Central Banking with Many Voices: The Communications Arms Race

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Information Transmission from the Federal Reserve to the Stock Market: Evidence from Governors' Calendars

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Monetary policy by committee: Makes communication harder

Around the world most central banks set policy by committee:

- Groups thought to reach better decisions than individuals
- Representation of different geographical areas and economic constituencies
- Median number of board members on monetary policy boards: 8 (BIS (2009)).
- Fed: 19 members of FOMC (of which 12 vote at any given time)

Tension between decision making by committee and effective monetary policy communication:

- Most Fed policy makers give frequent public appearances or comments – this is the Fed "cacophony".
- Faust (2016): Cacophony can be viewed as a tug-of-war over public sector expectations.

This paper: Cacophony is even worse than commonly appreciated

Tug-of-war over public sector expectations results not only in a public cacophony of Fed voices, but also in a **"quiet cacophony"** of Fed policy makers seeking to drive market expectations via informal channels such as the media and market newsletters.

1. **Review recent work in asset pricing:**

   Large asset price movements at times of Federal Reserve debate and decision making that are not associated with public Fed communication.

   - Lucca and Moench (2015):
     The pre-FOMC drift
   - Cieslak, Morse and Vissing-Jorgensen (2019):
     Stock returns over the FOMC cycle
   - Morse and Vissing-Jorgensen (2020):
     Information Transmission from the Federal Reserve to the Stock Market:
     Evidence from Governors' Calendars

This paper: Cacophony is even worse than commonly appreciated

2. **A history of leak discussions in FOMC documents, 1948-2013:**
   - **FOMC itself expresses frequent concerns about leaks**
   - **Lessons about what motivates leaks:**
     - Often motivated by **disagreement**
     - Used for **tactical advantage**: Disclosure about policy to some extent ties the hands of the committee, i.e. **reduces flexibility** by changing public expectations
   - **Lessons about what the costs of leaks are:**
     - Lost flexibility
     - Damage to the Fed's reputation
     - Damage to the Fed's decision making process

This paper: Cacophony is even worse than commonly appreciated

3. **Game-theoretical model to understand the communications arms race:**

   - Two policy makers **decide what to communicate about policy preferences** to the public at an intermediate date between policy meetings.
     - **Disagree** about the optimal policy rate.
     - **Disclosure reduces flexibility**
     - **Spin is possible** with selective disclosure of confidential information.

   - If disagreement is sufficiently strong and sufficent spin is possible **the unique Nash equilibrium** is that each policy maker communicates informally
     - All internal information comes out.
     - Both are **worse off than if they could commit to not using informal communication**. Analogue to **prisoners' dilemma**.

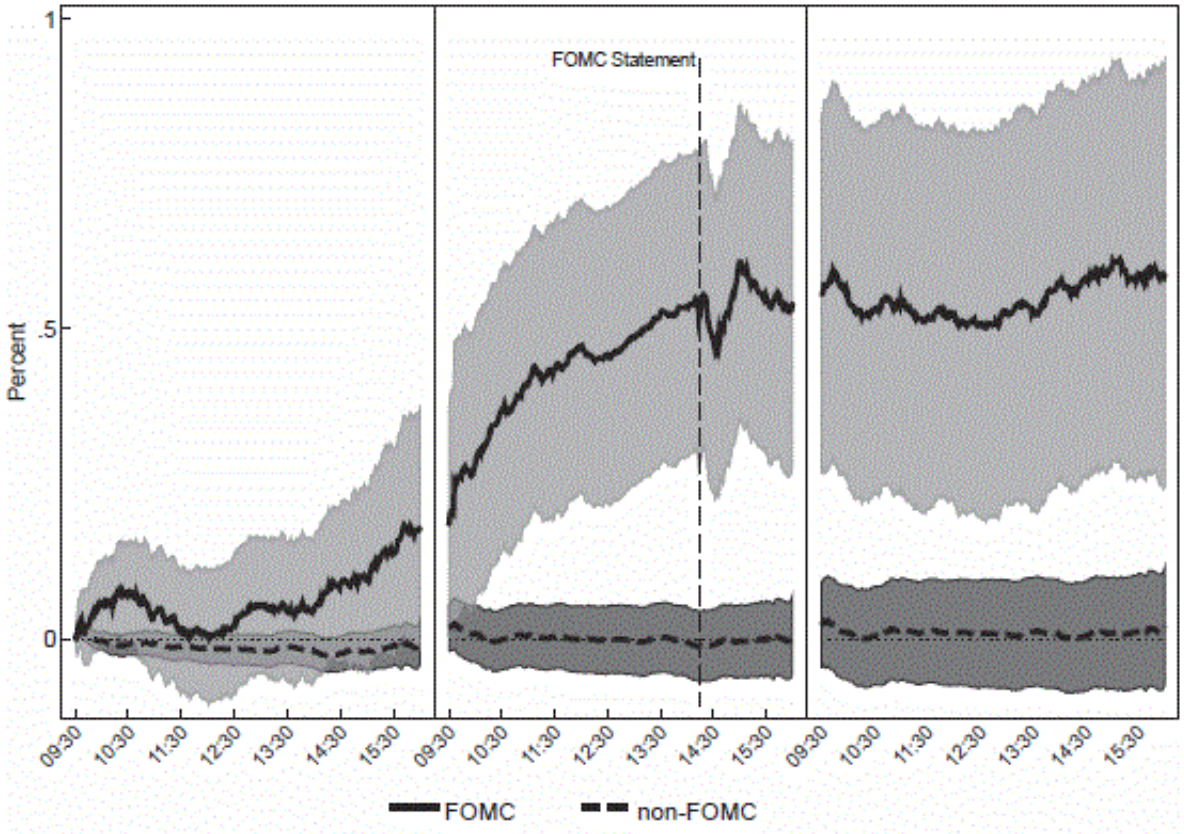
   - Discuss **what can be done** to improve the situation.

BUSINESS NEWS FEBRUARY 9, 2020 / 11:03 PM / 14 DAYS AGO

No phones, no leaks: How Lagarde is making her mark on ECB

PART 1. REVIEW OF ASSET PRICING EVIDENCE

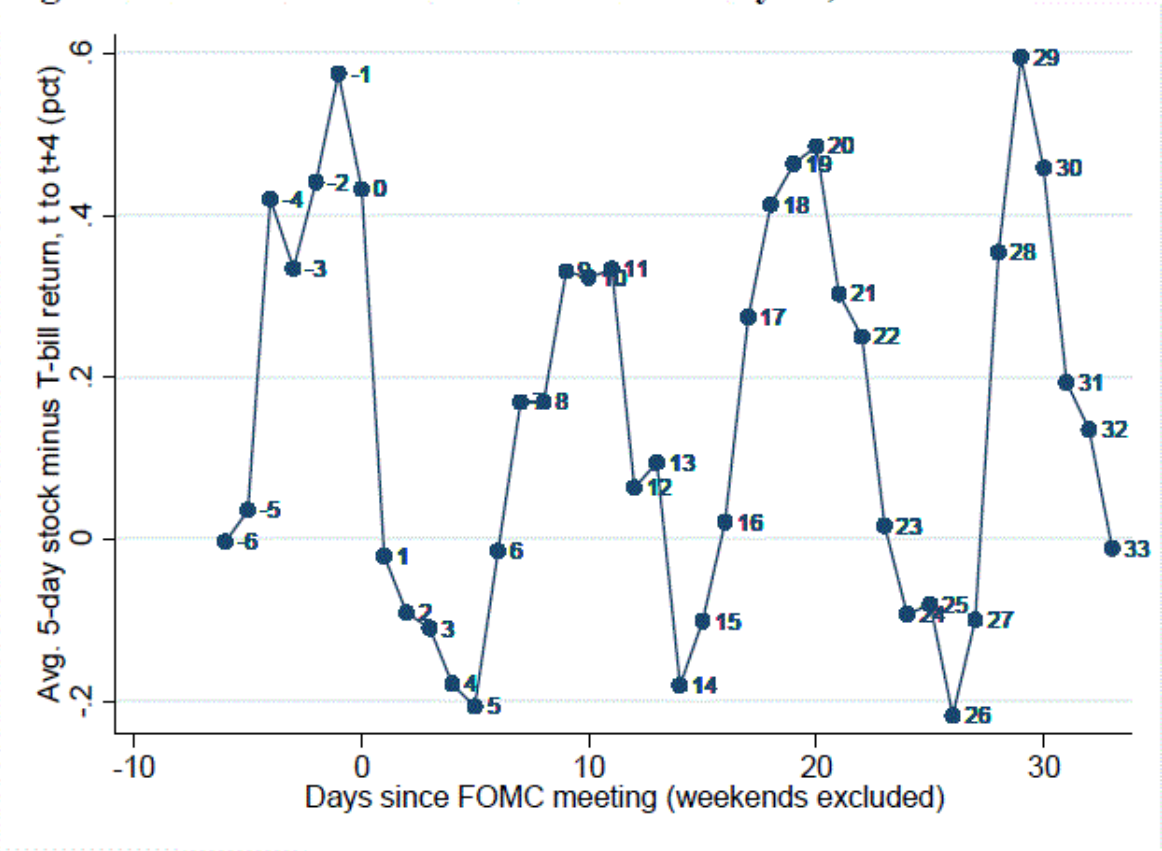
Lucca and Moench (2015): The pre-FOMC drift



- Avg return on S&P500 about 50 bps in 24 hours before scheduled FOMC announcements (1994–2011). They argue this is puzzling:
  - No news appears to arrive during this period.
  - Leaks are "unrealistic from an institutional viewpoint" and monetary policy news coming out would have to be systematically positive.

Cieslak, Morse and Vissing-Jorgensen (2019): FOMC cycle

Figure 1. Stock returns over the FOMC cycle, 1994-2016



Note. Based on 184 FOMC cycles (8 scheduled FOMC meetings per year). The numbers along the line indicate the value on the horizontal axis. If a given day is day -6 or closer to the next meeting, the 5-day (forward) return for this day is not used in the right part of the graph, so points to the right do not use any data for days -2 and later.

Cieslak, Morse and Vissing-Jorgensen (2019): FOMC cycle

They argue that high even-week returns are in fact driven by monetary policy news which over post-1994 period has been **positive for the stock market on average** and has **reached markets via informal communications channels**:

1. **Inter-meeting changes to the Fed funds target** (rare post-1994 but common before that) tend to take place in even weeks in FOMC cycle time
2. **Fed funds futures rates** on average declined in even weeks
3. Even-week stock returns are higher following **board meetings of the Board of Governors** (with even-week meetings more important likely due to Board having a full fresh set of policy recommendations from Reserve Banks)
4. **"Fed put"** pattern: About half of even-week returns arise due to even-week mean-reversion in stock market following market declines
5. High even-week returns are **robust to controlling** for macroeconomic news releases, corporate earnings announcements and reserve maintenance periods.
6. No evidence that Fed **information releases or speeches** by Fed officials line up systematically with even weeks. Provide some examples of leaks.

Morse and Vissing-Jorgensen (2020): Governors' calendars

FOIA requests for calendars of Fed governors (incl. chair, vice chair)

- February 2007 to November 2018
- Bernanke, Brainard, Fischer, Powell, Tarullo, Yellen: **28,771 calendar items**

Use calendars to study:

1. **Communication:** Which interactions are central for information production and dissemination?
2. **Asset pricing:** Even-week effect can't be risk premia if earned following non-publicly known interactions.

Of particular interest: **Interactions between governors and presidents**

- We know returns are high during FOMC meetings
- Are governor-pres. interactions important for even-week returns in general?

Example from Bernanke's calendar:

Friday, April 22, 2011

10:00 AM - 12:00 PM	Meeting w/staff *Location :* Anteroom
12:30 PM - 01:30 PM	Lunch: Sheila Bair, FDIC *Location :* Dining Room A
02:30 PM - 02:45 PM	Call from FRBank president *Location :* Chairman's Office

Monday, April 25, 2011

10:00 AM - 12:30 PM	Pre-FOMC Board Meeting *Location :* Board Room
02:30 PM - 03:30 PM	Meeting w/staff *Location :* Anteroom

Tuesday, April 26, 2011

08:00 AM - 08:05 AM	Telephone call from Mr. Alan Mullally (CEO Ford Motor Company) *Location :* Chairman's office
09:00 AM - 09:30 AM	Meeting w/FRBank president *Location :* Chairman's Office
10:30 AM - 05:45 PM	FOMC Meeting/Luncheon *Location :* Board Room
06:00 PM - 08:30 PM	FOMC Farewell Reception/Dinner for Gov. Warsh [immediately after FOMC meeting] *Location :* Reception: Cafeteria -- Dinner: Dining Rooms (D,E&F)

Available calendars (number of items) (chairs in red)

Year	Bernanke	Brainard	Fischer	Powell	Tarullo	Yellen	Total
2007	954	0	0	0	0	0	954
2008	1,203	0	0	0	0	0	1,203
2009	1,098	0	0	0	1,078	0	2,176
2010	518	0	0	0	937	0	1,455
2011	857	0	0	0	768	929	2,554
2012	640	0	0	0	864	801	2,305
2013	651	0	0	0	901	785	2,337
2014	0	571	0	587	997	1,043	3,198
2015	0	968	0	1,138	976	963	4,045
2016	0	552	704	983	964	939	4,142
2017	0	743	0	1,336	234	899	3,212
2018	0	0	0	1,103	0	87	1,190
Total	5,921	2,834	704	5,147	7,719	6,446	28,771

Classify calendar items by counterparty

- Descriptive statistics
- Which items do governors view as important?
- Which items line up with stock market gains?
  (in even weeks but not odd, or occurring more in even weeks)

Calendar items by counterparty

	Interaction with:	# obs	% of obs
Internal	FOMC	706	2.45
Internal	Federal Reserve Banks, Presidents	1,484	5.16
Internal	Federal Reserve Banks, directors	293	1.02
Internal	Federal Reserve Banks, staff	273	0.95
Internal	Federal Reserve Banks, meetings	132	0.46
Internal	Board of Governors, board meeting	961	3.34
Internal	Board of Governors, committee meeting	384	1.33
Internal	Board of Governors, meeting with member	1,304	4.53
Internal	Board of Governors, other	248	0.89
Internal	Staff at Board of Governors	10,696	37.18
Internal	Top staff at Board of Governors	197	0.68
Internal	System-wide committee	28	0.10
External/Internal	Fed conferences (Board/FR Bank)	216	0.75

	Interaction with:	# obs	% of obs
External	Media	789	2.74
External	Congress	1,082	3.76
External	White House and administration	249	0.87
External	National Economic Council	141	0.49
External	Council of Economic Advisers	275	0.96
External	Treasury	897	3.12
External	Treasury Borrowing Advisory Committee	82	0.29
External	Federal Reserve advisory councils	381	1.32
External	Agencies and regulators	1,403	4.88
External	Financial institutions	1,077	3.74
External	Financial interest groups	459	1.60
External	Fintech firms	37	0.13
External	Non-financial corporations	89	0.31
External	Non-financial interest groups	418	1.45

	Interaction with:	# obs	% of obs
External	BIS	218	0.76
External	Foreign central banks	715	2.49
External	Foreign governments	267	0.93
External	G3/G4/G7/G10/G20/G30	272	0.95
External	IMF	238	0.83
External	Other intl. regulators and organizations	193	0.67
External	Think tanks and conf. organizers	212	0.74
External	Academic conferences	51	0.18
External	Academics	378	1.31
External	Fed watchers	137	0.48
External	Former Fed governors/staff	80	0.28
External	Consultants, lawyers	51	0.18
External	Students	117	0.41
Secret	Redacted	498	1.73
Various	Travel	642	2.23
Various	Personal	52	0.18
Various	Photo	36	0.13
Various	Public service	32	0.11
Various	No appointments	195	0.68
Various	Other (incl. hard to categorize)	86	0.30
		28,771	100.00

Start at the daily frequency (4pm to 4 pm, following market hours):

- **D(FOMC item)=1** for days with one/more governor calendar items reflecting calls/meetings of FOMC
  - 706 calendar items
  - 678 on day 0 (318) or -1 (360) in FOMC cycle

- **D(FR Bank President item)=1** for days with one or more governor calendar items reflecting calls/meetings with a Federal Reserve Bank president
  - 1,484 calendar items
  - At least 1,285 are one-on-one call/meeting between a governor and a FRB president
  - Spread out over FOMC cycle
    24 on day 0, 141 on day -1

- **Same for other 45 categories**

Which items do governors find important?

- **What is on the calendar today when governors are busy assessing the outlook and any needed policy changes?**
    - Proxy such times as times of high VIX

- Approach works for identifying **important** categories of calendar items if scheduling is somewhat **flexible** (items can be added/cancelled on short notice)
    - Doesn't pick up inflexible items such as scheduled FOMC meetings or conferences.

- **Probit model:**

$$D(Calendar\ item\ of\ type\ i)_t = \alpha + \beta VIX_{t-1} + \varepsilon_t$$

Include year dummies to account for different number of calendars per year

Daily data: Probit model predicting item dummy with lagged VIX

Dependent variable: Dummy for calendar item category below	Marginal effect, VIX(t-1)	t-stat	Obs	Pseudo R^2	Mean of dept. variable
	(1)	(2)	(3)	(4)	(5)
Redacted	0.0026	4.85	2,324	0.382	0.097
Federal Reserve Banks, Presidents	0.0054	4.45	3,086	0.084	0.259
FOMC	0.0012	2.12	3,086	0.006	0.062
Other intl. regulators and org.'s	0.0015	2.11	3,086	0.064	0.051
…..					
No appointments	-0.0029	-2.67	2,824	0.134	0.056

Daily data: Calendar items associated with higher even-week returns than other even-week days

Regression:

$$r_t^{stock} - r_t^{bill} = \alpha + \beta_1 D(Even\ week)_t + \beta_{2,i} D(Calendar\ item\ of\ type\ i)_t D(Even\ week)_t + \beta_{3,i} D(Calendar\ item\ of\ type\ i)_t D(Odd\ week)_t + \varepsilon_t$$

Std. errors robust to heteroscedasticity.

Daily data: Calendar items associated w/higher even-week returns

	(1)	(2)	(3)	(4)	(5)	(6)
D(Even)	0.11**	0.084*	0.069	0.11**		
	[2.54]	[1.84]	[1.33]	[2.32]		
D(Even)*D(FOMC item)		0.22*			0.22*	0.26*
		[1.88]			[1.84]	[1.90]
D(Even)*D(FR Bank President item)			0.15*		0.15**	0.25**
			[1.93]		[2.01]	[2.10]
D(Even)*D(Fed Conference item)				0.26*	0.32**	0.31
				[1.85]	[2.34]	[1.19]
D(Even)*D(None of the above items)					0.036	0.010
					[0.71]	[0.10]
D(Odd)*D(FOMC item)		-0.35				
		[-0.69]				
D(Odd)*D(FR Bank President item)			-0.028			
			[-0.45]			
D(Odd)*D(Fed Conference item)				0.12		
				[1.11]		
Constant	-0.018	-0.016	-0.010	-0.023	-0.013	-0.011
	[-0.63]	[-0.56]	[-0.30]	[-0.79]	[-0.43]	[-0.14]
N (days)	3087	3087	3087	3087	3087	803

- Larger effects of governor-president interactions following BOG board meetings
- Results are robust to controlling for D(Even)*D(Gov. or Pres. speech)

How much of the even-week effect is accounted for by each category?

	Number of even-week obs=1	Total effect (sum)
D(Even)	1453	164%
D(Even)*D(FOMC item)	180	39%
D(Even)*D(FR Bank President item)	347	54%
D(Even)*D(Fed Conference item)	67	22%
D(Even)*D(None of the above 3 items)	964	34%

Note: The calendar item dummies are not mutually exclusive so rows 2 to 5 do not sum to row 1.

Items associated with significantly *lower* even-week returns:

- Top staff at Board of Governors

  Federal Reserve advisory councils
- G3/G4/G7/G10/G20/G30

  IMF

  BIS
- No appointments

  Personal

Almost nothing is associated with significantly *higher* or significantly *lower* odd-week returns:

- A few tiny categories with <20 obs in odd weeks
  (systemwide committee (lower), public service (higher))

Hourly data: Ruling our endogenous meeting scheduling

- Day is going well, peaceful time to make some calls?
- **Causality:** Requires positive returns after calendar item start time.
  - OK if returns are also positive before: We are missing calendars.

Arguments against endogenous scheduling after good returns:

- We saw that *high* VIX yesterday (correlated w/*low* returns) led to more FR Bank Pres items and more FOMC items today
- Not relevant for FOMC items on day 0, -1: Planned long in advance
- If true, then we would see D(Odd)(t)*D(Item i)(t) enter significantly positively too, but we don't
- But, to be sure, **use hourly data** (S&P500 futures, 24 hours/day).

Regression:

$$r_{t,h}^{stock} - r_{t,h}^{bill} = \alpha + \beta_1 D(Even\ week)_{t,h}$$
$$+\beta_{2,i} D(Post\ calendar\ item\ of\ type\ i)_{t,h} D(Even\ week)_{t,h}$$
$$+\beta_{3,i} D(Pre\ calendar\ item\ of\ type\ i)_{t,h} D(Even\ week)_{t,h}$$
$$+\beta_{4,i} D(Post\ Calendar\ item\ of\ type\ i)_{t,h} D(Odd\ week)_{t,h}$$
$$+\beta_{5,i} D(Pre\ calendar\ item\ of\ type\ i)_{t,h} D(Odd\ week)_{t,h} + \varepsilon_{t,h}$$

$D(Post\ calendar\ item\ of\ type\ i)_{t,h} = 1$:

- There is one or more calendar items of type i on day t
- Hour h is after (or equal to) the hour of the first such calendar item

$D(Pre\ calendar\ item\ of\ type\ i)_{t,h} = 1$:

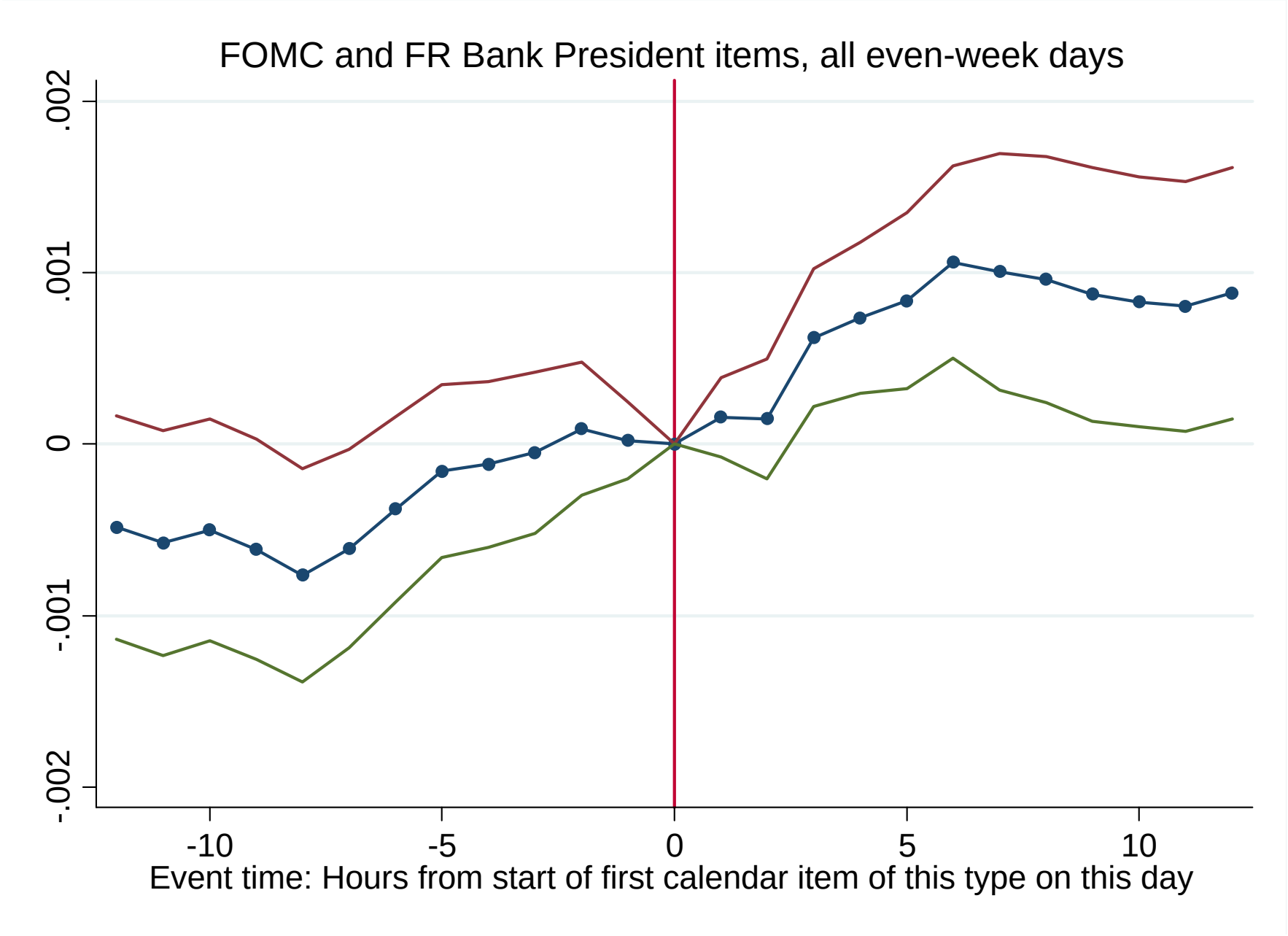
- There is one or more calendar items of type i on day t
- Hour h is before the start of the first such calendar item

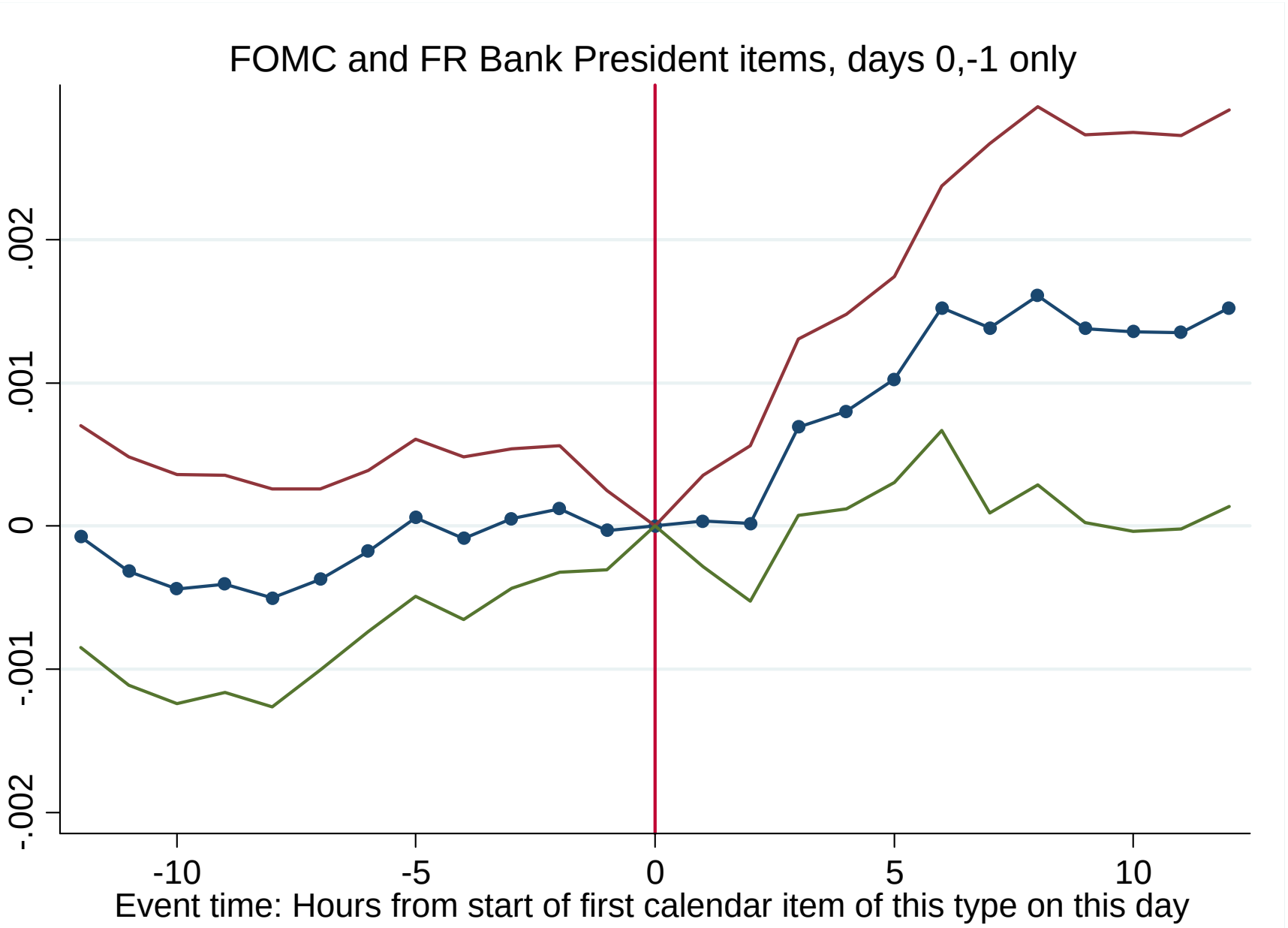
Time stamp missing for 38% of Fed Conf items, so skip conf's from hourly analysis.

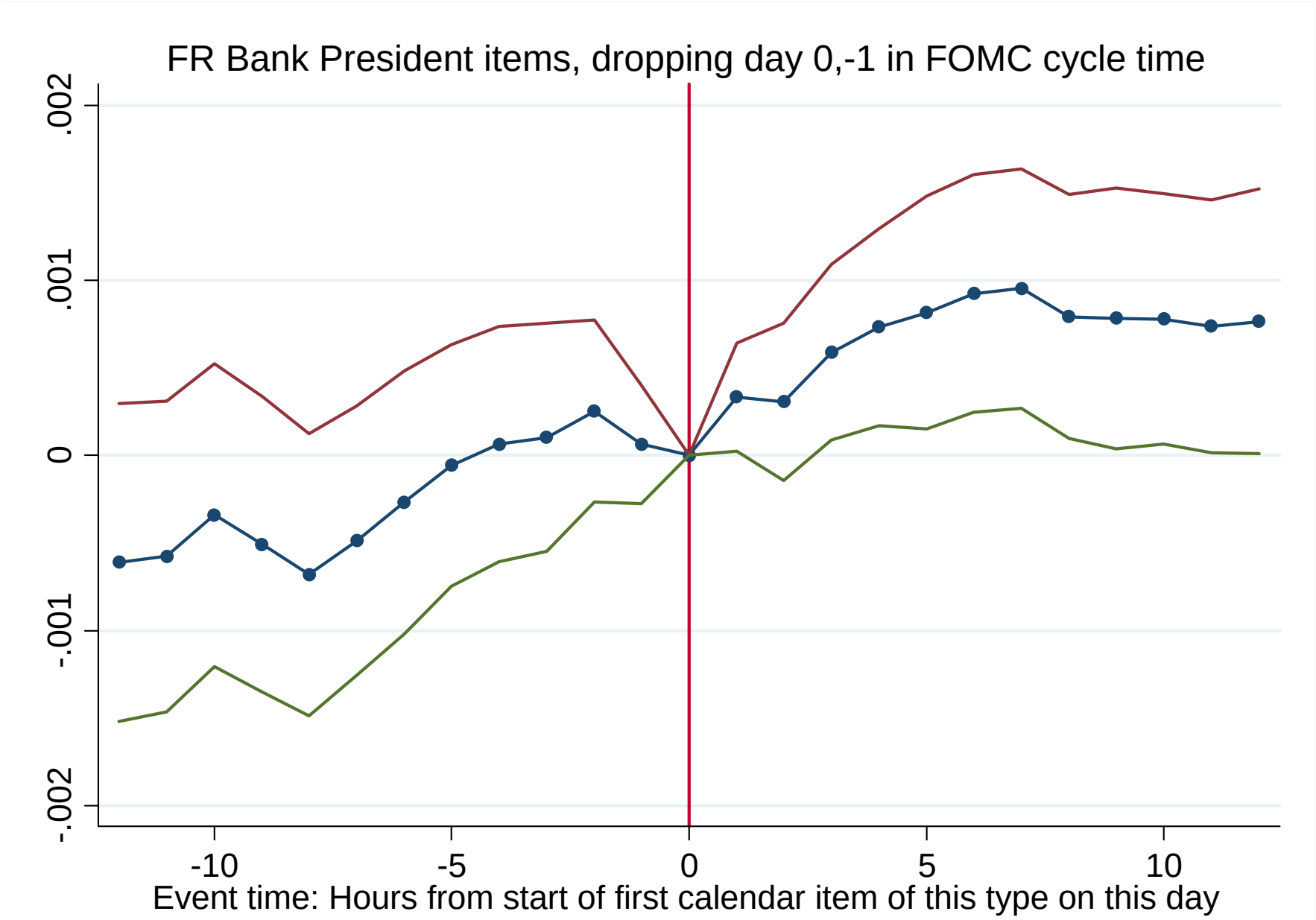
Hourly data: Returns pre vs. post FOMC and FR Bank President items

	(1)	(2)	(3)	(4)
	All days			Drop day 0,-1
D(Even)	0.0050***	0.0036*	0.0028	0.0018
	[2.69]	[1.94]	[1.29]	[0.82]
D(Even)*D(Post FOMC item)		0.014*		
		[1.79]		
D(Even)*D(Pre FOMC item)		0.0067		
		[1.15]		
D(Even)*D(Post FR Bank Pres)			0.012**	0.011*
			[2.08]	[1.76]
D(Even)*D(Pre FR Bank)			0.0032	0.0050
			[0.92]	[1.33]
D(Odd)*D(Post FOMC item)		-0.04		
		[-0.27]		
D(Odd)*D(Pre FOMC item)		-0.0057		
		[-0.90]		
D(Odd)*D(Post FR Bank Pres)			-0.0021	-0.0021
			[-0.45]	[-0.45]
D(Odd)*D(Pre FR Bank)			-0.0022	-0.0022
			[-0.79]	[-0.79]
Constant	-0.0011	-0.00096	-0.00052	-0.00052
	[-0.90]	[-0.76]	[-0.34]	[-0.34]
N (hours)	74037	74037	74037	69525

Event study:


FOMC and FR Bank President items, all even-week days
.002
.001
0
-.001
-.002
-10
-5
0
5
10
Event time: Hours from start of first calendar item of this type on this day


FOMC and FR Bank President items, days 0,-1 only
.002
.001
0
-.001
-.002
-10
-5
0
5
10
Event time: Hours from start of first calendar item of this type on this day


FR Bank President items, dropping day 0,-1 in FOMC cycle time
.002
.001
0
-.001
-.002
-10
-5
0
5
10
Event time: Hours from start of first calendar item of this type on this day

Lessons from the calendar analysis:

1. **Communication:**

   Of all the calendar items, governor-president interactions most strongly predict informal communications with markets

   - FOMC interactions
   - Governor-president calls/meetings

2. **Asset pricing:**

   - Results further ties the FOMC cycle in stock returns to events inside the Fed
   - Times of governor-president interactions (outside FOMC meetings) are not publicly known ahead of time

     → FOMC cycle in stock returns is not a risk premium, but instead reflects unexpectedly positive policy news

PART 2. A HISTORY OF LEAK DISCUSSIONS IN FOMC DOCUMENTS

Leak discussions in FOMC documents, 1948-2013

I searched the Board of Governors website in "FOMC information" category:

- Words: "leak", "Washington Post", "Wall Street Journal", "New York Times".

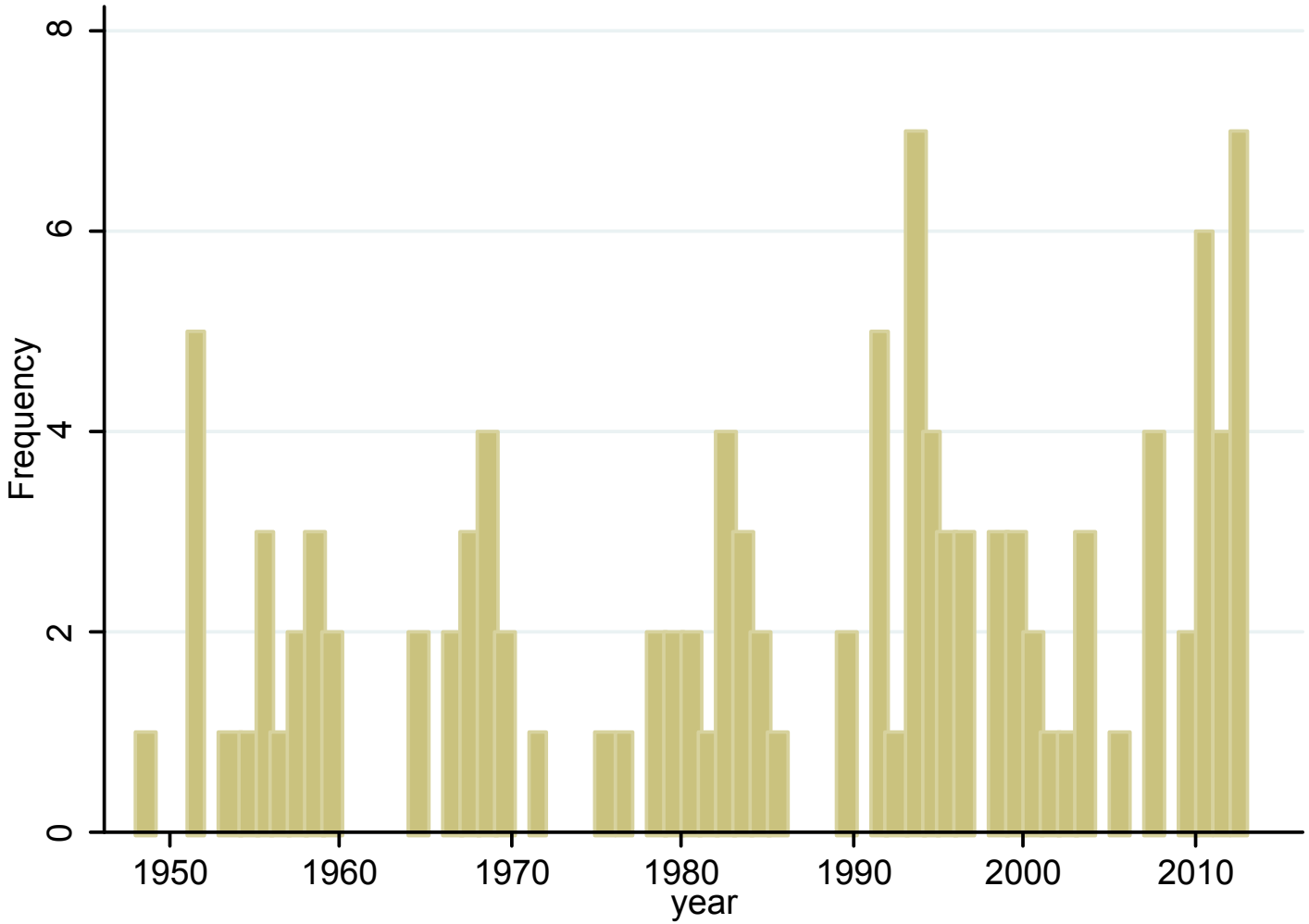
Leak discussions are quite frequent: 114 FOMC documents

- Typically, each FOMC document corresponds to one FOMC meeting or conference call (exceptions include leak mentions in the greenbook or in memos).
- 64 documents: Recent leak(s) or possible leak(s)
- 44 documents: Risk of leaks (including 8 warnings not to leak)
- 4 are about congressional hearings into leaks. A few are jokes/comments.

A repeated theme: The difficulty of detecting leakers.

- Richmond Fed President Lacker resigned in **2017** following admission of his involvement in leak to Medley Global Advisers in **2012**.

Figure 1. Number of FOMC documents with leak mentions, 1948-2013



The figure graphs the number of FOMC documents per year with leak discussions. The average number is 1.7 documents per year.

Table 2. FOMC documents with leak mentions

Date	Category	Topic
12/17-12/18/2013	Risk of leaks	FOMC information security at the Reserve Banks.
3/19-3/20/2013	Recent leaks	Lack of results from investigation of prior leaks. Governor Tarullo concerned about risk of divided loyalty of board staff serving multiple governors.
1/29-1/30, 2013	Recent leaks	Leaks to New York Times and Medley Global Advisors
12/11-12/12, 2012	Recent leaks	Investigation into leaks to New York Times and Medley Global Advisors
10/23-10/24/2012	Recent leaks	Investigation into leaks to New York Times and Medley Global Advisors. Separately, concern about leaks if SEP forecasts by name are circulated internally within the Fed.
7/31-8/1, 2012	Risk of leaks	Risk of leaks if Summary of Economic Projections includes names
6/20/2012	Possible leak	Possible leaks about plans for the maturity extension program (MEP)
12/13/2011	Recent leaks	Leaks of the FOMC agenda ahead of the meeting
11/28/2011	Recent leak	WSJ article on leak to newsletter writer
9/20-9/21, 2011	Risk of leaks	Fisher pushing back against more information sharing with reserve banks due to risk of leaks
1/25-1/26, 2011	Recent leaks	Long discussion to formulate policy to prevent leaks from FOMC participants
11/3/2010	Recent leaks	Recent leaks to the press
10/15/2010	Recent leaks	Chairman disappointed with recent leaks of FOMC information
9/21/2010	Recent leaks	Leaks from August 10, 2010 FOMC meeting
8/24/2010	Recent leaks	Recent leaks of FOMC information to the press
5/9/2010	Risk of leaks	Risk of leaks via Congress
1/26-1/27, 2010	Risk of leaks	Leaking to Larry Meyer of Macroeconomic Advisers
4/28-4/29, 2009	Recent leak	Leaked stress-test results
2/7/2009	Warning not to leak	Chairman reminder to avoid leaks
10/31/2007	Possible leak	WSJ obtaining confidential information

Leak discussions in FOMC documents, 1948-2013

Steps taken to reduce leaks: Further evidence that the Fed is concerned with leaks.

1. **The FOMC statement:** Emerged after pressure from Congress in the early 1990s following a series of leaks.

2. **Press conferences:** Leaks may have contributed to introduction and timing.

   - First press conference was in April 2011, just two meetings after the most extensive discussion of leaks in FOMC transcripts.

   - This discussion led to the FOMC's first "Policy on External Communications of Committee Participants". The first principle states:

     "Committee participants will endeavor to enhance the public's understanding of monetary policy. They are free to explain their individual views but are expected to do so in a spirit of collegiality and to **refrain from characterizing the views of other individuals on the Committee**. *In explaining the rationale for announced Committee decisions,* **participants will draw on Committee communications and the Chairman's press conference remarks** *as appropriate."*

Leak discussions in FOMC documents, 1948-2013

- Initially: Statement out at **12:30 p.m.** Press conference at **2:15 p.m.**
  Since March 2013: Statement out **2 p.m.** Press conference at **2:30 p.m.**

  Bloomberg:

  "Ben S. Bernanke is **tightening his control of Federal Reserve communications** *to ensure investors hear his pro-stimulus message over the* **cacophony of more hawkish views from regional bank presidents**. *The Fed chairman, starting tomorrow, will cut the time between the release of post-meeting statements by the Federal Open Market Committee and his news briefings,* **giving investors less opportunity to misperceive the Fed's intent**."

Leak discussions in FOMC documents, 1948-2013

3. **Withholding information from other policy makers:**

   The **board withholds the identity of which Reserve Bank made a given discount rate request** from the other Reserve Banks (until minutes are made public).

   - May help explain why Morse and Vissing-Jorgensen (2020) find important role for calls/meetings between governors and presidents.

4. **Limit attendance:**

   After years of leaks, in July 1983 **Chairman Volcker limited policy making discussion at FOMC meetings to committee members**.

   - Perhaps recognizing that reduced attendance would not solve the problem if leaks were from committee members, he noted in the June 1982 meeting:

     CHAIRMAN VOLCKER. "There's only one recourse, which is obvious, if we have some sense of lack of confidentiality. There are a lot of people in this room and we could make it quite a few fewer; **we can't make it less than the Committee members**."

Lessons about what motivates leaks: Tactical advantage from changing public expectations

Political science classification of leaks (Pozen (2013)):

- **Policy leak:** Intended to help, hurt, or alter a plan or policy. Subtypes:

  Internecine leak, "through which competing agencies or factions within the executive branch strive to strengthen their relative positions"

  Counter-leak (or record-correction leak), "intended to neutralize or dispute prior disclosures";

- **Trial-balloon leak:** Used to test the response of key constituencies, members of Congress, or the general public;
- **Whistleblower leak:** Meant to reveal a perceived abuse;
- **Ego leak:** Used to satisfy the leaker's sense of self-importance;
- **Goodwill leak:** Meant to curry favor with a reporter;
- **Animus leak:** Meant to settle grudges or embarrass others;
- **Inadvertent or lazy leak:** Leak by accident or ignorance.

Lessons about what motivates leaks: Tactical advantage from changing public expectations

Linsky survey implies a central role for internecine leaks and counter-leaks in US government policy making:

- 42% answered yes to the question "Did you ever feel it appropriate to leak information to the press?"
- Most commonly cited reasons for leaking:
  "to counter false or misleading information": 78%
  "to gain attention for an issue or policy option": 73%
  "to consolidate support from the public or a constituency outside govt.": 64%.

FOMC documents suggest that internecine leaks and counter-leaks are also important in the Fed context

Lessons about what motivates leaks: Tactical advantage from changing public expectations

Bernanke Aug 2010 memo to FOMC about recent stories in the press:

CHAIRMAN BERNANKE. "[...] it damages the reputation and credibility of the institution if the outside world perceives us as **using leaks and other back channels to signal to markets**, *to disseminate points of view, or to advance particular agendas"*

CHAIRMAN BERNANKE. "It is my hope that FOMC participants or observers are not **intentionally or tactically conveying confidential information** *to the public."*

CHAIRMAN BERNANKE. "It is particularly important **not to characterize the views of another participant** *at the meeting."*

Lessons about what motivates leaks: Tactical advantage from changing public expectations

Chairman Volcker more colorfully expresses the same sentiment of internecine leaks driven by policy disagreement in the November 1982 transcript:

> *CHAIRMAN VOLCKER. "I think there is a tendency on the part of any organization, for people to say* **"Damn it! If somebody else is leaking, I'm going to talk to a reporter, too, and get my story out."** *Unless this is stopped, it's just going to cut us up."*

Lessons about what motivates leaks: Tactical advantage from changing public expectations

Leaks affect policy by driving market expectations

- The Fed is reluctant to not deliver on expectations

Direct evidence that Federal Reserve policy makers care about market expectations:

- **Survey of Primary Dealers**, **Survey of Market Participants** surveys policy expectations prior to each FOMC meeting.
- Attesting to the impact of these market expectations on policy:

  A private company (Macropolicy Perspectives) in 2017 launched a **Shadow Survey of Market Participants** in order to "collect information about consensus expectations that the FOMC uses as an input into its policy decisions".

Lessons about what motivates leaks: Tactical advantage from changing public expectations

Examples from FOMC documents provide evidence of the importance of market expectations for policy via reduced flexibility.

June 2012 FOMC meeting:

> *MR. FISHER.* **"I'm just saying that if we can—in every way possible, however we do it—we should try to preserve the options to be debated at this table, and then not use the argument that markets expect us to do X or Y. What is leading the markets to expect that? I haven't seen this broad-based discussion that we are having in the speeches."**

December 2011 FOMC meeting:

> *CHAIRMAN BERNANKE. "I also wanted, though, to mention today some* **press reports** *on the timing of our communications initiatives. [...]* **it does complicate the work of the subcommittee and of this Committee if the expectations of the public are for delivery of certain outcomes at certain dates**."

Lessons about what motivates leaks: Tactical advantage from changing public expectations

1989 FOMC meeting:

> *CHAIRMAN GREENSPAN. "Secondly, let me just indicate to those to whom I haven't spoken that those* **articles in The Washington Post and The New York Times yesterday were not authorized releases.** *They were not done by myself nor anyone I'm aware of. I'm not sure at this stage particularly what damage was done, but* **it clearly has very severely restricted our options, or it could.** *I hope that during this period everyone will endeavor to stay away from the press."*
>
> *VICE CHAIRMAN CORRIGAN. "Mr. Chairman, if I could, I'd like to add a point on those unfortunate press articles.* **It is clear to me that they have already done some damage in terms of reducing [our] flexibility** *and undermining discipline in the marketplace. It is absolutely essential, regardless of what the motivation for those particular articles may have been, that there is only one person who speaks for the Federal Reserve in these circumstances and that is you."*

Lessons about what motivates leaks: Tactical advantage from changing public expectations

What reduces the flexibility of policy makers going forward, appears to be what has been disclosed (not market expectations in general).

- Why? Difficult to explain the state-contingent nature of optimal policy $\Longrightarrow$ **Fed looks less competent (flip-flopping) if it does not deliver a policy consistent with what it earlier had lead the market to believe**

Importantly, to the extent advocacy relies on the disclosure of internal confidential information it can't be done publicly.

Selective reporting of facts via leaks is a standard issue in political science.

- Pozen (2013): *"plants must be watered by leaks"*
- Abel (1987): *"In the jaundiced but not unfounded view of some veteran reporters, "[t]he guiding principle, then and now, is that* **when it suits an administration's purpose to leak secret information to the press, it simply ignores or temporarily overrides a document's classification**.""

Lessons about what the costs of leaks are

1. **Reduced policy flexibility**

2. **Damage to the central bank's reputation**

   CHAIRMAN GREENSPAN. "[...] Jerry Corrigan, as you may recall, said at the luncheon that we gave him on his farewell immediately following the last meeting of the FOMC that **the one thing that could do this institution in is the leak question and the whole issue of the credibility of our operations**. *And I must tell you that Jerry is almost surely right on this."* (July 1993 FOMC meeting)

Lessons about what the costs of leaks are

One specific channel for reputational damage: The (correct) perception that some in private sector/press have access to confidential information.

Long discussion at Jan 2011 FOMC meeting.

> *VICE CHAIR YELLEN. "[...] As you may recall, the Chairman gave our subcommittee a three-part charge.[...]; second, we were to develop policies to* **avoid the perception that individuals outside of the Federal Reserve System are able to gain inappropriate access to FOMC information that could be valuable in forecasting monetary policy**"

> *MR TARULLO. "[...] This is not limited to one person, and* **this is not just Macroeconomic Advisers**, *although they have been mentioned. [...] I think this problem is more serious than most of the people around the table think it is, and* **I have believed since I've been here that there was a real problem waiting to explode**."

Lessons about what the costs of leaks are

3. **Damage to decision making process: Quality of policy deliberations**

CHAIRMAN BERNANKE "And such **leaks threaten the free give and take of ideas** *and collegiality of the FOMC as we grapple with the difficult issues we face."* (Aug 2010 memo)

CHAIRMAN GREENSPAN. "We have had two extraordinary leaks, and perhaps more, in recent days [...]. **If [our discussions] start to be subject to selective leaks on content, I think we're all going to start to shut down.** *[...]* **If we cannot be free and forward with our colleagues, then I think the effectiveness of this organization begins to deteriorate** *to a point where we will not have the ability to do what is required of us to do."* (Dec 1989 FOMC meeting)

CHAIRMAN VOLCKER. "[...] We had a leak about the aggregates [...]. Wherever it came from, **there is nothing more corroding of the confidence with which we sit around the table or in a telephone conference and discuss [policy] than the fear that somehow there is going to be a leak of what is discussed.** " (Aug 1980 FOMC meeting)

PART 3. THE GAME THEORY OF THE QUIET CACOPHONY

The game theory of the quiet cacophony.
Policy preferences

Two policy makers D and H decide on interest rate at each policy meeting.

- They **disagree** on the appropriate policy rate, given economic conditions.
- Policy makers' views of the **appropriate interest rate** evolve as:

Date 0: Last policy meeting	Date 1: Intermediate date	Date 2: Current policy meeting
r_0^D	$r_1^D = r_0^D + e_1^D$	$r_2^D = r_0^D + e_2^D$
r_0^H	$r_1^H = r_0^H + e_1^H$	$r_2^H = r_0^H + e_2^H$

The e's are **shocks to policy preferences** and

$$\begin{aligned} e_2^D &= e_1^D + v_2^D \\ e_2^H &= e_1^H + v_2^H \end{aligned}$$

$$\begin{aligned} \text{cov}\left(e_1^D, v_2^D\right) &= \text{cov}\left(e_1^H, v_2^H\right) = 0 \\ \text{cov}\left(e_1^D, e_1^H\right) &= \text{cov}\left(e_2^D, e_2^H\right) = \text{cov}\left(e_1^D, e_2^H\right) = \text{cov}\left(e_2^D, e_1^H\right) = 0 \end{aligned}$$

The game theory of the quiet cacophony.
Policy preferences

The policy rate r is set at date 2 just after the realization of e_2^D and e_2^H.

- r_0^D and r_0^H are observable by policy makers and markets at date 0 after the last policy meeting.
- Policy makers observe e_1^D, e_1^H at time 1 and e_2^D, e_2^H at time 2 (via internal communication at the central bank).
- They have a **choice of whether to reveal information about e_1^D or e_1^H to markets at date 1**.

If information about e_1^D or e_1^H is disclosed:

- Policy makers incur a **loss if the chosen policy rate r differs from** the market's perception of average policy preferences as of date 1.

The game theory of the quiet cacophony.
Policy preferences

Loss functions as a function of the policy outcome, r:

$$
\begin{aligned}
L^D &= \alpha\left(r - r_2^D\right)^2 + I^{disc}\beta\left(r - E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)\right)\right)^2 \\
L^H &= \alpha\left(r - r_2^H\right)^2 + I^{disc}\beta\left(r - E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)\right)\right)^2
\end{aligned}
$$

- $\alpha > 0$, $\beta > 0$.
- $I^{disc} = 1$ if D or H has made a date 1 disclosure about average policy preferences
- $E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)\right)$: Market's expectation of average preferred policy rate given all disclosure.
- Both policy makers look equally bad if the Fed appears to be flip-flopping.

The game theory of the quiet cacophony.
Policy preferences

r at date 2 chosen to minimize total policy maker loss, given date 1 disclosure:

$$\begin{aligned} & \min_r \; L\left(r|r_2^D, r_2^H, I^{disc}, E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)\right)\right) \\ = \quad & L^D + L^H \\ = \quad & \alpha\left(r - r_2^D\right)^2 + \alpha\left(r - r_2^H\right)^2 + 2I^{disc}\beta\left(r - E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)\right)\right)^2 \end{aligned}$$

Disclosure reduces the flexibility of policy makers to react to news arriving between date 1 and 2.

The game theory of the quiet cacophony. Policy outcome given disclosure

Lemma 1 (Policy outcome at date 2 given disclosure).
The policy outcome without disclosure is

$$r = \frac{1}{2}\left(r_2^D + r_2^H\right)$$

and the policy outcome with disclosure is

$$r = \frac{\alpha}{\alpha+\beta}\frac{1}{2}\left(r_2^D + r_2^H\right) + \frac{\beta}{\alpha+\beta}E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)\right).$$

The game theory of the quiet cacophony. Advocacy (spin)

Conditional on knowing e_1^D and e_1^H:

$$E_1\left(\frac{1}{2}\left(r_2^D + r_2^H\right)|e_1^D, e_1^H\right) = \frac{1}{2}\left(r_0^D + r_0^H\right) + \frac{1}{2}\left(e_1^D + e_1^H\right)$$

Assumption (spin): Policy makers can selectively reveal information

- For a given value of $E_1\left(\frac{1}{2}\left(r_2^D + r_2^H\right)|e_1^D, e_1^H\right)$ a policy maker could, if he was the only one disclosing, **make the market expect any value for the average policy preference within S^* of the truth**:

$$\begin{aligned} & E_1\left(\frac{1}{2}\left(r_2^D + r_2^H\right)|e_1^D, e_1^H\right) - S^* \\ \leq \quad & E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)|\text{disclosure by one}\right) \\ \leq \quad & E_1\left(\frac{1}{2}\left(r_2^D + r_2^H\right)|e_1^D, e_1^H\right) + S^*. \end{aligned}$$

- If competing policy makers each advocate in opposite directions, then market expectations are the truth plus the sum of the spin:

$$E_1^{market}\left(\frac{1}{2}\left(r_2^D + r_2^H\right)|\text{disclosure by both}\right) = E_1\left(\frac{1}{2}\left(r_2^D + r_2^H\right)|e_1^D, e_1^H\right) + S^D + S^H.$$

The game theory of the quiet cacophony. Defining strategies and Nash equilibrium

A disclosure strategy (for a given policy maker):

- A decision of whether to disclose and, if yes, what value of spin to use.

A Nash equilibrium consists of:

1. A disclosure strategy for D that is optimal given the disclosure strategy of H and market expectations.
2. A disclosure strategy for H that is optimal given the disclosure strategy of D and market expectations.

If advocacy (spin) was not feasible, neither would have an incentive to disclose.

- The full value of $\frac{1}{2}\left(e_1^D + e_1^H\right)$ will (in expectation) be incorporated in policy even without disclosure so truthful disclosure would only serve to reduce policy flexibility.

The game theory of the quiet cacophony. Disclosure equilibrium

Theorem 1 (Prisoners' dilemma, for sufficient disagreement and feasible spin). Consider the situation where $E_1\left(r_2^H - r_2^D\right) > 0$, i.e., H is hawkish relative to D. Let E_1 denote expectations at time 1 conditional on e_1^D, e_1^H. If

$$\sqrt{2}\sigma_v < |\frac{1}{2}E_1\left(r_2^H - r_2^D\right)| \leq S^*$$

then:

(a) D **prefers disclosure to non-disclosure regardless of** H**'s choice** (disclosure is a strictly dominant strategy for D).

(b) H **prefers disclosure to non-disclosure regardless of** D**'s choice** (disclosure is a strictly dominant strategy for H).

(c) Given (a)-(b), **the unique Nash equilibrium outcome is that both disclose with** $S^D = -S^*$ **and** $S^H = S^*$. **Both policy makers are worse off in this equilibrium than if neither disclosed.**

The game theory of the quiet cacophony.
Spin reaction functions: Tug of war!

D's optimal spin (given disclosure) is **negative**

- If H does not disclose: $S^D = -\frac{1}{2}E_1\left(r_2^H - r_2^D\right)$
- If H discloses, D is trying to reach a total spin of

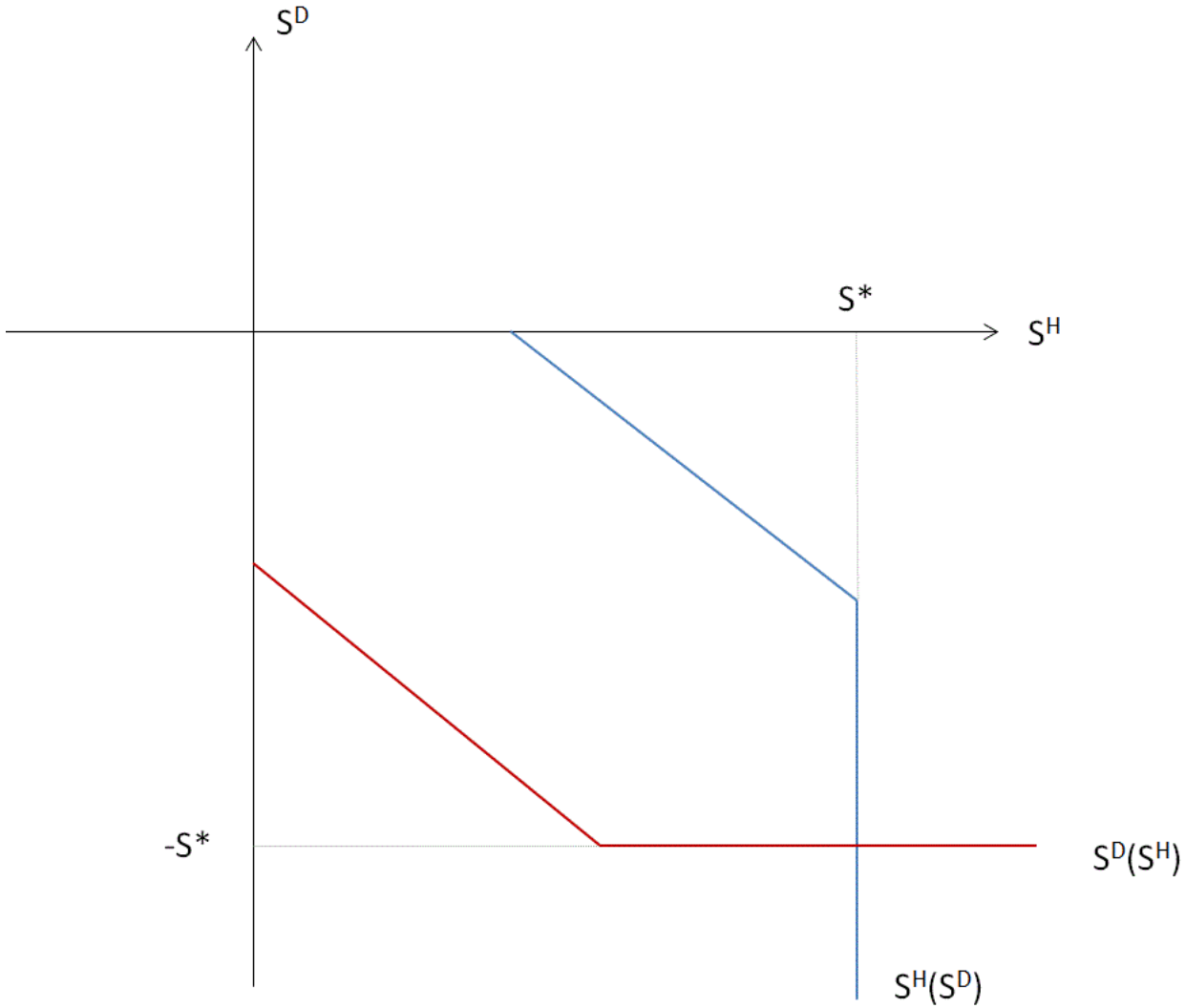
$$S^D + S^H = -\frac{1}{2}E_1\left(r_2^H - r_2^D\right) \Longrightarrow S^D = -\frac{1}{2}E_1\left(r_2^H - r_2^D\right) - S^H \quad \text{unless below } -S^*.$$

H's optimal spin (given disclosure) is **positive**

- If D does not disclose: $S^H = \frac{1}{2}E_1\left(r_2^H - r_2^D\right)$
- If D discloses, H is trying to reach a total spin of

$$S^D + S^H = \frac{1}{2}E_1\left(r_2^H - r_2^D\right) \Longrightarrow S^H = \frac{1}{2}E_1\left(r_2^H - r_2^D\right) - S^D \quad \text{unless above } S^*.$$

The game theory of the quiet cacophony. Disclosure equilibrium



- The two spin reaction functions intersect at $S^D = -S^*$, $S^H = S^*$. Each side discloses all the information that supports their case.

The game theory of the quiet cacophony. Disclosure equilibrium

Theorem 2 (If disagreement is low, or not much spin is feasible, then non-disclosure is possible).
Consider the situation where $E_1\left(r_2^H - r_2^D\right) > 0$, i.e., H is hawkish relative to D.
Condition 1: $\sqrt{2}\sigma_v \geq |\frac{1}{2}E_1\left(r_2^H - r_2^D\right)|$.
Condition 2: S^* is sufficiently small.

If either of the above two conditions hold, then:

(a) D's spin reaction function:
If H does not disclose, disclosure is not worthwhile for D.
If H discloses, and picks spin of S^H, D prefers a spin of
$S^D = \max\left(-\frac{1}{2}E_1\left(r_2^H - r_2^D\right) - S^H, -S^*\right)$.

(b) H's spin reaction function:
If D does not disclose, disclosure is not worthwhile for H.
If D discloses, and picks spin of S^D, H prefers a spin of
$S^H = \min\left(\frac{1}{2}E_1\left(r_2^H - r_2^D\right) - S^D, S^*\right)$.

(c) **Given (a) and (b) there are two Nash equilibria.**
In one neither discloses. In the other both disclose with $S^D = -S^*$ and $S^H = S^*$. Both D and H prefer the non-disclosure equilibrium.

In this case, I'd expect D and H to coordinate on the non-disclosure equilibrium.

The game theory of the quiet cacophony. Can leaking never work in equilibrium?

Possible variations of the model in which leaking may benefit a leaker in equilibrium:

1. **One side may be better informed or better at spinning than the other.** Then the less informed party would not fully be able to counter the effects of leaks by the more informed party on market expectations.

2. **Perhaps record-corrections do not work fully** in that once markets have been influenced by the first leaker it is difficult to fully undo this

   - Recall how Bernanke moved up his press conference in 2013

   Induces an incentive to leak fast and may provide a mechanism for leaking to benefit the first leaker in equilibrium.

3. **Some policy makers may be more willing to break the rules by leaking**

   - Could lead to distorted policy choices that are driven disproportionately by those leaking.

The game theory of the quiet cacophony. What can be done?

There are obvious but unattractive solutions:

- **Avoid disagreement** by appointing similar-thinking policy makers.
  Runs counter to why we have group-decision making in the first place.

- **Publicly disclose policy preferences in real time** so there is less to leak.
  Would likely lead to even more loss in policy flexibility than current framework:
  - No disclosure: Full flexibility
  - Informal disclosure: Some loss of flexibility
  - Public disclosure: Even more loss of flexibility

The game theory of the quiet cacophony. What can be done?

Instead, think about what drives β:
Imperfect understanding of Fed's policy framework.

- If the public fully understood how the Fed would optimally react to each type of incoming data, disclosure would serve only to communicate the framework and not lead to lost flexibility.

Currently, the market needs to understand 19 economic frameworks (7 governors, 12 presidents)

This is hard: 2016 Brookings survey of private sector Fed watchers and academics:

- Only 34% state that they have a very clear or mostly clear understanding of the Fed's policy reaction function.
- 64% want the presidents to speak less.
  Instead, 51% want the chair to speak more.

The game theory of the quiet cacophony. What can be done?

Suggestion: Avoid FOMC rotation. Have only X of the Reserve Banks vote, but the same ones all the time, "Super Reserve Banks"

- The market would have **fewer Reserve Bank presidents to understand**.
- The chair would have an easier time communicating the consensus with a **stable set of people voting**.

β would likely fall as the public understands policy framework better:

- The quiet cacophony would be a weaker driver of policy.
- Policy flexibility would increase.
- Other costs of quiet cacophony would also diminish: Damage to Fed reputation and decision making process.

The Lagarde solution to the (loud and quiet) cacophony problem

- In addition to no phones, the Lagarde solution is to **change ECB culture**

Lagarde pledged to spend more time listening, and not to front-run decisions before policymakers had weighed in, as her predecessor Mario Draghi was often accused of doing.

In return, she asked for discipline from the Governing Council, the ECB's top policymaking body, which comprises national central bank chiefs from the 19 euro zone countries and six Executive Board members, including Lagarde herself.

Governors had to stop trashing policy decisions once taken and keep internal disputes out of the media, presenting a common external front, 11 sources — both critics and supporters of the ECB's last, controversial stimulus package — told Reuters.

A look at her first three months in office suggests Lagarde is using the entente of Schlosshotel Kronberg to make subtle but significant changes at Europe's most powerful institution.

"The change is cultural but quite profound," one of the sources, who asked not to be named, told Reuters. "Culture drives how we make decisions so it impacts policy."