Federal Reserve Transparency and Aggregate Trading around FOMC Meeting Days

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Abstract

We find that cross-sectional volatility and trading volume around Federal Open Market Committee meeting days have increased steadily over 20 years. These upward trends are not found for other macroeconomic announcements and randomly selected days. The evidence suggests that more extensive information about the future economic outlook is announced on FOMC meeting days as the Federal Reserve consistently improves transparency and communication. Cross-sectional volatility and trading volume increase as the market reflects more flow of information announced at FOMC meeting days.

JEL classification: E52, E58, G14

Keywords: Federal Reserve Transparency; Federal Reserve Communication; FOMC Meetings; Cross-Sectional Volatility; Trading Volume

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1 Introduction

The context and rationale for the Federal Reserve's interest rate decisions are more open and transparent to the public than ever before. In contrast to interest rate decisions prior to the 1980s, where the rationale and context of the Federal Reserve's decisions were in a black box, the Fed has steadily improved its transparency policies and provided additional information to help market participants understand the background of its decisions since the 1980s.[1] Among the changes, perhaps the most significant change in the Fed's transparency policy is the Chairman's press conference, which has been in place since 2011. It attempts to communicate directly with the market about the future economic outlook and to address the forward guidance for the target rate decision.

A primary reason the Fed seeks to communicate directly with the market and provide forward guidance is to induce economic agents to act promptly in the direction of the Fed's intentions by proactively informing them of future interest rate changes (Woodford 2005; Blinder, Ehrmann, Fratzscher, De Haan, and Jansen 2008). Agents will immediately form their future expectations if FOMC meetings announce information that is useful for predicting future interest rate decisions and the economic outlook. To manage the monetary policy more effectively, the Fed tries to improve transparency and present the context for its decisions.

Indeed, the market attempts to predict the future in more sophisticated ways with the additional context provided by the Fed. For example, textual and sentiment analysis of press conference transcripts and even a biographical analysis of the committee members who voted for and against the Fed rate change are performed (See Cannon (2015), Möller and Reichmann (2021), and Apel, Blix Grimaldi, and Hull (2022) for technical analysis of the conference and transcripts. See Smales and Apergis (2016), Lähner (2018), and Ainsley (2019) for analysis of the characteristics of committee members). Therefore, recent FOMC meetings are likely to provide a more complete picture of the future economic outlook than the early FOMC meetings of the 1980s.

Motivated by the unprecedented improvement in the Fed's communication policy, we examine whether the cross-sectional volatility and trading volume of the stock market have gradually increased as a part of the process by which market participants interpret more extensive information

[1] See Table A1 for a more detailed history of the transparency policy.

and form the expectations.[2] Cross-sectional volatility and trading volume should capture the rate of information flow to the stock market as suggested by a number of previous papers (Lamoureux and Lastrapes 1990; Rahman 2007). Thus, if the information flow to the stock market increases with the enhancement of transparency policies and communication over time, these two variables should show an upward trend or a significant increase relative to the past.

Consistent with this ex ante conjecture, we find that abnormal cross-sectional volatility and abnormal trading volume in the stock market occur on the day of the FOMC meeting and persist for about five days after the meeting. These abnormal variables around the meeting days have increased over the past two decades. This uptrend is not found for the announcement dates of the inflation rate and the unemployment rate, is not a simple time-series trend, and is not due to random effects. The results suggest that recent FOMC meetings have provided a greater amount of information, largely as a result of improved transparency and communication policies.

Our paper contributes to the existing literature in the following perspectives. First, we present a timely evidence that shed lights on discussion about the effectiveness of the Fed's transparency and communication policies. It is a global trend that the central banks focus on communication to directly influence economic agents' expectations. This trend is supported by a large body of literature that reports the positive impact of central bank transparency and communication on financial stability (Born, Ehrmann, and Fratzscher 2014; Papadamou, Sidiropoulos, and Spyromitros 2014). However, there is also a group of literature that doubts its validity due to the incompleteness of policy implementation (Österholm, Dale, and Orphanides 2008; Siklos 2013; Thornton 2016). We add new evidence to a recent debate by observing the historical pattern of cross-sectional volatility and trading volume around FOMC meetings.

Second, we provide new insights on the macroeconomic announcement premium (Savor and Wilson 2013; Savor and Wilson 2014; Ai and Bansal 2018; Fisher, Martineau, and Sheng 2022). On the day of the macroeconomic announcement, including the FOMC meeting, market participants demand a market risk premium. Thus, the beta of the Capital Asset Pricing Model has a distinguishable explanatory power (Savor and Wilson 2014). However, if the FOMC meetings announce not only the federal funds rate but also extensive information about future economic

[2]We emphasize the cross-sectional volatility measures the degree to which individual stock returns deviate from market returns. It should be distinguished from the time-series volatility, which contains information about return reversals during a specific period. This is discussed in more detail in section 2 and 3.

conditions that can affect asset prices, then returns could show a different pattern that cannot be explained by the market risk premium or conventional risk factors. Idiosyncratic risk may have increased on that day, so FOMC meeting days should be considered separately. This paper has important implications for asset pricing by indirectly observing the evolution of FOMC information.

Section 2 describes data collection and the construction of variables. Section 3 presents the empirical strategy, empricial results, and discuss implications. We conclude in Section 4.

2 Data and Consturction of Variables

We collect the dates of scheduled FOMC meetings from the Federal Reserve's website from January 1980 to December 2022. Daily stock returns and trading volumes for all publicly traded stocks listed on the NYSE, the NASDAQ, and the AMEX during the same period are obtained from the CRSP database.

Then we construct daily cross-sectional volatility as follows:

$$CSV_t = \sqrt{\sum_{i=1}^{N} \left(R_{i,t} - R_{M,t}\right)^2 \times w_{i,t}} \tag{1}$$

where $R_{i,t}$ is the return on the individual stock i at day t, $R_{M,t}$ is the value-weighted market return at t, $w_{i,t}$ is the weight of stock i by market capitalization at t, and N is the number of stocks that are listed at t.

Aggregate trading volume is the value-weighted average of the trading volume of each stock i on day t.

$$TV_t = \sum_{i=1}^{N} \left(\frac{\text{Trading Shares}_{i,t}}{\text{Shares Outstanding}_{i,t}} \times w_{i,t} \right) \tag{2}$$

Instead of using the variables calculated from the above equations, we use *abnormal cross-sectional volatility* ($ACSV_t$) and *abnormal trading volume* (ATV_t) at day t that exceed the average CSV_t and TV_t of the last 30 calendar days.[3] The purpose of using abnormal variables is to rule out the possibility of upward or downward trends that may be inherent in the long time-series of cross-sectional volatility and trading volume, and to focus on the abnormal effects that are concentrated on FOMC meeting days. We calculate the average volatility and trading volume from 37 days to 7

[3]We only use abnormal variables if at least 15 business days are included.

days prior to the FOMC meeting. This 7-day interval is intended to observe the abnormal variables in the 5-day window prior to the meeting. We report summary statistics of CSV_t, TV_t, $ACSV_t$, and ATV_t in Table 1.

[Table 1]

While the average daily CSV_t is about 1.844% and TV_t is about 4.587%, $ACSV_t$ and ATV_t are close to 0 for the sample period. Therefore, subtracting the past 30-day average is valid for estimating the abnormal effects of daily cross-sectional volatility and trading volume.

3 Empirical Analyses

3.1 Graphical Illustration

As a first step of the empirical analysis, we present the patterns of cross-sectional volatility and trading volume around the FOMC meeting in a simple but intuitive way. We classify the days around the FOMC meeting into three windows: the five days before the meeting ($t-5, t-1;\ W_{t-5,-1}$), the day of the meeting ($t;\ W_t$), and the five days after the meeting ($t+1, t+5;\ W_{t+1,+5}$). We average $ACSV_t$ and ATV_t for each window and then average them again by year. In Figure 1, the annual averages of these variables are plotted and trend lines from the linear regressions are presented.

[Figure 1]

Panel A shows the pattern of $ACSV_t$ and ATV_t in $W_{t-5,-1}$, Panel B and Panel C show those in W_t and $W_{t+1,+5}$, respectively. The blue dots represent the annual average of $ACSV_t$ (left column) and ATV_t (right column). The solid red line is the trend line of the scatterplot. There is a slight upward trend of ACV_t and ATV_t in $W_{t-5,-1}$ (Panel A). However, their magnitudes are very small compared to the trend found in W_t (Panel B) and in $W_{t+1,+5}$ (Panel C). In Panel B and C, the upward trend of $ACSV_t$ and ATV_t is more pronounced than in Panel A. These results support our hypothesis that the Fed's improvement in transparency and communication leads to the release of more extensive information about the future economic outlook at FOMC meetings. Aggregate cross-sectional volatility and trading volume increase as the market reflects the FOMC information and the agents form future expectations. Panel A also indirectly supports this argument. If information released at FOMC meetings is not the primary factor driving the upward trend in the

abnormal variables, the magnitude of the slope of $ACSV_t$ and ATV_t in $W_{t-5,-1}$ should be similar in W_t and $W_{t+1,+5}$.

We conduct two additional tests to examine whether the upward trend in $ACSV_t$ and ATV_t stems from the unique nature of the information announced at the FOMC meetings. First, we collect the announcement dates of the inflation (Producer Price Index) and the employment rate. Then, we observe the trend in abnormal volatility and abnormal trading volume around the announcement dates. Inflation and the employment rate are similar to the federal funds rate in that they are macroeconomic information. However, we expect the FOMC meetings to become unique as the Fed provides more extensive information on the future economic outlook. If the upward trend in volatility on FOMC meeting days is indeed due to the Fed's increased transparency and communication efforts, the trend should not be seen on other macroeconomic announcement days.

Second, we perform a placebo test to exclude the possibility that the increase in $ACSV_t$ and ATV_t following the FOMC meeting comes from the random effects. The results presented so far are based on the abnormal variables that exceed the normal effects estimated from 37 days to 7 days prior to the FOMC meeting, which is intended to remove time-series trends. If there is a trend in the abnormal variables, even if it is very unlikely, picking random days and calculating the $ACSV_t$ and the ATV_t of those days would show similar results to the FOMC. To test this effect, we randomly pick eight days in a year, excluding the FOMC meetings, and calculate the $ACSV_t$ and ATV_t at that day. We visualize the trend on the annual average of the abnormal variables from 100 times of simulation.

In Figure 1, the dashed line (orange) shows the trend in the abnormal variables of other macroeconomic announcement days and the dashed dot line (violet) shows the trend of the average from the placebo tests. In contrast to the trend of increasing $ACSV_t$ and ATV_t on the day of the FOMC meeting and the five days following, we do not see such an upward trend on other macroeconomic announcement days or randomly selected days. This strongly suggests that the upward trend in abnormal variables around FOMC meetings is a unique feature that cannot be explained by other macroeconomic variables or random effects.

3.2 Trends in Aggregate Tradings around FOMC

We analyze whether $ACSV_t$ and ATV_t are statistically different by FOMC and non-FOMC meeting days and these differences are on an upward trend with statistical significance. To see this, we summarize the averages of the abnormal variables and the average differences between FOMC and non-FOMC by subperiod in Table 2.[4]

In Table 2, we confirm two empirical facts. First, $ACSV_t$ and ATV_t on the FOMC meeting days increase monotonically over time. The average differences in $ACSV_t$ and ATV_t between column 1 (1980-1989) and column 4 (2010-2022) are 0.152% and 0.576%, respectively, which are statistically significant at the 1% level. Second, there is no pattern in $ACSV_t$ and ATV_t on non-FOMC meeting days, which are close to zero. This not only confirms again that there are no trends in either of the two abnormal variables, but also suggests that the differences between FOMC and non-FOMC meeting days are entirely driven by increased aggregate trading on FOMC days.

[Table 2]

The empirical results in Table 2 are consistent with our hypothesis that the nature of the information released at the FOMC has become more extensive as the Fed has increased its transparency and focus on communicating with the market. Aggregate trading increases as market participants form expectations about the future economy.

3.3 Regressions

We run regressions to examine whether this upward trend is robust even when we control for the January effect, the Friday effect, and other macroeconomic variables. We construct the following baseline regression and estimate the coefficients:[5]

$$y_t = \beta_0 + \beta_1 \cdot D_t^{FOMC} + \beta_2 \cdot D_t^{FOMC} \cdot D_t^{Post} + \beta_3 \cdot D_t^{Post} + \beta_4 \cdot Y_{t-1} + \mathbf{\Theta} \cdot \mathbf{X}_t + FE + \varepsilon_t \qquad (3)$$

Regression (3) is repeated for $ACSV_t$ and ATV_t as the dependent variable y_t. D_t^{FOMC} is the dummy variable indicating FOMC meeting days and D_t^{Post} is the dummy variable of the post-

[4] We present the results for FOMC meeting days only (Panel B in Figure 1).

[5] See Krieger, Mauck, and Chen (2010), Heyes, Neidell, and Saberian (2016) for empirical model of testing differences in a specific day in time-series data.

2000 sample. Y_{t-1} is CSV_{t-1} and TV_{t-1} calculated by (1) and (2). $\mathbf{X}_t$ is the control vector composed of macroeconomic variables and FE is the fixed effects for January, Friday, and month. We consider macroeconomic uncertainty (MU_t) of Jurado, Ludvigson, and Ng (2015) and economic policy uncertainty (EPU_t) of Baker, Bloom, and Davis (2016). In addition, we include the log growth of industrial production (MP_t), the volatility of the term spread ($\sigma(TS)_{t-37,-7}$) and the default spread ($\sigma(DS)_{t-37,-7}$) from 37 days to 7 days prior to the FOMC meeting.

If the post-2000s FOMC communication with additional context is indeed effective in inducing market participants to form future expectations, the coefficient β_2 should be significantly positive. By looking at β_2, we can discuss the extent to which volatility differs before and after 2000s, even after controlling for other macroeconomic sources. The choice of the year 2000 is arbitrary. We use the year 2000 for an interpretive purpose because the regression is designed to observe whether there is a significant change in $ACSV_t$ and ATV_t around FOMC meeting days relative to the past, even after controlling for other macroeconomic variables that may affect volatility.[6]

[Table 3]

Table 3 estimates the regression coefficients of equation (3). We present the results of post-FOMC (y_t is estimated as the average during $W_{t+1,+5}$). Columns 1 to 6 present the results of when the dependent variable is $ACSV_t$ and columns 7 to 12 present the results for ATV_t. We can see that abnormal cross-sectional volatility is about 0.14% higher in the post-2000s than in the pre-2000s. The results in columns 7 to 12 show that the abnormal trading volume is about 0.60% higher after the 2000s. The coefficients are all significant at the 1% level. These differences are of similar magnitude in Table 2. The differences of abnormal variables are also robust to controlling for other macroeconomic variables; the coefficients do not vary much and are fairly consistent.

Given that the 75 percentiles of $ACSV_t$ and ATV_t are 0.151% and 0.416% in Table 1, respectively, it is difficult to reject the economic significance of the differences between the pre-2000s and the post-2000s. Therefore, it can be argued that the cross-sectional volatility and trading volume are abnormally high on post-FOMC meeting and these differences become larger.

[6] We have verified that the use of a specific year does not change the main results of our study. The unreported results are available upon request.

3.4 Discussions

It is worth clarifying that our results do not violate the prior literature, which argues that central bank transparency effectively promotes financial stability. We observe cross-sectional volatility that is specific to FOMC meeting days, rather than the unconditional price volatility inherent in stock markets that may arise from the opacity of central bank decision-making. Unlike time-series volatility, which represents price reversals over a period of time, cross-sectional volatility measures the dispersion of returns around market returns. It reflects the flow of information at a point in time and is, therefore, inherently different from time-series volatility. Our results support the expectation path hypothesis of interest rate changes. That is, the stock market reflects more information flow and immediately forms future expectations in response to direct future economic outlook released by the FOMC meeting days.

4 Conclusion

This paper examines whether the Fed's enhanced communication has led to the release of more information about the future economic outlook at FOMC meetings, using cross-sectional volatility and trading volume around FOMC meetings. We find an increasing trend in abnormal cross-sectional volatility and abnormal trading volume around the FOMC meeting (the day of the meeting and five days after the meeting), which is not found on other macroeconomic announcement days and randomly selected days. Our results suggest that the nature of the FOMC meeting day has gradually changed as the Fed's transparency and communication policies have improved. It is no longer just a day for announcing the federal funds rate, but has become a communication day where a comprehensive and direct economic outlook is released.

References

Ai, Hengjie and Ravi Bansal (2018). "Risk preferences and the macroeconomic announcement premium". In: *Econometrica* 86.4, pp. 1383–1430.

Ainsley, Caitlin T (2019). "The consequences of gender diversity at the Federal Reserve: An empirical analysis of FOMC voting and discourse". In: *Unpublished Working Paper*, pp. 1–33.

Apel, Mikael, Marianna Blix Grimaldi, and Isaiah Hull (2022). "How much information do monetary policy committees disclose? Evidence from the FOMC's minutes and transcripts". In: *Journal of Money, Credit and Banking* 54.5, pp. 1459–1490.

Baker, Scott R, Nicholas Bloom, and Steven J Davis (2016). "Measuring economic policy uncertainty". In: *The Quarterly Journal of Economics* 131.4, pp. 1593–1636.

Blinder, Alan S et al. (2008). "Central bank communication and monetary policy: A survey of theory and evidence". In: *Journal of Economic Literature* 46.4, pp. 910–945.

Born, Benjamin, Michael Ehrmann, and Marcel Fratzscher (2014). "Central bank communication on financial stability". In: *The Economic Journal* 124.577, pp. 701–734.

Cannon, San (2015). "Sentiment of the FOMC: Unscripted". In: *Economic Review-Federal Reserve Bank of Kansas City* 5.

Fisher, Adlai, Charles Martineau, and Jinfei Sheng (2022). "Macroeconomic attention and announcement risk premia". In: *The Review of Financial Studies* 35.11, pp. 5057–5093.

Heyes, Anthony, Matthew Neidell, and Soodeh Saberian (2016). *The effect of air pollution on investor behavior: Evidence from the S&P 500*. Tech. rep. National Bureau of Economic Research.

Jurado, Kyle, Sydney C Ludvigson, and Serena Ng (2015). "Measuring Uncertainty". In: *American Economic Review* 105.3, pp. 1177–1216.

Krieger, Kevin, Nathan Mauck, and Denghui Chen (2010). "The Uncertainty Resolution of FOMC Meeting Days". In: *Available at SSRN 1662184*.

Lähner, Tom (2018). "Inconsistent voting behaviour in the FOMC". In: *Applied Economics* 50.14, pp. 1617–1643.

Lamoureux, Christopher G and William D Lastrapes (1990). "Heteroskedasticity in stock return data: Volume versus GARCH effects". In: *The Journal of Finance* 45.1, pp. 221–229.

Möller, Rouven and Doron Reichmann (2021). "ECB language and stock returns–A textual analysis of ECB press conferences". In: *The Quarterly Review of Economics and Finance* 80, pp. 590–604.

Österholm, Pär, Spencer Dale, and Athanasios Orphanides (2008). "Imperfect central bank communication-Information versus distraction". In.

Papadamou, Stephanos, Moïse Sidiropoulos, and Eleftherios Spyromitros (2014). "Does central bank transparency affect stock market volatility?" In: *Journal of International Financial Markets, Institutions and Money* 31, pp. 362–377.

Rahman, Md Arifur (2007). "The information content of cross-sectional volatility for future market volatility: Evidence from Australian equity returns". In: *Frontiers in Finance and Economics* 4.1, pp. 91–124.

Savor, Pavel and Mungo Wilson (2013). "How much do investors care about macroeconomic risk? Evidence from scheduled economic announcements". In: *Journal of Financial and Quantitative Analysis* 48.2, pp. 343–375.

— (2014). "Asset pricing: A tale of two days". In: *Journal of Financial Economics* 113.2, pp. 171–201.

Siklos, Pierre L (2013). "Sources of disagreement in inflation forecasts: An international empirical investigation". In: *Journal of International Economics* 90.1, pp. 218–231.

Smales, Lee A and Nick Apergis (2016). "The influence of FOMC member characteristics on the monetary policy decision-making process". In: *Journal of Banking & Finance* 64, pp. 216–231.

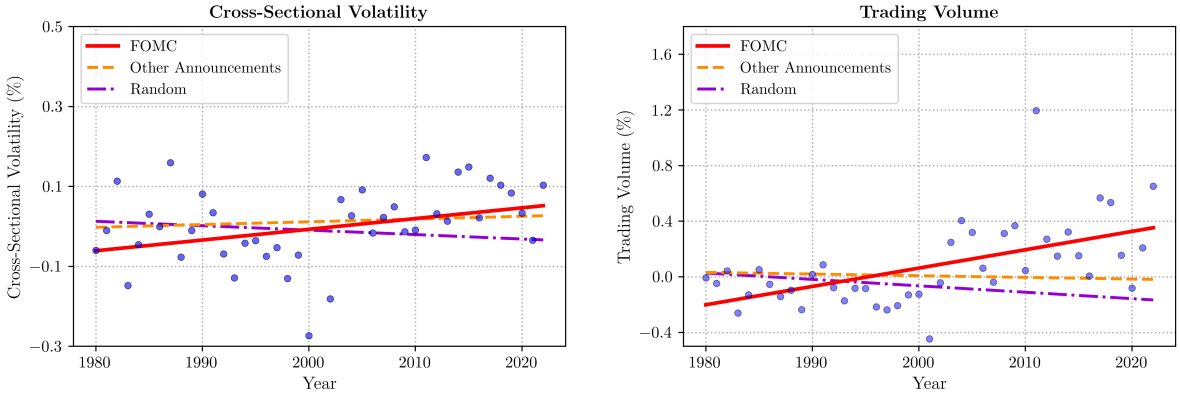
Thornton, Mark (2016). "Transparency or deception: what the FED was saying in 2007". In: *Quarterly Journal of Austrian Economics* 19.1, p. 65.

Woodford, Michael (2005). *Central bank communication and policy effectiveness.*

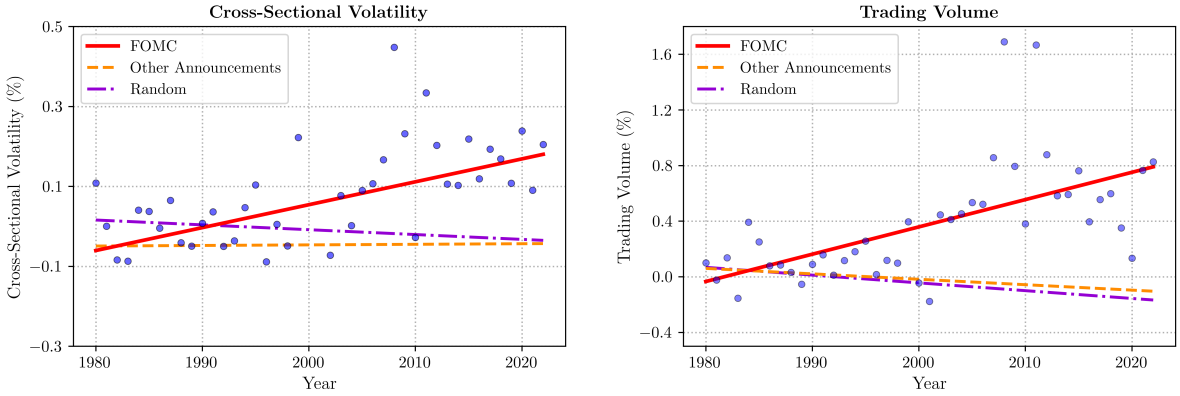
Figure 1: Cross-Sectional Volatility and Trading Volume around FOMC Meetings

Each dot represents the average of abnormal variables (cross-sectional volatility and trading volume) around FOMC meetings in a given year. The solid line (red) shows the trend of those on FOMC meeting days. The dashed line (orange) shows the trend on other macroeconomic announcement days. The dashed dot line (violet) is the trend on randomly-picked-days in a year.

Panel A. Pre-FOMC (-5, -1)



Panel B. FOMC



Panel C. Post-FOMC (+1, +5)

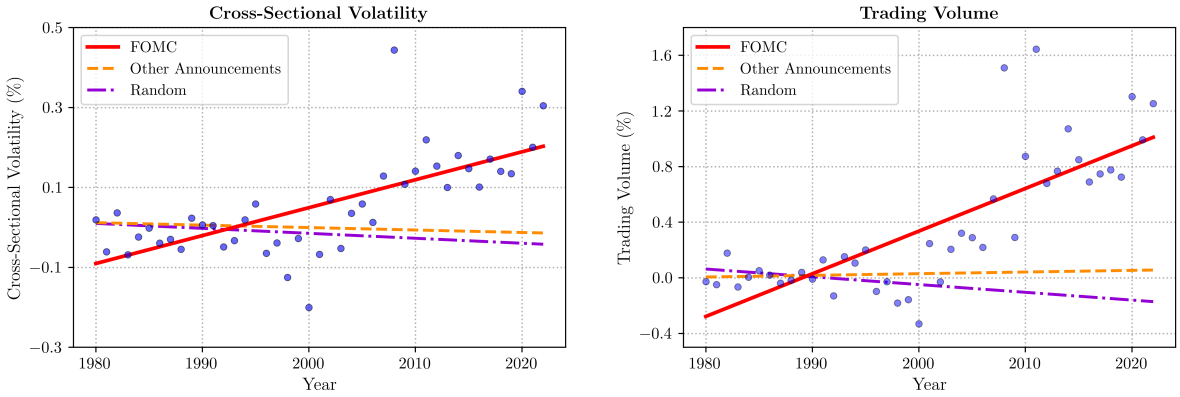


Table 1: Descriptive Statistics

The following table presents descriptive statistics on the cross-sectional volatility (CSV_t), trading volume (TV_t), abnormal cross-sectional volatility ($ACSV_t$), and abnormal trading volume (ATV_t).

	N	Mean	SD	P25	P50	P75
CSV_t	10,843	1.844	0.651	1.456	1.728	2.024
TV_t	10,843	4.587	2.268	2.718	4.517	5.890
$ACSV_t$	10,824	-0.001	0.415	-0.197	-0.033	0.151
ATV_t	10,824	0.009	1.056	-0.481	-0.045	0.416

Table 2: Trends of Aggregate Tradings

The following table summarizes the trend of abnormal cross-sectional volatility($ACSV_t$) and abnormal trading volume (ATV_t) by subperiods. The average of the trading variables and their t-statistics are shown in parentheses. (*), (**), (***) denote statistical significance at the 10% level, 5% level, and 1% levels, respectively.

		(1) 1980-1989	(2) 1990-1999	(3) 2000-2009	(4) 2010-2022	(4) − (1)
$ACSV_t$	FOMC	0.006	0.020	0.033	0.158***	0.152***
		(0.22)	(0.60)	(0.59)	(4.46)	(3.37)
	Non-FOMC	-0.003	0.009	-0.015	-0.002	0.001
		(-0.46)	(1.52)	(-1.34)	(-0.34)	(0.10)
	Differences	0.009	0.011	0.048	0.160***	0.151***
		(0.24)	(0.33)	(0.76)	(4.04)	(3.35)
ATV_t	FOMC	0.083**	0.144***	0.549***	0.658***	0.576***
		(1.77)	(2.58)	(4.08)	(5.22)	(4.10)
	Non-FOMC	0.004	0.015	-0.009	-0.017	-0.020
		(0.31)	(1.18)	(-0.31)	(-0.73)	(-0.72)
	Differences	0.079	0.130*	0.558***	0.675***	0.596***
		(1.33)	(1.87)	(3.49)	(5.30)	(4.24)

Table 3: Cross-Sectional Volatility and Trading Volume around FOMC Meetings

The following table summarizes the estimated coefficients from the regression (3). Columns 1 through 6 are the results when the dependent variable is $ACSV_{t+1,+5}$ and columns 7 through 12 are the results when the dependent variable is $ATV_{t+1,+5}$. The t-statistics on the coefficients are reported in parentheses. (*), (**), (***) denote statistical significance at the 10% level, 5% level, and 1% levels, respectively.

	$y_t = ACSV_{t+1,+5}$						$y_t = ATV_{t+1,+5}$					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
D_t^{FOMC}	0.01	-0.01	-0.01	-0.01	-0.01	-0.01	0.07	0.05	0.05	0.05	0.05	0.06
	(0.51)	(-0.34)	(-0.37)	(-0.32)	(-0.34)	(-0.41)	(1.11)	(0.75)	(0.73)	(0.61)	(0.76)	(0.67)
$D_t^{FOMC} \cdot D_t^{Post}$	0.14***	0.14***	0.14***	0.14***	0.14***	0.15***	0.60***	0.58***	0.59***	0.57***	0.58***	0.58***
	(4.85)	(3.84)	(3.99)	(3.35)	(3.87)	(3.51)	(7.28)	(6.17)	(6.26)	(5.27)	(6.18)	(5.33)
D_t^{Post}	-0.00	-0.01	-0.01	-0.01	0.00	0.01	-0.60	-0.33***	-0.33***	-0.30***	-0.33***	-0.43***
	(-0.02)	(-0.75)	(-1.52)	(-1.20)	(0.03)	(1.37)	(-1.28)	(-13.07)	(-12.94)	(-11.37)	(-12.91)	(-15.87)
MU_t			2.66***						3.97***			
			(16.01)						(9.25)			
EPU_t				0.00***						0.00***		
				(19.17)						(12.76)		
MP_t					2.37***						3.53***	
					(7.26)						(4.20)	
$\sigma(TS)_{t-37,-7}$						-0.23***						-0.60***
						(-9.45)						(-9.58)
$\sigma(DS)_{t-37,-7}$						-0.23***						-0.69***
						(-14.25)						(-16.45)
Y_{t-1}	0.09***	0.07***	0.06***	0.07***	0.08***	0.12***	0.12***	0.09***	0.09***	0.09***	0.09***	0.14***
	(11.97)	(14.83)	(12.84)	(12.60)	(15.67)	(20.76)	(13.91)	(16.06)	(15.54)	(14.85)	(16.21)	(22.61)
Observations	10,813	10,813	10,813	9,545	10,813	9,295	10,813	10,813	10,813	9,545	10,813	9,295
R-squared	0.418	0.037	0.059	0.074	0.042	0.085	0.359	0.089	0.096	0.109	0.090	0.149
Friday FE	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
January FE	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y
Month FE	Y	N	N	N	N	N	Y	N	N	N	N	N

Table A1: Changes in Federal Reserve Transparency Policies Since the 1980s

The following table summarizes selected changes in Federal Reserve transparency policies since the 1980s. (Source: fraser.stlouisfed.org)

Year	Transparency policy changes in Federal Reserve
1983	Begins to publish the "Beige Book" regularly, which contains Reserve Banks' qualitative projections on the economic conditions
1993	Begins to release FOMC minutes with 6-8 week lag
1994	Begins to announce the change in target federal funds rate after FOMC meetings if there is a change in rate
-	Begins to release transcripts of FOMC meetings with five year lag
1997	Begins to explicitly specify the target federal fund rate in policy statements
2000	Begins to release the policy statement after each FOMC meeting, despite whether there is the change in target rate.
2002	Begins to release the dissenting votes of Committee members
2004	Begins to expedite the release of FOMC minutes, making them available three weeks after each meeting.
2011	Begins to hold four press conferences per year to provide FOMC's economic projections
2012	Begins to formally announce that FOMC will target a 2 percent inflation rate for pursuing of the price stability goal
2018	Begins to hold press conferences after every FOMC meeting