The FOMC minutes effect: Their role in expectations formation and transmission of monetary policy

By Shreeyesh Menon

In this paper, I identify FOMC minutes shocks using changes in treasury yields around FOMC minutes releases. I use methods motivated by Swanson (2019) to identify the current Fed Funds rate, Forward Guidance and LSAP components of the monetary policy shocks for both monetary policy announcements as well as minutes releases. I estimate impulse responses to these shocks and find that they have similar effects on output. I also find that not accounting for these minutes effects can lead to overestimating the sensitivity of macroeconomic aggregates to short-term rates and underestimating that of forward guidance. I also find some evidence of financial market overreaction to forward guidance information contained in announcements and try to explain this observation using a model of diagnostic expectations.

Beginning December 2004, the Federal Open Market Committee (FOMC) began making the minutes of the FOMC meetings available after three weeks following a policy decision. These minutes serve as important policy indicators for the financial market that allows them to interpret the FOMC's outlook on the economy and predict their future actions. For instance, on 25th May, a CNBC article noted "Fed minutes point to more rate hikes that go further than the market anticipates" while referring to the minutes of the May 4 meeting released earlier that day.

While the vast literature on monetary policy transmission has studied the effects of monetary policy announcements, there is a gap in the literature when it comes to understanding the relevance of the information carried by the minutes. The staggered release of information by the FOMC can offer insights into how the financial market's expectations respond to both types of communication. Thus motivated, my goal in this paper is to shed light on this FOMC minutes-effect. I identify monetary policy shocks using shifts in treasury yields around policy events (announcements and minutes-releases). I estimate the dynamic macroeconomic responses to these announcement and minutes shocks and find that they have similar effects. I also argue that not accounting for these minutes-effects results in overweighing the importance of the Fed funds rate and understates that of forward guidance. Additionally, I find some evidence that financial market participants tend to overreact to the forward guidance information conveyed by announcements and subsequently correct following the release of minutes. I try to explain this behaviour using a model combining noisy information and diagnostic expectations.

I. Previous literature

The present work borrows from insights provided by the literature on high-frequency identification of monetary policy shocks pioneered by Kuttner (2000) and more closely to work by Gurkaynak, Sack, and Swanson (2004) (henceforth GSS) as well as Swanson (2021). These papers establish high-frequency shifts in asset prices as important tools for the identification of monetary policy shocks. Broadly, these studies use shifts in fed funds futures in a 30-minute window around monetary policy announcements to measure the shock. I use a variant of Swanson (2021)'s method for identification of the components of monetary policy shocks in this paper.

Now I turn to literature specifically looking at the effects of FOMC minutes on asset prices. Jegadeesh and Wu (2015) find evidence that the language of the minutes contain information above and beyond the announcement that is relevant to financial markets. Nechio and Wilson (2016) also make use of text analysis to find that impact of minute releases on asset prices are largest when the "tone" of the minutes differs from that of the announcement, thus relaying more additional information. Among the high-frequency identification literature Rosa (2013) study the effects of minutes releases on asset prices. They look at the volatility of assets around a 30-minute window around the releases and find that the minutes-day responses to be significantly different from non-event days. However, while these studies show that minutes-day effects are significant, they do not speak to what aspect of monetary policy the minutes are most informative about. These studies also do not address how the announcement effects are related to the minutes effects. I attempt to address these issues to some extent in this paper.

This paper also invokes ideas from a strand of literature studying forecast revisions and forecaster irrationality. Beginning with Coibion and Gorodnichenko (2012) (CG henceforth), several papers (Kohlhas and Walther (2021), Bordalo, Gennaioli, Ma, and Shleifer (2020), Angeletos, Huo, and Sastry (2021)) address the problem of irrational behavior in forecast revisions on receiving macroeconomic news. CG introduced the strategy of regressing the forecast revisions on the forecast error defined as the difference between the true value known in the future and the forecast to understand how agents depart from Full Information Rational Expectations (FIRE). They find that for inflation and several other macro variables, forecasts underreact relative to FIRE. They explain these findings using a model of rational inattention. Bordalo, Gennaioli, Ma, and Shleifer (2020) (henceforth - BGMS) find evidence for consensus-level overreaction and individual-level underreaction to news among forecasters. Within this paper, I model the financial market responses to announcements and minutes in the same spirit and address the broad patterns observed.

II. Empirical framework

I characterise both the announcements as well as the release of minutes of meeting as monetary policy events in my sample and look at changes in treasury yields in a 1-day window[1] around the events. I use a longer window than the traditional 30-minutes to allow for the market to completely interpret and respond to the information contained in the announcements as well as minutes. Using a one-day window is consistent with GSS's finding that a one-day window is sufficient for the identification of shifts in monetary policy behaviour.

Identification of the shocks borrows from Swanson (2021). To identify the different components of monetary policy shocks, I follow a recursive identification scheme. I identify the current Fed funds rate shock (FFR shock) as the shift in the 1 month rate in a 1-day window around an announcement or a minutes release. The Forward Guidance (FG) shock is defined as the corresponding shift in the 2-year rate that is exogenous to the FFR shock. The LSAP shock is defined similarly as the residual of the shift in the 10-year rate after regressing on the shifts in the 1-month and the 2-year shocks. Thus,

$$\epsilon_{FFR} = \Delta y_{1m}$$

$$\epsilon_{FG} = \Delta y_{2y} - \beta_1 \Delta y_{1m}$$

$$\epsilon_{LSAP} = \Delta y_{10y} - \beta_2 \Delta y_{2y} - \beta_3 \Delta y_{1m}$$

This identification scheme gives us shock measures that are easy to interpret.

The identification of the shock in this scheme relies on the following assumption:

Assumption 1

- (a) Relevance: The shifts in the treasury yields in a secular 1-day window around a monetary policy event capture the entirety of the shock.

- (b) Exogeneity: The shifts in a 1-day window around a monetary policy event are only due to the monetary policy shocks

Assumption 1(a) is reasonable since a 1-day window allows enough time for most of the information to be absorbed and interpreted.

I argue that 1(b) is also satisfied since I control for relevant news releases (CPI inflation, unemployment, industrial production) within two days of monetary policy events. Hence, the changes in the yield curve are in large part driven only by monetary policy.

Figure 1 shows the time series of these shocks to illustrate how they are distributed across time.

[1] closing 1-day after the event minus closing 1-day before

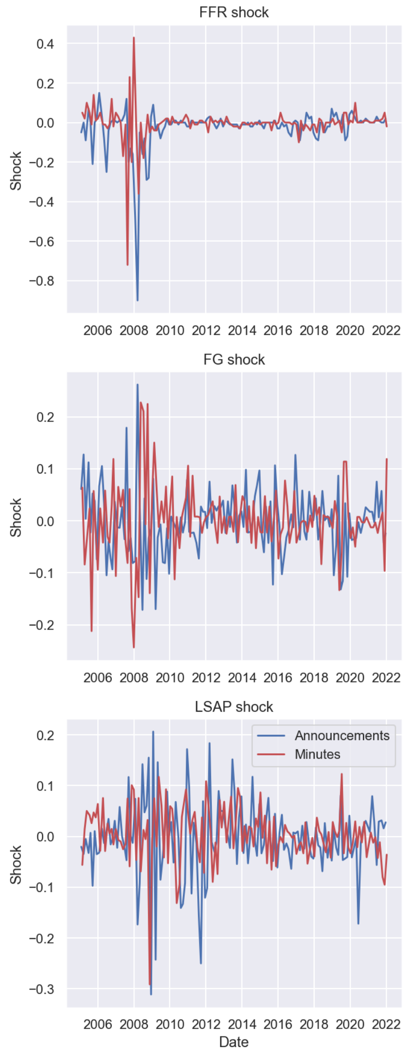


Figure 1. : Time series of Announcement and Minutes shocks

III. Impulse Responses

In this section, I try to answer how these minutes shocks are relevant to the macroeconomic transmission of monetary policy. I estimate the impulse responses to these shocks using the local projections specification:

$$y_{t+h} = a_h + \Gamma(p) y_t + \Lambda^a(p) s_t^a + \Lambda^m(p) s_t^m + \beta_h^a s_t^a + \beta_h^m s_t^m + e_{t+h} \tag{1}$$

y_t is a 2-vector that includes output growth measured by log-differenced Industrial production index and price growth measured by log-differenced CPI i.e

$$y_t = lnY_t - lnY_{t-1}$$

This specification allows us to estimate the impact of the minutes shocks and ascertain whether they are still relevant after taking into account the corresponding announcement shocks. s_t^a and s_t^m denote the announcement and minutes shock that realise during month 't'.

I include $p = 2$ lags on the RHS for the macroeconomic variables as well as the shock. β_h is recovered as the h-period ahead response of the variable y_t to shock s_t.

Since the data on Industrial Production and CPI is available at a monthly frequency, I create a monthly shock measure as the sum of the minutes and announcement shocks (separately) that realise during that month and as zero if there are no monetary policy events in that month.

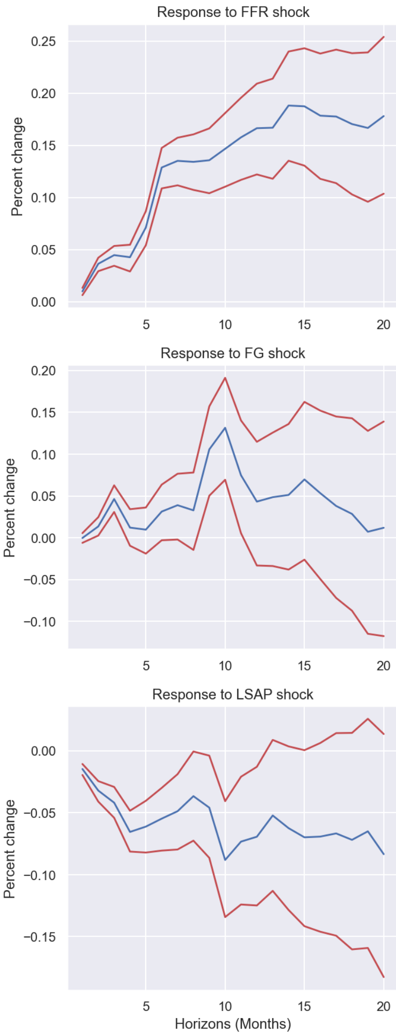
In the baseline specification, I estimate (1) for the entire sample 2005-2022. The aggregate output responses are shown in Figure 2.

The response to FFR shock is not consistent with theory as both announcement and minutes shocks seem to go in opposite directions to what the theory would predict and do not show a tendency to converge to zero at least within the horizons considered. The forward guidance announcement shock has smaller effects as compared to the corresponding minutes shock. I interpret these results as being caused due to the non-linearity stemming from the regime change that occurred after the Global Financial Crisis after which the resulting ZLB constraint led to Fed changing its monetary transmission strategy dramatically. To address this, I estimate the same specification but restrict the estimation sample to just the post-GFC period (Oct 2008 - Mar 2022). The results are shown in Figure 3.

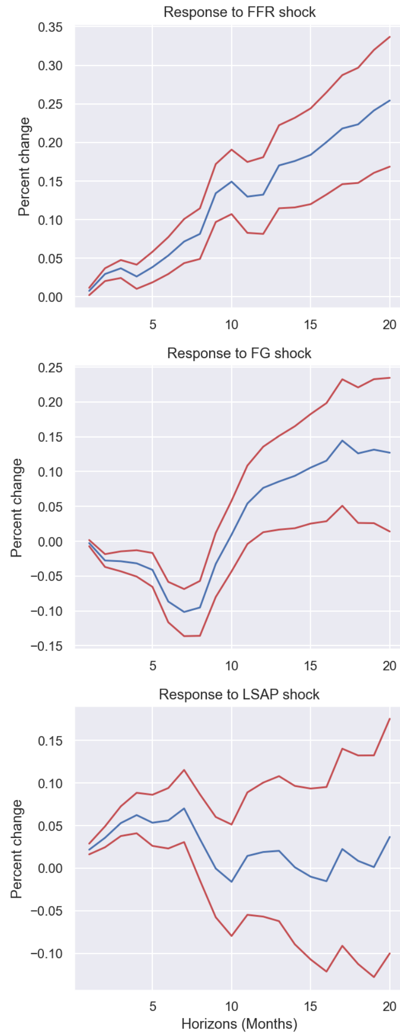
We can see here that the announcements as well as the minutes shocks have similar effects both in magnitude and direction for all the shock components. Importantly, the minutes shock appears to be just as relevant to transmission as the announcement shock. The responses are in line with theory in that both the FFR and forward guidance shocks lead to a fall in output and the effect lasts for roughly two quarters.

A. *What are traditional measure of shocks missing?*

I find that ignoring the minutes-releases and the corresponding financial market reaction results in drastically different conclusions regarding the transmission of monetary policy shocks. Since from the preceding section announcement and minutes-shocks have similar macroeconomic effects (as observed in Figure 3), we can define a measure of monetary policy shocks in a month as the sum of the announcement and minutes shocks and estimate the local projections of output again.



(a) *Response to announcement shock*



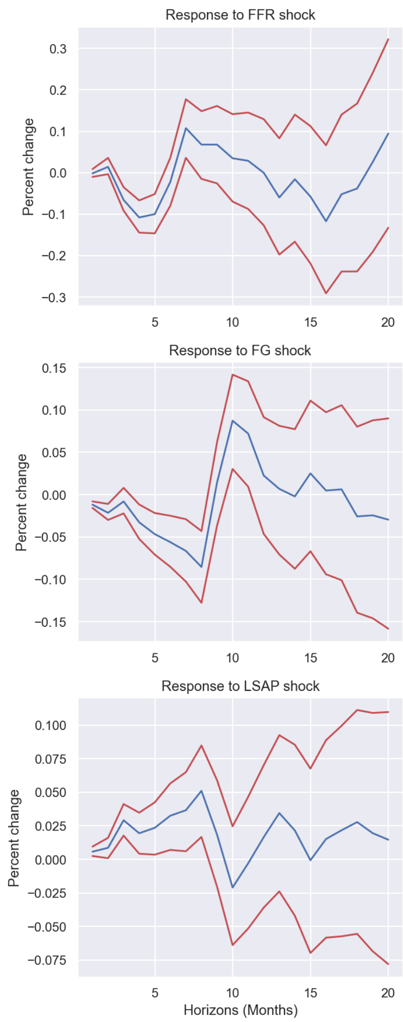
(b) *Response to minutes shock*

Figure 2. : Industrial Production response to shock components (to a 1bp shock)

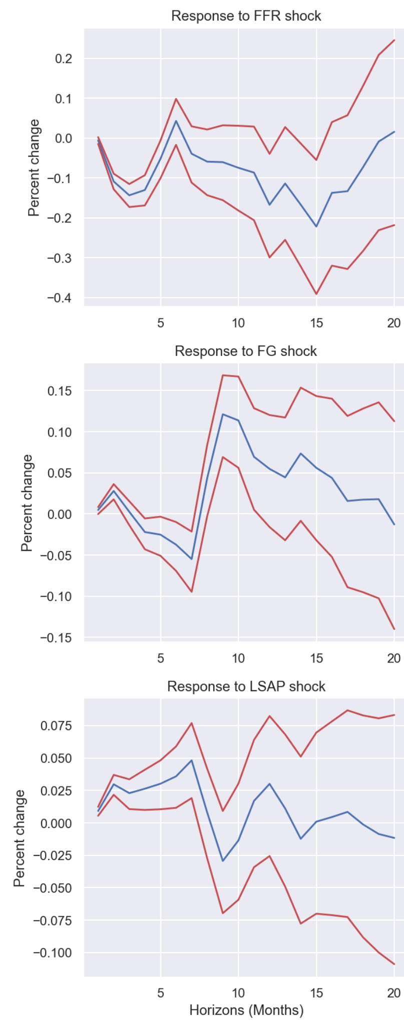
Note: The red lines indicate 68% confidence bands

$$y_{t+h} = a_h + \Gamma(p) y_t + \Lambda(p) s_t + \beta_h s_t + e_{t+h} \tag{2}$$

To illustrate how the transmission effects would change when minutes are accounted for, I define two specifications. In the first specification, I define the shock in a month as the sum of the monetary policy shocks (both announcement and minutes) within a month. In the second, I define the shock purely as the sum of the announcement shocks in that month.



(a) *Response to announcement shock*



(b) *Response to minutes shock*

Figure 3. : Industrial Production response to shock components (to a 1bp shock) in the post GFC sample

Note: The red lines indicate 68% confidence bands

The results are shown in Figure 4. Some key differences are immediately striking. When minutes are ignored, the Forward Guidance effect is much too diluted in this specification while the FFR effect is much more prominent compared to the baseline. This suggests that current methods could be severely underestimating the role of Forward Guidance in moving macroeconomic aggregates and placing too much emphasis on short-term rates. The LSAP effects are not significant even close to impact. This could be due to the fact that many LSAP announcements were on non-meeting days (as documented in Bhattarai and Neely (2021)) and thus not observed in my sample leading to the estimates being diminished.

IV. What information do minutes convey?

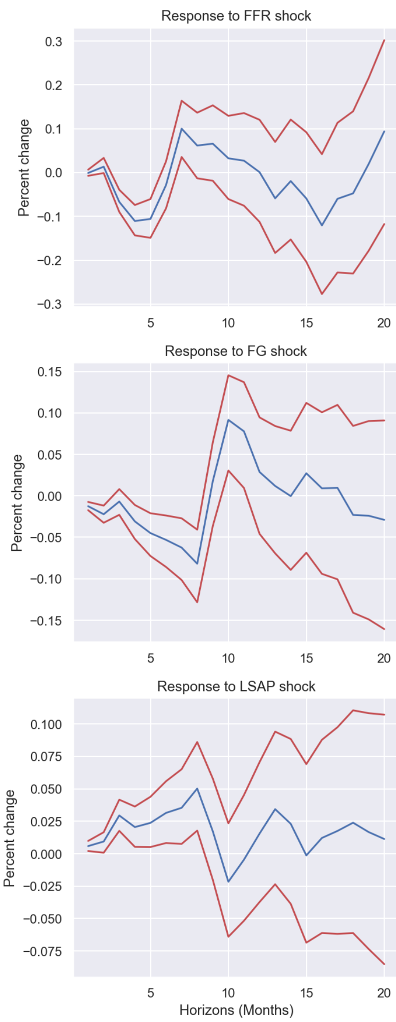
Now I turn to the question of whether the minutes contain additional information over and above the announcement that is relevant to the financial markets. Since the minutes and the announcement result from the same meeting, they must contain similar policy signals. Hence, the relationship between the financial market's response to both of these types of communication can reveal facts about the process of belief formation.

Table 1—: Regression of minutes shocks on corresponding announcement shocks

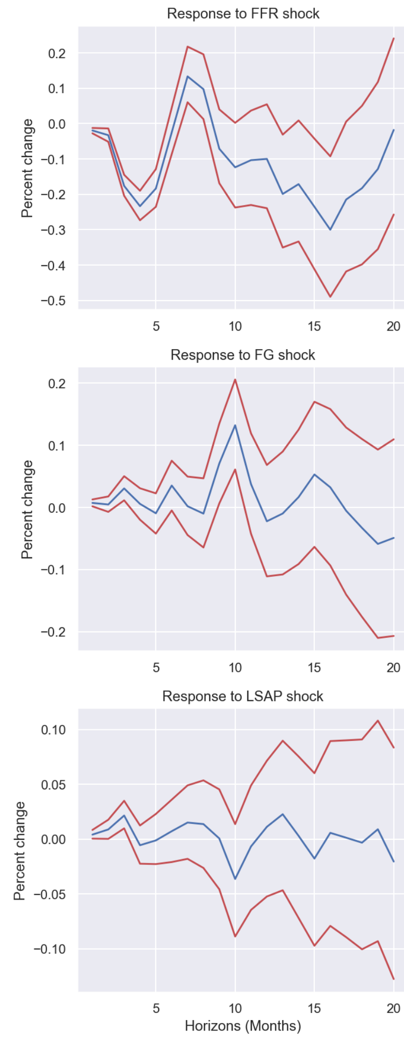
	FFR_{min}	FG_{min}	$LSAP_{min}$
const	-0.00	0.00	0.00
	(0.01)	(0.01)	(0.00)
FFR_{ann}	0.10		
	(0.18)		
FG_{ann}		-0.20*	
		(0.11)	
$LSAP_{ann}$			-0.09
			(0.07)
R-squared	0.01	0.03	0.02
R-squared Adj.	0.01	0.03	0.01
N	133	133	133

Note: The standard errors reported are HAC robust with 3 Newey-West lags.

In Figure 5, I plot the announcement shock measures against their corresponding minutes shocks for each meeting in my sample. The results of the regression of the shock components of minutes-days on the corresponding announcement-days are shown in Table 1. While the minutes shocks are largely uncorrelated (null not rejected in either case) with the announcement shocks for FFR and LSAP measures, the Forward Guidance shocks have a slope of -0.20 ($p - value = 0.06$), significant at the (10% level). This suggests that the forward guidance component displays a pullback of the announcement-day effects once the minutes are



(a) *Including minutes-shocks*



(b) *Ignoring minutes-shocks*

Figure 4. : Output response to shock components (to a 1bp shock)

Note: The red lines indicate 68% confidence bands

released. This evidence is consistent with a view that the financial market consensus overreacts to the information about forward guidance conveyed by the announcements. Since all news relevant to current Fed funds rate is released on the day of the FOMC announcement itself, it is reasonable to expect that the minutes do not carry much additional information beyond it. For the LSAP factor, a similar argument can be made since the quantum of Fed asset purchases is revealed during the announcement as well. The forward guidance stance however, is inferred by the financial market participants based on the Fed's language and is not clearly revealed. This offers some insight into why minutes-effect are particularly relevant when it comes to the forward guidance component.

A. Robustness: Winsorization Test

In order to account for the distortion of these estimates resulting from outliers, the announcement and minutes shocks are winsorised at the 5 per cent threshold symmetrically. The results are reported in Table 2.

Table 2—: Winsorized sample regression estimates

	FFR_{min}	FG_{min}	$LSAP_{min}$
const	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
FFR_{ann}	0.04		
	(0.07)		
FG_{ann}		-0.12	
		(0.08)	
$LSAP_{ann}$			-0.07
			(0.07)
R-squared	0.01	0.02	0.01
R-squared Adj.	-0.00	0.01	0.00
N	133	133	133

The slope coefficient for forward guidance is no longer statistically significant after winsorization. This could be partly due to the fact that winsorization damps the variation in the outliers which are mostly from the period of GFC of 2007-2008 (some other large shocks are documented in Appendices A and B) and by themselves, do not constitute a random sample and introduce bias. This period of high-volatility could be particularly informative as this is when market participants are more attentive to Fed communication and thus we could be missing important observations.

To explain the overreaction to announcements observed in the baseline, I interpret the announcement and the minutes effects as forecasters revising their forecast of monetary policy based on FOMC's announcement signal and then revising again when the true realisation is known (at the release of the minutes). This interpretation takes us back to the world of CG regressions and forecaster irrationality. To explain the overreaction in case of the forward guidance stance, I turn to BGMS's model incorporating diagnostic expectations. In the next section, I motivate the model using a basic model of noisy signals.

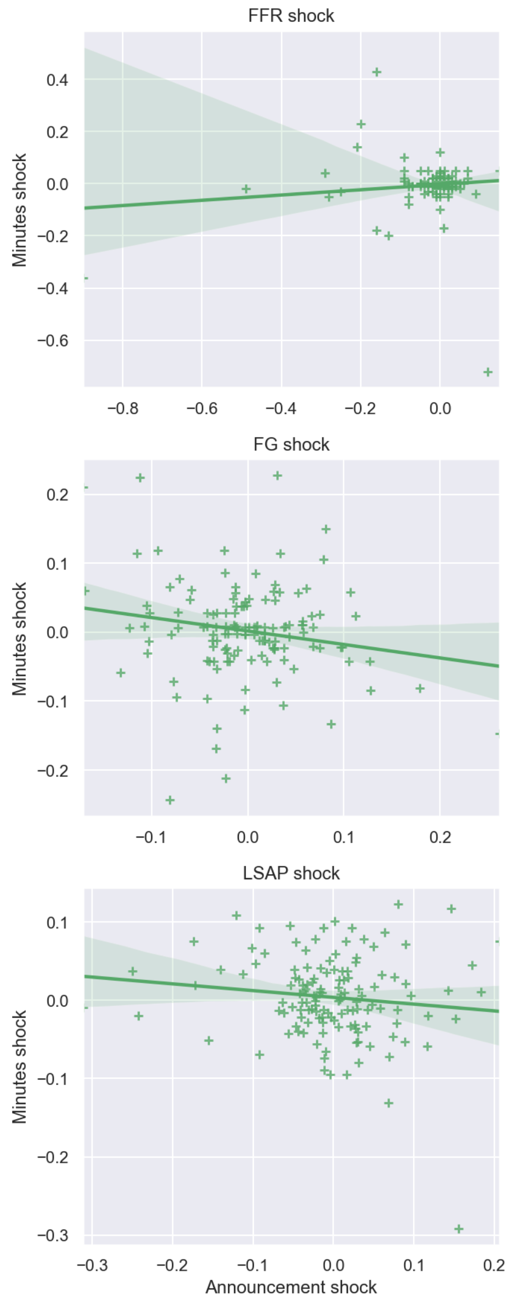


Figure 5. : Relationship between announcement and minutes effects

V. Model

A. A basic model of Noisy Signals

At the time of a monetary policy announcement "t", the Fed generates a signal

$$s_t = x_t + e_t$$

$$e_t \sim N(0, \sigma_e^2)$$

The underlying variable x_t denoting a component of the forward guidance stance.

I assume that the uncertainty about the signal is completely resolved when minutes are released and market participants observe x_t.

Hence, in the model the financial market has an expectation based on the past realisation of x_t and revises its forecast upon observing the announcement signal. Finally upon the release of minutes, the true monetary policy signal x_t is observed and so is the forecast error.

Let x_t have a persistent process given by:

$$x_t = \rho x_{t-1} + u_t$$

$$u_t \sim N(0, \sigma_u^2)$$

This persistent structure is motivated from the persistence of the underlying macroeconomic variables

Let S_t denote the history of signals received up to time 't'.

A rational agent updates beliefs about the underlying state x_t according to Bayes' Rule as:

$$f(x_t|S_t) = \frac{f(s_t|x_t)f(x_t|S_{t-1})}{\int_X f(s_t|x_t)f(x_t|S_{t-1})}$$

The rational estimate in this case is given by

$$f(x_t|S_t) \sim N(x_{t|t}, \frac{\Sigma_{t|t-1}\sigma_\epsilon^2}{\Sigma_{t|t-1} + \sigma_\epsilon^2})$$

where the $x_{t|t}$, the Kalman filtered-estimate at time 't' is given by

$$x_{t|t} = x_{t|t-1} + \frac{\Sigma}{\Sigma + \sigma_\epsilon^2}(s_t - x_{t|t-1}) \tag{3}$$

where Σ, the long-run asymptotic variance of $f(x_{t+1}|S_t)$ i.e $\Sigma_{t+1|t} = \Sigma_{t|t-1} = \Sigma$

$$\Sigma = \frac{-(1-\rho^2)\sigma_\epsilon^2 + \sigma_u^2 + \sqrt{[(1-\rho^2)\sigma_\epsilon^2 - \sigma_u^2]^2 + 4\sigma_\epsilon^2\sigma_u^2}}{2}$$

Define the Kalman gain, $K = \frac{\Sigma}{\Sigma+\sigma_\epsilon^2}$

Then it can be shown that under rationality, the forecast error $(x_t - x_{t|t})$ and the forecast revision $(x_{t|t} - x_{t|t-1})$ at meeting 't' are related as:

$$x_t - x_{t|t} = \frac{1-K}{K}(x_{t|t} - x_{t|t-1}) \tag{4}$$

Hence, underreaction in adjustments in response to announcements (which would imply a positive coefficient) can be produced by a model with rational Bayesian updating.

B. A Model of Diagnostic Expectations

Following BGMS, I describe a model with a distortion of rationality with diagnostic expectations to account for the observed results.

The diagnostic expectations model is based on the heuristic that after observing a signal that is different from the expected signal, states that become more likely in comparison are weighted more than under full rationality.

Define

$$R(x) = \frac{f(x|S_{t-1} \cup s_t)}{f(x|S_{t-1})}$$

Under diagnostic expectations, the posterior distribution is given by

$$f^\theta(x|S_t) = f(x|S_t)R(x)^\theta \frac{1}{Z}$$

$\theta = 0$ corresponds to rational expectations. For $\theta > 0$, the diagnostic filter inflates the probability of representative states (the ones with higher probability as compared to what they would be under the expected signal) and deflates the probability of the unrepresentative ones.

$$f^\theta(x_t|S_t) \sim N(x^\theta_{t|t}, \frac{\Sigma\sigma_\epsilon^2}{\Sigma + \sigma_\epsilon^2})$$

where $x^\theta_{t|t}$ is given by

$$x^\theta_{t|t} = x_{t|t} + \theta(x_{t|t} - x_{t|t-1})$$

Under diagnostic expectations, the forecast revision at 't' FR_t is

$$x^\theta_{t|t} - x^\theta_{t|t-1} = (1+\theta)(x_{t|t} - x_{t|t-1}) - \theta\rho(x_{t-1|t-1} - x_{t-1|t-2})$$

The forecast error at 't' denoted by FE_t is given by

$$x_t - x^{\theta}_{t|t} = (\frac{1-K}{K} - \theta)(x_{t|t} - x_{t|t-1})$$

Define $m_t = x_{t|t} - x_{t|t-1}$

$$var(FE_t) = (\frac{1-K}{K} - \theta)^2 var(m_t) \tag{5}$$

$$var(FR_t) = [(1-\theta)^2 + \rho^2\theta^2]var(m_t) - 2\theta(1+\theta)\rho^2(1-K)var(m_t) \tag{6}$$

$$var(m_t) = (\frac{\Sigma}{\Sigma + \sigma^2_{\epsilon}})^2(\sigma^2_u + \sigma^2_{\epsilon})$$

The CG coefficient is

$$\beta_{CG} = \frac{cov(x_t - x^{\theta}_{t|t}, x^{\theta}_{t|t} - x^{\theta}_{t|t-1})}{var(x^{\theta}_{t|t} - x^{\theta}_{t|t-1})}$$

In the model, this simplifies to

$$\beta_{CG} = (\frac{1-K}{K} - \theta)\frac{(1+\theta) - \theta\rho^2(1-K)}{[(1+\theta)^2 + \theta^2\rho^2] - 2\theta(1+\theta)\rho^2(1-K)} \tag{7}$$

Similarly, it can be shown that

$$cov(FR_t, FR_{t-1}) = [[(1+\theta)^2 + \theta^2\rho^2](1-K) - \theta(1+\theta) - \theta\rho(1+\theta)(1-K)]\rho var(m_t) \tag{8}$$

$$cov(FE_t, FE_{t-1}) = (\frac{1-K}{K} - \theta)^2(1-K)\rho var(m_t) \tag{9}$$

VI. Calibration

In order to evaluate the model parameters $(\theta, \rho, \sigma_u, \sigma_{\epsilon})$ I use an over-identified system matching the 5 moments given by equations (5)-(9). The solution involves a least squares solution for the system:

$$(\frac{1-K}{K} - \theta)^2 var(m_t) = 0.005$$

$$[(1-\theta)^2 + \rho^2\theta^2]var(m_t) - 2\theta(1+\theta)\rho^2(1-K)var(m_t) = 0.004$$

$$(\frac{1-K}{K}-\theta)\frac{(1+\theta)-\theta\rho^2(1-K)}{[(1+\theta)^2+\theta^2\rho^2]-2\theta(1+\theta)\rho^2(1-K)}=-0.20$$

$$[[(1+\theta)^2+\theta^2\rho^2](1-K)-\theta(1+\theta)-\theta\rho(1+\theta)(1-K)]\rho var(m_t)=0.000$$

$$(\frac{1-K}{K}-\theta)^2(1-K)\rho var(m_t)=0.000$$

Where

$$var(m_t)=(\frac{\Sigma}{\Sigma+\sigma_\epsilon^2})^2(\sigma_u^2+\sigma_\epsilon^2)$$

I weight all moment conditions equally, using an identity weighting matrix. Solution yields parameter values:

$$\rho=0.25\ \ \theta=0.70\ \ \sigma_u^2=0.011\ \ \sigma_\epsilon^2=0.004$$

The low persistence ρ suggests that the forward guidance stance is not as predictable from past realisations and a large component of expectations is driven by shocks. The diagnosticity parameter θ has a value of 0.70 which suggests that beliefs respond 70% more to recent news than do rational expectations. This is close to the estimates for several macroeconomic series as found in BGMS.

Table 3—: Comparison of targeted moments generated by the model with data

	Data	Model-implied
$var(FE_t)$	0.005	0.001
$var(FR_t)$	0.004	0.004
β_{CG}	-0.203	-0.201
$cov(FE_t, FE_{t-1})$	0.000	-0.002
$cov(FR_t, FR_{t-1})$	0.000	0.000

VII. Effects in the post-2011 sample

In this section, I run the CG regressions as before but on the subset of announcement and minutes shocks that occur after 2011. Rosa (2013) documents that the minutes-effect has weakened since 2011 on account of enhanced signaling by FOMC during announcements (by way of holding a press conference right afterwards and releasing Survey of Economic Projections in the "off" meetings). I do find evidence for a weakening of the overreaction effect as the figure shows. None of the slope coefficients are significant including the effects on the forward guidance factor (as seen in Table 4). This finding does imply a weakening of the financial market overreaction that was present earlier.

Table 4—: Regression results for Post-2011 sample

	FFR_{min}	FG_{min}	$LSAP_{min}$
const	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.01)
FFR_{ann}	0.02		
	(0.06)		
FG_{ann}		-0.10	
		(0.13)	
$LSAP_{ann}$			-0.07
			(0.08)
R-squared	0.00	0.01	0.01
R-squared Adj.	-0.01	-0.01	0.00
N	86	86	86

VIII. Conclusions

In much of the monetary policy literature, the identification of monetary policy shocks is focused on the information revealed during the FOMC announcement-day. This is the first attempt to understand the effects of FOMC minutes-releases and their relevance to monetary policy transmission through their financial market effects. The major contribution of this work is highlighting the importance of these minutes effects in determining the dynamics of macroeconomic variables. I find that minutes-shocks identified in this framework are relevant for macroeconomic transmission even after accounting for the corresponding announcement shocks. I also find that announcements and minutes shocks have quite similar implications for the dynamics of the macroeconomic variables. Disregarding the minutes-releases results in impulse responses under-estimating the forward guidance channel of monetary policy and placing too much emphasis on the short-term rates.

I also document a consensus overreaction of financial markets to information about forward guidance contained in the announcements. I model the phenomenon based on work by Coibion and Gorodnichenko (2012) and Bordalo, Gennaioli, Ma, and Shleifer (2020). Estimates suggest that the financial markets react to news from FOMC announcements concerning forward guidance about 70% more than they would under rational expectations. This effect has faded in the recent years, however. Together, these empirical facts cement the importance of Fed communication through the minutes as drivers of macroeconomic expectations.

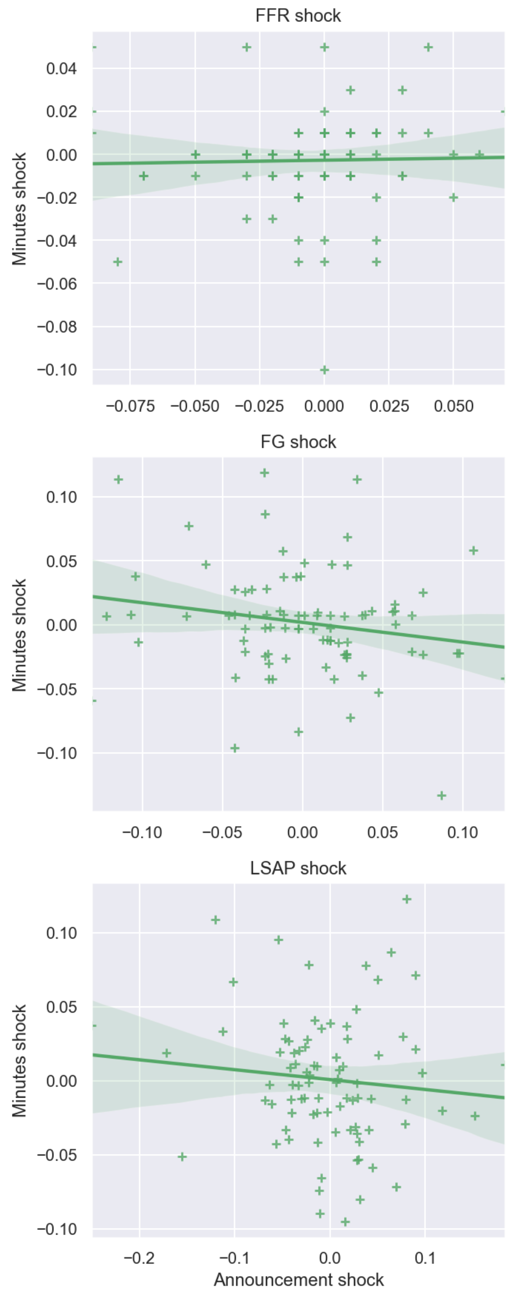


Figure 6. : Announcement and Minutes-day effects in post-2011 sample

References

Angeletos, George-Marios, Zhen Huo, and Karthik A. Sastry (May 2021). "Imperfect Macroeconomic Expectations: Evidence and Theory". en. In: *NBER*

Macroeconomics Annual 35, pp. 1–86. ISSN: 0889-3365, 1537-2642. DOI: 10.1086/712313. URL: https://www.journals.uchicago.edu/doi/10.1086/712313.

Bhattarai, Saroj and Christopher Neely (2021). "An Analysis of the Literature on International Unconventional Monetary Policy". In: *Journal of Economic Literature (Forthcoming)*.

Bordalo, Pedro et al. (Sept. 2020). "Overreaction in Macroeconomic Expectations". en. In: *American Economic Review* 110.9, pp. 2748–2782. ISSN: 0002-8282. DOI: 10.1257/aer.20181219. URL: https://pubs.aeaweb.org/doi/10.1257/aer.20181219.

Coibion, Olivier and Yuriy Gorodnichenko (Feb. 2012). "What Can Survey Forecasts Tell Us about Information Rigidities?" en. In: *Journal of Political Economy* 120.1, pp. 116–159. ISSN: 0022-3808, 1537-534X. DOI: 10.1086/665662. URL: https://www.journals.uchicago.edu/doi/10.1086/665662.

Gurkaynak, Refet S., Brian P. Sack, and Eric T. Swanson (2004). "Do Actions Speak Louder Than Words? The Response of Asset Prices to Monetary Policy Actions and Statements". en. In: *SSRN Electronic Journal*. ISSN: 1556-5068. DOI: 10.2139/ssrn.633281. URL: http://www.ssrn.com/abstract=633281.

Jegadeesh, Narasimhan and Di Wu (2015). "Deciphering Fedspeak: The Information Content of FOMC Meetings". In.

Kohlhas, Alexandre N. and Ansgar Walther (Sept. 2021). "Asymmetric Attention". en. In: *American Economic Review* 111.9, pp. 2879–2925. ISSN: 0002-8282. DOI: 10.1257/aer.20191432. URL: https://pubs.aeaweb.org/doi/10.1257/aer.20191432 (visited on 05/11/2022).

Kuttner, Kenneth N. (2000). "Monetary Policy Surprises and Interest Rates: Evidence from the Fed Funds Futures Markets". en. In: *SSRN Electronic Journal*. ISSN: 1556-5068. DOI: 10.2139/ssrn.933694. URL: http://www.ssrn.com/abstract=933694.

Nechio, Fernanda and Daniel J. Wilson (2016). "How Important Is Information from FOMC Minutes?" In: *FRBSF ECONOMIC LETTER* 37.

Rosa, Carlo (2013). "The Financial Market Effect of FOMC Minutes". In: *Economic Policy Review,* 19.2.

Swanson, Eric T. (Mar. 2021). "Measuring the effects of federal reserve forward guidance and asset purchases on financial markets". en. In: *Journal of Monetary Economics* 118, pp. 32–53. ISSN: 03043932. DOI: 10.1016/j.jmoneco.2020.09.003. URL: https://linkinghub.elsevier.com/retrieve/pii/S0304393220301082.

Appendix A: Notable Announcement shocks

Table A1—: Large FFR shocks

Date	ffr	fg	lsap
2007-08-28	-0.72	-0.08	0.07
2007-10-09	0.23	0.06	-0.06
2007-11-20	-0.20	-0.17	0.10
2008-01-02	0.43	-0.24	0.09
2008-04-08	-0.36	-0.15	0.07

Note: "Large" shocks have been defined as shocks that are larger than 2 standard deviations above the mean in absolute value

Table A2—: Large FG shocks

Date	ffr	fg	lsap
2005-08-30	-0.01	-0.211	0.026
2007-11-20	-0.20	-0.168	0.100
2008-01-02	0.43	-0.243	0.092
2008-04-08	-0.36	-0.146	0.075
2008-05-21	0.00	0.227	-0.068
2008-07-16	-0.18	0.210	0.012
2008-10-07	0.04	0.224	0.032
2008-11-19	-0.05	-0.139	-0.291
2009-02-18	-0.04	0.150	0.075

Table A3—: Large LSAP shocks

Date	ffr	fg	lsap
2008-11-19	-0.05	-0.139	-0.291
2009-05-20	-0.01	-0.011	0.117
2010-05-19	0.00	0.007	-0.131
2012-01-03	0.00	0.007	0.108
2019-07-10	-0.05	-0.059	0.123

Appendix B: Notable Minutes shocks

Table B1—: Large FFR shocks

Date	ffr	fg	lsap
2006-06-29	-0.25	-0.104	0.012
2008-01-30	-0.49	-0.077	0.074
2008-03-18	-0.90	0.261	-0.173
2008-09-16	-0.29	-0.111	0.060
2008-10-29	-0.28	-0.032	0.155

Table B2—: Large FG shocks

Date	ffr	fg	lsap
2007-08-07	0.12	0.178	-0.046
2008-03-18	-0.90	0.261	-0.173
2008-06-25	-0.16	-0.171	0.142
2009-03-18	-0.04	-0.169	-0.242
2019-06-19	-0.01	-0.131	0.080

Table B3—: Large LSAP shocks

Date	ffr	fg	lsap
2008-03-18	-0.90	0.261	-0.173
2008-12-16	0.03	-0.015	-0.311
2009-01-28	0.09	0.080	0.206
2009-03-18	-0.04	-0.170	-0.243
2010-12-14	-0.02	0.079	0.172
2011-08-09	0.00	-0.072	-0.156
2011-09-21	0.00	0.027	-0.250
2012-03-13	0.03	0.075	0.184
2020-06-10	0.00	-0.003	-0.172