

# THE VOICE OF MONETARY POLICY

*Yuriy Gorodnichenko*

UC Berkeley and NBER

*Tho Pham*

University of Reading

*Oleksandr Talavera*

University of Birmingham

# EVOLUTION OF POLICY COMMUNICATION

A. Greenspan, September 22, 1987

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“As Chairman, I hope to foster a public conversation about what the Fed is doing to support a strong and resilient economy. **And one practical step in doing so is to have a press conference like this after every one of our scheduled FOMC meetings.** And we're going to do that beginning in January. **That will give us more opportunities to explain our actions and to answer your questions.** I want to point out that having twice as many press conferences does not signal anything about the timing or pace of future interest rate changes. This change is only about improving communications.”

# WHAT IS COMMUNICATION?

Mehrabian (1971) posited a 7-55-38 rule of communication:

- the words convey 7 percent of a message,
- the body language (gestures, facial expressions, etc.) accounts for 55 percent
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- the tone delivers 38 percent
  - this paper



# WHAT ARE TRADERS LOOKING FOR?

“FELICIA TAYLOR, CNN FINANCIAL CORRESPONDENT: The press conference, though, that is coming up in just a few minutes is where traders are really going to be looking for every little nuance. **They want to see how he is going to read into everything. The tone of his voice, his body language, his inflection, for any clue about the direction the markets are still looking for.** And that is something that is not out there yet. Growth is going to be less than we expected. That is good. He acknowledged it. The marketplace wanted to hear that.”

(CNN International QUEST MEANS BUSINESS; June 22, 2011 Wednesday)

# PREVIEW

Methodological approach:

- Use press-conference after FOMC meetings
- Train a machine learning algorithm to identify emotions in the voice tone
- Construct the “tone” of voice communication
- Study responses of financial variables to the “tone”

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## Main results:

- The tone moves the stock market, uncertainty, inflation expectations and exchange rate
- **HOW** policy is communicated matters and voice could be a separate channel

# SOURCES OF COMMUNICATION DATA

## Board of Governors of the Federal Reserve System

*The Federal Reserve, the central bank of the United States, provides the nation with a safe, flexible, and stable monetary and financial system.*



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The Federal Reserve often referred to as "the Fed" is the central bank of the United States. Congress created the Fed in 1913 to help promote a safe and sound monetary and financial system for our nation. The Fed includes the Board of Governors in Washington D.C. which has seven members including the Chairman and Vice Chairman. All of the members of the Board are appointed of the President of the United States and

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# SOURCES OF COMMUNICATION DATA

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Yellen (Dec 16, 2015): “Okay. Boxed lunches will be available. If anybody wants to watch TV in the Special Library and see me get skewered at the press conference, please feel free. I will do my best to communicate the points that have been made here. END OF MEETING”

# SOURCES OF COMMUNICATION DATA

- Press conferences, particularly the Q&A sessions, play an important role in clarifying market views about the future outlook (especially in periods of high uncertainty)
- **Unscripted nature of the answers**



# SOURCES OF COMMUNICATION DATA

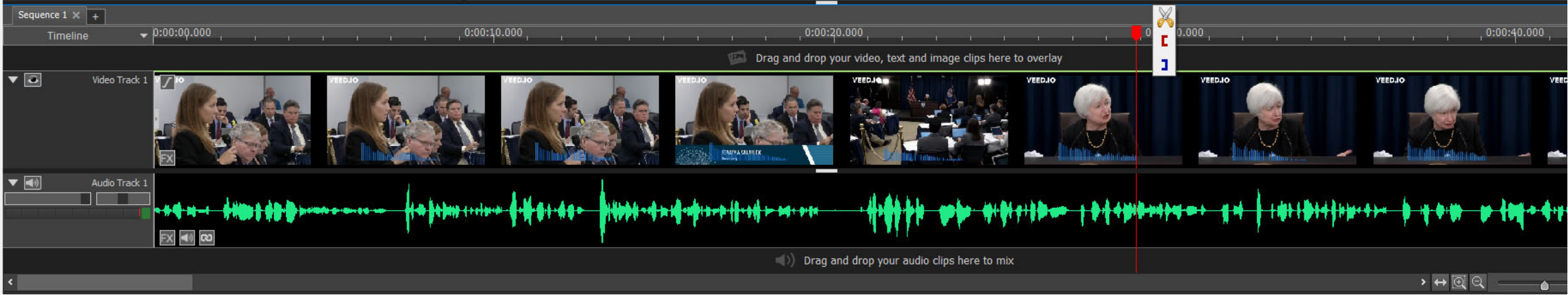
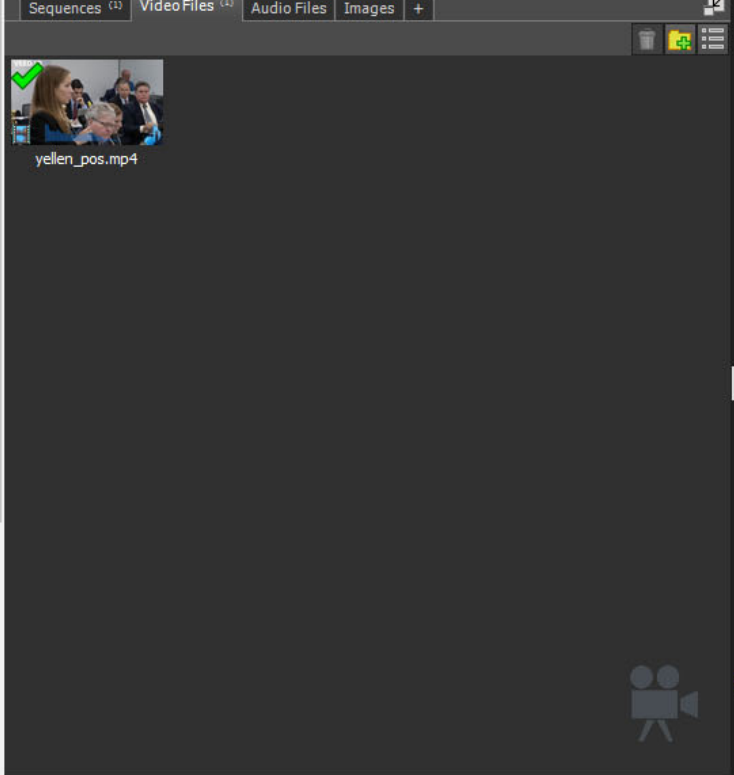
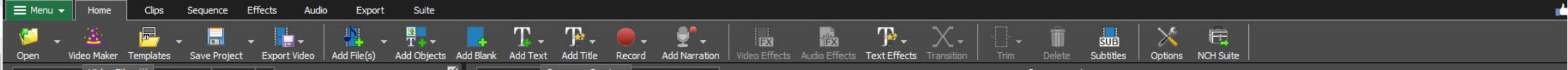
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- **Unscripted nature of the answers**
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- 692 answers of 3 speakers: Bernanke, Powell, Yellen

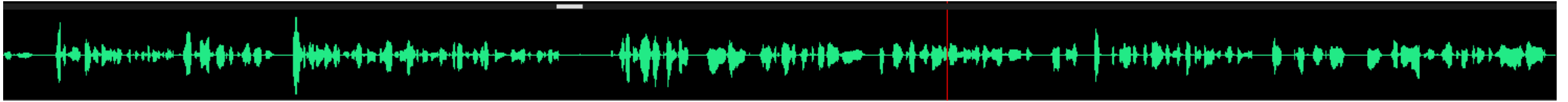
# **EXAMPLE: JANET YELLEN**

**PLAY VIDEO**



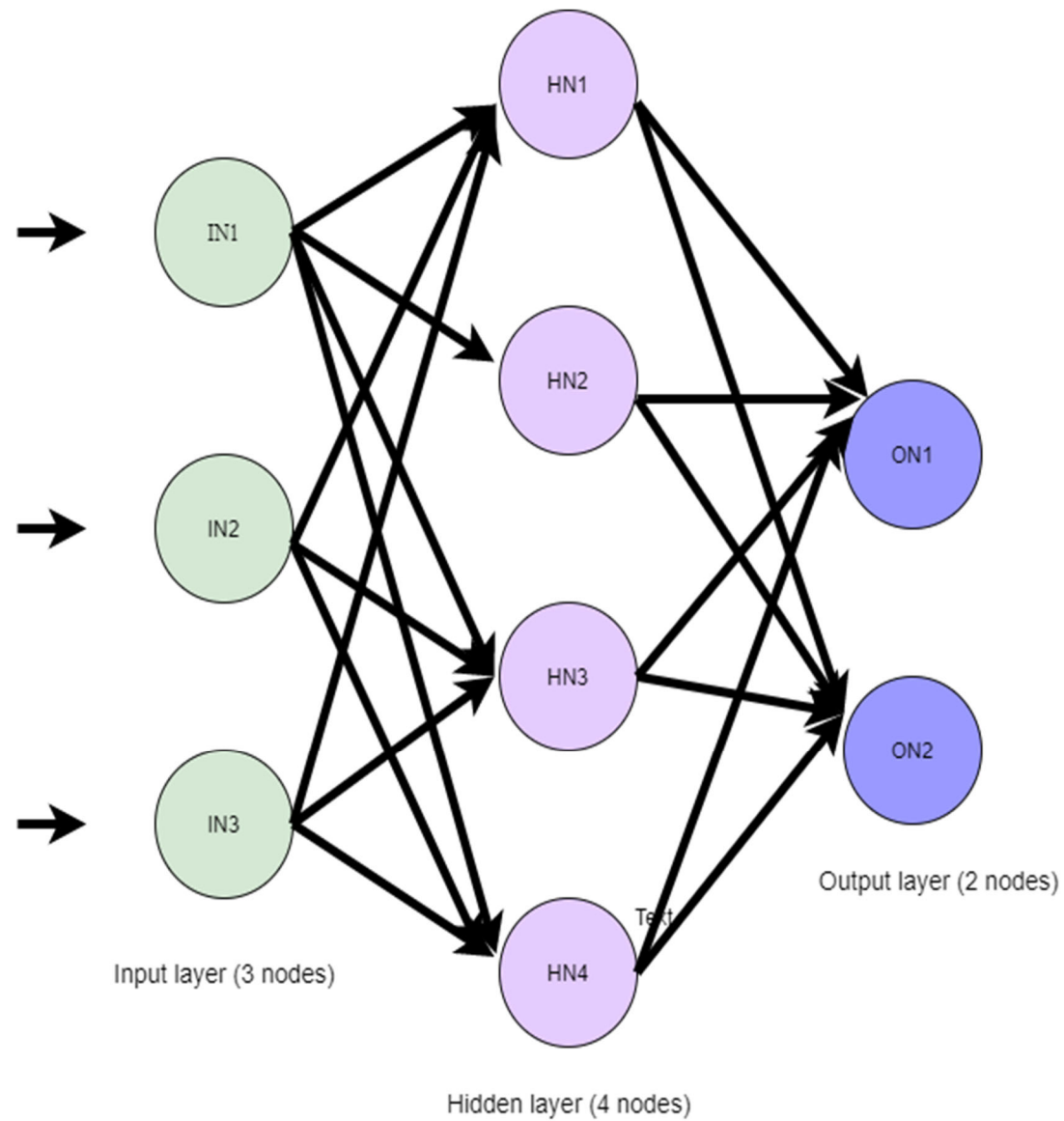
# INTERPRETING VOICE TONE

Need to convert



into emotions

# INTERPRETING VOICE TONE



Emotions

# INTERPRETING VOICE TONE

Training data:

- Ryson Audio-Visual Database of Emotional Speech and Song (RAVDESS):
  - 24 actors (12 male, 12 female) speaking identical statements in the neutral North American accent with different emotions.
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Audio measurement: Mel-frequency cepstral coefficients, Chromagram, Mel-scaled spectrogram

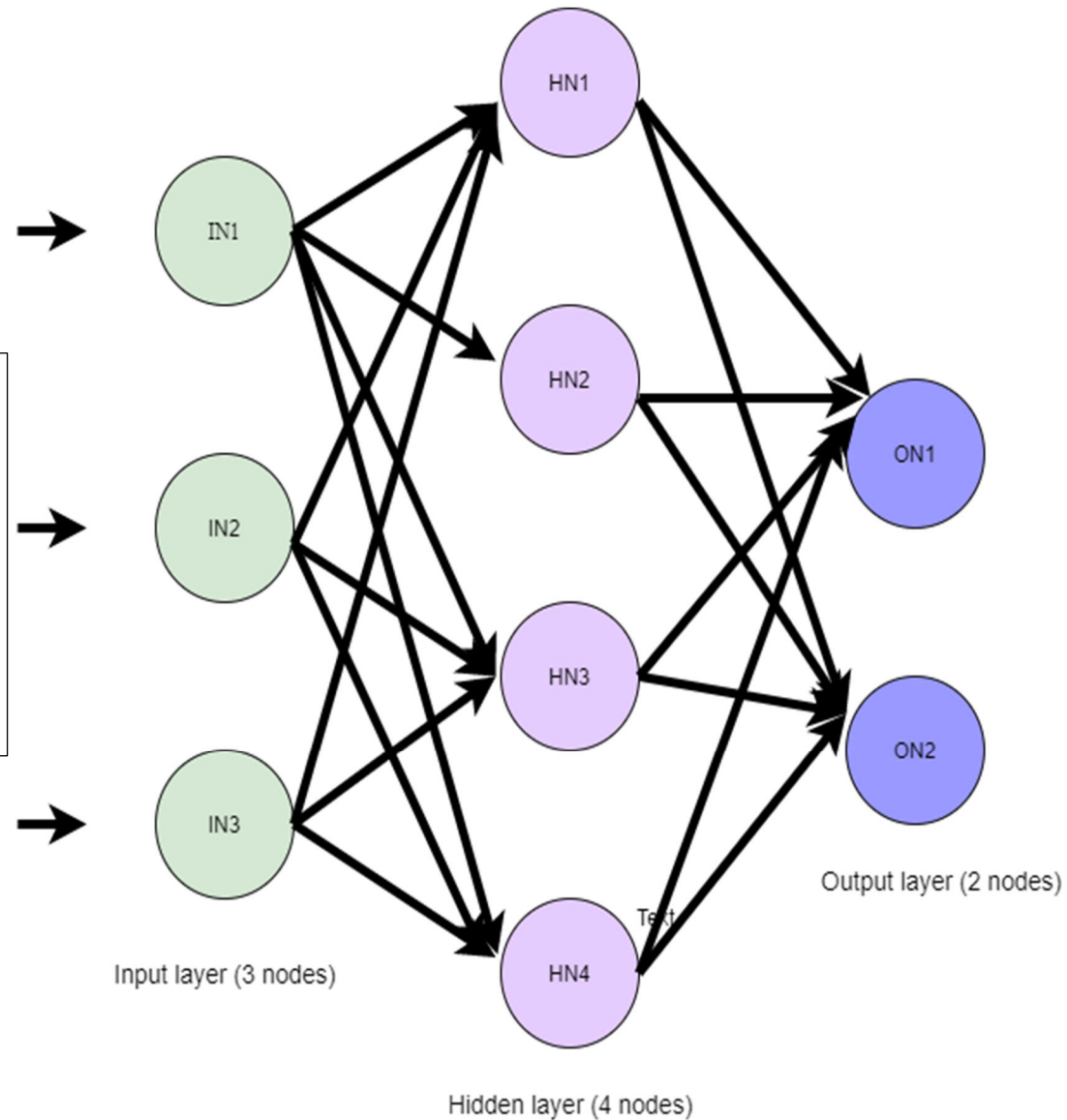


# INTERPRETING VOICE TONE



Audio inputs:

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- Chromagram,
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Emotions:

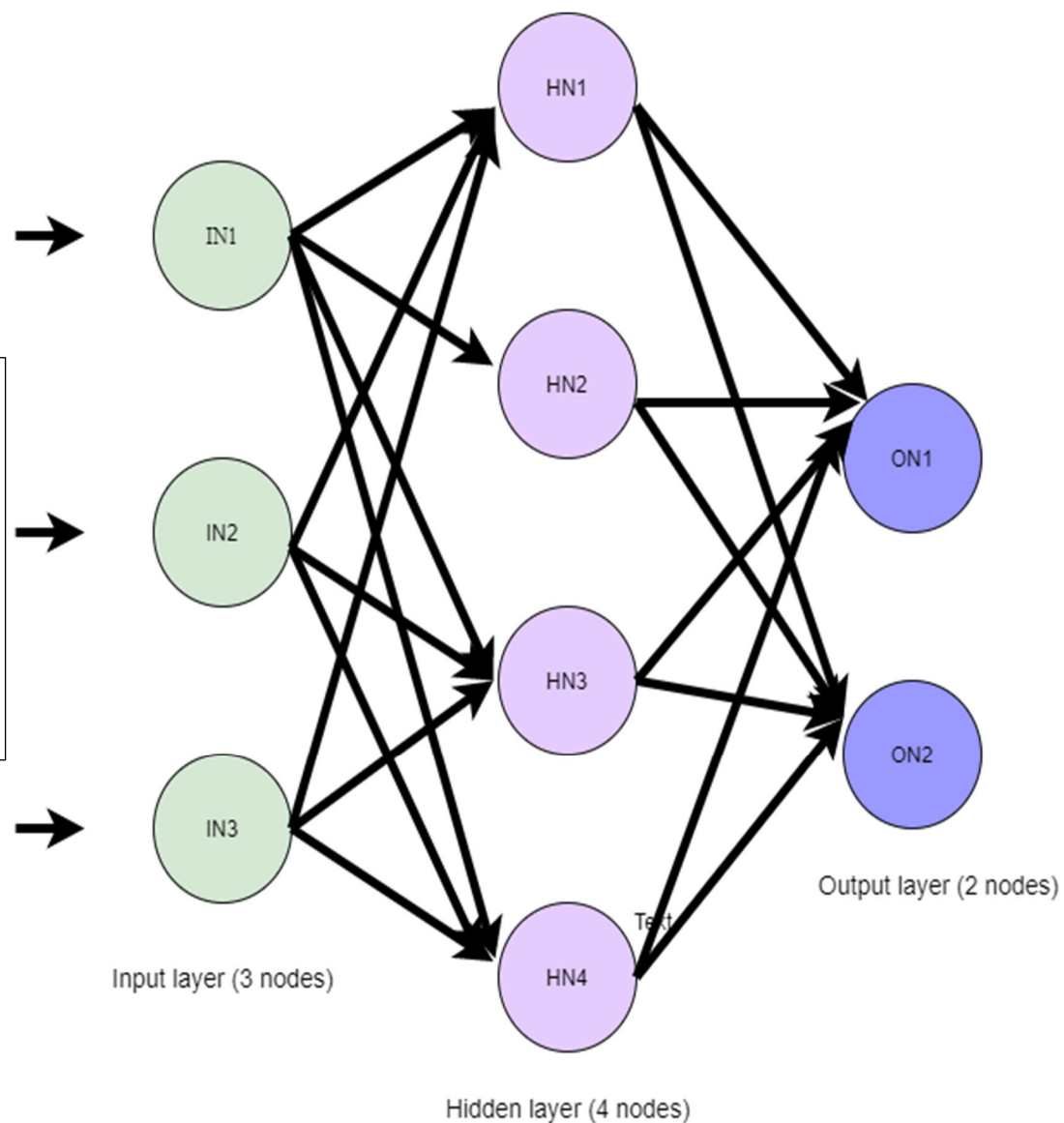
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Emotions:

- happy,
- (pleasant) surprised,
- neutral,
- sad,
- angry

Accuracy score = 84.1%.

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- Aggregate over each FOMC press conference

$$\text{VoiceTone} = \frac{\text{Positive answers} - \text{Negative answers}}{\text{Positive answers} + \text{Negative answers}}$$

- Positive answers are the answers which have either “happy” or “surprised” emotion.
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- The VoiceTone indicator is in the  $[-1;1]$  range.

# RESULTS

---

Voice tone	All
	(1)

---

mean	0.09
standard deviation	0.75

---



# RESULTS

---

Voice tone	All	Bernanke	Yellen	Powell
	(1)	(2)	(3)	(4)
mean	0.09	0.64	-0.13	-0.30
standard deviation	0.75	0.58	0.61	0.82

---

# EVENTS ON PRESS CONFERENCE DAY

27/04/2011 (First press conference)

<b>12:30</b>		<b>14:15</b>	<b>14:45</b>
FOMC Statement		Economic projections	Press conference

From 22/06/2011 to 12/12/2012

<b>12:30</b>	<b>14:00</b>	<b>14:15</b>	
FOMC Statement	Economic projections	Press conference	

Since 20/03/2013

	<b>14:00</b>	<b>14:30</b>	
	FOMC Statement	Press conference	
	Economic projections		

Beginning in 2019, a press conference is held after each FOMC meeting

# CONTROLS

- Sentiment of the **text**:  $TextSentiment = \frac{Dovish\ phrases - Hawkish\ phrases}{Dovish\ phrases + Hawkish\ phrases}$

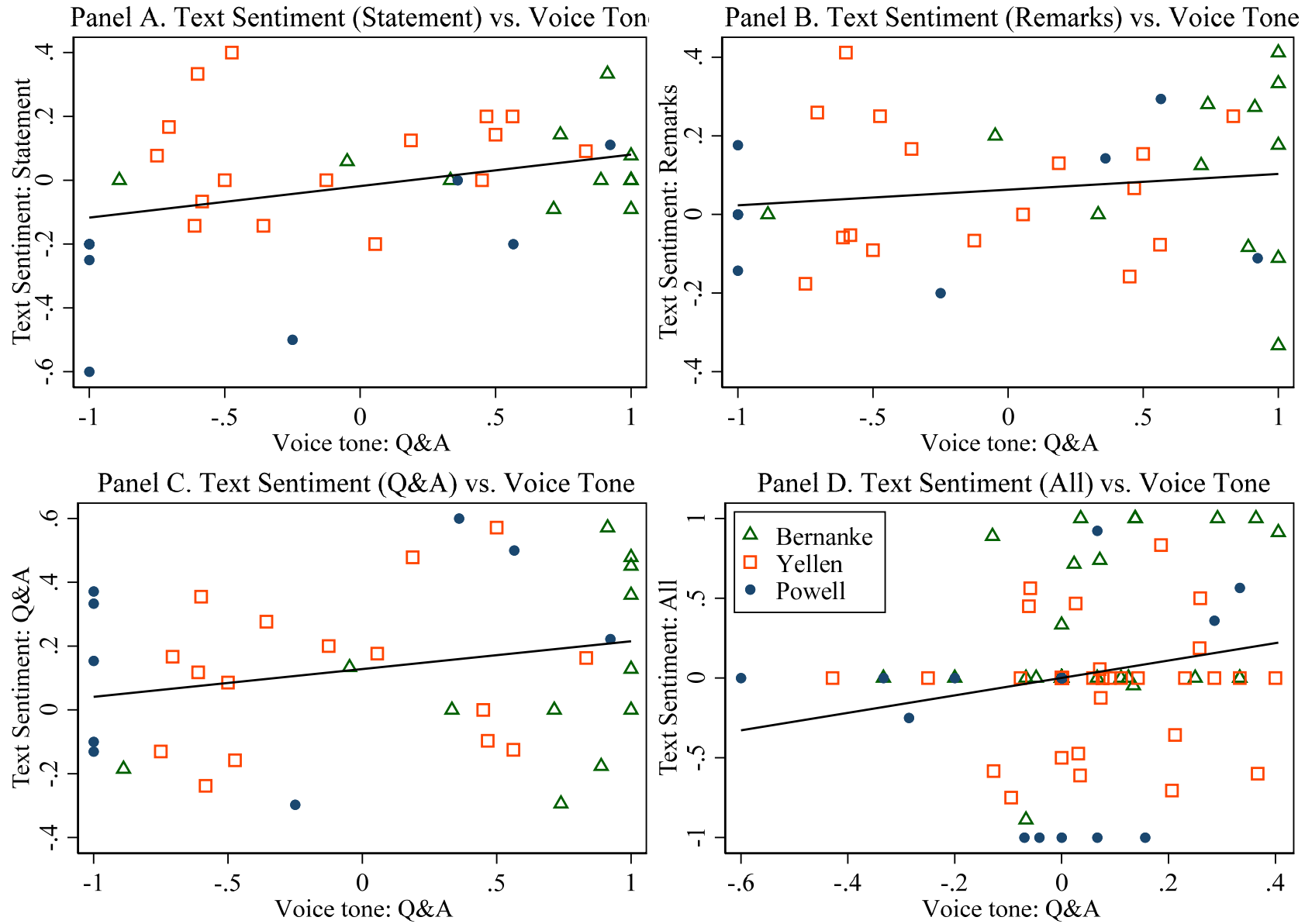
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  - FFR shock
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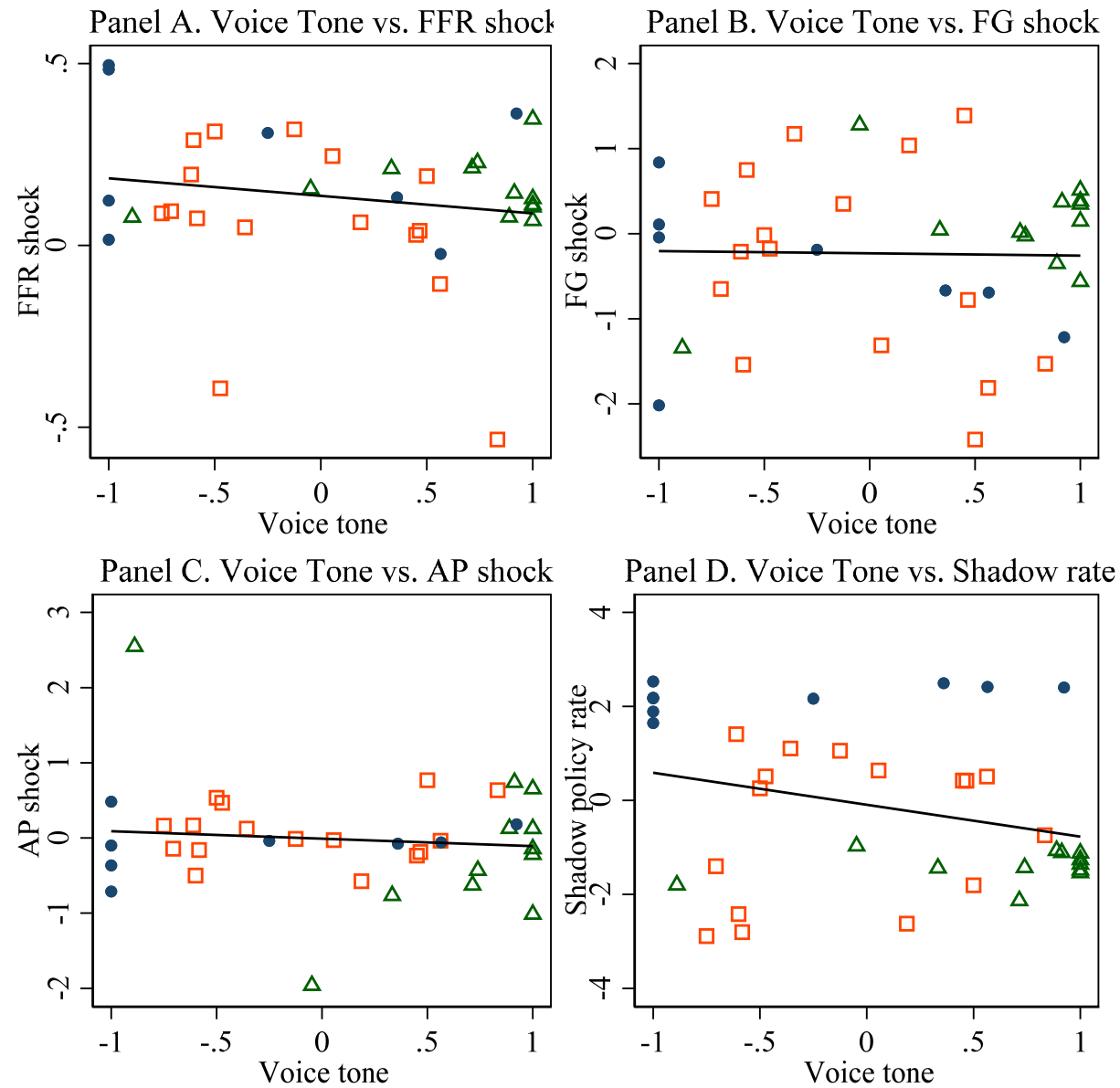
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- General stance of monetary policy: shadow policy rate (Wu and Xia, JMCB 2016)

# CORRELATIONS: VOICE TONE VS. TEXT SENTIMENT



Voice tone appears to have independent variation

# CORRELATIONS: VOICE TONE VS. POLICY ACTIONS



Voice tone appears to have independent variation

# ECONOMETRIC SPECIFICATION

$$\begin{aligned} Outcome_{t,t+h} = & b_0^{(h)} + b_1^{(h)} VoiceTone_t + b_2^{(h)} TextSentiment_t \\ & + b_3^{(h)} FFRShock_t + b_4^{(h)} FGShock_t + b_5^{(h)} APShock_t \\ & + b_6^{(h)} ShadowRate_t + error_t^{(h)} \end{aligned}$$

Time  $t$  is in days around press-conferences; unit of analysis is a press-conference; Bootstrap



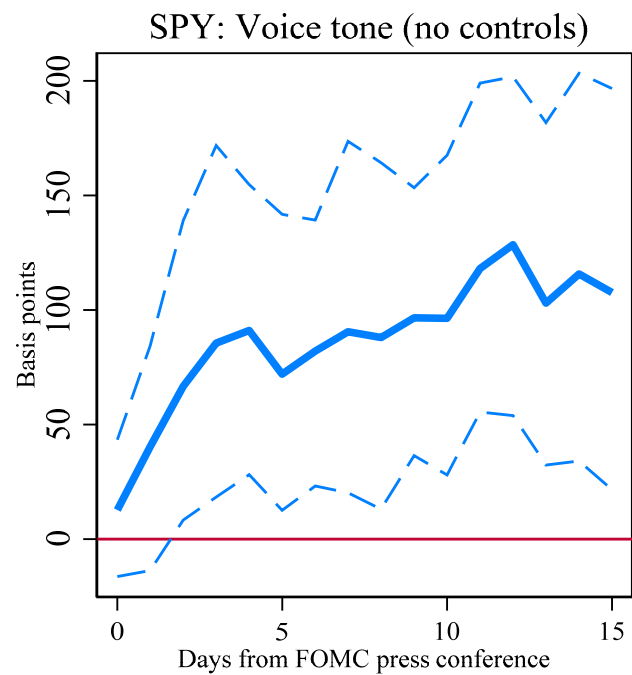
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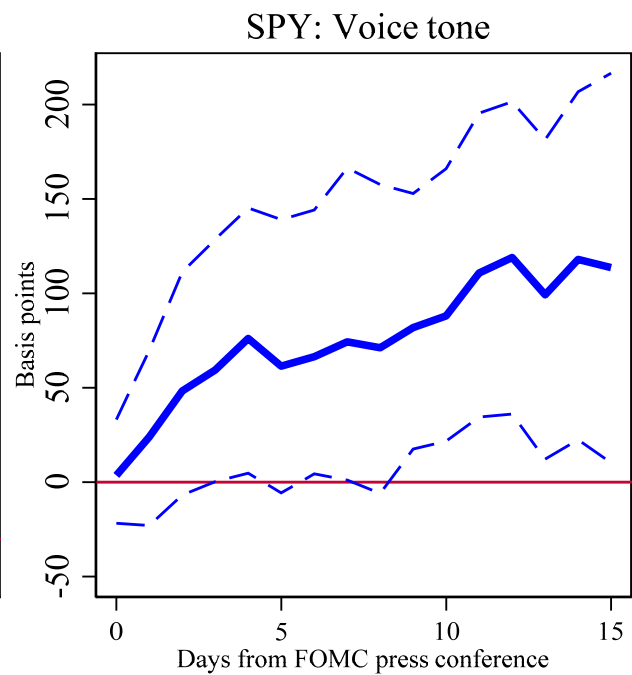
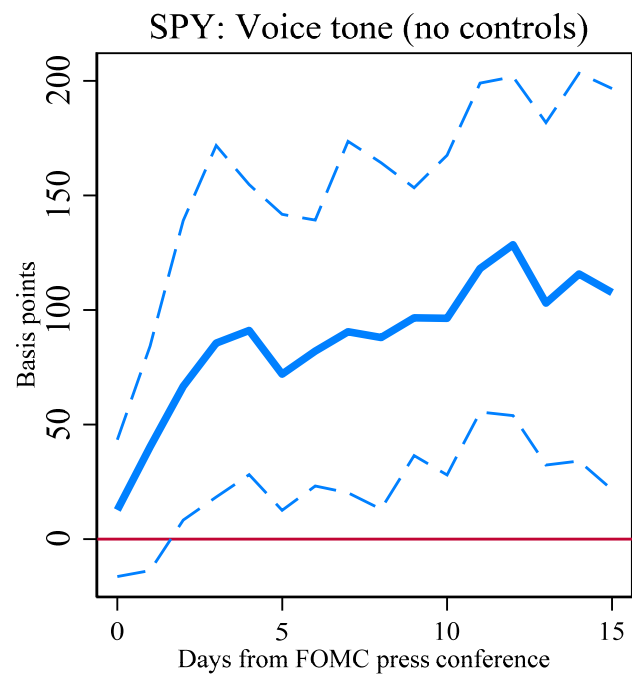
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Outcomes:

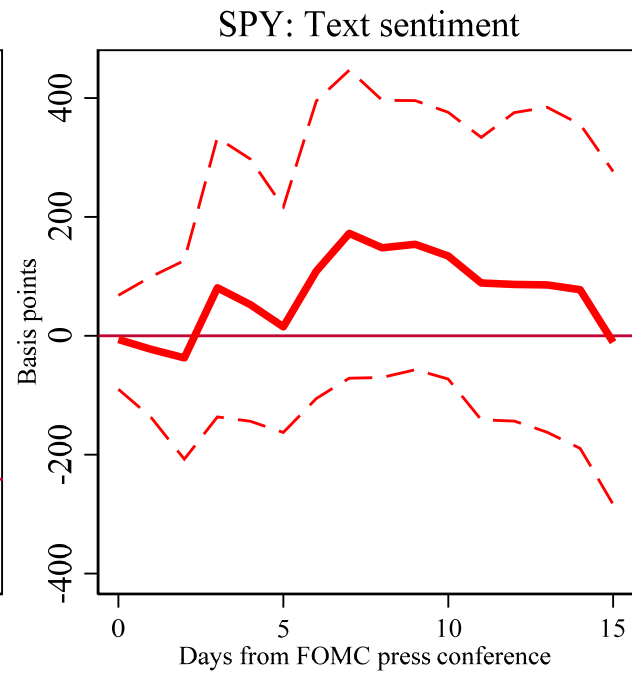
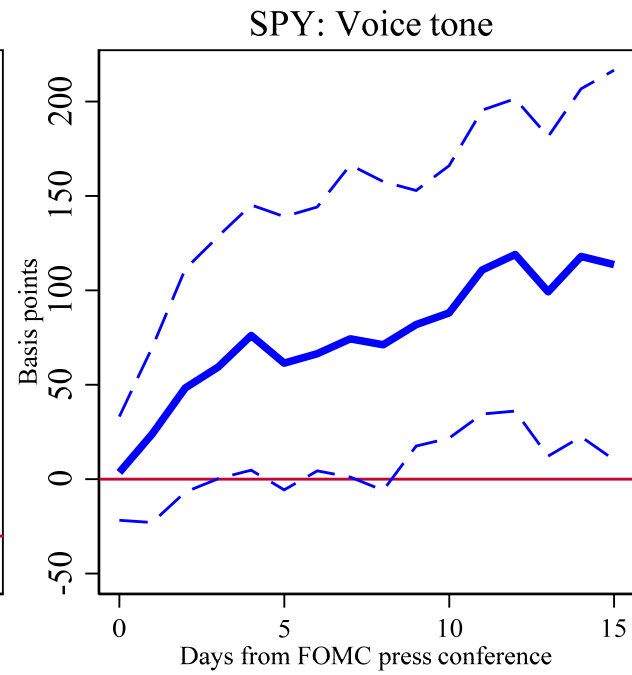
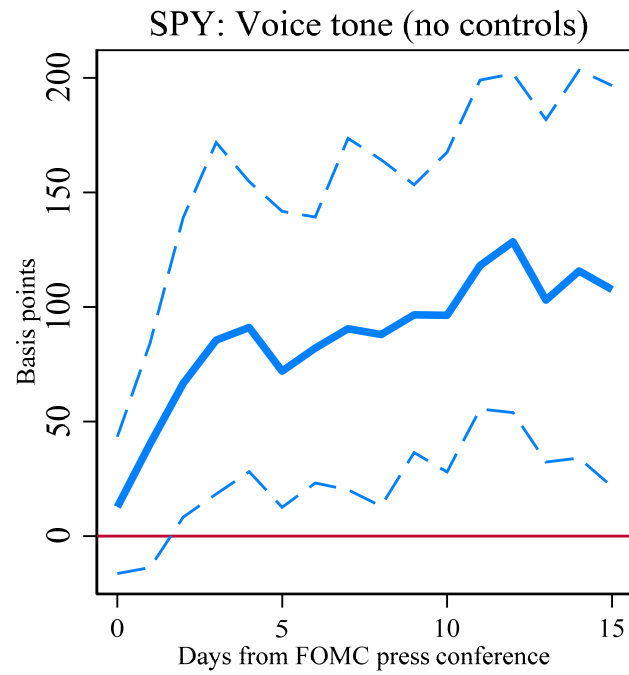
- Daily financial indicators collected from Thomson Reuters, Yahoo Finance, and Tiingo
- Prices of exchange-traded funds (ETFs) that track popular indices: e.g., SPY (an ETF fund that tracks the S&P 500 index)
- $Return_{t,t+h}^i = \log(close_{t+h}^i) - \log(open_t^i)$



SPY (S&P 500)

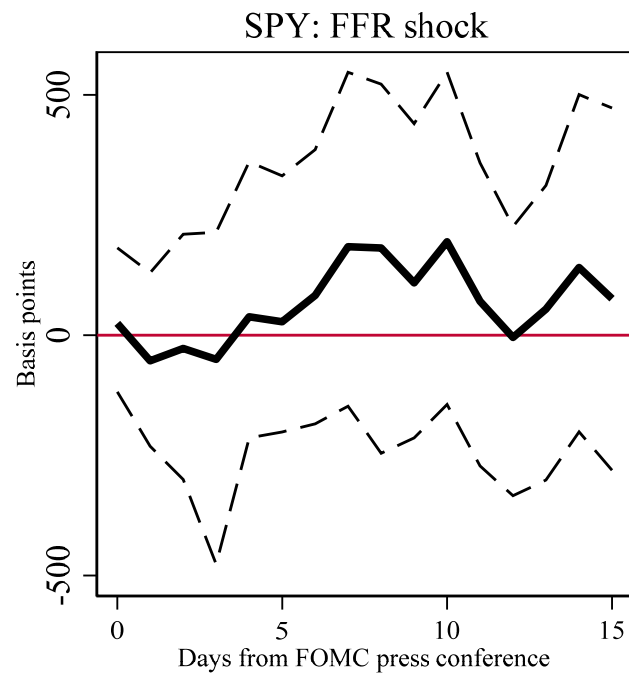
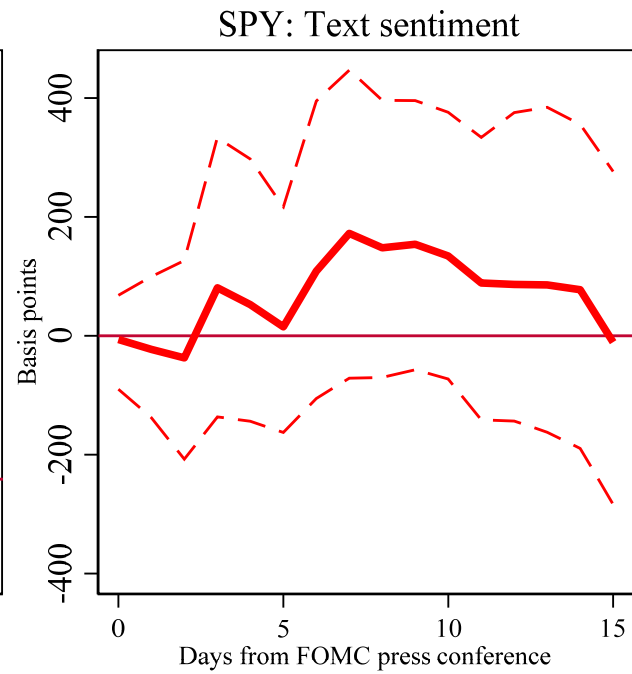
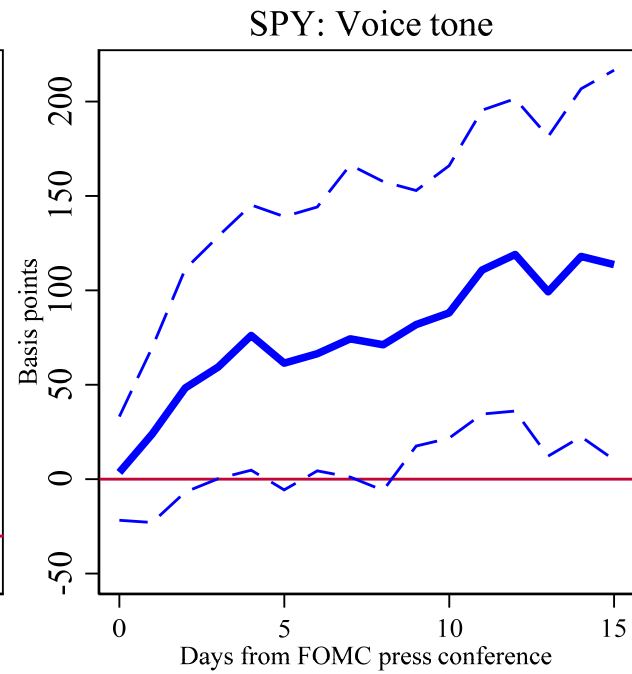
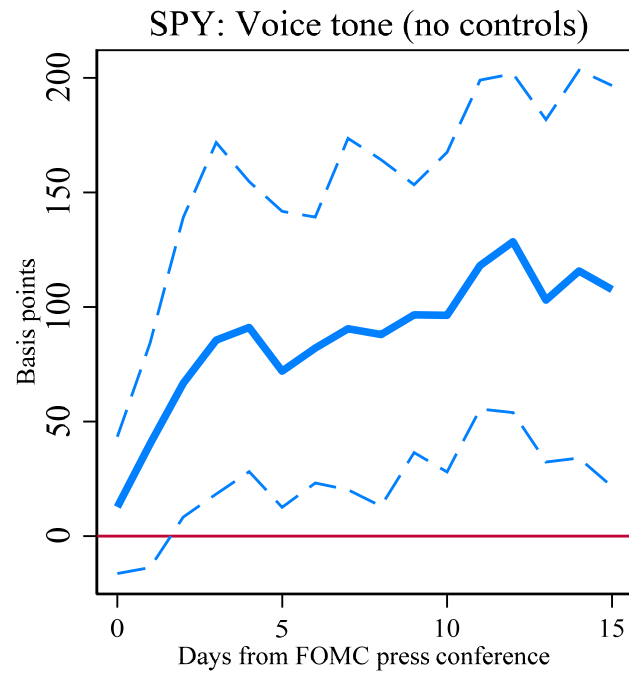


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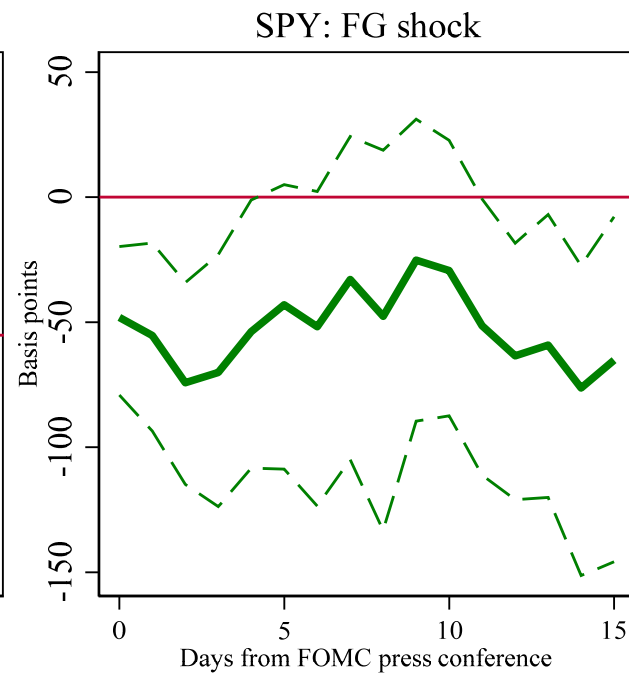
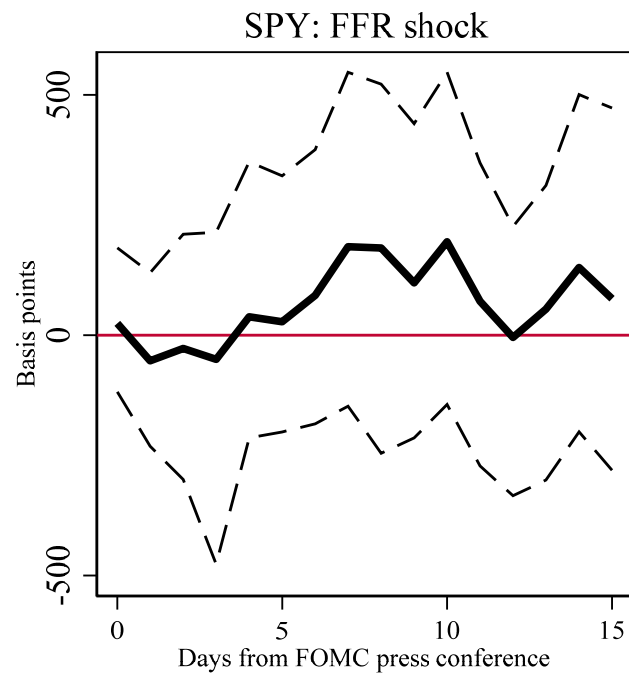
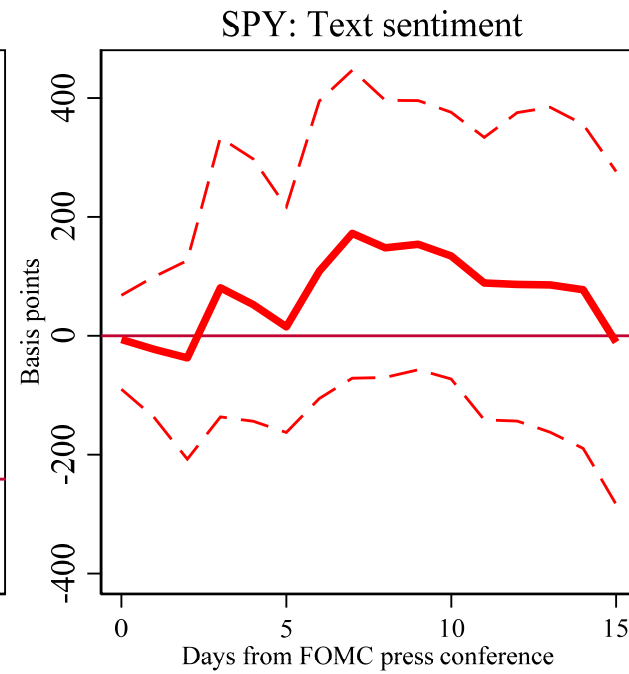
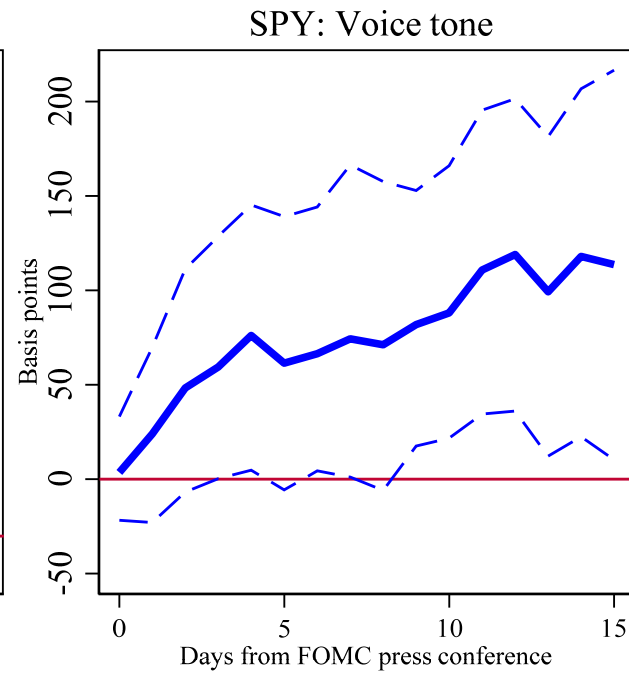
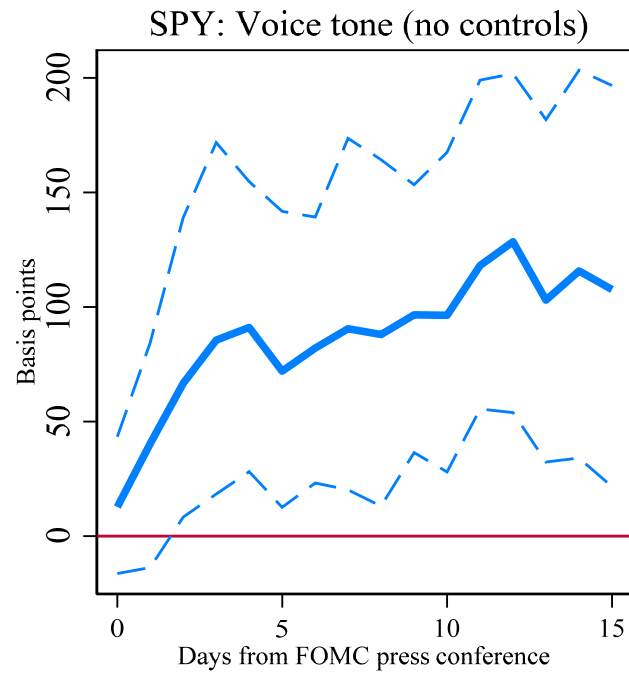


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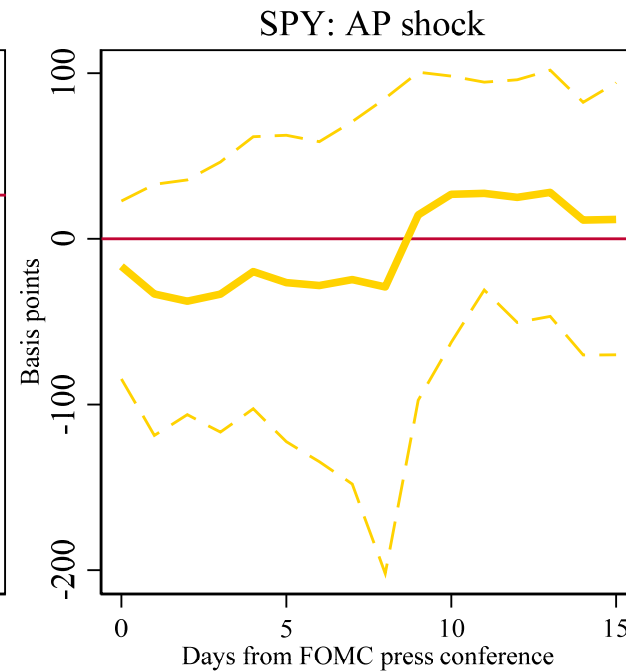
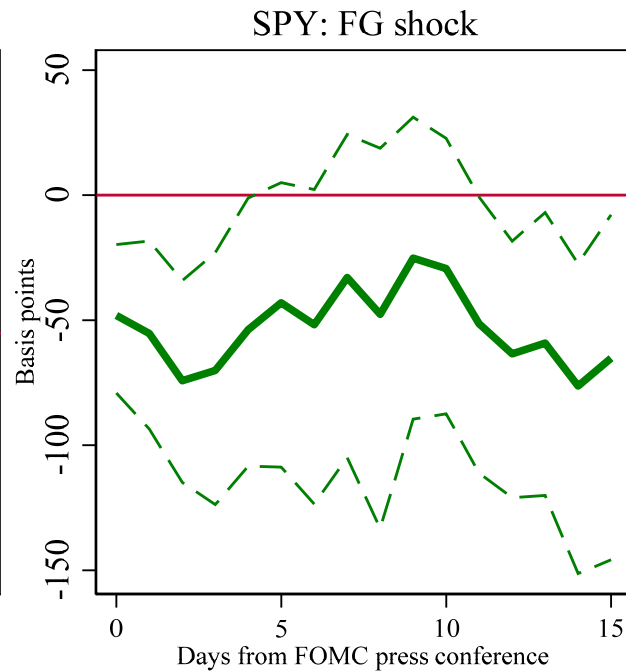
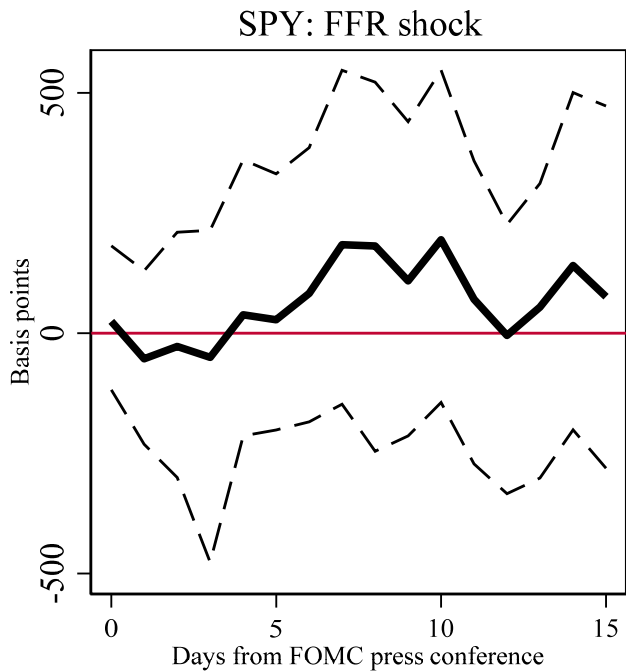
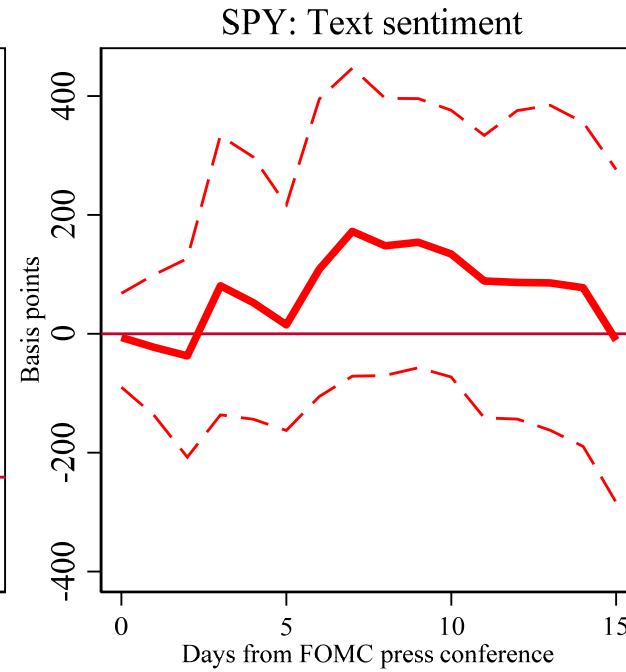
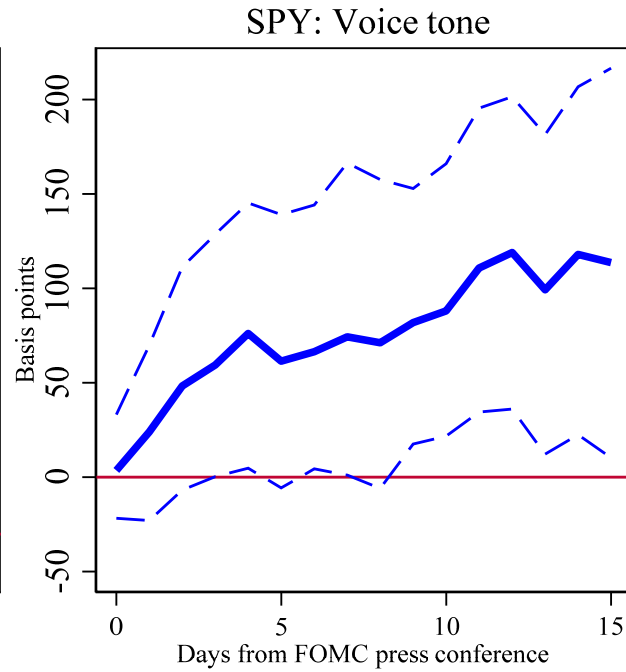
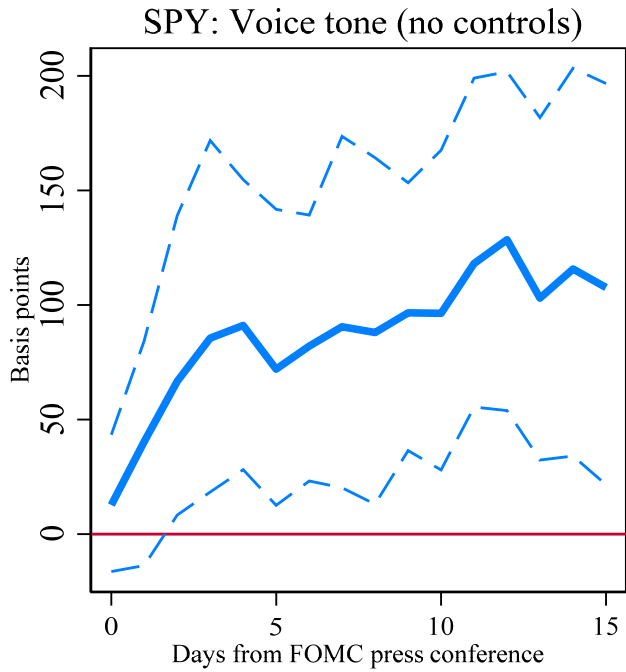
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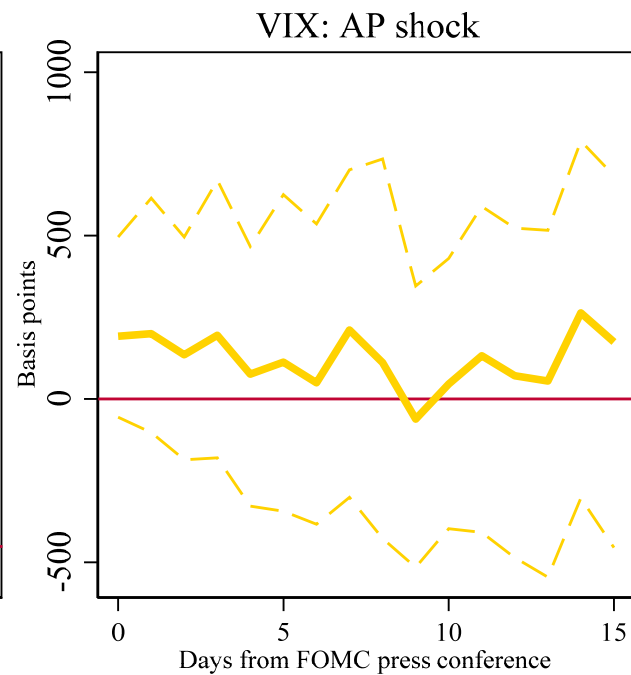
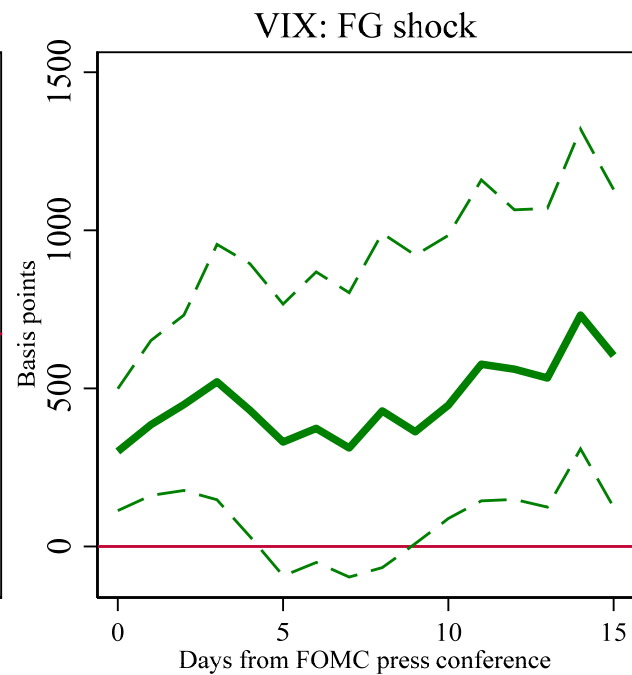
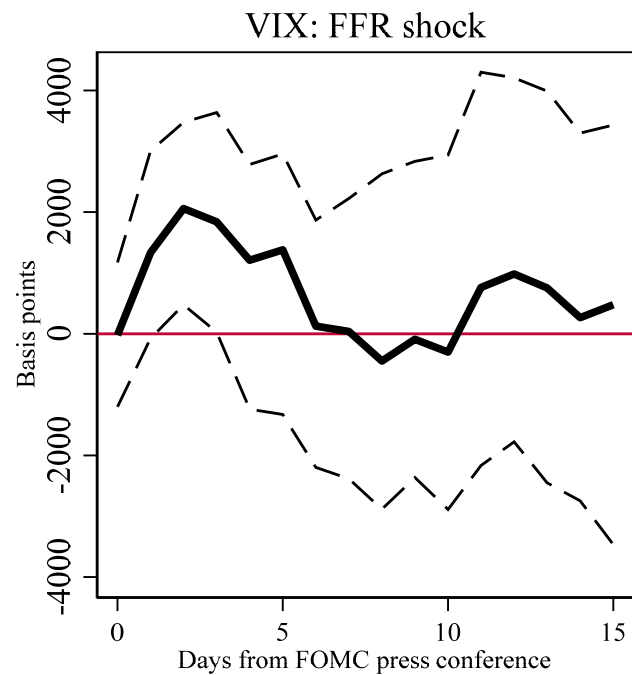
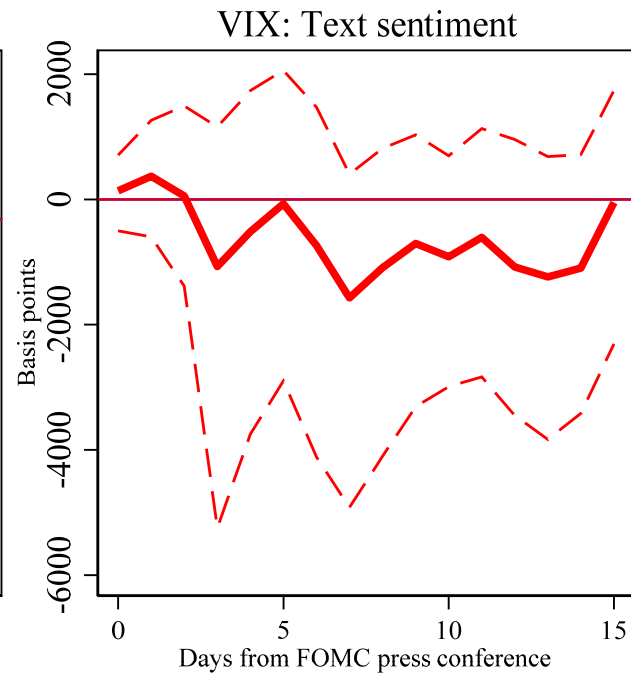
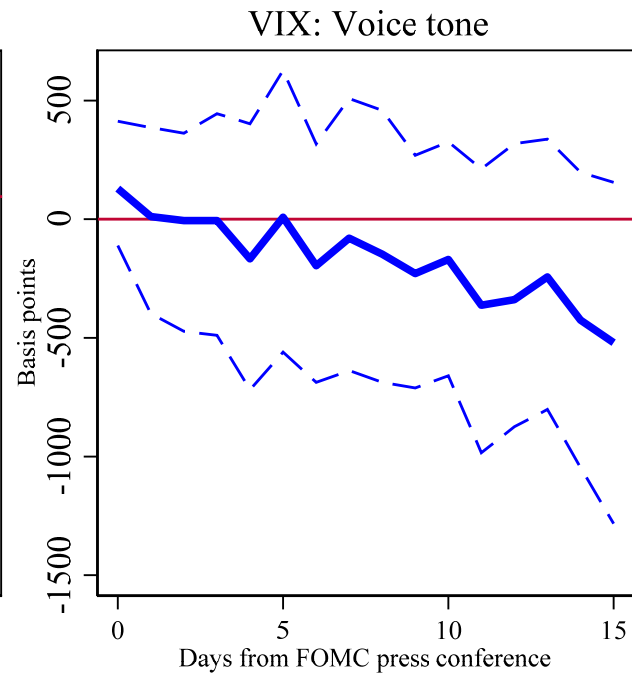
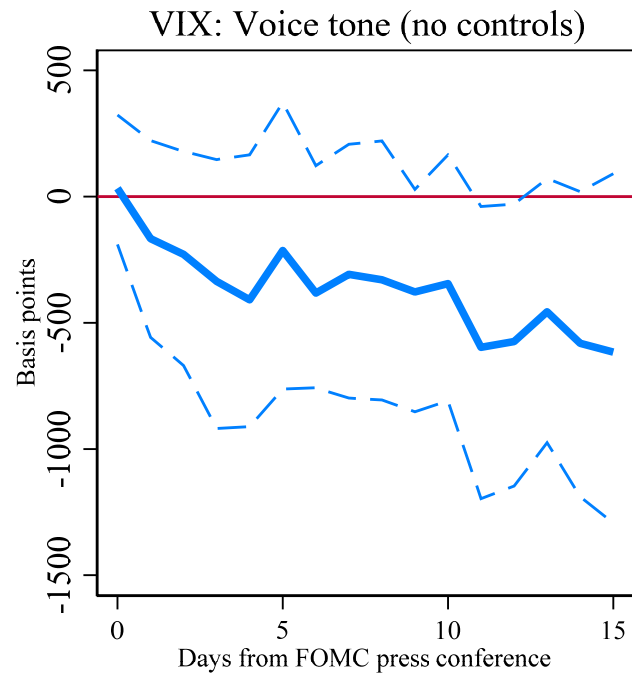


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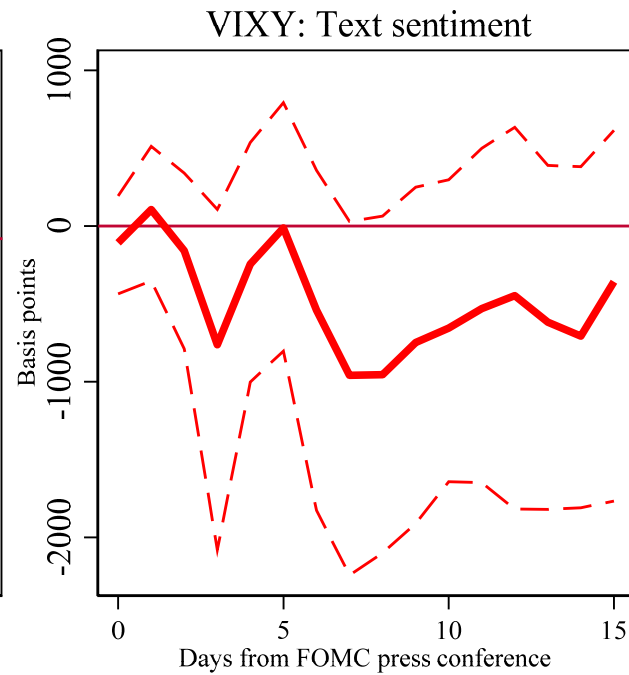
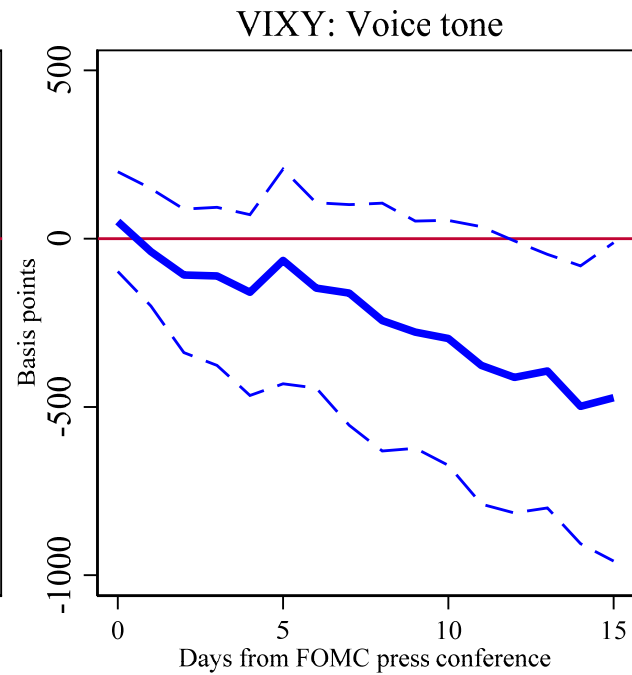
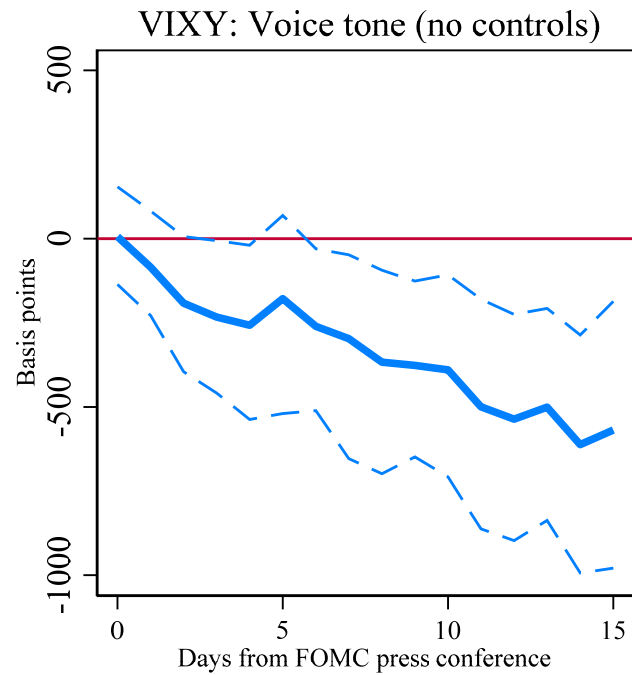


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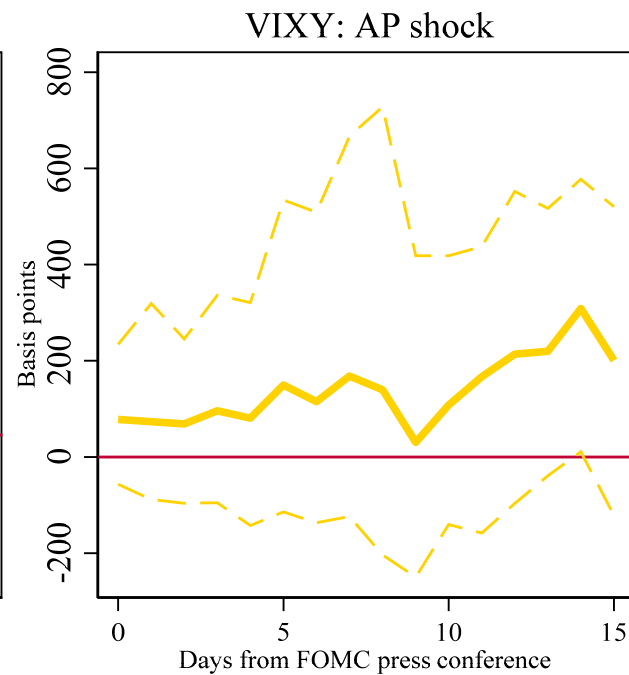
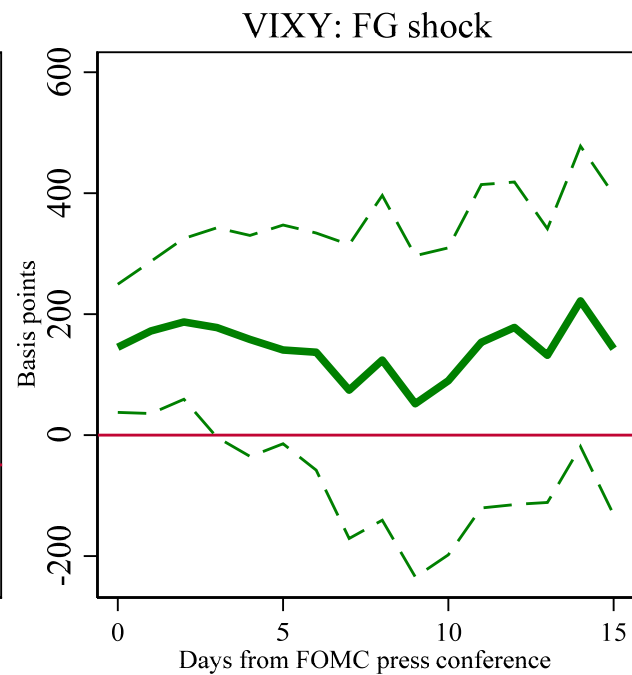
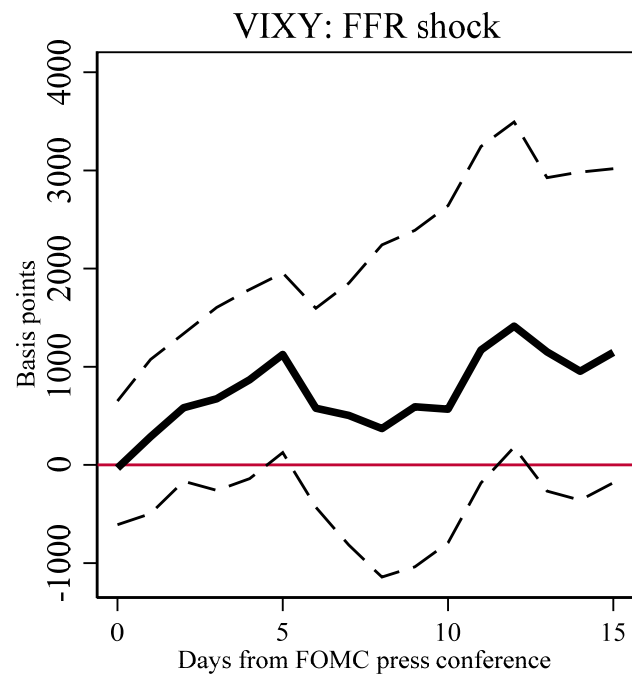


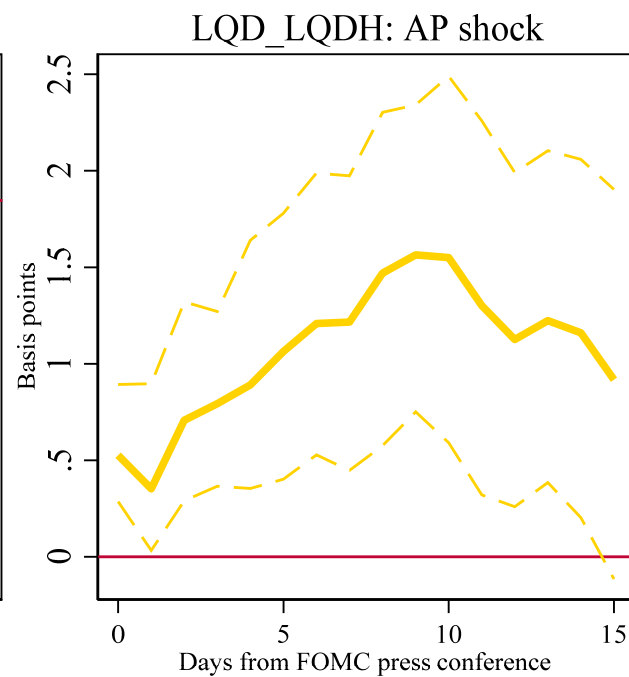
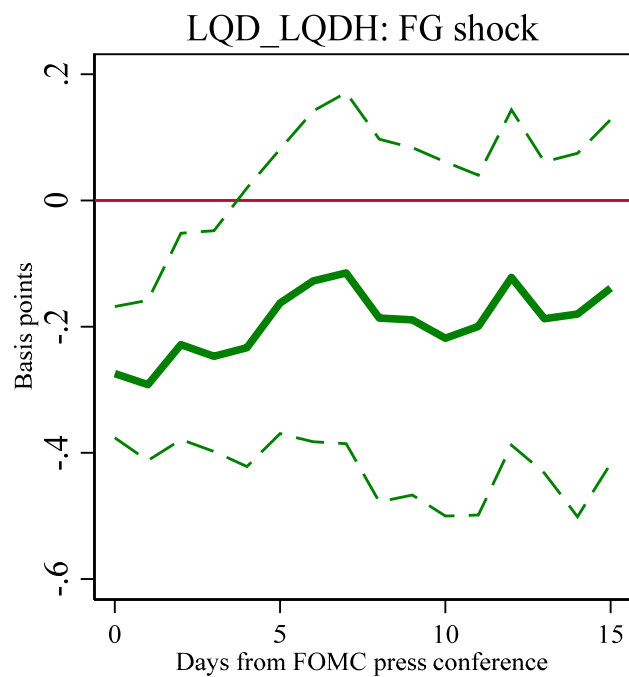
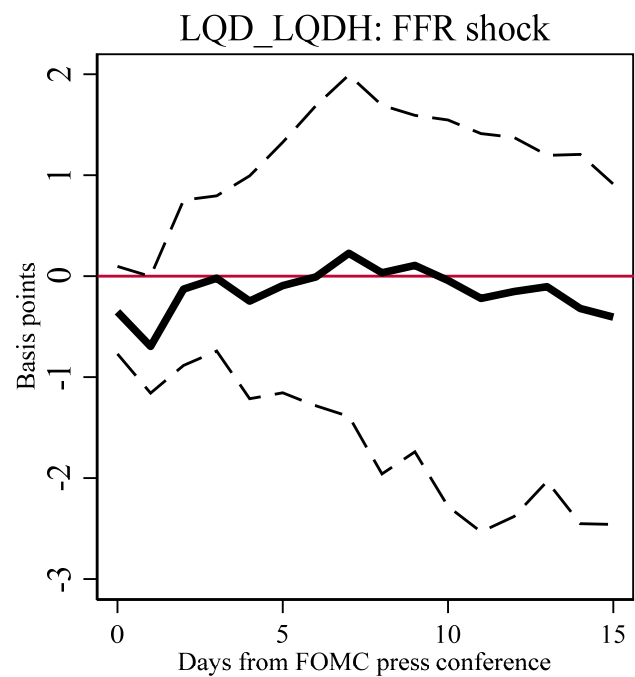
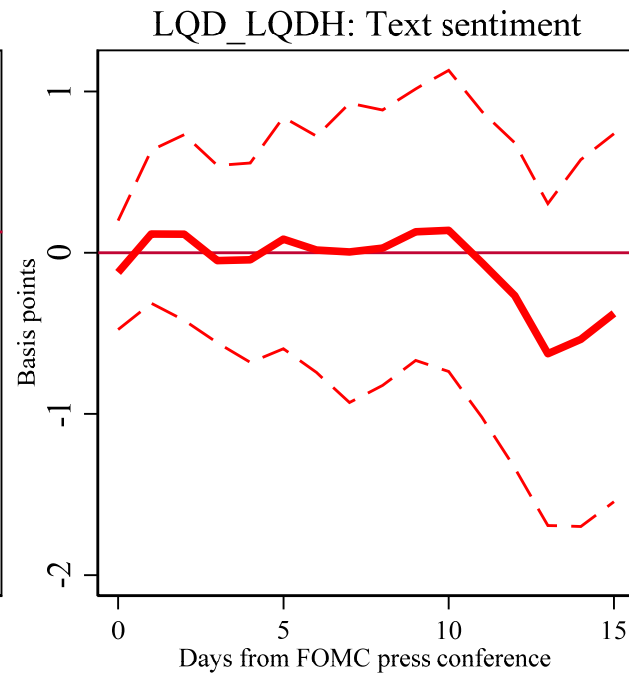
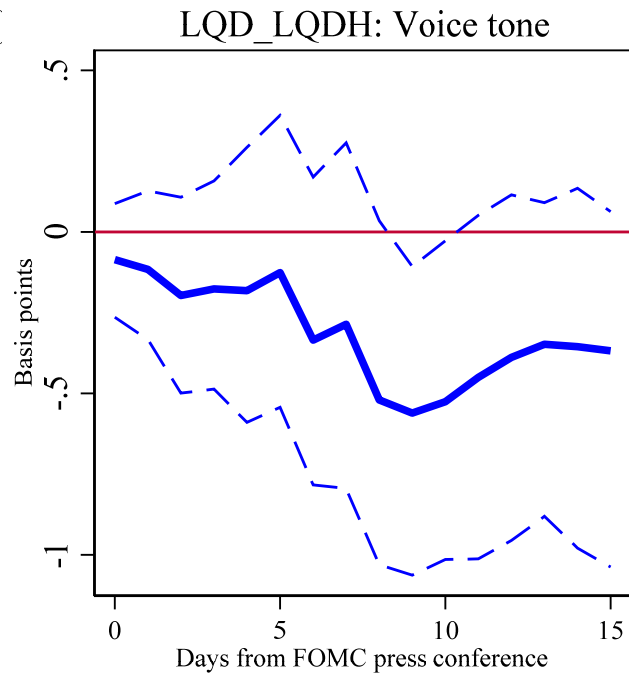
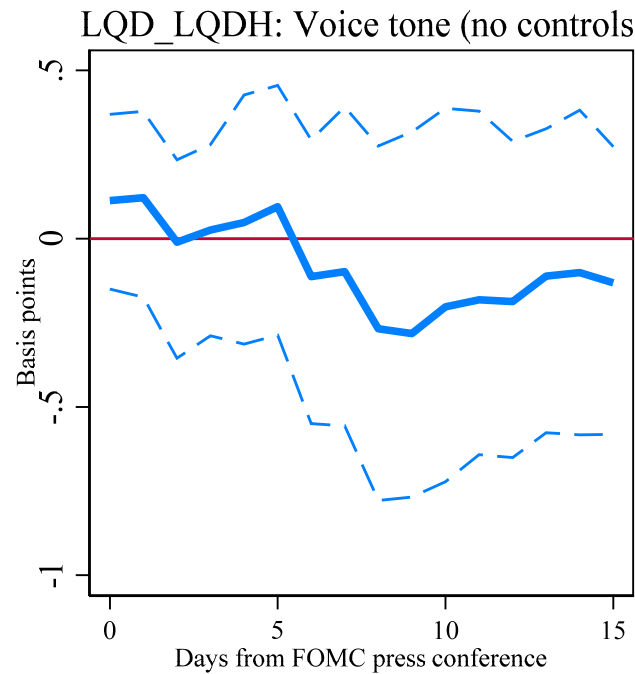






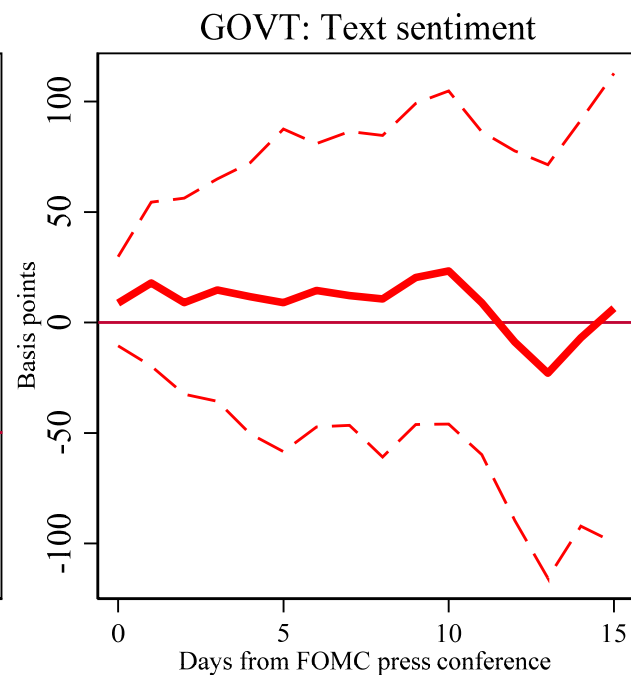
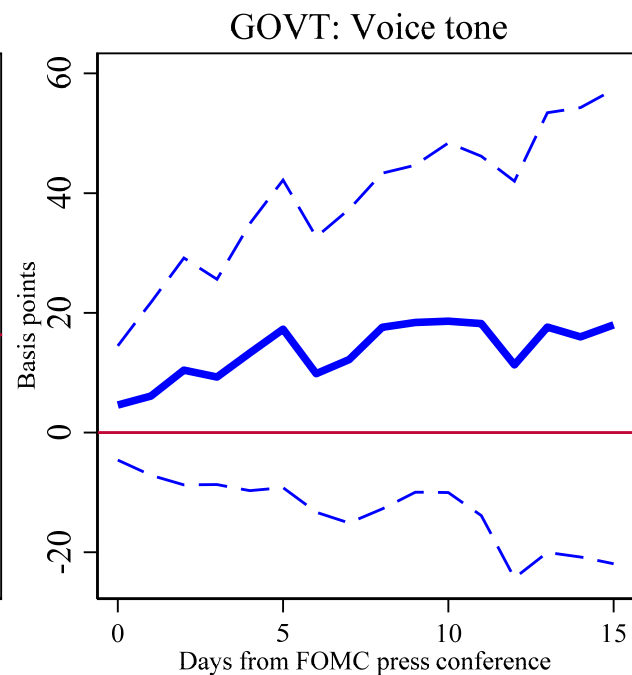
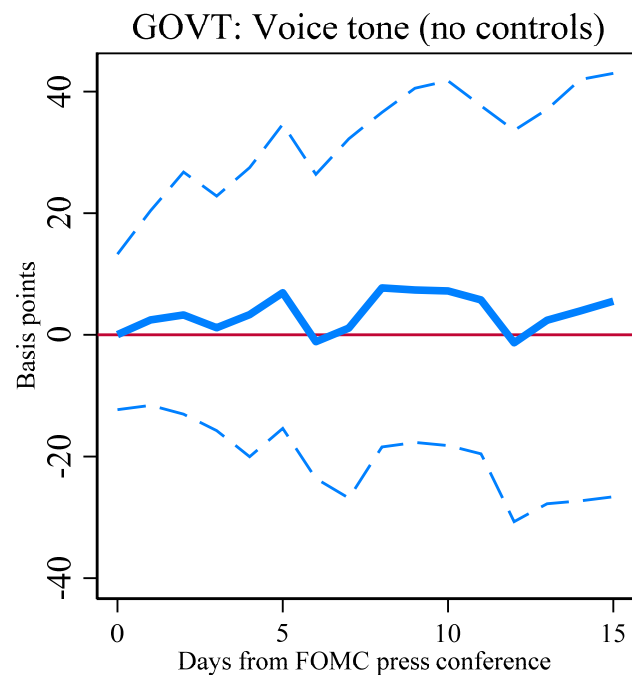
VIXY (VIX  
Short-Term  
Futures)



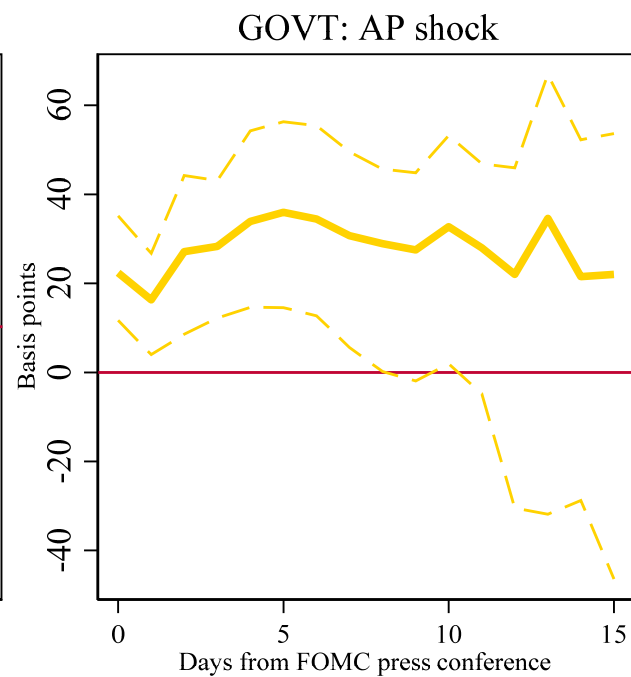
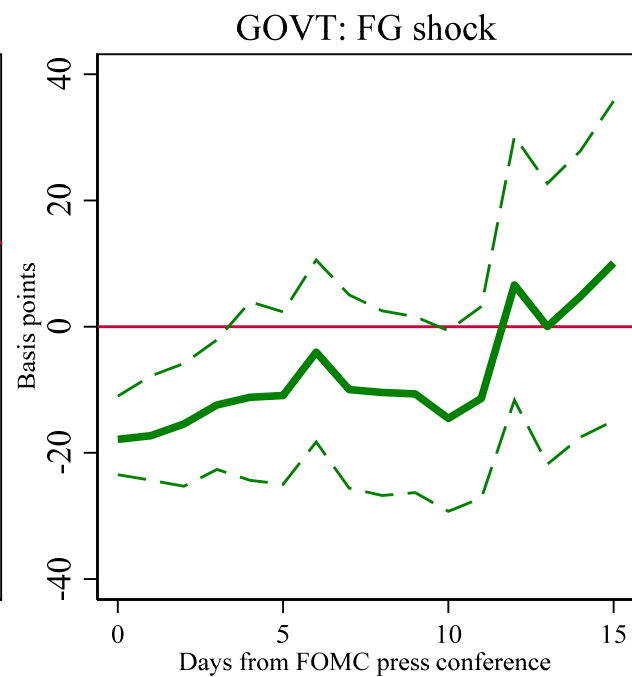
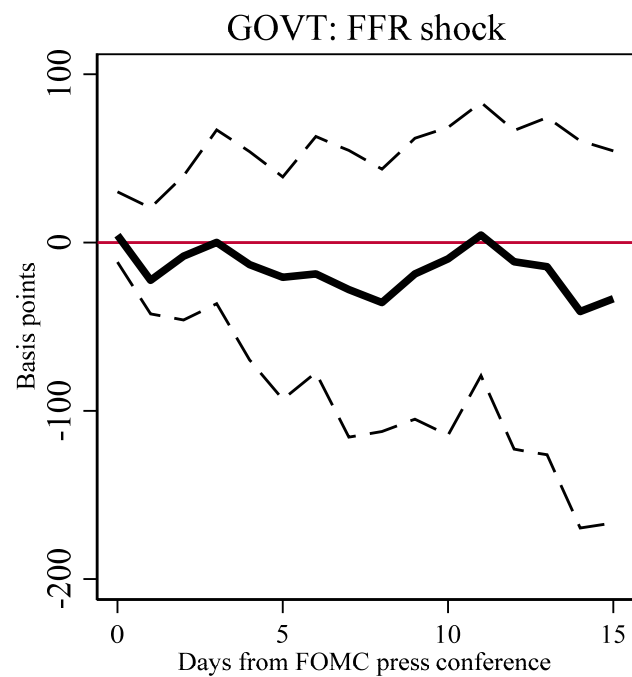


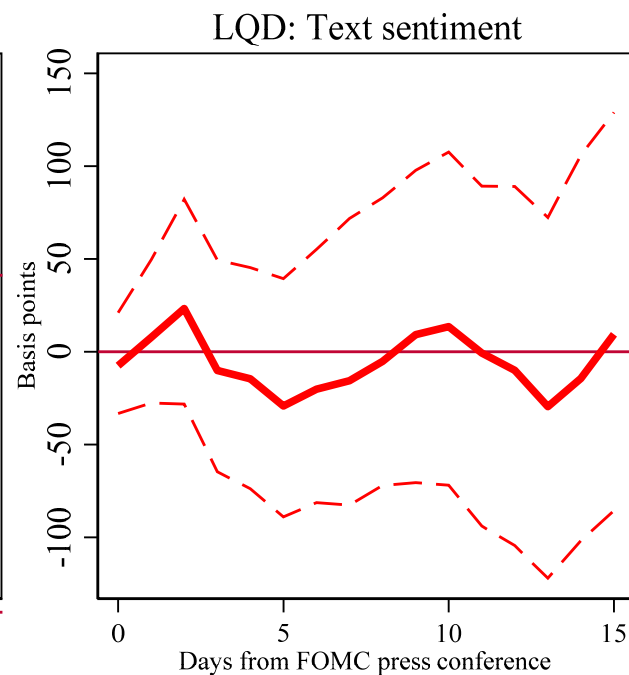
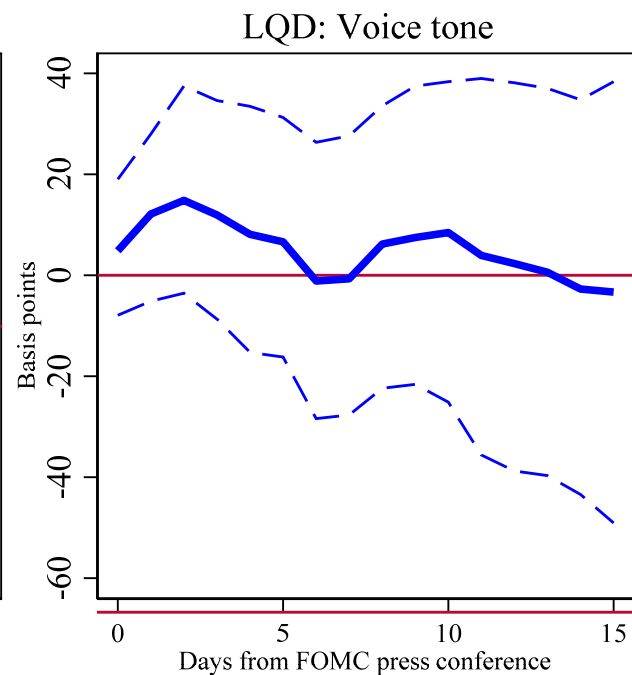
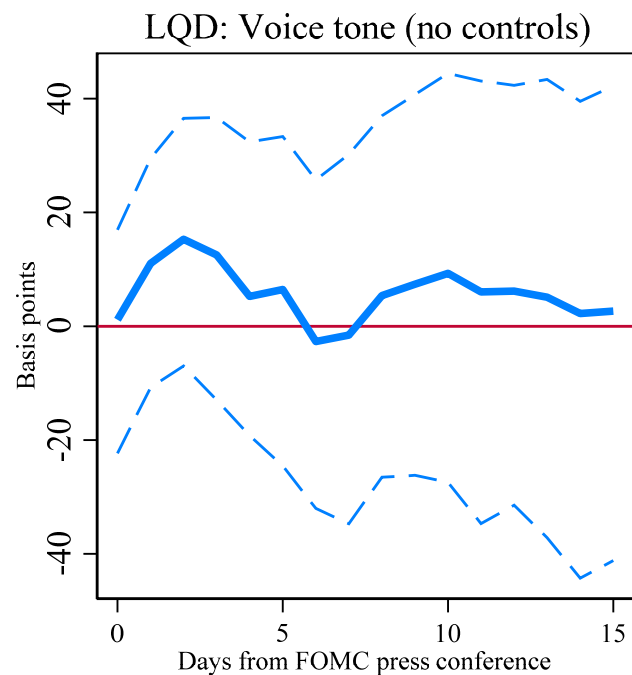
Interest rate path:  
 LQD ETF  
 (investment grade  
 corporate bond)  
 minus  
 LQDH EFT  
 (interest rate hedged  
 corporate bond)

$E(\text{interest rate}) \uparrow$   
 $\Rightarrow \text{spread} \downarrow$

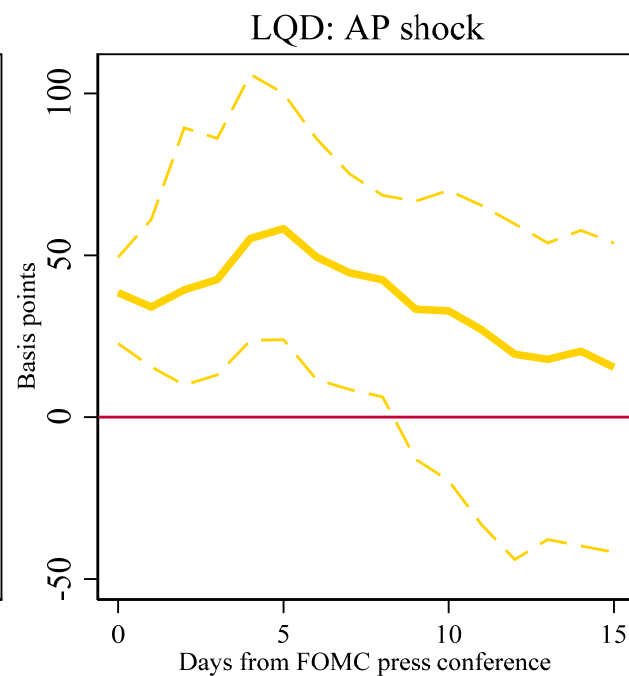
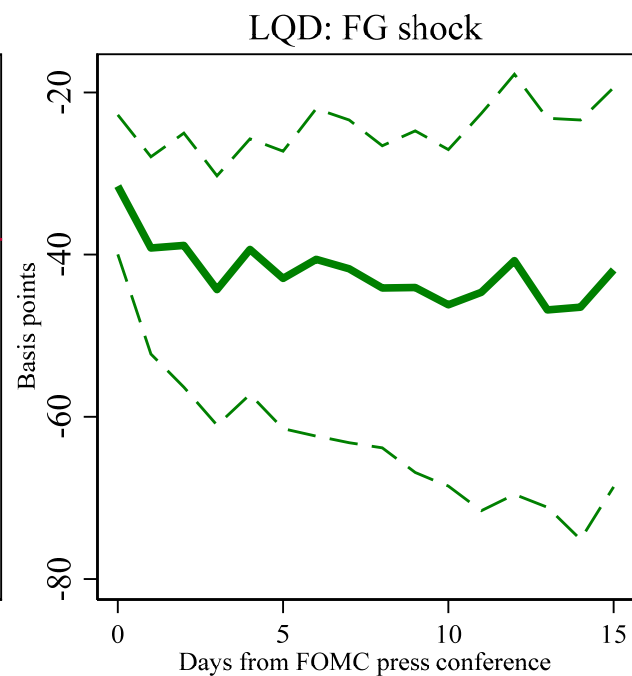
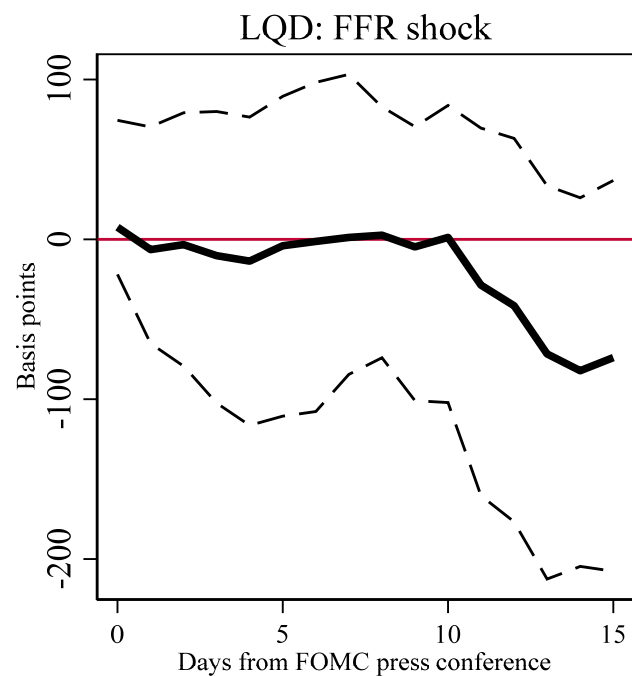


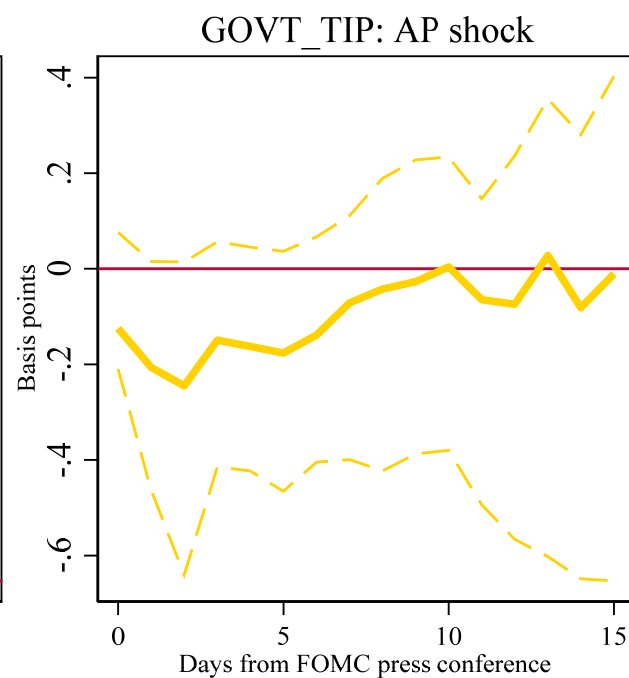
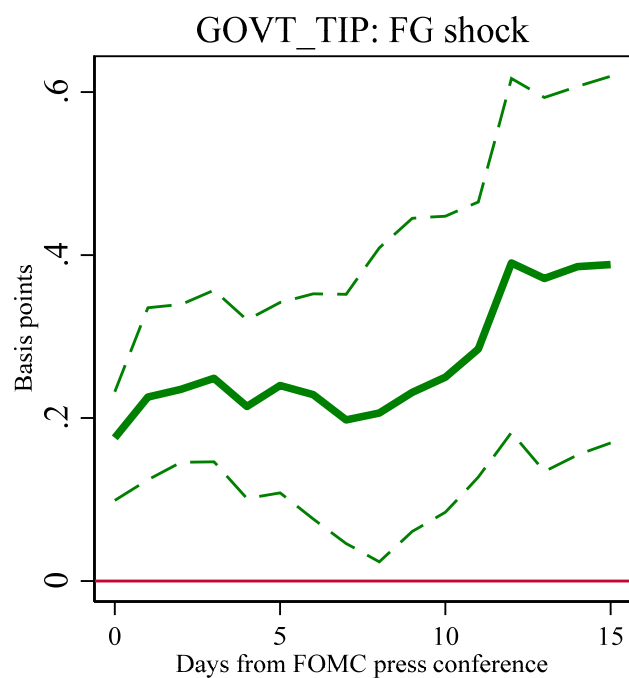
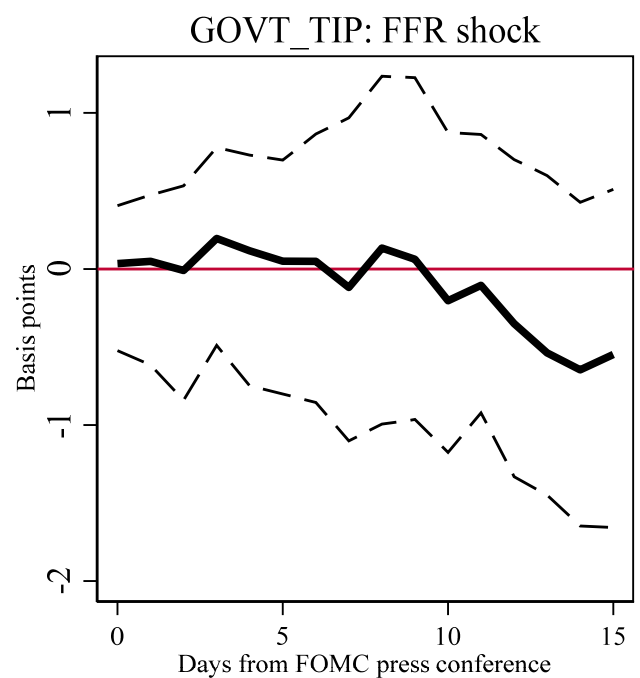
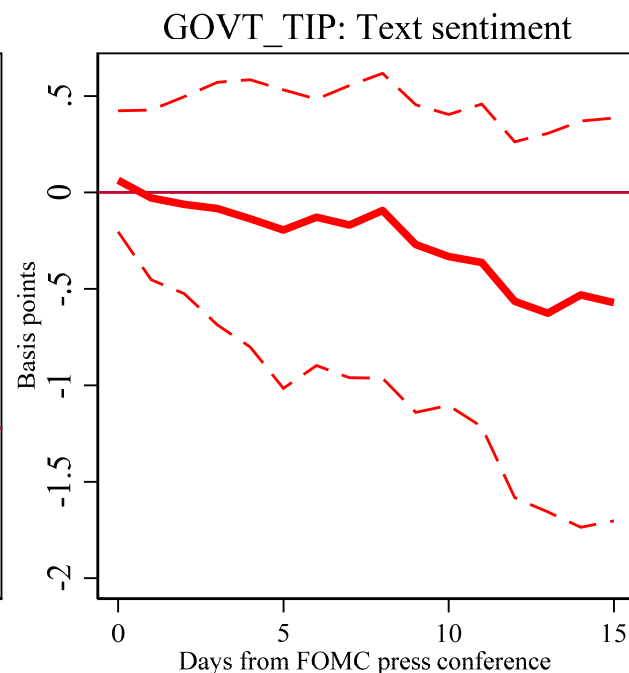
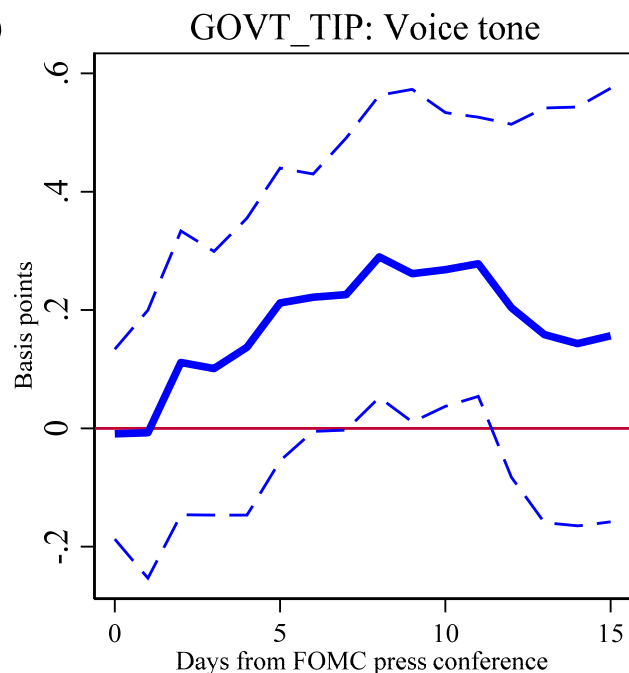
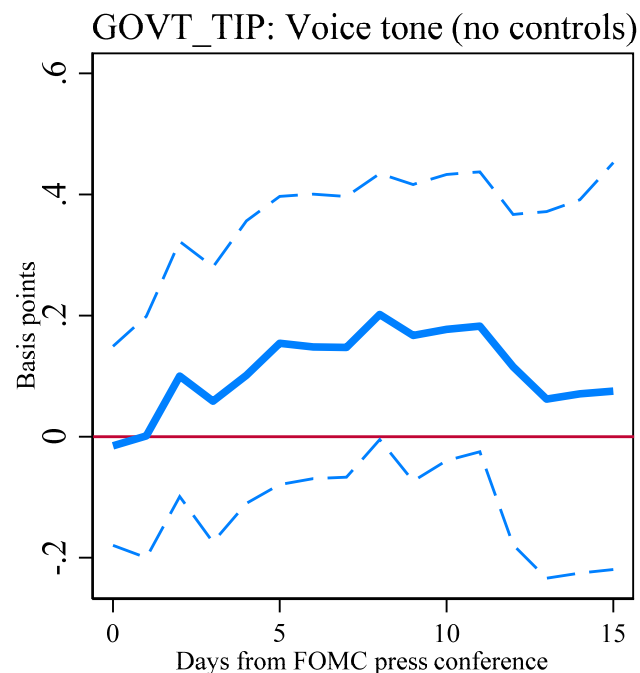
GOVT ETF  
(U.S. government debt)





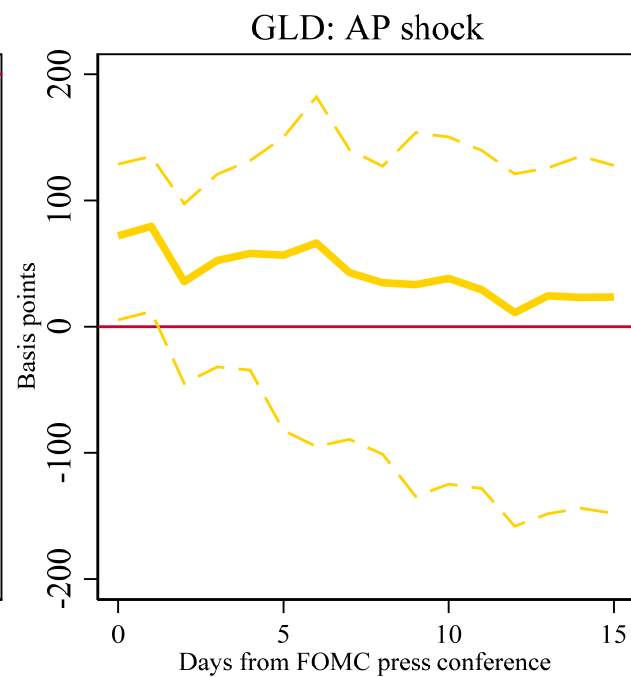
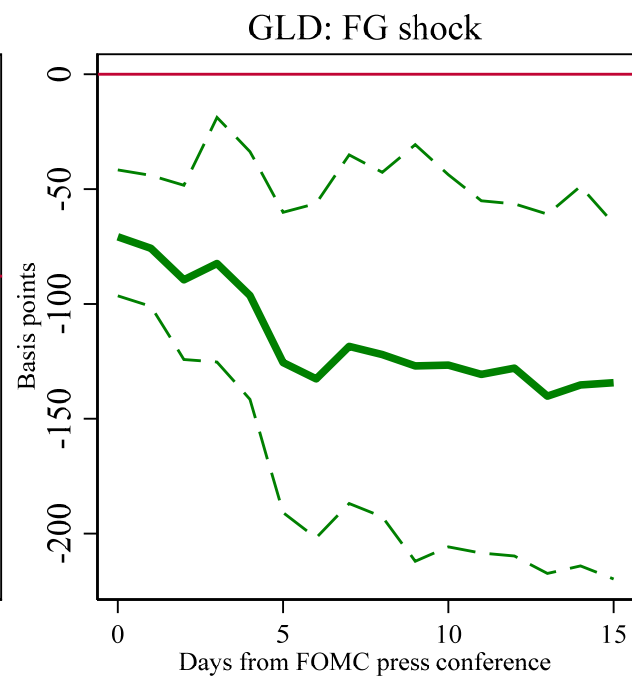
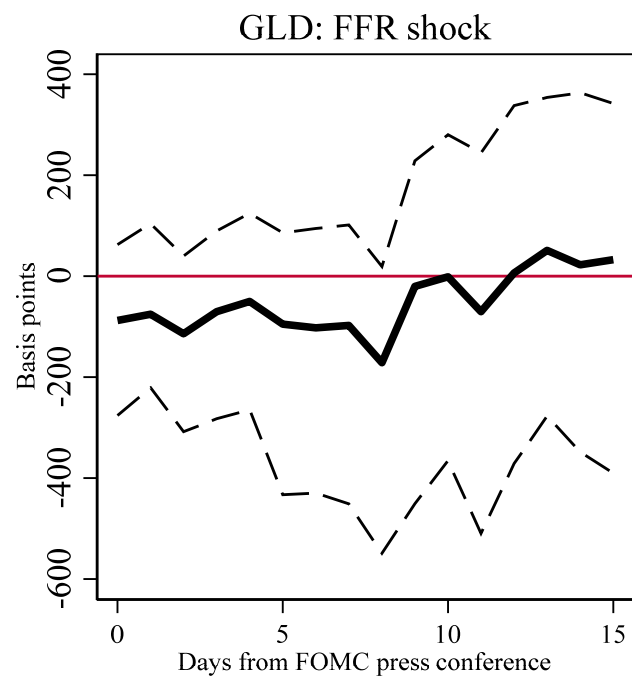
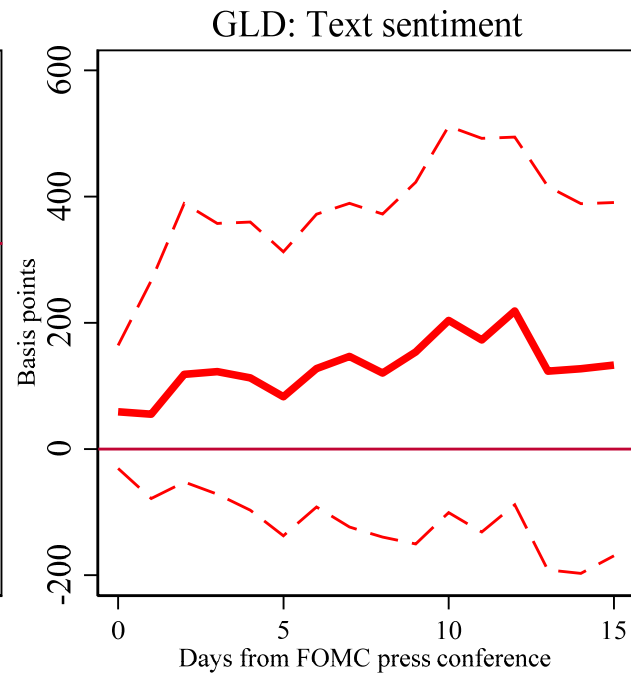
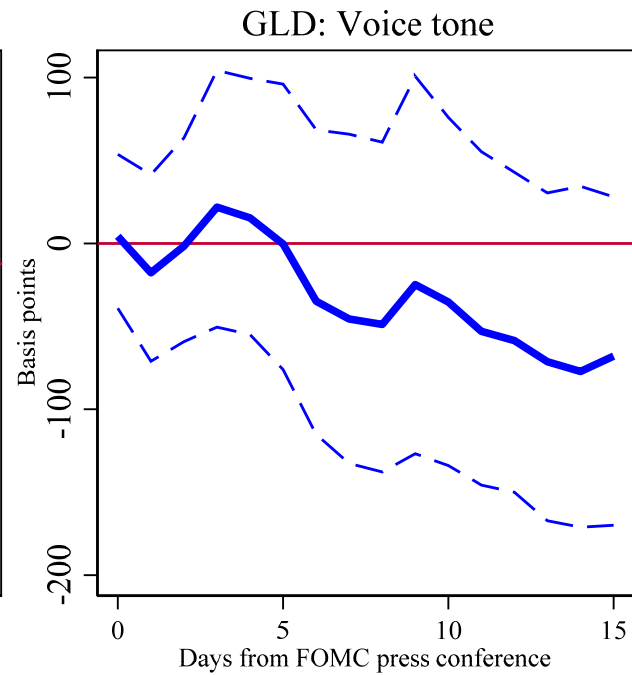
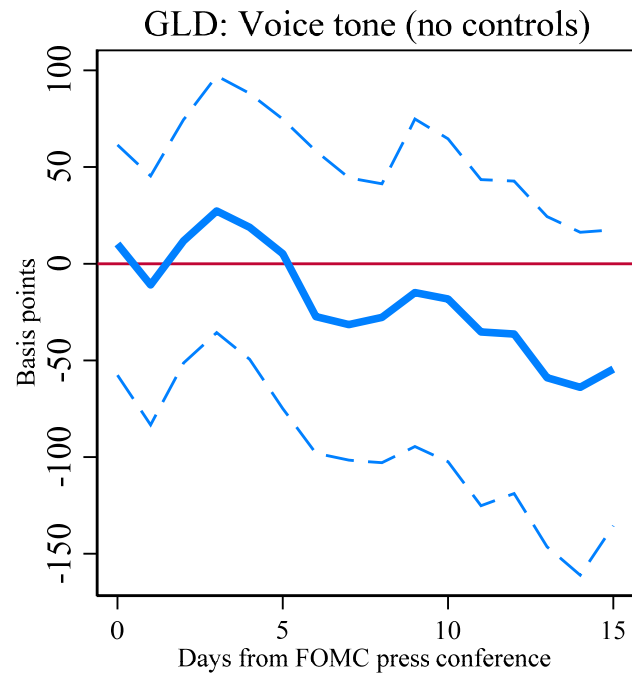
**LQD ETF**  
(corporate debt)



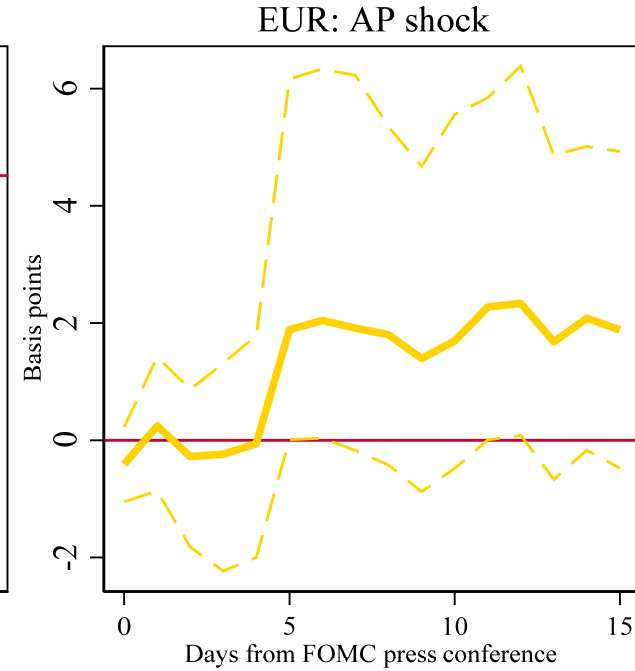
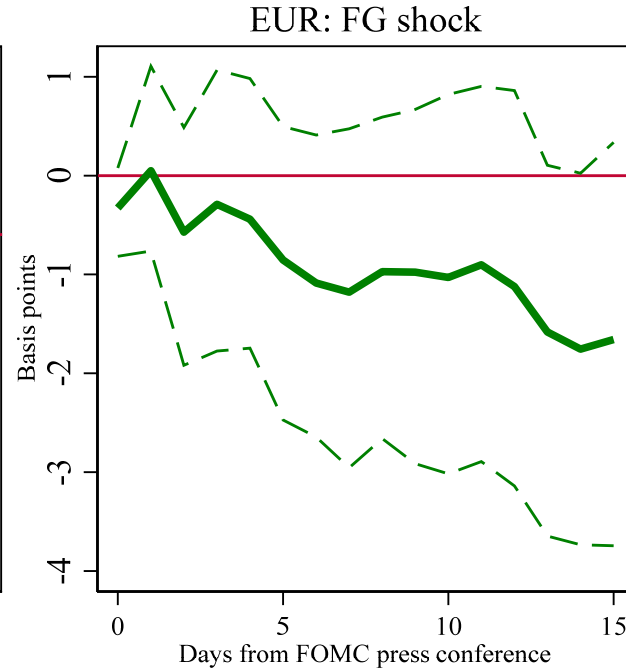
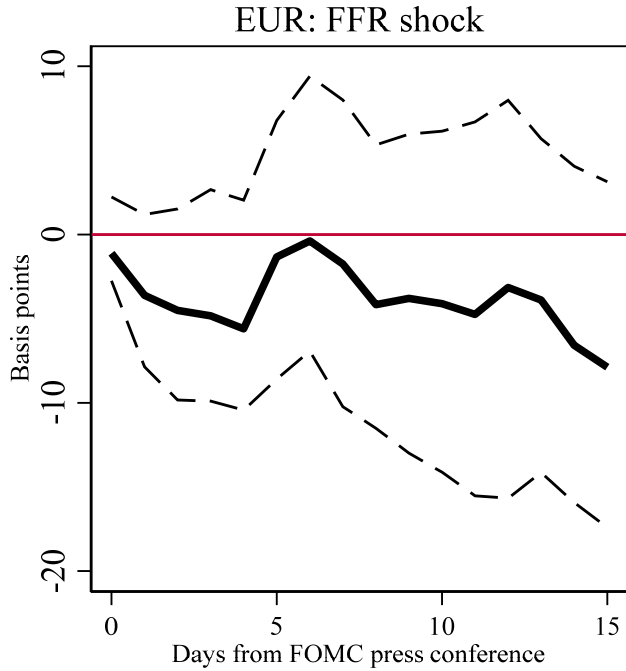
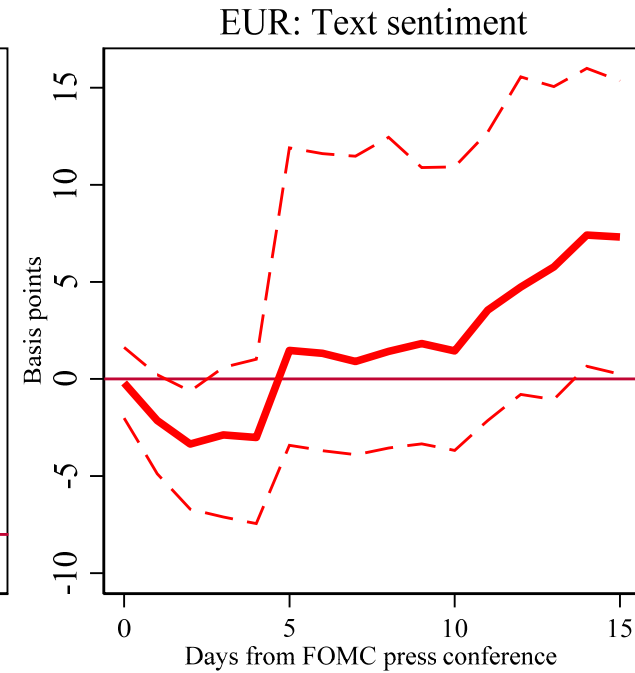
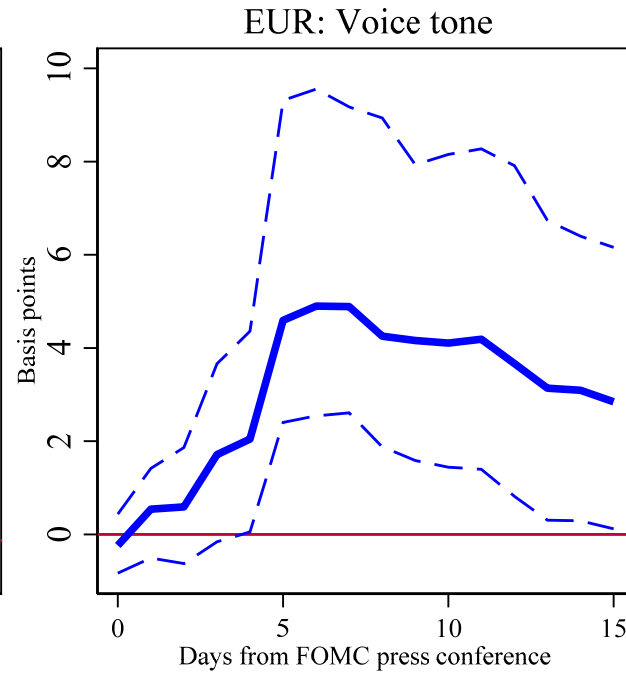
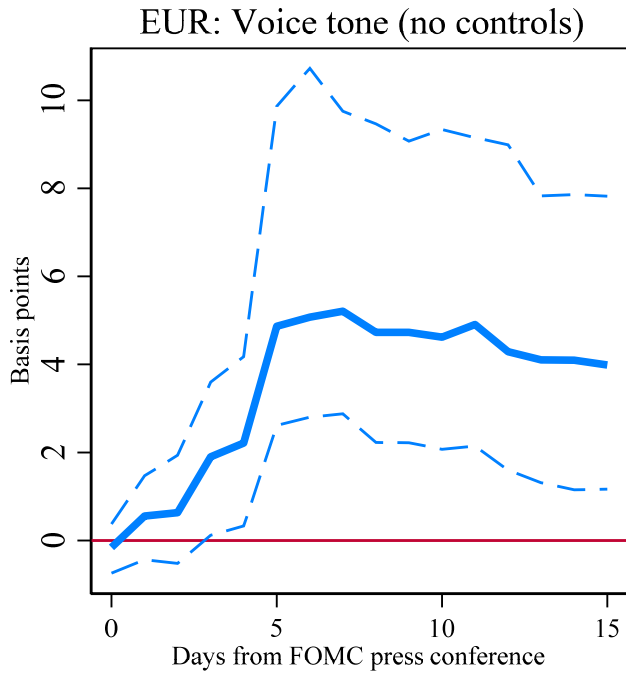


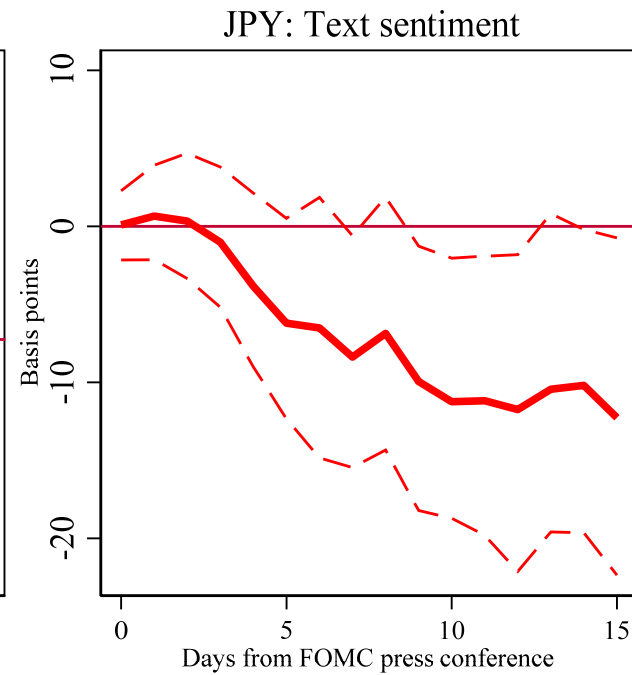
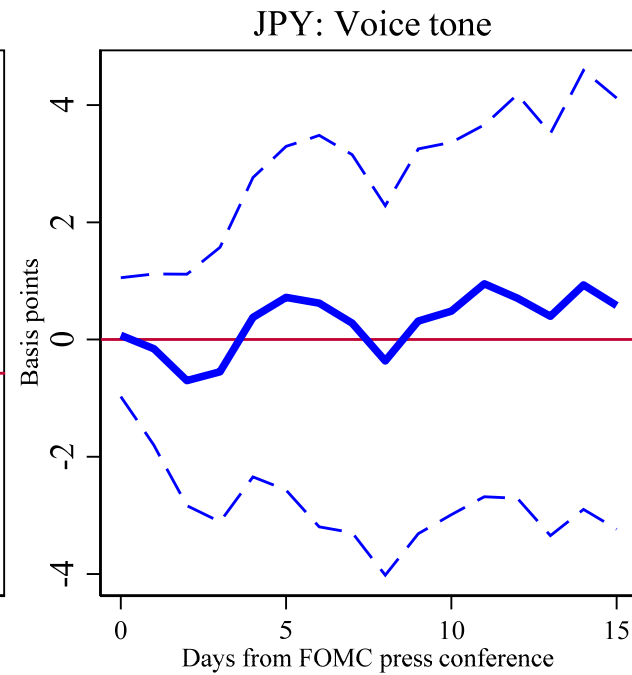
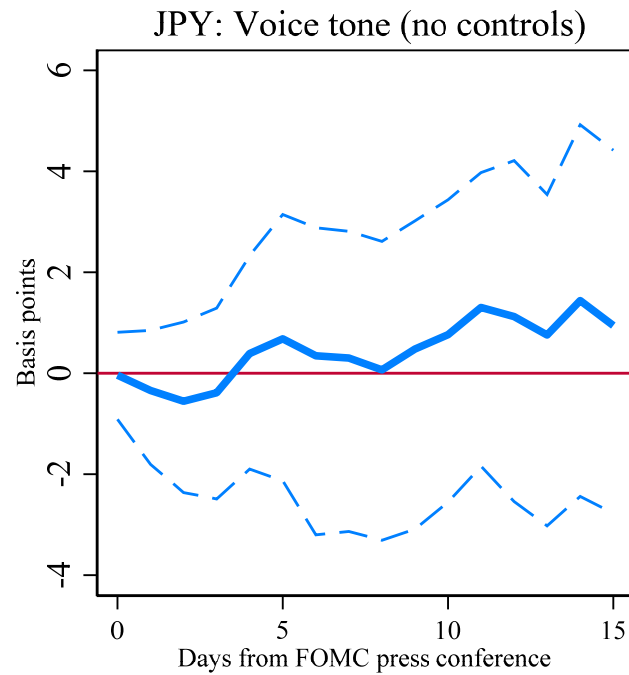
“Expected inflation”:  
 GOVT ETF (nominal  
 U.S. government  
 debt)  
 minus  
 TIP EFT (inflation-  
 protected U.S.  
 government debt)

Spread  $\uparrow \Rightarrow E\pi \downarrow$

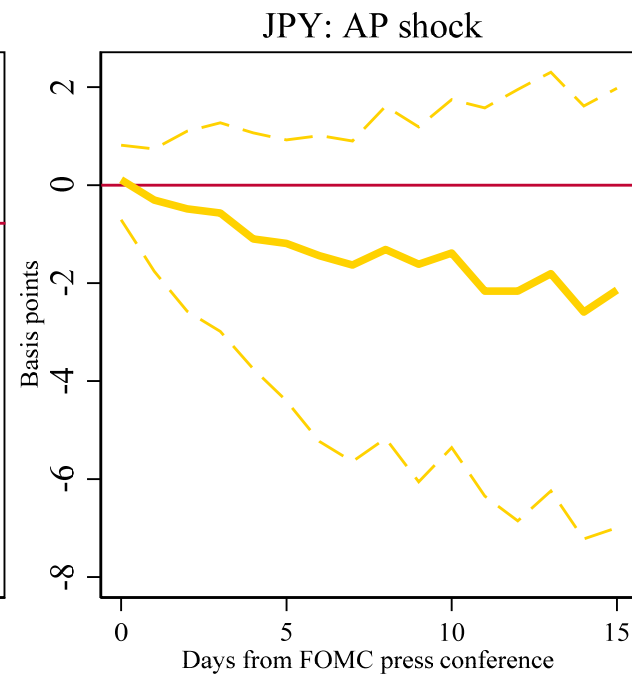
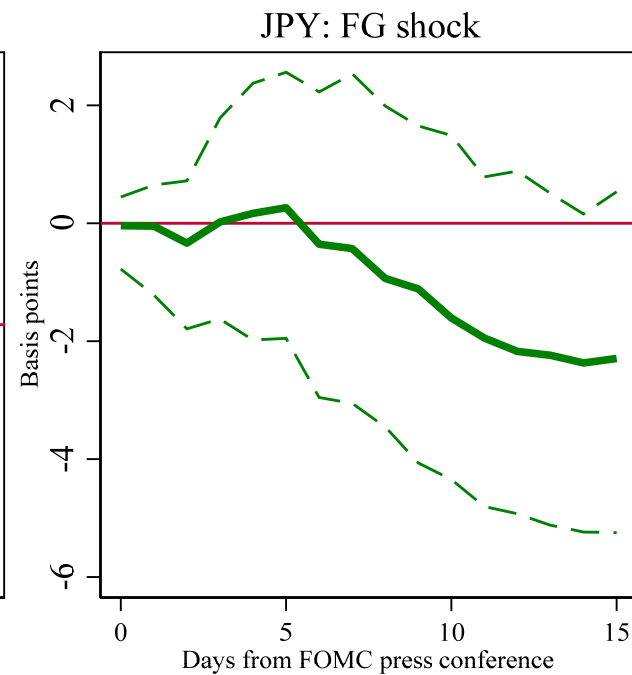
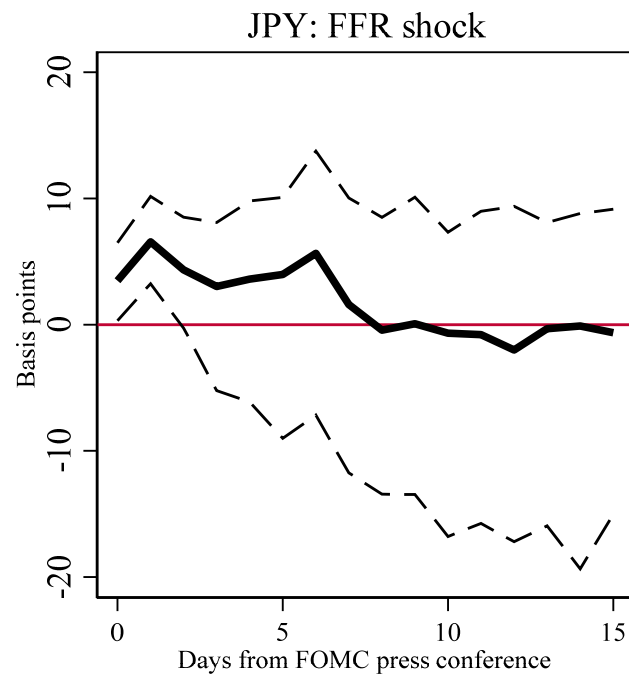


the Euro to one  
U.S. Dollar  
(euro/dollar)  
exchange rate





the Japanese Yen  
to one U.S. Dollar  
(yen/dollar)  
exchange rate





# CONCLUDING REMARKS

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- Ronald Reagan (1980): “How can a president not be an actor?”  
“How can a Fed chair not be an actor?”



# DO INVESTORS PAY ATTENTION?

Jim Barnes:

After the meeting, after we've read through the, the FOMC statement chairman Powell gets up there and he, he answers a number of questions from the press. **The tone of his voice was very consistent** as we've heard them in the past quarters. And in the past who FOMC statements, he wanted to somewhat downplay again in his dovish position, just what we've seen on the economic front. Like some of the economic data has been coming in better than expected. The labor markets are better right now than where they were obviously, you know, four or five months ago, but he wanted to taper that with there's still a lot more work to be done in order to get the economy back to where the federal reserve wants it to be. And we always think back to that three-and-a-half percent unemployment rate that existed towards the end of last year, right before the COVID-19 hit back in March, but we're still a far ways away.

The big question will be around the quantitative easing scheme: **Will the program end in June** What will Ben Bernanke answer? 3 scenarios:

1. **A definite Yes**,:the dollar will rise as speculations will end. The **hawks will celebrate a victory** and the road to future rate hikes will finally be opened, although not so soon. Probability: low. The doves seem in control.
2. **No – a hint of extension**: There's a higher chance of him saying something like "probably not" and that extending the program is possible. This means that he opens the door for QE3. Such an over-dovish policy will result in another plunge in the dollar, as QE3 seemed to be off the table. Probability: Medium. QE3 might eventually happen, but big hints are unlikely to be provided now.
3. **Confused answer**: Bernanke will try to avoid a direct answer by saying that policy will be carefully measured according to the new data **with a trembling voice** (as seen a few months ago in 60 minutes) and will be asked about it again and again by reporters. This scenario is also bearish for the dollar. Without a straight answer, the market will assume that there's a chance of QE3, and this will weaken the dollar. Perhaps not as strong as the previous scenario, but the dollar will still be hit. Probability: high. Confusing language is common at the Federal Reserve.

