gain changes in the narrow window, the yield curve factor moves much less than the combined equity premium and cash flow factor, suggesting that the Fed mostly moves the market via the latter (column 3 for VIX again suggests a role for equity premium changes). A variance decomposition of log capital gains over the narrow window, shown in **Table 3**, leads to the same conclusion.

We do want to mention one issue that could generate an abnormally high nonmonetary policy news component in the narrow window. Prices may move due to catch-up trading on nonmonetary policy information after the risk of asymmetric information related to monetary policy has passed [this would violate the assumption $V(r_{t,s}^{other}) = V(r_{t,s-1}^{other})$ used in Equation 10]. Lucca & Moench (2015) document abnormally low volatility and volume before the announcement (the low pre- announcement volatility is visible in **Figure 2**). We encourage more work on quantifying the importance of this issue.

3.3.3 Narrow event windows around other types of FOMC communication.

Swanson & Jayawickrema (2024) suggest studying not only FOMC announcements but also press conferences, chair's speeches, vice chair's speeches, and minutes releases. From **Figure 2*b***, press conferences are about as informative as FOMC announcements, and we agree that these warrant much more study. Vissing-Jorgensen (2024) provides a signal-to-noise calculation for each of these event types and finds much lower ratios for speeches and minutes releases than for FOMC announcements and press conferences. Gorodnichenko, Pham & Talavera (2023) show that the tone of the chair's voice at the press conferences predicts the stock market reaction and changes in VIX (thus indicating effects via the equity premium). They link the tone of the chair's voice to the text sentiment of media coverage in the days after the press conference. Curti & Kazinnik (2023) find effects of the chair's facial expressions at the press conference on the stock market and VIX. Boguth et al. (2024) find that stock returns on FOMC announcement days (and the

[10] See Boehm and Kroner (2021) for further evidence on the low R^2 and the non-monetary policy shock component of stock returns in the narrow window.

following few days) tend to partially mean-revert. They interpret the mean reversion as due to price-pressures caused by trading, which could suggest that sentiment-induced effects mean-revert.

4. Theory and Evidence on the Types of Monetary Policy Shocks and their Asset Pricing Channels

4.1 Pure Monetary Policy Shocks

A negative pure monetary policy shock is expected to boost the stock market via a combination of lower yields, a lower equity premium, and higher expected dividends. Yield changes could emerge via the expectations hypothesis component or the term premium component. The expectations hypothesis component captures forward guidance inferred from (or released at the same time as) the shock. This could include inference about the real natural rate of interest (the rate that would prevail in the absence of price frictions and thus the rate at which policy is neither stimulative nor contractionary). Kashyap & Stein (2023) emphasize that low rates may push policy makers to keep rates low to avoid an asset price reversal that would harm the economy. A low rate at today's date, furthermore, leads to durables consumption being moved forward (McKay & Wieland 2021) and to mortgage refinancing, both of which imply that lower rates are needed going forward to keep up economic activity. As for the term premium for real rates, it likely falls when the short rate falls. Hanson & Stein (2015) propose that banks, focused on keeping up their income, reach for yield and require a lower term premium when short rates are unattractive. Campbell & Sigalov (2022) show theoretically that reaching for yield can arise if investors face a constraint on the portfolio return they need to generate. Regarding the nominal term premium, if lower rates increase expected inflation sufficiently, the nominal term premium and long nominal rates may increase following negative pure monetary policy shocks.

A pure monetary policy shock may also affect expected dividends. By increasing asset prices (and thus wealth and collateral values), lowering the cost of borrowing, and depreciating the exchange rate, a negative pure monetary policy shock is expected to increase consumption, in- vestment, and exports and therefore expected profits and dividends. Lower rates may also make more projects positive net present value (NPV). If firms have floating rate debt, lower rates will further improve cash flows (Gürkaynak, Karasoy-Can & Lee 2022).

A series of recent papers provide channels through which a negative pure monetary policy shock could lower the equity premium. In Drechsler, Savov & Schnabl (2018), risk-tolerant banks borrow from risk-averse households to fund levered investments. A lower policy rate reduces the liquidity premium, increases bank leverage, and reduces the equity premium. Kekre & Lenel (2022) provide a model with heterogeneity in households' risk aversion. A surprise decrease in the policy rate redistributes wealth to households with higher marginal propensity to take risk, reducing the equity premium. Pflueger & Rinaldi (2022) construct a model with countercyclical risk aversion via habit formation preferences. A surprise decrease in the policy rate increases consumption relative to habit, lowering risk aversion and the equity premium. Kashyap & Stein (2023) suggest that much of the effect of both conventional and unconventional monetary policy on the real economy works via expansionary policy lowering a range of risk premia (equity premia, credit risk premia, term premia, and foreign exchange risk premia) as well as easing bank lending standards.

4.2 Fed Information Effects, Fed Belief Surprises

If the Fed is viewed as better informed, monetary policy shocks contain an element of what has been called Fed information effects, as discussed in Section 2.2.3. A positive monetary policy shock would signal higher growth or higher inflation (which, if driven by demand, signals higher growth). This could in turn lead to higher expected dividends or a lower equity premium, which could make the stock market go up. By contrast, if the Fed is not better informed than markets, monetary policy shocks may reveal information about what the Fed thinks, but this will not lead the public to update its view about the state of the economy. Caballero & Simsek (2022) refer to news about what the Fed thinks as Fed belief surprises. In their framework, these surprises have a similar effect on the economy and the stock market as a pure monetary policy shock.[11]

Whether Fed information effects and/or reaction function news are present is important, because this affects the interpretation of the monetary policy shock multiplier (i.e., Is it a multiplier for pure monetary policy shocks or for a mix of shock types?) and could help explain the modest R^2 of the regression. Early work on Fed information effects includes that by Romer & Romer (2000). They find internal Fed inflation forecasts (as well as Fed GDP forecasts) to be statistically superior to those of private forecasts and find that private forecasters update their inflation expectations in response to changes in the policy rate, thus indicating that these changes contain Fed information effects. Campbell et al. (2012) show that private forecasters' expected unemployment over the next few quarters tends to decrease following positive monetary policy shocks [using the Gürkaynak, Sack & Swanson (2005a) target and path factors], consistent with Fed information effects ["Delphic forward guidance" in the terminology of Campbell et al. (2012)]. Nakamura & Steinsson (2018) document a positive association between monetary policy shocks and private sector expectations for real GDP growth. In their theoretical model, monetary policy affects the public's beliefs about the neutral real rate of interest r^* and therefore about output (since r^* is driven by technological factors). Miranda-Agrippino & Ricco (2021) find that monetary policy surprises are predictable with the Fed's internal forecasts and forecast revisions (for output, unemployment, and inflation). They argue that this is indicative of Fed information effects and construct a narrow window monetary policy shock that is orthogonal to Fed forecasts and to lagged monetary policy shocks.

Other work has directly linked Fed information effects to stock returns. Jarocinski & Karadi (2020) classify pure monetary policy shocks as shocks generating negative comovement between the short interest rate and the stock market and Fed information effects as those generating positive comovement. Based on a chart like **Figure 1**, they classify one-third of scheduled and unscheduled FOMC announcements as being indicative of Fed information effects (the top right and bottom left quadrants). Cieslak & Schrimpf (2019) exploit the term structure of stock-bond covariances around announcements to decompose Fed information effects into growth shocks and risk premium shocks. They argue that while both of these types of information shocks induce a positive covariance between stock returns and yields, growth shocks do so by affecting the covariance of stocks with short- and intermediate-term bond yields, while risk premium shocks have a larger impact on the covariance of stocks with long maturity yields. They classify 60.8% of FOMC announcements as dominated by pure monetary policy shocks, 32.5% by growth shocks, and 6.7% by risk premium shocks. Lunsford (2020) argues that Fed information effects dominate the effect of pure monetary policy shocks on the stock market in a period from February 2000 to June 2003 when the Fed only gave forward guidance about its economic outlook, while pure monetary policy shocks dominated from August 2003 to May 2006 when the Fed gave explicit forward guidance about the policy rate.

Hillenbrand (2024) empirically investigates a Fed information effect regarding the natural real rate, r^*. He shows that the cumulative decline in both long nominal yields (since 1989) and long real yields (since 1997) is driven by changes in a 3-day window around FOMC meetings and that these changes relate to updates to the Fed's dot plot value for r^*. He suggests that the Fed may be better informed about r^* and thus may provide "long-run Fed guidance." Importantly, the literature has not found a similar 3-day pattern in stocks; the Lucca-Moench pre-FOMC announcement drift, which we review below in Section 5, is concentrated in a 24-hour period. Reductions in r^* due to a Fed information effect may be less relevant for stock returns because they likely come with negative news about cash flows via productivity growth, population growth, savings, etc. [as in the model of Nakamura & Steinsson (2018); see also Rungcharoenkitkul & Winkler (2022)].

4.3 Reaction Function News

If a positive monetary policy shock is interpreted as due to reaction function news, it may boost the stock market if it

[11] For evidence of Fed belief surprises, see Sastry (2025).

leads to a lower equity premium or higher expected dividends. A positive monetary policy shock at a time of a positive output gap may be interpreted as indicating a more activist Fed in terms of its reaction to the output gap. Bianchi, Ludvigson & Ma (2024), building on the work by Bianchi, Lettau & Ludvigson (2022), propose a model in which a higher expected coefficient on output growth in the policy rule ensures that the central bank more actively supports the economy in downturns. This reduces the risk of the stock market and therefore the equity premium. A similar argument could be made regarding inflation; reaction function news that the Fed would be less aggressive in fighting inflation could have similar effects to reaction function news that the Fed would be more aggressive in combating recessions. Bianchi, Ludvigson & Ma (2024) estimate that FOMC announcements contain substantial amounts of reaction function news but that reaction function news mainly arrives outside announcement windows.

Several papers argue that what has been interpreted as Fed information effects in survey data may in fact represent reaction function news. Bauer & Swanson (2023b) argue that, over the sam- ples studied in the Fed information effect literature, the Fed has responded more strongly to the business cycle than markets expected (they label this a "Fed response to news" effect, a particular form of reaction function news). The positive relation between high-frequency monetary policy surprises and lower-frequency GDP forecast updates documented by Nakamura & Steinsson (2018) could thus instead be due to a stronger than expected reaction by the Fed to the economic news that drove changes to survey forecasts (with bad economic news leading to both a dovish monetary policy surprise and a survey forecast downgrade). Once Bauer and Swanson control for macroeconomic and financial news released before FOMC announcements, monetary policy shocks are negatively related to GDP forecast updates consistent with pure monetary policy shocks. Bauer and Swanson also document that evidence for Fed information effects is statistically weak, being sensitive to sample periods and variables forecasted. Furthermore, they conduct a survey of the respondents to the Blue Chip survey, which reveals that no respondents revise their GDP forecast upward in response to a positive monetary policy surprise. Similarly, the evidence from Romer & Romer (2000) on statistical superiority of Fed forecasts is not robust, with the Fed and Blue Chip forecasts having similar accuracy over a sample from 1990 to 2013. As for the evidence from Miranda-Agrippino & Ricco (2021) that monetary policy surprises are predictable with internal Fed forecasts, Bauer & Swanson (2023b) show that monetary policy surprises are equally predictable with Blue Chip forecasts, implying no informational advantage of the Fed. We add that both the Fed and most professional forecasters failed to predict the persistence of the post-COVID inflation shock, again suggesting no Fed information advantage. Evidence on the Fed information effect from the stock market could also be driven by reaction function news. Cieslak, Morse & Vissing-Jorgensen (2019) suggest that reaction function news may have taken the form that the Fed revealed a willingness to act more aggressively to a poor economy than expected [similar to Bauer & Swanson's (2023b) argument above but focused on the downside]. This willingness could boost the stock market via a lower equity premium and perhaps higher expected dividends, but it may have little effect on bond yields or could even increase bond yields.[12] As an extreme example, if a policy announcement removed the risk of a recession, then the expected (probability weighted) path for rates may be higher (as rates are higher in booms). Bond yields may also go up via the announcement inducing a "risk on" shift toward stocks [such effects are related to the work by Cieslak & Pang (2021), who propose a two-risk premium framework, where one risk premium is common across stocks and bonds but the other moves stocks and bonds in different directions].

A series of papers are consistent with reaction function news of this type (an unexpectedly strong Fed put). We review evidence from Cieslak, Morse & Vissing-Jorgensen (2019) in the context of stock returns over the FOMC cycle in Section 6. Cieslak (2018) shows that survey respondents underestimated how much changes in observed employment growth would affect the short rate going forward. Focusing specifically on asymmetries, Cieslak & Vissing-Jorgensen (2021) document that negative stock returns predict rate reductions from 1994 to 2008 but not in an earlier sample dating back to 1982, implying that Bayesian learners would update their views during the 1994–2008 period of the likely size of

[12] European Central Bank President Mario Draghi's "whatever-it-takes" speech on July 26, 2012, provides a simple example supportive of this type of reaction function news in that case for the euro area (Draghi 2012). The European stock market rallied in response (see Krishnamurthy, Nagel & Vissing-Jorgensen 2018), while short German yields changed little and yields on 10-year German bonds increased 8 bps (see Cieslak & Schrimpf 2019).

rate cuts in bad times. The predictive power of negative stock return for rate cuts appears to work via negative stock returns being associated (in a causal or predictive way) with reductions in the Fed's internal growth forecasts. Schmeling, Schrimpf & Steffensen (2022) find that in a sample from 1990 to 2021, fed funds futures have systematically underpredicted how aggressively the Fed would cut the fed funds target following a drop in equity prices, while no systematic expectation error arises following high stock returns. Bauer, Pflueger & Sunderam (2024a) speak directly to reaction function news in monetary policy surprises. Using microdata from the Blue Chip survey, they estimate a Taylor rule for each month of data, exploiting variation across forecasters as well as across forecast horizons. Models of learning predict (as discussed) that the public should increase its estimate of the Taylor rule coefficient on the output gap (γ) following a hawkish monetary policy shock in a strong economy (measured by the output gap) or following a dovish monetary policy shock in a weak economy. This is supported in the data. Assessing the relative roles of reaction function news and pure monetary policy shocks in the overall monetary policy shock (in the absence of Fed information effects), they estimate each to be about equally important.

An imperfectly understood Fed reaction function can make monetary policy surprises predictable with publicly available data (as in, e.g., Cieslak 2018) if the Fed systematically reacts more or less than expected to economic activity or inflation over the sample. Bauer & Swanson (2023b) emphasize that the presence of pure monetary policy shocks slows down learning about the policy rule coefficients and can result in perceived coefficients being above (or below) the true coefficients for a prolonged period.[13]

A few recent papers study learning about the inflation coefficient in the Taylor rule (β). Bocola et al. (2024) estimate market perceptions of β from the comovement of nominal yield changes and changes to inflation compensation implied by Treasury and Treasury Inflation-Protected Securities yields. They find a decline of 0.5 in the coefficient in the 2-year period (2020–2022) that followed the Fed's framework review and the introduction of flexible average inflation targeting.

Bauer, Pflueger & Sunderam (2024b) estimate market perceptions of β in the recent inflationary episode from Blue Chip survey data. The estimated β coefficient was close to zero pre-liftoff but increased to around 1 as the Fed implemented its hiking cycle. The authors argue the evidence is consistent with uncertainty about the Fed reaction function, with agents learning from the Fed's implemented actions. Cieslak, McMahon & Pang (2024) also argue that the post-framework review period was characterized by Fed-induced uncertainty, which led to an elevated term premium until the hawkish pivot in 2022.

5. FOMC announcement day returns and the pre-FOMC announcement drift

The shocks for the narrow half-hour window are small. The average absolute values are 2 bps for the Kuttner shock (1995–2023) and 4 bps for *mps* (1994–2023). For comparison, the average absolute change from the end of one FOMC meeting announcement day to the next is much larger at 13 bps for the fed funds target (the target range midpoint) and between 20 and 29 bps for the first four quarters' eurodollar futures.[14] The vast majority of changes in the near-term expected path for the target rate thus happens outside the narrow window, so we cannot focus only on the narrow window if we want to understand the overall effect the Fed may have had on the market.[15] Outside the narrow window, monetary policy likely accounts for only a small portion of return variation. Perhaps for that reason, work on the effect of the Fed on the stock market outside announcement windows focuses on effects of the Fed on average realized returns.

[13] As for shifts in Taylor rule coefficients over time, Bauer & Swanson (2023a) find that both γ and β trend upward from 1990 to 2021 but Bauer, Pflueger & Sunderam (2024a) find no clear trends.

[14] We use quarterly forward rates based on Overnight Index Swap contracts after March 2023 when Eurodollar data are not available.

[15] Small monetary policy shocks in announcement windows also cause difficulties when using these shocks as instruments for lower-frequency interest rate changes in VAR estimations of the effect of monetary policy on the economy. Small shocks make for weak instruments.

5.1 Daily Results Combining FOMC, Employment, and Inflation Releases

Savor & Wilson (2013) focus on two macroeconomic releases (the employment situation release and the earlier of the Consumer Price Index and Producer Price Index releases) as well as sched- uled FOMC announcements. Their sample runs from 1958 to 2009, with FOMC announcements used from 1978. They document an average excess stock return of 11.4 bps on macro/FOMC an- nouncement days, compared to only 1.1 bps for nonannouncement days. Over 60% of realized average excess returns are earned on announcement days, which only account for 13% of days. They interpret this as evidence of an equity premium for macro/FOMC news. Since realized volatility in daily data is only marginally (4%) higher on announcement days than nonannounce- ment days, they suggest that the news coming out on announcement days may have a higher risk premium due to being more informative about long-run growth or inflation. Ernst, Gilbert & Hrdlicka (2019) suggest that ex post selection of announcement types as well as lack of controls for the day of the month could bias Savor and Wilson's results but note that FOMC announcements consistently lead to significant excess returns.

5.2 The Pre-FOMC Announcement Drift

Lucca & Moench (2015) focus on the period before scheduled FOMC announcements. They document that, in a sample from September 1994 to March 2011, the average excess return on the S&P 500 in the 24 hours from 2:00 PM to 2:00 PM leading up to the FOMC announcement at 2:15 PM was 49 bps. With eight scheduled FOMC meetings per year, the 24-hour window return, dubbed the "pre-FOMC announcement drift," is about 4% per year and accounts for about 80% of annual realized excess stock returns over their sample. The start of Lucca and Moench's sample period in 1994 is motivated by the change in the FOMC's communication practices to announce its decisions and issue a statement after scheduled FOMC meetings (in contrast to the earlier practice of markets having to learn about policy changes from the open market operation the day following the meeting). They find a smaller pre-FOMC effect of about 20 bps from 1980 to 1993 but none from 1960 to 1979. **Figure 3*a*** documents the pre-FOMC announcement return in the Lucca and Moench sample and in the subsequent period from April 2011 to December 2023. There is a substantial average overnight return of about 20 bps the night before the FOMC pre-FOMC drift return, cumulated over the sample September 1994 to December 2023, with the vertical gray dashed line at March 2011 indicating the end of the Lucca & Moench (2015) sample period. The black line shows the S&P 500 Index return, the blue line the contribution from the yield curve component of the Index return, and the red line the contribution from the cashflow and equity premium components combined. Panel *c* shows the average 3-day yield change around scheduled FOMC announcements for the announcement day in the post–Lucca and Moench period, though this reverts at the end of the day and overnight after the announcement. Boguth, Grégoire & Martineau (2019) find that, over the April 2011 to September 2017 period, the pre-FOMC announcement return is higher only for FOMC meetings with press conferences. This helps causally link the pre-FOMC announcement returns in the post–Lucca and Moench sample to the Fed.

Lucca & Moench (2015) consider various explanations for the pre-FOMC announcement drift but conclude that it is a puzzle. They note that standard risk-based asset pricing models struggle to explain the pre-FOMC announcement drift because price volatility is abnormally low during the pre-FOMC announcement period, suggesting a lower than usual flow of in- formation. Another possibility is that information from the Fed was systematically better than expected during their sample. They find this explanation wanting since there is no or little pre- FOMC announcement reduction in fed funds futures rates, eurodollar rates, or Treasury yields. Furthermore, the pre-FOMC announcement period is part of the FOMC's self-imposed information blackout period, raising questions of how information would flow from the Fed to markets. They suggest that information might be incorporated in market prices during the pre-FOMC announcement period if investors only then process information that was publicly available beforehand.

To date, no consensus has emerged on what may explain the pre-FOMC announcement drift, neither in terms of the asset pricing channel (i.e., Is it a risk premium or due to unexpectedly good news over the 1994 to 2011 sample?) nor the information channel (informal communication, processing of existing information, etc.). We summarize and extend evidence regarding the asset pricing channel in the rest of Section 5 and comment on information channels in Section 6, where stock returns over the full cycle between FOMC meetings are covered.

5.3 The Yield Curve Return Component of the Pre-FOMC Announcement Drift

Figure 3*c* illustrates the average change in the 30-year on-the-run Treasury yield in the 3-day window around FOMC meetings for the September 1994 to March 2011 and April 2011 to December 2023 periods. In the Lucca & Moench (2015) sample, the 30-year yield falls 1.5 bps over the 3-day window, of which 0.6 bps occur in the 2:00 PM to 2:00 PM preannouncement period. Falling long-dated yields around FOMC days, as documented by Hillenbrand (2024), therefore seem to play some role for the pre-FOMC announcement drift in the stock market.[16]

In **Figure 3*b*** and **Table 4**, we quantify the impact of falling yield changes, implementing the Knox & Vissing-Jorgensen (2025) decomposition in the 2:00 PM to 2:00 PM pre-FOMC window. **Figure 3*b*** cumulates 2:00 PM to 2:00 PM returns over the full 1994–2023 period. The yield curve return component was substantial in the period 1994–2003, contributing a cumulative 10% return to the cumulative 31% return that had been earned on the aggregate stock market in the 2:00 PM to 2:00 PM windows to that point. However, since 2003, the yield curve return component has been approximately zero on average and did not contribute to the extraordinarily large pre-FOMC announcement drift in the global financial crisis period (the preannouncement drift was on aver- age about 180 bps per meeting for the 15 meetings from March 2008 to December 2009) or to the 20 bps per meeting overnight drift since March 2011. This implies a large role for some combination of the equity risk premium and cashflow expectations. **Figure 3*d*** shows changes in VIX around FOMC announcements, illustrating a sharp decline in both the 1996–2011 and 2011–2023 periods and suggesting an important role for a falling equity premium, which we explore below in Section 5.5.[17] The VIX reductions are statistically significant; see **Table 4** columns 4 and 8.

5.4 Is the Pre-FOMC Announcement Drift a Risk Premium?

A series of papers argue that the pre-FOMC announcement drift represents a risk premium. Ai & Bansal (2018) show theoretically that an announcement risk premium does not emerge under time-separable expected utility given that consumption in practice does not adjust instantaneously to news [for a dissenting view on this claim, see Laarits (2019)]. An announcement risk premium is, however, possible under more general preferences denoted "generalized risk sensitivity," a class that include recursive utility and robust control preferences. In Ai and Bansal's model, agents learn from macro and FOMC announcements about the persistent component of consumption. Ai, Bansal & Guo (2024) provide a survey of theoretical and empirical work on macro announcement premia. Wachter & Zhu (2022) provide a model (also with generalized risk-sensitivity preferences) in which agents learn from macro and FOMC announcements about the likelihood of an economic disaster. This generates a risk premium for these events. Hu et al. (2022) emphasize that a two-shock model is needed to explain the pre-FOMC announcement drift as a risk premium, given the very different ratios of average return to volatility in the pre-FOMC period and in the narrow window around the announcement. In their two-shock framework, the news that will be announced is a random variable ε and the impact of this news on the market is σ*ε. Standing before the preannouncement period, the impact measure σ is a random variable (with volatility λ) and represents "impact uncertainty." σ becomes known during the preannouncement period, with the pre-FOMC announcement drift therefore interpreted as a risk premium for resolution of impact uncertainty. For large λ, impact uncertainty carries a higher

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[16] We find similar results with the 10-year yield but illustrate the 30-year yield given the long duration of the stock market. Lucca & Moench (2015) also found that the 10-year yield fell, although not significantly so.

[17] We start the VIX sample in January 1996 due to data availability. We estimate the abnormal VIX change up to each point in the 3-day window around FOMC announcements using a diff in diff approach that specifies 3-day FOMC windows as the treatment group all other 3-day windows as the control group. For each s we estimate the regression:

$$\Delta_s VIX_t = a_s + b_s * I_t(FOMC) + u_{t,s}$$

where $\Delta_s VIX_t = VIX_{t+s} - VIX_t$ is the change in VIX from time t, which denotes the start of a 3-day window, to time $t+s$, with $s = 5,10,15\ldots$ measured in 5-minute increments. $I_t(FOMC)$ is an indicator variable set to 1 if t is the start of an FOMC announcement window, with the figure plotting the estimated b_s across all s. This implementation removes average overnight VIX changes (i.e., Muravye and Ni (2020) and Chen, Jiang, Yuan and Zhu (2021)) that occur on FOMC and non-FOMC days and are thus unlikely to be driven by the FOMC announcement itself.

risk premium and return to variance ratio than news risk. The explanations of both Ai & Bansal (2018) and Hu et al. (2022) rely on in- formation being created in the preannouncement window via leaks/informal communication from the Fed or via processing of existing information. Laarits (2024) presents a different two-shock model in which the pre-FOMC announcement drift is a risk premium for resolution of uncertainty about whether the upcoming FOMC news will be a Fed information shock or monetary policy shock. This explanation requires that Fed information effects are present (hotly debated, as summarized above) and that the Fed conditions its decision particularly on macro news that emerges in the preannouncement period. Fisher, Martineau & Sheng (2022) document, consistent with the pre-FOMC drift containing a risk premium element, that preannouncement attention measured by newspaper coverage predicts announcement excess returns. This lines up with the- ories of endogenous attention according to which investors pay more attention to risks with higher risk premia (Bansal & Shaliastovich 2011; Kacperczyk, Van Nieuwerburgh & Veldkamp 2016).

Results from other papers suggest that the pre-FOMC announcement drift over Lucca & Moench's (2015) sample may not predominantly represent a risk premium. In 1998–2016 data, Brusa, Savor & Wilson (2020) find no abnormal excess stock returns around central bank meet- ings outside the United States (they study the euro area, United Kingdom, Japan, and eight other countries). This is the case even for German stocks around Bundesbank announcements in 1973– 1998 and even for domestically focused firms. It is unlikely to be due to monetary policy being more predictable abroad, as interest rate volatility is materially elevated on announcement dates. By contrast, excess returns even outside the United States are high around Fed meetings [also shown by Lucca & Moench (2015) and Cieslak, Morse & Vissing-Jorgensen (2019)]. Brusa, Savor & Wilson (2020) suggest that the Fed is somehow special and do not view their evidence as re- jecting the pre-FOMC announcement drift being a risk premium. Another interpretation of their findings is that there may be only a modest risk premium for monetary policy announcements (in the United States and abroad) with the very high pre-FOMC announcement drift over Lucca & Moench's (2015) sample instead mostly being due to unexpectedly good news (more on this in Section 5.5).

Knox et al. (2025) seek to directly measure the equity premium for FOMC data using equity premium measures based on S&P 500 options data. They observe that, with a fine grid of S&P 500 options expiration dates, one can construct an ex ante measure of the equity premium for each calendar day (since May 2022) or for 1- or 2-day periods (since August 2016) using the Martin (2017) lower bound, Chabi-Yo & Loudis (2020) lower bound, or Tetlock, McCoy & Shah (2024) equity premium measures. They show that, from August 2016 to December 2023, the equity premium is about 1 bps [Martin (2017) measure] to 2 bps higher [Tetlock, McCoy & Shah (2024) measure] for 1- or 2-day periods that include FOMC announcements than surrounding days. Prior to August 2016, S&P 500 options are available back to 1996 but with fewer expirations: one per month for 1996 to November 2008 and one expiration per week from November 2008 to August 2016. This still allows one to assess whether the equity premium is elevated on FOMC announcement days based on whether a given option covers an FOMC announcement day before its expiration, or not. **Figure 4*a*** shows the time series (across trade dates) for the (cumulative) equity premium based on the options with the shortest time to expiration.[18] Options spanning FOMC dates do not stand out compared to others. Using the shortest maturity options, Knox et al. (2025) estimate that the FOMC announcement day equity premium is similar in the 1996–2023 sample and in the more detailed sample since August 2016.

The options-based estimates of the abnormal equity premium on FOMC announcement days are far below the abnormal realized excess return over the pre-FOMC announcement period in Lucca & Moench's (2015) sample and (to a lesser extent) over the post–Lucca-Moench pe- riod. Either the pre-FOMC announcement drift is predominantly not a risk premium or the option-implied equity premium measures are not spiky enough around FOMC announcements. For horizons of a month and longer, evidence from Martin (2017), Martin (2025), and Knox & Vissing-Jorgensen (2025) shows that regressions of realized excess returns on the Martin lower bound lead to coefficients above 1 though typically not significantly different from 1 [for evidence that the bounds are not tight, see also Back, Crotty & Kazempour (2022)].

[18] For illustrative purposes, the figure shows only shortest-maturity options with less than 7 days to maturity.

Knox et al. (2025) pro- vide evidence for horizons of 1–2 days and 1 week, finding coefficients around 2 to 3 but with large standard errors. The abnormal equity premium for FOMC meetings may thus be a factor 2–3 times the 1 bps estimated by Knox et al. (2025) and based on the Martin (2017) measure. The literature on options-based equity premium measures is still young, and we encourage more work to assess and improve these measures (including the role of the stochastic discount factor assumptions and available investments).[19]

5.5 Good News About the Equity Premium Helps Explain the Pre-FOMC Announcement Drift

A complementary approach to rule out that the full 49-bps abnormal average excess return documented by Lucca & Moench (2015) represents an equity premium for FOMC news is to rule in that part of it is due to good news over the sample studied. Consider the equity premium calculated from options with a particular expiration date. The cumulative *n*-day equity premium on day *t* is, approximately, the sum of the daily forward equity premia for each of the next *n* days:

$$EP_t^{\text{Day 1 to } n} \approx f_t^{EP,1} + f_t^{EP,2} + \ldots f_t^{EP,n} \tag{11}$$

The one-day change in the equity premium based on options with the same expiration date is then:

$$EP_{t+1}^{\text{Day 1 to } n-1} - EP_t^{\text{Day 1 to } n} \approx -f_t^{EP,1} + \left[\left(f_{t+1}^{EP,1} - f_t^{EP,2}\right) + \ldots + \left(f_{t+1}^{EP,n-1} - f_t^{EP,n}\right)\right] \tag{12}$$

The term $-f_t^{EP,1}$ will be the same for all expiration dates. will be the same for all expiration dates. If we observe a larger daily decline in the cumulative equity premium for later expirations, then this reflects good news about forward equity premia.[20] **Figure 4*b*** illustrates the average 1-day change in the equity premium on FOMC announcement days, using data for 1996–2023 and the Martin (2017) equity premium measure. For each expiration, we calculate the change in the equity premium on the FOMC announcement day relative to the prior day, following Equation 12. On each calendar day, we average these daily changes across expirations in each of 10 maturity bins and keep the observation for each bin on each FOMC announcement day. Lastly, we average the values for each maturity bin across FOMC announcement days. In **Figure 4*b***, the line for 1996–2023 shows equity premium changes out to 1- year maturity. The equity premium for the shortest expiration bin (which has an average maturity of 10 days) drops only about 2 bps on average, suggesting that the $-f^{EP,1}$ term in Equation 12 is small and thus the equity premium for FOMC announcement days modest. By contrast, the equity premium for the longest expiration dates drops about 7 bps. This rules in good equity premium news on FOMC announcement days. In **Figure 4*b***, we also show lines that focus on subsamples where longer maturities of equity premium are available and find declines of 11 bps and 15 bps for the longest expiration bins. Furthermore, the lines have not yet flattened out for the longest expiration bins, so the total equity premium declines are likely larger than those illustrated. Overall, the pre-FOMC announcement drift since the mid-1990s may be driven more by good equity premium news than by a somewhat elevated equity premium for FOMC announcement days.

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[19] Liu, Tang & Zhou (2022) combine options data with an Epstein-Zin utility model like that of Ai & Bansal (2018) to recover the equity premium for FOMC announcement dates and find that for sufficiently high risk aversion the entire pre-FOMC announcement drift could represent a risk premium. They do not seek to match risk premia for non-FOMC days or address the issue raised by Hu et al. (2022) that two shocks may be needed to understand the very different ratios of average return to volatility in the pre-FOMC period and the narrow announcement window.

[20] Using options with a constant maturity is less informative. The daily change in the cumulative equity premium using options with *n* days to maturity is:

$$EP_{t+1}^{\text{Day 1 to } n} - EP_t^{\text{Day 1 to } n} \approx f_{t+1}^{EP,n} - f_t^{EP,1} + \left[\left(f_{t+1}^{EP,1} - f_t^{EP,2}\right) + \ldots + \left(f_{t+1}^{EP,n-1} - f_t^{EP,n}\right)\right] \tag{13}$$

The first term now differs across different *n* implying that one cannot be sure that a differential effect across expirations is due to news. Different authors emphasize different terms when using (7). Savor and Wilson (2013) focus on the first term. They argue for a risk premium on announcement dates by observing that VIX (which follows a similar intuition) falls as the announcement day drops out of the calculation. Cieslak et al (2019) focus on the second term, emphasizing the role of equity premium news. Related, Ghaderi and Seo (2024) use innovations in VIX (in an AR(1) model sense) as an indicator of good return news but these could be due to a high equity premium day rolling out of VIX.

6. The FOMC Cycle in Average Stock Returns

Cieslak, Morse & Vissing-Jorgensen (2019) study the full period between scheduled FOMC meetings. From 1994 to 2016 they find that the realized excess return on stocks over T-bills is, on average, earned entirely in weeks 0, 2, 4, and 6 (the even weeks), relative to the FOMC announcement day.[21] Excess returns on even-week days are on average 12 bps higher than excess returns on odd-week days (weeks −1, 1, 3, and 5). **Figure 5*a*** illustrates their finding, plotting 5-day average S&P 500 excess returns for day t to $t + 4$ over the FOMC cycle.[22] Cieslak, Morse & Vissing- Jorgensen (2019) argue that the FOMC cycle in excess stock returns over their sample is due to monetary policy news that was unexpectedly accommodating on average (partly due to a stronger than expected Fed put) and reached the market via informal communication.

6.1 Causality

To link the pattern to news from the Fed, Cieslak, Morse & Vissing-Jorgensen (2019) show that before 1994, when intermeeting changes to the fed funds target were common and thus reveal the timing of the Fed's decision-making/debate, these changes disproportionately took place in even weeks. Furthermore, yields on fed funds futures on average fell in even weeks, and the covariance between daily changes in fed funds futures yields and daily excess stock returns is lower in even weeks, consistent with a larger role for monetary policy news in even weeks. They suggest that an even-week timing of Fed deliberations may be related to discount rate requests from the Federal Reserve Banks that have to be submitted at least every 2 weeks. This could make a 2-week cycle for discussions between policy makers meaningful.

6.2 The FOMC Cycle in Stock Returns Is Unlikely to Mainly Be a Risk Premium

Several arguments speak against the FOMC cycle in stock returns representing an equity pre- mium for Fed news. First, no one appears to have been aware of the FOMC cycle in stock returns until it was documented by Cieslak, Morse & Vissing-Jorgensen (2019). Market participants do not require compensation for risk they are not aware of. Second, using the methodology of Knox et al. (2025) to obtain the equity premium for each calendar day, we find no evidence of the equity premium being systematically higher on even-week days, aside from the higher day 0 equity premium. Third, in the subsequent 5-year period from 2017 to 2021, there is a statistically significant opposite cycle in stock returns, with average returns lower in even weeks (**Figure 5*b***; **Table 5**, columns 5–8). A simple explanation is that news from the Fed on average came out worse than expected over the 2017–2021 period, supporting the idea that news can be unexpectedly good or bad on average even over a multiyear period. The 2017–2021 chart also suggests that the initial FOMC cycle evidence for 1994–2016 is not simply due to data mining—if so, one should not find any systematic pattern, positive or negative, out of sample.

6.3 Asset Pricing Channels and Types of Monetary Policy Shocks

Table 5 columns 1–4 use the decomposition of Knox & Vissing-Jorgensen (2025) to show that, for the 1994–2016 sample, 6.1 bps of the 11.5 bps even-week effect in S&P 500 excess returns are due to yield declines, with a 5.9 bps even-week effect in the cash flow and equity premium return component.[23] Using changes in equity premia to year 1 or year 2 (based on the Martin equity premium measure), we estimate a 2.4 bps even-week return effect due to falling equity premia. Nagel & Xu (2024) find that over the 1994–2023 sample, yield declines account for 5.8 bps of an 8.2 bps effect. We note that there is a negative FOMC cycle in much of the post-2016 sample, making it more meaningful to study the

[21] Week 0 runs from day -1 to day 3 (both included), week 2 from day 9 to 13, week 4 from day 19 to 23, and week 6 from day 29 to 33, with day 0 indicating the FOMC announcement day.
[22] The pattern is similar for the total stock market and when subtracting the riskless rate. We use the S&P500 return here because this can be decomposed using the Knox and Vissing-Jorgensen (2024) decomposition.
[23] There is no significant even-week effect in the riskless rate or the dividend yield, so the even-week effect in excess returns in Table 5 column 1 is due to an even-week effect in capital gains.

samples separately. The negative FOMC cycle in 2017–2021 appears to be due to equity premium increases or lower expected dividends (**Table 5**, columns 5–8).

For 1994–2016, Cieslak, Morse & Vissing-Jorgensen (2019) emphasize that different asset pric- ing channels appear to drive the even-week effect on stock returns depending on whether or not the market has done poorly recently. This is summarized in **Table 6**. They sort days based on the excess stock return over the prior week (days $t-5$ *to* $t-1$). The even-week effect in realized stock returns is about three times stronger if the prior week's excess stock return was low (bot- tom quintile, denoted "quintile 1 days"), with average excess returns 34 bps higher (per day!) on even-week quintile 1 days than odd-week quintile 1 days (**Table 6**, column 1). This is consistent with a surprisingly strong Fed put, i.e., reaction function news. There is no even-week decline in fed funds futures or Treasury yields on quintile 1 days, so the stronger than expected Fed put ap- pears to have boosted the stock market via a lower equity premium or higher expected cash flows **Table 6**, column 1-4). Cieslak, Morse & Vissing-Jorgensen (2019) rule in a role for falling equity premia by documenting that the Martin (2017) equity premium fell in even weeks, as shown in **Table 6** column 4. As for non–quintile 1 days, the more modest even-week effect in stock returns on non–quintile 1 days appears driven by monetary policy shocks, pure or reaction function, that increase stock returns by lowering yields (**Table 6**, columns 5–8).

6.4 Information Transmission Channels: Informal Communication

Analyzing how information gets from the Fed to markets, Cieslak, Morse & Vissing-Jorgensen (2019) find no effects on average stock returns of formal announcements (the Beige book, FOMC minutes, and discount rate minutes) or of speeches by Fed officials. Instead, the Fed appears to use informal communication such as communication with financial reporters. For example, the frequency of articles in *The Wall Street Journal* authored by David Wessel (a well-known reporter who covered the Fed during their sample) is higher in even weeks over the 1994–2016 sample.

To further understand information flows, Morse & Vissing-Jorgensen (2020) study a set of calendars of Federal Reserve governors (including the chair and vice chair) covering 2007–2018. They classify around 29,000 calendar entries based on the type of counterparty the governor is interacting with. Interactions (at FOMC events or in phone calls or meetings) between Federal Reserve governors and Federal Reserve Bank presidents emerge as a significant predictor of high stock returns on even-week days in FOMC cycle time, as well as in an hourly event study. Average stock returns on even-week days with governor–president interactions are particularly high on days with on-the-record public commentary by the FOMC (e.g., in public interviews) and on- background media interviews in a governor's calendar (with "on-background" inferred from the calendars not identifying the news outlet and meaning that the reporter can use the material but cannot quote the specific Fed source). Information thus appears to be created/shared in governor– president interactions and disseminated partly via informal media interactions.

Cieslak, Morse & Vissing-Jorgensen (2019) and Vissing-Jorgensen (2019) explore reasons for use of informal communication, also called unattributed communication. From an institutional perspective, it may be used to convey the Fed's reaction function to avoid unintended policy surprises [Caballero & Simsek's (2022) "tantrum shocks"]. Pre-FOMC newspaper articles typically lay out the issues facing the Fed and how the Fed may think about them. Informal communication may also be a convenient way to gauge support outside the Fed for a particular policy change, as it retains more flexibility than public communication. However, unattributed communication may hurt central bank credibility since it is the opposite of transparency and accountability. From the perspective of individual policy makers, unattributed communication may be used to change market expectations to improve one's bargaining position in policy negotiations. This is harmful because it lowers the FOMC's flexibility relative to no information disclosure and, as argued in a 2010 memo from Chair Bernanke to the FOMC, harms Fed credibility and the free give-and-take of ideas and collegiality of the FOMC (Bernanke 2010). Vissing-Jorgensen (2019) provides a game-theoretic model of the tug-of-war over market expectations between policy makers. In equilibrium, informal communication is used by disagreeing policy makers even if they would be better off if they could commit to not using it. She documents 114 FOMC documents discussing leaks, consistent with concerns about such communication. Ehrmann, Gnan & Rieder (2024) document 368 leaks related to ECB policy and link them to policy maker disagreements.

Regarding the pre-FOMC announcement drift, informal communication could contribute to this even if the communication took place beforehand. Reporters may only publish their article just before the meeting when attention is high, and traders with information may delay trading to shortly before the FOMC announcement to optimize their Sharpe ratios by taking on the least possible amount of volatility.

7. Conclusions

While the literatures we cover are quickly evolving, we tentatively draw the following lessons.

1. The effect on the stock market of shocks to short rates around FOMC announcements is substantial. The monetary policy shock multiplier is around 5 for *mps*, meaning that a 20 bps shock to rates at 1-year maturity leads to a 1% market loss. Short-rate shocks affect the market via both yields (for year 1 and past year 1) and equity premia/expected dividends.
2. The R^2 for the monetary policy shock multiplier regression is modest even in the narrow half-hour event window, suggesting the presence of multiple underlying types of monetary policy shocks (pure monetary policy shocks, Fed information effects, or reaction function news). An active literature works on the relative importance of Fed information effects versus reaction function news. In our assessment, for understanding stock returns (all three empirical facts we study), reaction function news appears to be more important than Fed information effects. In terms of asset pricing channels, the full stock return in the narrow window is driven more by equity premium and expected dividend changes than by yield curve changes.
3. The Fed can have a large effect on average stock returns over long samples, as evidenced by the pre-FOMC announcement drift and even-week pattern over the FOMC cycle. While the equity premium is elevated on FOMC announcement days, this likely accounts for only a modest fraction of the pre-FOMC announcement drift, and it is unlikely that the even- week pattern over the FOMC cycle represents an equity premium. Good news from the Fed leading to unexpected declines in equity premia or yields or positive cash flow news appear to be more important for understanding these two facts, with falling equity premia related to reaction function news. With little high-frequency evidence on expected dividends, the role of changes to expected cash flows is unclear.
4. The channels for information flow outside of FOMC announcements remain understudied. Early papers suggest that informal information flow via the financial press is important.

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Figure 1.

S&P 500 return against mps, half-hour window, scheduled FOMC announcements, 1994–2023. This figure shows S&P 500 Index returns graphed against monetary policy surprises on scheduled FOMC announcement dates. The line of best fit is shown in red. Abbreviations: FOMC, Federal Open Market Committee; mps, monetary policy surprise. Data from Bauer & Swanson (2023a).

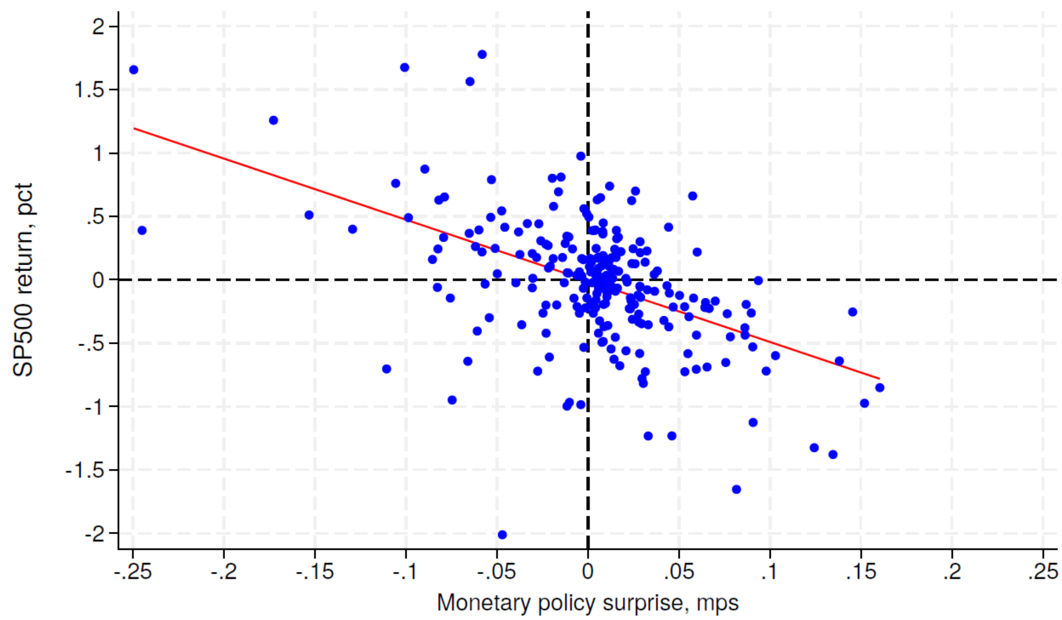


Figure 2.

Standard deviations of 5-minute and half-hour returns, intraday, 1994–2023. This figure shows the intraday standard deviations of S&P 500 Index returns. Panel a shows days when FOMC announcements were at 2:15 PM (versus other days, for comparison). Panel b shows days when FOMC announcements were at 2:00 PM, and panel c includes both days with 2:00 PM and days with 2:15 PM announcements. Data from Bloomberg and Tick History.

Panel A. **Panel B.** **Panel C.**

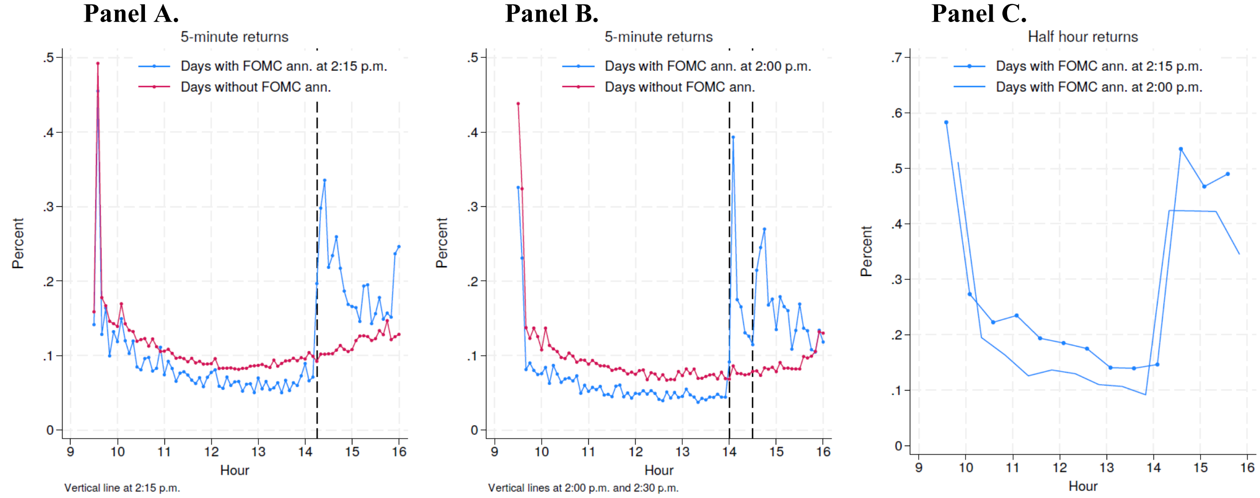


Figure 3.

The aggregate stock market, long-dated yields, and VIX around FOMC announcements. Panel *a* shows the average 3-day cumulative S&P 500 return around scheduled FOMC announcements. The black line covers the Lucca & Moench (2015) sample period of September 1994 to March 2011. The gray line covers the period post publication, April 2011 to December 2023. The vertical red dashed lines indicate 2:00 PM the day before the FOMC to 2:00 PM on the day of the FOMC, which are the start and the end of the pre-FOMC drift window. Panel *a* adapted with permission from Lucca & Moench (2015). Panel *b* shows the 2:00 PM–2:00 PM pre-FOMC drift return, cumulated over the sample September 1994 to December 2023, with the vertical gray dashed line at March 2011 indicating the end of the Lucca & Moench (2015) sample period. The black line shows the S&P 500 Index return, the blue line the contribution from the yield curve component of the Index return, and the red line the contribution from the cashflow and equity premium components combined. Panel *c* shows the average 3-day yield change around scheduled FOMC announcements for the on-the-run 30-year Treasury bond. Panel *d* shows the average 3-day index point change around scheduled FOMC announcements for the VIX. Data from Bloomberg and Tick History.

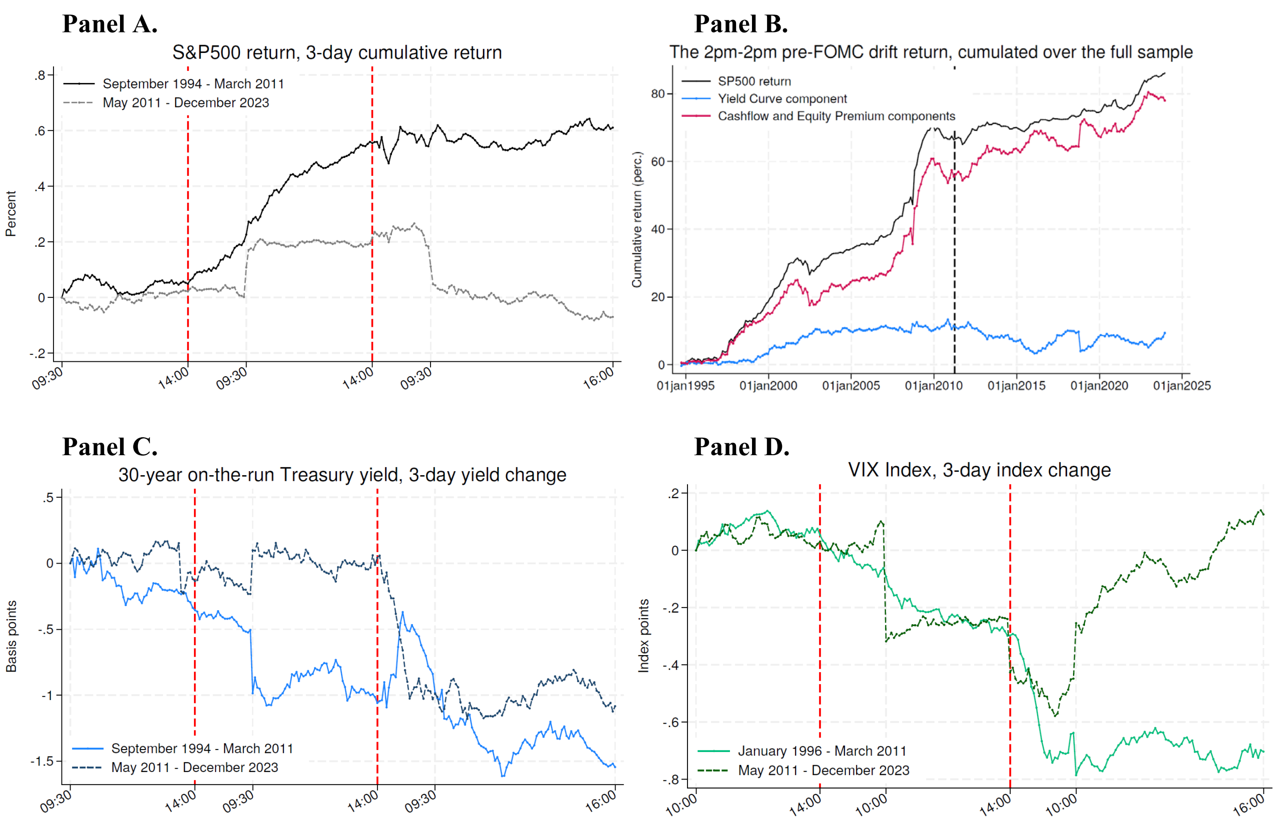
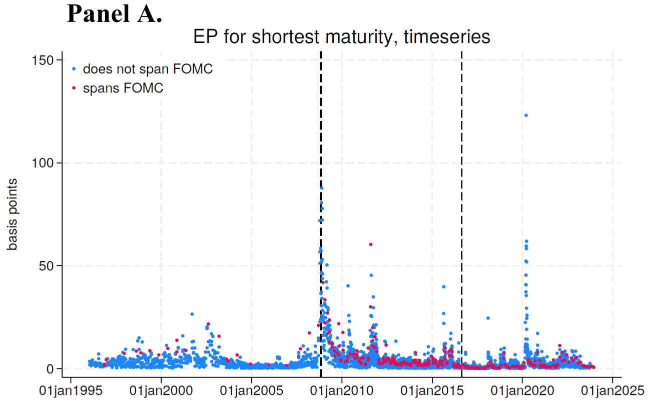


Figure 4.

Equity premium levels and changes around FOMC meetings. Panel *a* shows the time series of the option-implied Martin lower bound of the equity premium, with the equity premium estimated from options with the shortest time to expiration that day. Panel *b* shows a binned scatter plot of the change in the equity premium by maturity (measured in years to expiration) on FOMC days. Ten bins for each series. *x* and *y* values are means for the bin. The blue line shows data from all scheduled FOMC meetings over the 1996–2023 period and uses equity premium changes out to 1-year maturity. The red and green lines show equity premium changes in subsamples of FOMC meetings when longer maturities of equity premium are available. Data from OptionsMetrics.

Panel A.



Panel B.

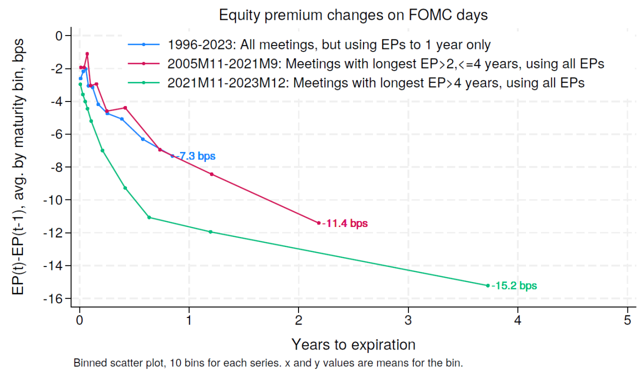
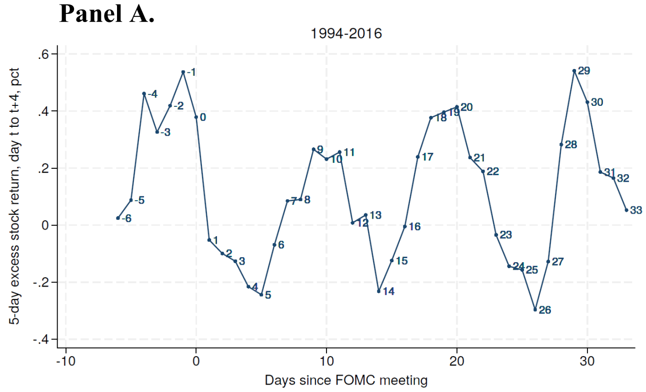


Figure 5.

The FOMC cycle in the excess stock return (S&P 500 Index excess return). This figure shows average 5-day excess stock returns across the FOMC cycle for (*a*) 1994–2016 and (*b*) 2017–2021. The numbers along the line indicate the value on the horizontal axis. Data from CRSP.

Panel A.



Panel B.

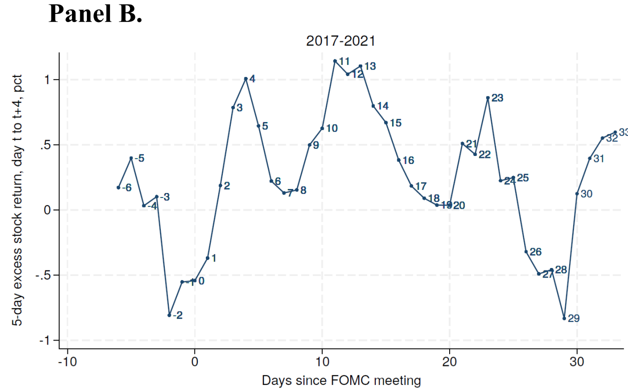


Table 1. The monetary policy shock multiplier, half-hour window.
Column 1-3: 1995-2023, Column 5-7: 1994-2023. Column 4, 8: 1996-2023.

	S&P500 return	YC return	CF and EP return	ΔVIX		S&P500 return	YC return	CF and EP return	ΔVIX
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
Kuttner	-3.26**	-1.08**	-2.18	2.87*	*mps*	-4.83***	-3.57***	-1.26	4.54***
surprise	(t=-2.51)	(-2.07)	(-1.46)	(1.83)		(-7.33)	(-6.33)	(-1.39)	(5.50)
Const.	-0.04	-0.01	-0.03	-0.18***	Const.	-0.01	0.01	-0.02	-0.21***
	(-1.14)	(-0.31)	(-0.82)	(-4.52)		(-0.29)	(0.66)	(-0.64)	(-5.32)
Obs.	231	231	231	221	Obs.	239	239	239	221
R^2	0.065	0.012	0.027	0.035	R^2	0.257	0.252	0.016	0.148

t-statistics are robust to heteroscedasticity throughout tables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Abbreviations: CF, cash flow; EP, equity premium; VIX, Volatility Index; YC, yield curve. Data from Bauer & Swanson (2023a), Bloomberg and Tick History.

Table 2. Understanding the full stock return in the narrow window, 1994–2023: regressions of return components and VIX on the half-hour log S&P 500 return around FOMC announcements.

	YC return	CF and EP return	ΔVIX
S&P500 return	0.24**	0.76***	-0.86***
	(t=2.39)	(7.51)	(-11.94)
Constant	0.01	-0.01	-0.21***
	(0.29)	(-0.26)	(-7.39)
Observations	239	239	221
R^2	0.106	0.536	0.540

Data from Bloomberg and Tick History

Table 3. Understanding the full stock return in the narrow window, 1994–2023: variance decomposition of half-hour log S&P 500 returns around FOMC announcements.

	Fraction
Var (ln(1+S&P500 return))	100%
= Var (ln(1+YC return))	55%
+ Var (ln(1+EP and CF return))	107%
+ 2*Cov (ln(1+YC return),ln(1+EP and CF return))	-63%

Data from Bloomberg and Tick History

Table 4 Asset pricing channels for the 2:00 PM to 2:00 PM pre-FOMC drift.

	Sept 1994 – March 2011				April 2011 – December 2023			
	S&P500 return	YC return	CF and EP return	ΔVIX	S&P500 return	YC return	CF and EP return	ΔVIX
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$I_t(preFOMC)$	0.49***	0.08	0.41***	-0.33**	0.16	-0.03	0.18	-0.46***
	(t=4.61)	(1.22)	(3.03)	(-2.11)	(1.50)	(-0.29)	(1.18)	(-2.67)
Constant	0.02	0.01	0.02	0.01	0.04**	0.01	0.04	0.01
	(0.87)	(0.61)	(0.64)	(0.40)	(2.14)	(0.37)	(1.41)	(0.42)
Observations	4,322	4,150	4,147	3,975	3,323	3,183	3,181	3,325
R^2	0.005	0.000	0.002	0.001	0.001	0.000	0.000	0.002

Data from Bloomberg and Tick History

Table 5: The FOMC cycle in stock returns and its asset pricing channels.

	Sept 1994 – December 2016				January 2017 – December 2021			
	S&P500 excess return (bps)	YC return	CF and EP return	EP return, Yr 1-2	S&P500 excess return	YC return	CF and EP return	EP return, Yr 1-2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$I_t(even\ week)$	11.48***	6.08*	5.88	2.36***	-12.01*	9.97*	-21.57**	-0.98
	(t=3.83)	(1.92)	(1.19)	(2.75)	(-1.84)	(1.68)	(-2.03)	(-0.54)
Constant	-3.00	-0.69	-0.67	-1.11*	11.76**	-1.97	15.44**	0.42
	(-1.52)	(-0.32)	(-0.21)	(-1.88)	(2.44)	(-0.50)	(2.08)	(0.31)
Observations	5,997	5,736	5,736	5,193	1,305	1,251	1,251	1,210
R^2	0.002	0.001	0.000	0.001	0.003	0.002	0.003	0.000

Data from CRSP and OptionsMetrics