Liquidity Premium Around FOMC Announcements *

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Abstract

This paper investigates the relationship between market liquidity and equity returns around scheduled Federal Open Market Committee (FOMC) meetings. We document significant time-series heterogeneity in liquidity conditions across meetings, even in the highly liquid E-mini S&P 500 futures market. We show that ex-ante excess liquidity contains substantial predictive power for post-announcement returns, which have traditionally proven difficult to forecast. Our findings are consistent with a time-varying liquidity premium: periods of low pre-announcement liquidity are associated with lower pre-announcement returns and higher post-announcement returns. We show that this liquidity channel remains a robust determinant of FOMC returns even after controlling for proxies for risk aversion, investor positioning, and monetary policy shocks.

Keywords: FOMC Announcements; Liquidity Premium; Post-FOMC Announcement Return.

JEL Classification: G12; G14.

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1 Introduction

The relation between central bank policies and asset prices is a widely discussed topic in financial economics and has received a lot of attention both in the academic literature and among practitioners, as monetary policy announcements have a substantial impact on the stock market. A large body of literature studies equity return dynamics around Federal Open Market Committee (FOMC) announcements and focuses mainly on the daily stock market return of the FOMC day and on the 24-hour return before scheduled FOMC announcements.[1] In fact, only a handful of papers find interesting patterns related to the stock market behaviour from the monetary policy announcement (or just before) until the end of the trading day.[2] While FOMC announcements cause substantial spikes in equity trading volume (e.g., Rosa, 2016a,b; Bollerslev et al., 2018; Zhu, 2021), the reaction of the stock market is mainly generated by unexpected monetary policy actions (Bernanke and Kuttner, 2005). The average post-announcement return is approximately zero (Lucca and Moench, 2015), and the post-announcement return-to-variance ratio is far exceeded by the pre-announcement counterpart, suggesting that distinct types of risk premia are realized around the announcement window (Hu et al., 2022). Few papers have studied the behavior of stock market liquidity around U.S. monetary policy announcements (e.g., Chung et al., 2013; Rosa, 2016a; Karolyi et al., 2019; Lagos and Zhang, 2020). Nevertheless, they have not explored the time series variation of market liquidity across FOMC meetings and how it impacts the market return. The aim of this paper is to explore whether FOMC meetings are characterized by a liquidity premium around the announcement, and thus if market liquidity is a determinant of the FOMC returns.

The main finding of this paper is that market liquidity varies significantly on the day before the FOMC announcement and contains information that helps predict the post-announcement return, which has proven difficult to forecast in the existing literature. Our objective, in con-

[1] The day of the release of the policy statement of a regularly scheduled FOMC meeting is defined henceforth as "event," or "FOMC day." We denote by $FOMC_{t-1}$ the trading day before an FOMC day. We refer to "pre-announcement," as the interval that spans from the closing of $FOMC_{t-1}$ to the end of the minute immediately preceding the announcement. Similarly, "post-announcement" indicates the interval spanning from the start of the announcement minute to the market close on the FOMC day. When referring to related studies, the expression "post-announcement return" may correspond to a slightly different interval, such as a window around the announcement, but the interpretation of the results is not affected.

[2] Gorodnichenko and Weber (2016) document that most monetary policy shocks within narrow event windows around FOMC decisions are tiny, in line with Neuhierl and Weber (2019), according to which the FOMC releases most of the news about monetary policy outside of scheduled FOMC meetings throughout the year.

trast to Lucca and Moench (2015), is not to document new anomalies, but rather to study the predictability of post-announcement returns and their relationship with market liquidity measured before the announcement.

Our goal is to assess whether a calm-before-the-storm effect affects asset prices through a liquidity channel. Lucca and Moench (2015) show that trading volume and realized volatility are, on average, subdued in the pre-announcement interval and tend to spike at the time of the announcement, consistent with the "calm-before-the-storm" effect documented by Jones et al. (1998) for Treasury securities ahead of inflation and labor-market releases, and by Bomfim (2003) for FOMC announcements.

We revisit the calm-before-the-storm effect by focusing on time-series variation in market liquidity and its implications for asset prices. In our framework, the calm-before-the-storm reflects periods of lower trading activity rather than lower stock-return volatility. We show that this liquidity effect is independent of volatility dynamics and we argue that it is reflected in asset prices through a time-varying liquidity premium. Interpreting the calm period as one of reduced trading activity and lower liquidity, we find that the calmer the market before the announcement, the larger the subsequent increase in liquidity and the higher the post-announcement return.

We focus on FOMC days based on the conjecture that market liquidity may fluctuate more surrounding this particular announcement, which the literature identifies as having the most pronounced impact on asset prices (Savor and Wilson, 2013). While we recognize that the S&P 500 Futures market is among the most liquid in the world, we hypothesize that there is significant heterogeneity in liquidity conditions across different FOMC meetings.

If this conjecture is correct, our analysis yields three main predictions, all of which are confirmed empirically. First, market liquidity should exhibit greater time-series variation on the day preceding FOMC announcements than on non-announcement days, implying a more pronounced and time-varying liquidity premium. Second, ex-ante excess liquidity should be positively related to pre-announcement returns and negatively related to post-announcement returns on FOMC days, consistent with the pricing and subsequent realization of this premium; importantly, no such relationship is expected on non-FOMC days. Third, these liquidity effects should persist even after controlling for other variables correlated with liquidity — including pre-announcement returns, proxies for risk aversion or investor positioning, and monetary policy shocks — demonstrating that liquidity is a distinct and important determinant of post-announcement returns.

The economic mechanism underlying these predictions is a time-varying liquidity premium around announcement dates. When market liquidity deteriorates sharply prior to the announcement (e.g., at t–1) and subsequently normalizes — either immediately after the announcement or shortly before it — the required liquidity premium varies over time and is reflected in asset prices. Although an increase in the liquidity premium raises expected returns immediately, it is accompanied by a negative price impact that dominates during the pre-announcement period. As a result, realized returns may be negative before the announcement, despite expected returns already being higher. Consequently, the positive return effects associated with liquidity are more readily observed after the announcement. When liquidity improves, the liquidity premium declines, and realized returns turn positive even if the premium remains temporarily elevated.

One potential concern is the endogeneity of market liquidity. It is possible that pre-announcement liquidity is driven by broader shifts in market-wide risk aversion or strategic investor positioning ahead of FOMC meetings. To investigate this, we examine the relationship between our liquidity proxies and several benchmarks, including the VIX Index, realized volatility, and non-market uncertainty measures, and we find that the predictive power of pre-announcement liquidity for post-announcement returns remains robust after controlling for these variables. Furthermore, we include pre-announcement returns as a control for investor positioning or sentiment, recognizing that shifts in market mood prior to the meeting can significantly influence pre-announcement stock prices. Our results suggest that the "liquidity channel" is not merely a proxy for risk aversion or investor positioning; rather, it reflects the specific compensation required by market makers and arbitrageurs for bearing inventory risk and asymmetric information in the lead-up to the policy announcement. This suggests that the "liquidity channel" provides unique information beyond standard risk and sentiment proxies. While liquidity is undoubtedly influenced by risk aversion and positioning, our results indicate that it acts as the primary transmission mechanism through which these latent factors are priced. Consequently, market liquidity serves as a more comprehensive "summary statistic" for the frictions faced by market participants ahead of major policy shifts.

To capture the multi-dimensional nature of market liquidity, we employ four distinct proxies. While our analysis considers a broad suite of measures, all of which are found to be statistically significant, we present our main results using market depth and dollar volume. These measures directly reflect the trading capacity and market participation central to liquidity provision around scheduled announcements. Specifically, depth represents the quantity available for trade

at the best bid and offer without inducing price movement, providing a snapshot of latent market resilience. In contrast, dollar volume measures the extent of realized trading activity. Together, these measures are particularly well-suited to capturing the strategic withdrawal and subsequent re-entry of liquidity providers around FOMC meetings. For completeness, we also incorporate the Amihud (2002) measure and the bid-ask spread. The Amihud measure, calculated as the ratio of absolute returns to trading volume, serves as a proxy for price impact, representing the price response associated with each dollar of trading. Finally, the bid-ask spread captures the direct transaction costs faced by market participants. To ensure comparability across time and measures, each proxy is adjusted to reflect excess liquidity, defined as liquidity that deviates from historical norms. We calculate this by scaling the daily liquidity (the average of one-minute observations) by its trailing monthly average. Based on this metric, we classify an FOMC announcement as being preceded by high (low) liquidity if the excess liquidity on the trading day prior to the announcement exceeds (does not exceed) its average level over the previous month.

We focus on liquidity measured on the day prior to the announcement to ensure that it is fully predetermined with respect to announcement-day returns and captures market conditions entering the event. This timing choice reflects investors' willingness to supply liquidity ahead of a known information event and avoids the pronounced intraday variation in liquidity observed on announcement days.[3]

Our study contributes to the literature on equity return dynamics around FOMC announcements by providing an integrated analysis of the relationship between equity market liquidity and returns around scheduled FOMC meetings. The empirical analysis is based on an event study of 215 scheduled FOMC announcements over the period 1997 – 2024. We use intraday data on E-mini S&P 500 futures at one-minute frequency to construct measures of market liquidity as well as pre- and post-announcement returns.

First, to study the behavior of market liquidity around FOMC announcements, we test

[3] A small literature documents that FOMC announcements are associated with substantial and systematic intraday fluctuations in liquidity and trading activity. Chung et al. (2013) show that several measures of market liquidity decline prior to scheduled monetary policy announcements and change sharply following the release, consistent with shifts in information flow and trading behavior. Rosa (2016a) documents a deterioration in market quality around FOMC announcements, with liquidity measures worsening immediately after the release, reflecting heightened adverse selection and uncertainty. Focusing on trading activity, Zhu (2021) shows that volume decreases ahead of FOMC announcements and increases sharply afterward, consistent with a temporary withdrawal of trading prior to the release and a resumption of activity once information becomes public.

whether liquidity exhibits greater time-series variation on the day preceding the announcement than on non-announcement days. We find that liquidity varies substantially more on FOMC_{t-1} days, which are also characterized by abnormally low levels of liquidity. As a consequence of this heterogeneity in pre-announcement market conditions across events, investors may require a more strongly time-varying liquidity premium to compensate for bearing illiquidity risk.

Second, we examine the relationship between ex-ante excess liquidity and intraday returns on both FOMC and non-FOMC days. On FOMC days, ex-ante excess liquidity is positively and significantly related to pre-announcement returns and negatively and significantly related to post-announcement returns, consistent with the presence of a liquidity premium around FOMC announcements. On non-FOMC days, using morning and afternoon returns as proxies for pre- and post-announcement returns, we also find negative but statistically insignificant relationships, accompanied by substantially larger standard errors.

Third, we show that this effect remains strong even after accounting for other variables that are correlated to liquidity. We find that both pre-announcement returns and Federal funds rate shocks, each of which is statistically related to post-announcement returns, vary systematically with the level of liquidity of the day before the announcement. Conditioning post-announcement returns jointly on the level of liquidity and on these variables, we find that liquidity remains an important determinant of post-announcement returns.

Finally, we study post-announcement changes in liquidity and volatility conditional on liquidity on the day before the announcement. We show that liquidity and volatility have distinctive behavior around FOMC announcements. Although both variables spike after the announcement, low-liquidity meetings exhibit significantly larger increases in liquidity, while volatility responses are similar across liquidity states and not statistically different. Taken together, our findings add to the "calm-before-the-storm" literature by showing that this mechanism is not only reflected in volatility dynamics. We show that there are particular patterns in market liquidity that also have an impact on equity prices.

Our results are robust to alternative constructions of excess liquidity as well as to different definitions of high- and low-liquidity events. The findings of this study are relevant for policymakers, portfolio managers, and investors interested in understanding how equity markets respond to monetary policy announcements. The remainder of this paper proceeds as follows. Section 2 describes the data and the liquidity measures. The results of the empirical analysis are presented in Section 3. Section 4 reports the robustness tests, and conclusions are offered in Section 5.

2 Data Description and Liquidity Measures

2.1 Data Description

To explore the presence of a liquidity premium around FOMC announcements, we rely on intraday data on E-Mini S&P 500 futures at one-minute frequency, that we got from Tickdata-market. We use E-Mini S&P 500, as they are one of the most efficient, liquid, and cost-effective ways to gain market exposure to the S&P 500 Index.

The time period of the empirical analysis spans from September, 10, 1997 to December, 31, 2024.[4] Over this period, there have been a total of 218 scheduled FOMC meetings (eight regularly scheduled meetings per year).[5] Right after the conclusion of every meeting, a policy statement is released by the Federal Reserve. Until March 2011, policy statements are released, on average, at about 2:15 p.m. ET; we obtained the exact release time from the Internet Appendix of Lucca and Moench (2015).[6] Since April 2011, policy statements have been released at 2:00 p.m., except for eight meetings when the policy statement was released at 12:30 p.m. From the website of the Federal Reserve, we obtained data and information on FOMC meeting calendars, Federal funds rate, and monetary policy decisions.[7]

To mitigate data errors and outliers, we apply a series of standard data-cleaning filters. Specifically, we verify that bid and ask prices, bid and ask sizes, bid-ask spreads, and trading volume are non-negative and non-missing; that mid-prices are within a reasonable range relative to the S&P 500 Index; and that bid-ask spreads are lower than four index points.

[4] The FOMC started announcing the outcome of the meetings in February 1994. In February 1995, the FOMC announced that all monetary policy changes would be communicated to the public immediately. In January 2000, the FOMC announced that, following each regularly scheduled meeting, it would issue a statement even if there had been no change in monetary policy. Our analysis starts when E-Mini S&P 500 was launched.

[5] As for two FOMC meetings we do not have complete intraday data on the volume, we exclude those two meetings. As Baglioni and Ribeiro (2023), we exclude the FOMC meeting of October 2008, which is characterized by a 24-hour pre-announcement return greater than 10% (extreme observation). We thus consider 215 events in our empirical analysis.

[6] All times mentioned in this paper are in Eastern Time (ET).

[7] Detailed information on FOMC meeting calendars and statements is available at `https://www.federalreserve.gov/monetarypolicy/fomccalendars.htm`.

2.2 Measuring Market Liquidity

As a proxy for market liquidity, we use four different measures that capture different aspects of liquidity. While we consider several liquidity proxies in our analysis, we present our main results using market depth and dollar volume. The results with other liquidity measures are available either in the Internet Appendix or upon request. These measures directly capture trading capacity and market participation, which are central to our interpretation of liquidity provision around scheduled monetary policy announcements. Depth reflects the quantity that can be traded without moving prices, while volume measures the extent of actual trading activity, making both measures particularly well suited to capturing the strategic withdrawal and subsequent re-entry of liquidity around FOMC meetings. The Amihud (2002) measure, which reflects the correlation between an incoming market order and the subsequent price change, can be interpreted as the price response associated with one dollar of trading volume, thus serving as a measure of price impact. Bid-ask spread reflects the size of the transaction costs.

We measure market liquidity on trading day t and minute m ($Liquidity_{\mathrm{t,m}}$), using the following liquidity measures:

$$Depth_{t,m} = Mid\ Price_{t,m} \times [Ask\ Size_{t,m} + Bid\ Size_{t,m}]/2 \tag{1}$$

$$Dollar\ Volume_{t,m} = 50 \times Mid\ Price_{t,m} \times Volume_{t,m} \tag{2}$$

$$Amihud\ Liquidity_{t,m} = [\frac{|R_{t,m}|}{Dollar\ Volume_{t,m}}]^{-1} \tag{3}$$

$$Spread\ Tightness_{t,m} = [Ask\ Price_{t,m} - Bid\ Price_{t,m}]^{-1} \tag{4}$$

where Ask (Bid) $Price_{\mathrm{t,m}}$ represents the Ask (Bid) closing price of minute m. Ask (Bid) $Size_{\mathrm{t,m}}$ represents the number of contracts that investors are trying to buy at the Ask (Bid) $Price_{\mathrm{t,m}}$. $Mid\ Price_{\mathrm{t,m}}$ indicates the mid-price closing value of minute m, and is equal to $0.5 \times (Ask\ Price_{\mathrm{t,m}} + Bid\ Price_{\mathrm{t,m}})$. $|R_{\mathrm{t,m}}|$ is the absolute value of the mid-price 1-minute return. $Dollar\ Volume_{\mathrm{t,m}}$ is computed as the product of the number of contracts traded during one minute ($Volume_{\mathrm{t,m}}$) and the value paid to enter one E-Mini S&P 500 contract at the end of that minute ($50 \times Mid\ Price_{\mathrm{t,m}}$).

For each measure of liquidity, we compute daily excess liquidity as follows: first, for every minute of every trading day, we compute liquidity as in equations (1) to (4). Second, we take

the average of all minutes for each trading day (daily liquidity). Third, we divide the daily liquidity of each trading day by its daily average of the previous month. By controlling for the average liquidity of the previous month, we make sure that we are using a proxy for the liquidity that is unexpected (or out of the ordinary), reflecting innovations in liquidity.[8]

In equations (3) and (4), we take the reciprocal to reflect liquidity instead of illiquidity. For instance, the Amihud (2002) measure, which reflects the correlation between an incoming market order and the subsequent price change, can be interpreted as the price response associated with one dollar of trading volume, thus serving as a measure of price impact. Intuitively, the higher the price impact, the higher the illiquidity; as we take the reciprocal, the higher the value of this measure, the higher the liquidity (instead of the illiquidity) of the market. The same applies to the bid-ask spread, which reflects the size of the transaction costs: its reciprocal reflects liquidity instead of illiquidity, and we refer to it as spread tightness.[9]

Table 1 reports the correlation among our liquidity measures on $FOMC_{t-1}$ and non-FOMC days (defined as trading days different from $FOMC_{t-1}$, $FOMC_t$, and $FOMC_{t+1}$). As shown in Table 1, the correlation across the four variables tends to be stronger on the day before FOMC announcements than on non-FOMC days.

INSERT TABLE 1

2.3 Variables Description

The main variables of interest in this paper, along with the liquidity measures described in the previous paragraph, are the pre- and the post-announcement returns. These measures of market return are computed using the mid-price closing value of E-Mini S&P 500 of a certain minute. In particular, the pre-announcement return is the return that spans from the closing of the $FOMC_{t-1}$ trading day (3:59 p.m.) until the minute before the announcement, whereas the post-announcement return spans from the minute of the announcement (this time, opening value of the minute) until the closing of the FOMC day. For non-FOMC days, as a proxy for pre- and post-announcement returns, we use the morning and afternoon return, which are computed over similar intervals: the morning return spans from the closing of the previous trading day until 1:59 p.m., while the afternoon return spans from 2 p.m. to 3:59 p.m. All returns are expressed in basis points.

[8] We thank Prof. Yakov Amihud for validating the approach used to compute excess liquidity.

[9] For a comprehensive review of the literature on liquidity measures, see Le and Gregoriou (2020).

We distinguish between announcements characterized by high and low liquidity. We define an FOMC announcement as associated with a high (low) level of liquidity if liquidity on $FOMC_{t-1}$ is higher (not higher) than the average daily liquidity of the previous month (i.e., if excess liquidity is either positive of negative). We measure market liquidity on the trading day preceding the FOMC announcement to ensure that liquidity is fully predetermined with respect to announcement-day returns and to avoid concerns arising from the sharp intraday variation in trading activity observed on FOMC days. In fact, equity market liquidity on announcement days exhibits pronounced intraday swings and discrete jumps at the time of the announcement (Chung et al., 2013), making daily or intraday measures difficult to interpret and potentially endogenous to price changes. By contrast, liquidity measured on the previous trading day captures market conditions entering the announcement and reflects investors' willingness to supply liquidity ahead of a known information event.

We identify Federal funds rate target and path shocks using data from Acosta et al. (2024), which updated previous data from Nakamura and Steinsson (2018).[10] As a proxy for volatility, we use the percentage difference between the high and the low mid-price value of the minute. We compute daily volatility, as the average volatility across all minutes of the trading day. Along with volatility, as control variables, we use the open to close return of the previous trading day and the Monetary Policy Uncertainty (MPU) Index from Husted et al. (2020).[11]

3 Empirical Findings

This section presents the results of our empirical analysis. We first examine the time-series properties of excess liquidity. We then study the relation between ex-ante excess liquidity and intraday returns on FOMC and non-FOMC days, focusing on whether this relation differs on FOMC days and is consistent with a liquidity premium. Next, we assess whether other determinants of post-announcement returns vary with pre-announcement liquidity and whether

[10] Data is available at `https://www.acostamiguel.com/research.html`.

[11] The MPU Index is a measure of the uncertainty that the public perceives about Federal Reserve monetary policy actions and their consequences. It is constructed by tracking the frequency of newspaper articles related to monetary policy uncertainty, searching for articles in the Washington Post, Wall Street Journal, and New York Times, containing the triple of "uncertainty" or "uncertain;" "monetary policy(ies)" or "interest rate(s)" or "Federal fund(s) rate" or "Fed fund(s) rate;" and "Federal Reserve" or "the Fed" or "Federal Open Market Committee" or "FOMC." Data on the MPU Index are available at `https://sites.google.com/site/lucasfhusted/data`.

liquidity remains important when conditioning on these variables. Finally, we analyze post-announcement changes in liquidity and volatility conditional on pre-announcement liquidity.

3.1 The Variation in Market Liquidity Around FOMC Announcements

We start by exploring the behavior of our liquidity measures around FOMC announcements. For this purpose, we investigate whether liquidity varies more on $FOMC_{t-1}$ than on non-FOMC days. As a proxy for variation in market liquidity, we use the inter-percentile range. For each of the four liquidity measures, we compute the median and the inter-percentile range value corresponding to the difference between the 90^{th} and 10^{th} percentile and the 75^{th} and 25^{th} percentile. The results are reported in Table 2. As our liquidity measures reflect the liquidity in excess or deficiency from the previous month's average, a positive (negative) value for a certain percentile would suggest that liquidity tends to be higher (lower) than the previous month.

INSERT TABLE 2

We find that market liquidity tends to vary much more than usual on $FOMC_{t-1}$. In fact, looking at the inter-percentile range value for the 90^{th} minus 10^{th} percentile, and the 75^{th} minus 25^{th} percentile, both ranges are wider on $FOMC_{t-1}$ days (Panel A) in comparison to non-FOMC days (Panel B), for each measure of liquidity. The greater variation in the time series of excess liquidity is due to low liquidity days, as the 25^{th} and the 10^{th} percentiles are much more negative in Panel A than in Panel B, while the 90^{th} and the 75^{th} percentiles tend to be closer across panels. Moreover, the percentage of high liquidity events is lower in Panel A.

The results from Table 2 suggest that the day before FOMC announcements is characterized by abnormally low levels of liquidity. Due to the cross-event heterogeneity in pre-announcement market conditions, investors might require a liquidity premium as compensation for bearing the risk to invest in the interval before and/or after the FOMC announcement.

3.2 Excess Liquidity and Intraday Returns on FOMC and Non-FOMC Days

In the previous paragraph, we document that there is an abnormal variation in excess liquidity on $FOMC_{t-1}$, especially when its level is low. In this paragraph, we examine the

relationship between ex-ante excess liquidity and intraday market returns, to explore whether this relationship is different around FOMC announcements.[12] We run the following regressions:

$$Afternoon\ Return_t = \alpha + \beta \ln(1 + Excess\ Liquidity_{t-1}) \times FOMC + \gamma \ln(1 + Excess\ Liquidity_{t-1}) \times Non\text{-}FOMC + \delta\, Volatility_{t-1} + \varepsilon_t \quad (5)$$

$$Morning\ Return_t = \alpha + \beta \ln(1 + Excess\ Liquidity_{t-1}) \times FOMC + \gamma \ln(1 + Excess\ Liquidity_{t-1}) \times Non\text{-}FOMC + \delta\, Volatility_{t-1} + \varepsilon_t \quad (6)$$

where, for FOMC days, the morning and afternoon returns are the pre- and post-announcement return. A detailed description of the variables in equations (5) and (6) is reported in paragraph 2.2 and 2.3. By construction, each liquidity measure reflects the percentage liquidity in excess (or in deficiency) from the average daily liquidity of the previous month. We estimate equations (5) and (6) using daily data over the period 1997 – 2024.

Table 3 reports the results using depth and volume as liquidity measures. As shown in columns (1) and (2), there is a negative and statistically significant relationship between ex-ante excess liquidity and the post-announcement return. In contrast, the relationship with the pre-announcement return is positive (columns (3) and (4)). On non-FOMC days, the relationship between ex-ante excess liquidity and the morning and afternoon returns is negative, but not statistically significant, and the magnitude of the coefficients is much smaller.[13] According to Savor and Wilson (2013), the risk-return relationship differs on days with scheduled macroeconomic announcements, suggesting that liquidity and return dynamics may exhibit distinct patterns in such environments.

INSERT TABLE 3

Our findings from Table 3 suggest that ex-ante excess liquidity contains useful information to predict intraday returns on FOMC days. We now explore in depth the relationship between these two variables on FOMC days, controlling for other variables that could potentially explain the post-announcement return. We run the following regressions:

[12] For expositional clarity, we present our main results using depth and dollar volume, which directly capture trading capacity and participation. The results with other liquidity measures are available either in the Internet Appendix or upon request.

[13] Results are robust to using lagged VIX levels or unexpected volatility, instead of realized volatility.

$$Post\text{-}Ann.\ Return_t = \alpha + \beta\ \ln(1 + Excess\ Liquidity_{t-1}) + \gamma\, FFR\ Target\ Shock_t + \delta\, FFR\ Path\ Shock_t + \theta' Controls + \varepsilon_t \quad (7)$$

$$Pre\text{-}Ann.\ Return_t = \alpha + \beta\ \ln(1 + Excess\ Liquidity_{t-1}) + \theta' Controls + \varepsilon_t \quad (8)$$

where FFR path and target shocks represent shocks to the path and to the current Federal funds rate, respectively. Controls represent volatility and open to close return of $FOMC_{t-1}$, along with the MPU Index level of the event. These controls aim to capture the possible effect of risk aversion and investor positioning prior to the meeting. Observations are related to FOMC days only, over the period 1997-2024.[14] The results are reported in Table 4.

INSERT TABLE 4

As shown in the first two columns of Table 4, there is a negative and statistically significant relationship between ex-ante excess liquidity and post-announcement returns on FOMC days. This negative relationship holds also after controlling for other variables, such as Federal funds rate target and path shocks, that potentially explain part of the equity market return following the announcement. In contrast, as reported in columns (3) and (4), ex-ante excess liquidity is positively associated with pre-announcement returns. Other variables that are statistically related with the pre-announcement return are the volatility of the previous day and the monetary policy uncertainty index of the event, in line with Martello and Ribeiro (2018) and Neuhierl and Weber (2019), who document that the pre-FOMC announcement drift occurs mainly in periods of considerable market uncertainty.

Taken together, these results are consistent with the presence of a liquidity premium around FOMC meetings: the positive (negative) association between excess liquidity and pre- (post-) announcement returns suggests that investors require compensation for bearing illiquidity risk.

The negative relationship between ex-ante excess liquidity and the market return reported in Table 3 and Table 4 is in line with the usual relationship documented in the literature. There is an extensive literature on the relationship between liquidity and asset prices, which suggests that liquidity predicts stock returns both at the firm level and at the aggregate market level. Amihud and Mendelson (1986a,b) are the first to study the effect of securities' bid-ask spreads on their returns and find that stock return increases in illiquidity: the higher a stock's spread, the higher its observed return should be. They are followed by Amihud and Mendelson (1989),

[14] We estimate equations (7) and (8) using observations related to 210 events, instead of 215 events, as we have data on Federal funds rate shocks and MPU Index up to the first half of 2024.

Brennan and Subrahmanyam (1996), Brennan et al. (1998), Datar et al. (1998), Easley et al. (2002), Baker and Stein (2004), Acharya and Pedersen (2005), Lee (2011) and Kim and Lee (2014). Amihud (2002) proposes that, over time, the ex-ante stock excess return is increasing in the expected illiquidity of the stock market, while unexpected illiquidity and contemporaneous stock return are negatively related. He explains this negative relationship with the fact that, if higher expected illiquidity causes ex ante stock returns to rise, stock prices should fall when illiquidity unexpectedly rises.

Many theoretical papers study the effects of market-wide events on stock liquidity. They predict that the demand for liquidity increases with a large market decline, as agents liquidate their positions across assets and the supply of liquidity is reduced (liquidity providers hit their wealth or funding constraints).[15] In accordance with the theoretical literature, Hameed et al. (2010) and Karolyi et al. (2012) empirically document that stock illiquidity increases following negative market returns, particularly during times of tightness in the funding market. Amihud et al. (2006) present an extensive review of the theoretical and empirical literature that studies the relationship between liquidity and asset prices.

3.3 Conditioning the Post-FOMC Announcement Return to Liquidity and Other Potential Determinants

In the previous paragraphs, we show that the level of liquidity on the day preceding an FOMC announcement contains useful information for predicting post-announcement returns. Table 4 further documents that shocks to both current and expected future Federal funds rates are statistically related to post-announcement returns. In addition, Baglioni and Ribeiro (2022) show that pre-announcement returns are negatively related to returns following the announcement, particularly for meetings accompanied by the Summary of Economic Projections (SEP).[16] Together with excess liquidity, these findings identify three additional variables that may help explain variation in post-announcement returns.

[15] The main models are the contagion models by Kyle and Xiong (2001), Pavlova and Rigobon (2008), and Gromb and Vayanos (2002, 2018); the coordination failure models by Bernardo and Welch (2004), Morris and Shin (2004), and Vayanos (2004); and the collateral-based models of Anshuman and Viswanathan (2006) and Brunnermeier and Pedersen (2009).

[16] Gu et al. (2018) document sizable positive unconditional stock returns after FOMC announcements accompanied by the SEP and press conferences, which are characterized by greater uncertainty resolution than other FOMC meetings. Results from Table 4 are robust to including a dummy for SEP meetings.

Table 5 shows that these explanatory variables vary systematically with the level of pre-announcement liquidity, using market depth and dollar volume as liquidity measures. In particular, pre-announcement returns are substantially lower in low-liquidity meetings, consistent with the interpretation that investors require compensation for bearing illiquidity risk. Similarly, Federal funds rate target and path shocks tend to be smaller in meetings characterized by low liquidity, even though the statistical significance is much lower in the latter case.

INSERT TABLE 5

Table 6 examines how post-announcement returns vary jointly with pre-announcement liquidity and other explanatory variables. Panel A conditions post-announcement returns on the level of liquidity and on the sign of the pre-announcement return, while Panel B conditions post-announcement returns on the level of liquidity and on the sign of Federal funds rate target shocks. Conditioning jointly on liquidity and these variables, we find that market liquidity remains an important determinant of FOMC announcement returns. In particular, the difference in post-announcement returns between low- and high-liquidity meetings is positive and statistically significant, indicating that the effect of pre-announcement liquidity on post-announcement returns is not subsumed by either pre-announcement return realizations or monetary policy shocks. The results are robust to alternative conditioning schemes. Specifically, we first condition post-announcement returns on the level of one variable (e.g., high versus low liquidity, positive versus negative pre-announcement returns or policy shocks) and then split the resulting subsamples into two equal groups based on the median value of the second variable.

INSERT TABLE 6

Figure 1 and Figure 2 report the average intraday market cumulative return across FOMC days, from the opening until the closing time, conditioned on the level of liquidity on $\text{FOMC}_{\text{t-1}}$. The first observation (9:30 ET) incorporates the overnight return from the previous day's close.

INSERT FIGURE 1 AND FIGURE 2

3.4 Liquidity and Volatility Over the Post-FOMC Announcement Interval

A large literature documents that scheduled macroeconomic announcements are preceded by unusually low trading activity and volatility, followed by sharp increases at the time of

the release. Jones et al. (1998) provide early evidence of a "calm-before-the-storm" effect in Treasury markets ahead of inflation and labor market announcements, documenting unusually low trading activity and volatility prior to the release and sharp increases thereafter, consistent with market participants awaiting the resolution of public information. Bomfim (2003) extends this mechanism to monetary policy announcements, showing that volatility is subdued prior to scheduled FOMC meetings and spikes sharply once the policy decision is released. Consistent with this evidence, subsequent works document similar dynamics in asset prices around FOMC announcements. Lucca and Moench (2015), Rosa (2016b), and Bollerslev et al. (2018) show that realized volatility and trading volume increase sharply after FOMC announcements. Similarly, Chung et al. (2013), Rosa (2016a), and Zhu (2021) document substantial increases in equity trading volume following these events.

Building on this literature, we examine the behavior of liquidity and volatility in the post-announcement interval, conditioning on the level of liquidity observed on the day before the announcement. We measure percentage changes in liquidity and volatility as the ratio of their average values over the post-announcement interval to their average values over the final 30 minutes preceding the announcement. Table 7 reports the resulting average spikes in liquidity and volatility across liquidity states. While both liquidity and volatility increase following the announcement regardless of ex-ante liquidity conditions, meetings preceded by low liquidity are associated with substantially larger increases in liquidity than meetings preceded by high liquidity. By contrast, volatility spikes are similar across liquidity states and are not statistically different, indicating that liquidity responses vary systematically with pre-announcement liquidity even when volatility responses do not.

INSERT TABLE 7

Taken together, our findings extend the calm-before-the-storm literature by showing that this mechanism, previously documented primarily in terms of volatility, is also closely linked to market liquidity and is priced in returns.

4 Robustness Tests

In this section, we test the robustness of our results.[17] First, we use alternative liquidity measures. Second, we modify the computation of our liquidity measures. Third, we change the

[17] The results of the robustness tests described in this paragraph are available either in the Internet Appendix or upon request.

definition of high and low liquidity events.

Using Alternative Liquidity Measures. Results are similar across the four measures of liquidity described in Section 2.2. For clarity and ease of interpretation, the main results of this paper (Table 3 to Table 7) are presented using depth and dollar volume as liquidity measures. In fact, the Amihud (2002) (il)liquidity measure is influenced by volatility, as it accounts for the absolute value of the market return in the numerator. Similarly, bid-ask spreads capture a different dimension of market frictions related to adverse selection and inventory risk, and exhibit distinct dynamics around announcements; in particular, spreads tend to widen following FOMC announcements, reflecting heightened information asymmetry rather than liquidity provision (Chung et al., 2013). In Table 2, we show that Amihud liquidity and spread tightness, computed as in equations (3) and (4), behave in a similar way as depth and dollar volume on $\text{FOMC}_{\text{t-1}}$. Using Amihud liquidity and spread tightness in Table 3 to Table 7, we obtain qualitatively similar results.

Modifying the Excess Liquidity Measures. The results are robust to alternative constructions of excess liquidity. In particular, we obtain similar findings when excess liquidity is computed using liquidity measured during the pre-announcement interval, the last trading day of the week preceding the announcement, or the first trading day of the FOMC week, rather than liquidity measured on the day before the announcement. In addition, the results are robust to alternative benchmarks used to define excess liquidity: replacing the trailing monthly average with the average over the previous one or two weeks yields qualitatively similar conclusions, as does using the corresponding median instead of the mean. In Table 3 and Table 4, we use the natural logarithm of (1 + excess liquidity) to reduce the influence of extreme observations. Results are robust to using the level of excess liquidity instead.

Changing the Definition of High and Low Liquidity Events. The results are robust to alternative thresholds used to define high- and low-liquidity events. In particular, defining liquidity as high (low) based on whether excess liquidity exceeds (does not exceed) the median excess liquidity across either FOMC or non-FOMC days, rather than being positive or not, yields qualitatively similar results. In Table 5, Table 6 and Table 7, we report mean values and the mean difference in low- versus high-liquidity events. The results are robust to using median values instead of mean values.

5 Conclusions

Our study contributes to the literature on equity return dynamics around FOMC announcements by providing an integrated analysis of the relationship between market liquidity and equity returns. While a small number of papers examine stock market liquidity around U.S. monetary policy announcements, they do not investigate the time-series variation in market liquidity across FOMC meetings or its implications for announcement-day returns.

The main finding of this paper is that pre-announcement market liquidity contains useful information for predicting post-announcement returns, a quantity that has proven difficult to forecast in the existing literature. Interpreting low pre-announcement liquidity as a manifestation of a "calm-before-the-storm" environment, characterized by reduced trading activity and the temporary withdrawal of liquidity provision, we find that calmer pre-announcement periods are followed by larger post-announcement increases in liquidity and higher post-announcement returns.

Our results extend the calm-before-the-storm story of Jones et al. (1998) and Bomfim (2003) by showing that pre-announcement liquidity conditions are not only associated with subsequent changes in trading activity and volatility, but are also priced in post-announcement returns. Importantly, while volatility increases following FOMC announcements are similar across liquidity states, liquidity responses differ markedly: post-announcement liquidity increases are significantly larger following low-liquidity meetings. This distinction indicates that our findings are not driven by differential volatility responses.

Our findings are robust across multiple liquidity measures capturing different aspects of market liquidity, alternative constructions of these measures, and different definitions of the pre-announcement liquidity state.

Several avenues for future research emerge from this paper. One promising direction is the development of theoretical frameworks that can rationalize the presence of a liquidity premium around scheduled monetary policy announcements. Existing models of return dynamics around FOMC meetings may need to be extended to account for the role of liquidity highlighted in this paper, while some may be challenged by the results that we document. In addition, it would be valuable to explore cross-sectional variation in liquidity and returns on FOMC versus non-FOMC days.

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6 Tables

Table 1: Correlation Among Excess Liquidity Measures.

Panel A – Correlation on $FOMC_{t-1}$

	Depth	Volume	Amihud Liquidity	Spread Tightness
Depth	1.0	0.71	0.42	0.41
Volume		1.0	0.91	0.52
Amihud Liquidity			1.0	0.55
Spread Tightness				1.0

Panel B – Correlation on Non-FOMC Days

	Depth	Volume	Amihud Liquidity	Spread Tightness
Depth	1.0	0.65	0.31	0.35
Volume		1.0	0.85	0.33
Amihud Liquidity			1.0	0.36
Spread Tightness				1.0

Note: This table reports the correlation among our excess liquidity measures on $FOMC_{t-1}$ and non-FOMC days (defined as trading days different from $FOMC_{t-1}$, $FOMC_t$, and $FOMC_{t+1}$). A detailed description of our liquidity measures is reported in paragraph 2.2. By construction, each measure reflects the percentage liquidity of the trading day in excess (or in deficiency) from the average daily liquidity of the previous month.

Table 2: Excess Liquidity across pre-FOMC and non-FOMC Days.

Panel A – Excess Liquidity on $FOMC_{t-1}$ Days

	Depth	Volume	Amihud Liq.	Spread Liq.
90^{th} Percentile	+32%	+42%	+43%	+5.8%
75^{th} Percentile	+14%	+19%	+22%	+1.3%
Median	-7%	-7%	+3%	+0.1%
25^{th} Percentile	-20%	-26%	-12%	-0.2%
10^{th} Percentile	-40%	-47%	-50%	-2.6%
90^{th} – 10^{th} Percentile	*72%*	*89%*	*93%*	*8.4%*
75^{th} – 25^{th} Percentile	*34%*	*44%*	*34%*	*1.5%*
High Liquidity Events	*40%*	*43%*	*55%*	*65%*

Panel B – Excess Liquidity on Non-FOMC Days

	Depth	Volume	Amihud Liq.	Spread Liq.
90^{th} Percentile	+32%	+40%	+32%	+2.5%
75^{th} Percentile	+16%	+20%	+18%	+0.8%
Median	+1%	+1%	+3%	+0.1%
25^{th} Percentile	-13%	-16%	-10%	-0.1%
10^{th} Percentile	-26%	-29%	-22%	-0.7%
90^{th} – 10^{th} Percentile	*57%*	*69%*	*54%*	*3.2%*
75^{th} – 25^{th} Percentile	*29%*	*36%*	*28%*	*0.9%*
High Liquidity Events	*52%*	*51%*	*56%*	*70%*

Note: This table reports a summary statistics of our liquidity measures on $FOMC_{t-1}$ and on non-FOMC days (defined as trading days different from $FOMC_{t-1}$, $FOMC_t$, and $FOMC_{t+1}$). For each of the four liquidity measures, this table reports the 90^{th}, 75^{th}, 50^{th}, 25^{th}, and 10^{th} percentile, as well as the inter-percentile range and the percentage of trading days where liquidity is higher than the average of the previous month. By construction, each measure reflects the liquidity of the trading day in excess (or in deficiency) from the average daily liquidity of the previous month. A positive (negative) value indicates that liquidity tends to be higher (lower) than the previous month by a certain percentage. A detailed description of our liquidity measures is reported in paragraph 2.2.

Table 3: Excess Liquidity and Intraday Returns on FOMC and non-FOMC Days.

	Dependent variable:			
	Afternoon Return		Morning Return	
	(1)	(2)	(3)	(4)
Constant	-5.36*	-5.14*	4.35	4.22
	(3.15)	(3.06)	(3.65)	(3.54)
Excess $\text{Depth}_{\text{t-1}} \times$ FOMC	-36.81*		21.60*	
	(19.85)		(11.44)	
Excess $\text{Depth}_{\text{t-1}} \times$ Non-FOMC	-2.95		-4.22	
	(2.60)		(4.26)	
Excess $\text{Volume}_{\text{t-1}} \times$ FOMC		-20.02**		5.24
		(9.39)		(6.00)
Excess $\text{Volume}_{\text{t-1}} \times$ Non-FOMC		-0.54		-2.85
		(1.07)		(1.85)
$\text{Volatility}_{\text{t-1}}$	1.06*	1.02	-0.15	-0.15
	(0.64)	(0.62)	(0.74)	(0.72)
Observations	6,455	6,455	6,455	6,455
R^2	0.01	0.01	0.0005	0.0004
FOMC Days Only	*X*	*X*	*X*	*X*

Note: This table reports the relationship between excess liquidity and intraday returns on FOMC and non-FOMC days, using depth and dollar volume as liquidity measures. We estimate the following equations:

$$Afternoon\ Return_t = \alpha + \beta \ln(1 + Excess\ Liquidity_{t-1}) \times FOMC + \gamma \ln(1 + Excess\ Liquidity_{t-1}) \times Non\text{-}FOMC + \delta\, Volatility_{t-1} + \varepsilon_t$$

$$Morning\ Return_t = \alpha + \beta \ln(1 + Excess\ Liquidity_{t-1}) \times FOMC + \gamma \ln(1 + Excess\ Liquidity_{t-1}) \times Non\text{-}FOMC + \delta\, Volatility_{t-1} + \varepsilon_t$$

where excess liquidity reflects the percentage liquidity in excess (or in deficiency) from the average daily liquidity of the previous month. For FOMC days, the morning and afternoon returns are the pre- and post-announcement return. The average volatility of the previous trading day is used as control variable. A detailed description of the variables is reported in paragraph 2.2 and 2.3. The equations are estimated using daily data over the period 1997 – 2024. Robust standard errors are reported in parenthesis. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Table 4: Excess Liquidity and FOMC Returns.

	Dependent variable:			
	Post-Ann. Return		Pre-Ann. Return	
	(1)	(2)	(3)	(4)
Constant	-20.63	-21.68	-11.30	-10.74
	(20.93)	(21.40)	(11.20)	(11.09)
Excess $\text{Depth}_{\text{t-1}}$	-33.68*		19.58*	
	(18.25)		(11.25)	
Excess $\text{Volume}_{\text{t-1}}$		-17.33**		9.99
		(8.69)		(6.35)
Target FFR Shock	-6.53***	-6.56***		
	(2.25)	(2.29)		
FFR Path Shock	-1.75*	-1.74*		
	(0.95)	(0.96)		
$\text{Volatility}_{\text{t-1}}$	3.09	2.73	11.08***	11.30***
	(3.40)	(3.40)	(2.38)	(2.33)
Open to Close $\text{Return}_{\text{t-1}}$	-0.06	-0.05	-0.02	-0.02
	(0.10)	(0.10)	(0.07)	(0.07)
MPU Index	0.01	0.03	-0.11*	-0.12**
	(0.11)	(0.11)	(0.06)	(0.06)
Observations	210	210	210	210
R^2	0.11	0.11	0.25	0.25
FOMC Days Only	✓	✓	✓	✓

Note: This table reports the relationship between excess liquidity and intraday returns on FOMC days, using depth and dollar volume as liquidity measures. We estimate the following equations:

$$\textit{Post-Ann. Return}_t = \alpha + \beta \ln(1 + \textit{Excess Liquidity}_{t-1}) + \gamma\, \textit{FFR Target Shock}_t + \delta\, \textit{FFR Path Shock}_t + \theta' \textit{Controls} + \varepsilon_t$$

$$\textit{Pre-Ann. Return}_t = \alpha + \beta \ln(1 + \textit{Excess Liquidity}_{t-1}) + \theta' \textit{Controls} + \varepsilon_t$$

where excess liquidity reflects the percentage liquidity in excess (or in deficiency) from the average daily liquidity of the previous month. FFR path and target shocks represent shocks to the path and to the current Federal funds rate, respectively. Controls represent volatility and open to close return of $\text{FOMC}_{\text{t-1}}$, along with the MPU Index level of the event. Observations are related to FOMC days only, over the period 1997-2024. A detailed description of the variables is reported in paragraph 2.2 and 2.3. Robust standard errors are reported in parenthesis. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Table 5: Is Liquidity Related to Other Potential Explanatory Variables?

Liquidity Measure	Liquidity Level	Pre-Ann. Return	FFR Target Shock	FFR Path Shock
Excess Depth	Low	17.73***	-1.06**	-0.83
	High	43.06***	0.46	1.27
	Difference	*-25.33****	*-1.52***	*-2.10**
Excess Volume	Low	22.24***	-1.20***	-0.73
	High	35.11***	0.53	0.97
	Difference	*-12.87**	*-1.76****	*-1.70*

Note: This table reports the relationship between excess liquidity and other variables that are statistically related with post-announcement returns. Liquidity is classified as high or low according to whether, on $FOMC_{t-1}$, it is higher or not than the average daily liquidity of the previous month. "Pre-Ann. Return" represents the average E-Mini S&P 500 mid-price return across FOMC meetings; it is computed using the price closing value of the minutes, over the interval that spans from the closing of $FOMC_{t-1}$ until the minute before the announcement, and is expressed in basis points. "FFR Path Shock" and "FFR Target Shock" represent the average percentage shock to the path and to the current Federal funds rate, respectively, across events. "Difference" represents the difference in mean when liquidity is low versus high. A detailed description of the variables is reported in paragraph 2.2 and 2.3. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Table 6: Conditioning Post-Announcement Return on Explanatory Variables.

Panel A – Conditioning on both Liquidity and Pre-Ann. Return		
	Positive Pre-Ann. Return	Negative Pre-Ann. Return
Low Depth	-0.61	24.45**
High Depth	-39.53***	12.79
Difference	*38.92***	*11.66*
Low Volume	-4.36	21.58**
High Volume	-35.37**	21.24
Difference	*31.01**	*0.34*
Panel B – Conditioning on both Liquidity and FFR Target Shock		
	Positive FFR Shock	Negative FFR Shock
Low Depth	-7.50	26.84**
High Depth	-40.81**	-10.44
Difference	*33.30**	*34.34***
Low Volume	-8.92	19.72*
High Volume	-35.14**	2.42
Difference	*26.21**	*17.29*

Note: This table reports the average conditional value of the post-announcement return across events. In Panel A, the post-announcement return is conditioned on liquidity and pre-announcement return. In Panel B, the post-announcement return is conditioned on liquidity and target Federal funds rate shocks. Liquidity is classified as high or low according to whether, on $FOMC_{t-1}$, it is higher or not than the average daily liquidity of the previous month. The pre-announcement return is computed over the interval that spans from the closing of $FOMC_{t-1}$ until the closing of minute before the announcement. FFR shock represents the shock to the current Federal funds rate. "Difference" represents the difference in mean when liquidity is low versus high. A detailed description of the variables is reported in paragraph 2.2 and 2.3. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

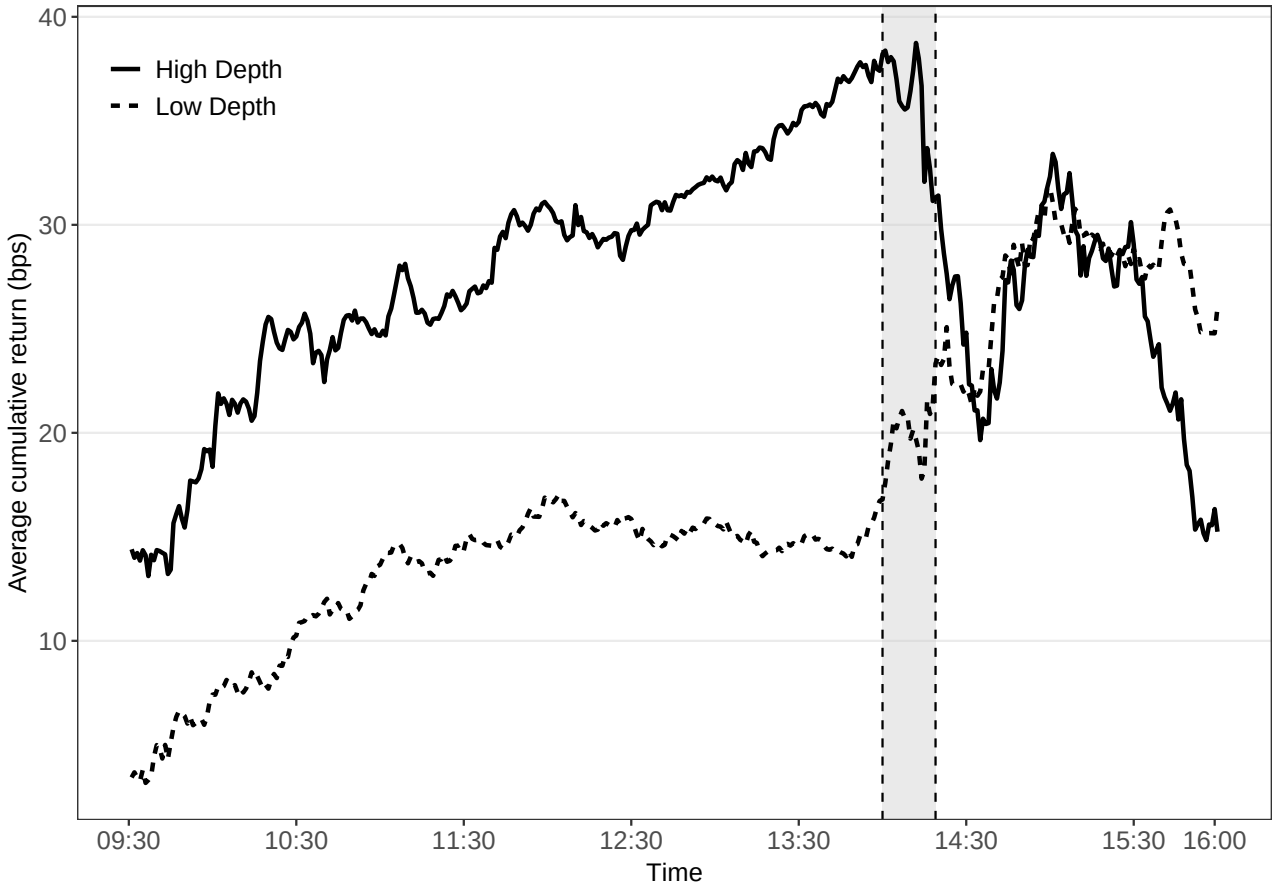
Table 7: Spikes in Liquidity and Volatility After the Announcement.

Liquidity Measure	Liquidity Level	Liquidity Change Post-Ann.	Volatility Change Post-Ann.
Excess Depth	Low	247%***	176%***
	High	205%***	161%***
	Difference	*42%***	*15%*
Excess Volume	Low	364%***	174%***
	High	297%***	165%***
	Difference	*67%***	*9%*

Note: This table reports the behavior of liquidity and volatility in the post-announcement interval, conditioned on the level of liquidity observed on the day before the announcement. Liquidity is classified as high or low according to whether, on $FOMC_{t-1}$, it is higher or not than the average daily liquidity of the previous month. "Liquidity Change Post-Ann." and "Volatility Change Post-Ann." represent the average value across events of the percentage changes in liquidity and volatility, measured as the ratio of their average values over the minutes of the post-announcement interval to their average values over the final 30 minutes preceding the announcement. "Difference" represents the difference in mean when liquidity is low versus high. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

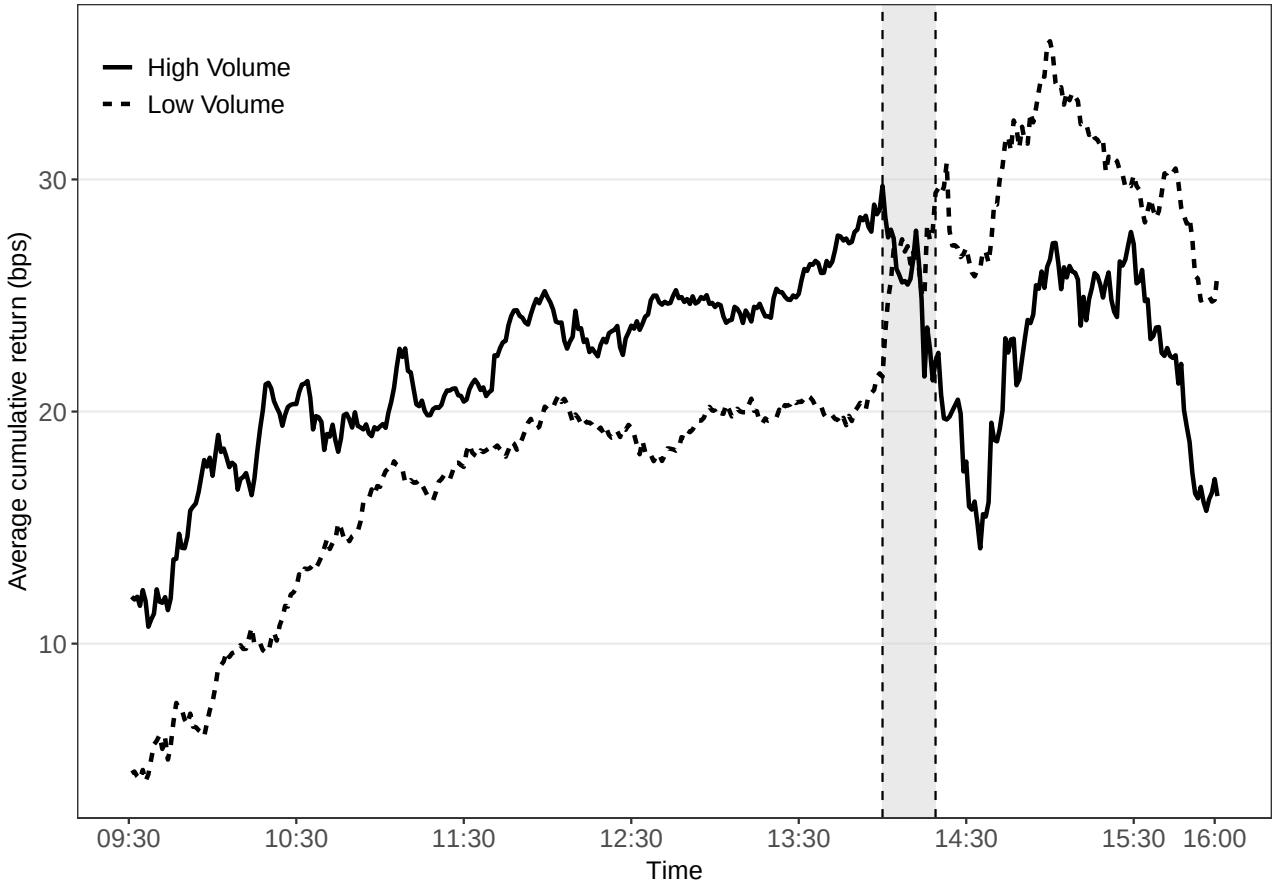
7 Figures

Figure 1: FOMC Intraday Average Cumulative Return Conditioned on Depth Levels.



Note: This figure plots the average intraday cumulative log return of E-Mini S&P 500 futures across scheduled FOMC announcement days over 1997 – 2024, using one-minute data from the market open to the end of the trading day, conditioned on the ex-ante level of depth. The first observation (9:30 ET) incorporates the overnight return from the previous day's close. FOMC days are classified as high- or low-liquidity events based on whether, on $\text{FOMC}_{t\text{-}1}$, daily liquidity exceeds or not its average level of the preceding month. The announcement window (14:00 – 14:20) is highlighted by the shaded area. We exclude eight meetings in which the policy statement was released at 12:30.

Figure 2: FOMC Intraday Average Cumulative Return Conditioned on Volume Levels.



Note: This figure plots the average intraday cumulative log return of E-Mini S&P 500 futures across scheduled FOMC announcement days over 1997 – 2024, using one-minute data from the market open to the end of the trading day, conditioned on the ex-ante level of dollar volume. The first observation (9:30 ET) incorporates the overnight return from the previous day's close. FOMC days are classified as high- or low-liquidity events based on whether, on $\text{FOMC}_{t\text{-}1}$, daily liquidity exceeds or not its average level of the preceding month. The announcement window (14:00 – 14:20) is highlighted by the shaded area. We exclude eight meetings in which the policy statement was released at 12:30.