EUROPEAN CENTRAL BANK

EUROSYSTEM

Voting right rotation, behavior of committee members and financial market reactions: Evidence from the U.S. Federal Open Market Committee

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Advanced analytics: new methods and applications for macroeconomic policy

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Introduction

- Monetary policy decisions generally taken by committees
  - Aggregation of diverse information leads to better decision…
  - … in the absence of frictions such as group think, social loafing,…
- This paper: effect of voting rights on behavior of committee members

Introduction

- Voting right rotation at the FOMC
  - In place since 1943; mechanical, without exclusion
  - Permanent voting right for Board of Governors and NY Fed president
  - One-year terms for 11 remaining Reserve Bank presidents
    - Boston, Philadelphia, Richmond
    - Cleveland, Chicago
    - Atlanta, St. Louis, Dallas
    - Minneapolis, Kansas City, San Francisco

- We focus on Reserve Bank presidents in the voting right rotation

Introduction

- The importance of regional economic conditions
  - Long-standing literature (Meade and Sheets 2005; Chappell et al. 2008): regional conditions (unemployment) affect speeches, preferences in the meeting and votes
  - Reserve Bank presidents are
    - Accountable to their own Board of Directors
      - Strong ties with regional financial industry, businesses and the community in general
    - Supposed to bring intelligence about regional economic conditions to the FOMC
      - Beige Book, published 2 weeks before meeting
      - At meeting (economy go-round)

Two hypotheses

- Loss compensation
  - Voting right is an instrument to further one's goals
  - In years *without* right to vote, a president behaves to compensate for the loss
    - H0: higher inclination to speak / longer contributions; more responsiveness to regional conditions
- Motivation
  - Having the right to vote makes it more likely that any other activity to promote the desired decision pays off
  - In years *with* right to vote, a president is more motivated to make more intense use of such activities
    - H0: higher inclination to speak / longer contributions; more responsiveness to regional conditions

Introduction

- 3 research questions
  - Effect on contributions during meetings and speeches between meetings
    - Speeches and contributions depend *more* on regional conditions in years with vote
  - Effect on financial market reactions to speeches
    - Markets react *less* to speeches by voters
  - Is the difference in market reaction consistent with the observed difference in behavior?
    - Yes; harder to extract signals about the US economy from speeches by voters

1 Data

Data

- Speeches
  - 2887 speeches between 1994-2013 (3846 until 2018)
  - Fed websites, BIS archive, FedInPrint
  - Construct measure of tone for each speech as

$$\tau_i = 100 \times \left(1 - \frac{N_i}{T_i}\right)$$

    - Count total and negative words, based on Loughran and MacDonald (2011)
    - Don't use positive words, as these are more frequently negated (Schmeling and Wagner 2017)
    - Sentence by sentence, adjusted for unemployment

Data

- Speeches
  - Identify monetary policy speeches (Gentzkow and Shapiro 2010)
    - Supervised machine learning using 300 manually labelled speeches
    - For each phrase p, calculate Pearson's χ^2 statistic

$$\chi_p^2 = \frac{\left(N_{pm}N_{\sim pn} - N_{pn}N_{\sim pm}\right)^2}{\left(N_{pm}+N_{pn}\right)\left(N_{pm}+N_{\sim pm}\right)\left(N_{pn}+N_{\sim pn}\right)\left(N_{\sim pm}+N_{\sim pn}\right)}.$$

    - Identify the 200 phrases with the largest values of χ_p^2
    - Monetary policy speeches: these account for more than 7.5% (5%, 10%) of total words
  - Aggregate to FOMC frequency for each speaker in the rotation scheme
  - 1735 president-meeting observations, 875 speeches (typically 1 or 2 per period)

Data

- Contributions made during the FOMC meetings
  - Word count and tone, for all contributions and subsets
- Beige Book
  - Tone for each Fed district
- Regional economic data
  - District-level unemployment rates, plus inflation and return on bank assets
  - Mapped to FOMC frequency based on days a certain figure is “in place”
  - Neither a real-time dataset (Orphanides 2001), nor forward-looking…

Data

- Voting status
  - Exogenous to economic conditions

	Voting status
Regional inflation	0.006
	(0.010)
Regional unemployment	0.013
	(0.009)
Regional return on assets	0.018
	(0.026)
Observations	1,735

Notes: Marginal effects of a probit model that explains voting status with district-level inflation, unemployment and return on assets of the financial sector. Numbers in brackets are standard errors. No parameter is estimated to be statistically significant at the 10% level.

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Speech behavior

Speech behavior

- Inclination to give speeches

$$\Pr(N_{it} = 1 \mid \mathbf{x}_{it}) = \Phi(\mu_i + \mu_t + \beta_u^N |u_{it} - u_{USt}| + \beta_v^N v_{it} + \gamma_{uv}^N |u_{it} - u_{USt}| v_{it} + \epsilon_{it})$$

  - Probit, standard errors clustered by president
  - President and period fixed effects
  - Voter dummy, absolute difference between district and US unemployment, interaction
  - H0: $\beta_u^N > 0; \quad \beta_u^N + \gamma^N > 0$
  - Loss-compensation: $\beta_v^N < 0;\ \gamma^N < 0$; motivation: $\beta_v^N > 0; \gamma^N > 0$

Speech behavior

- Inclination to give speeches

	(1) Without voting status	(2) Benchmark	(7) Pre-beige book release	(8) Post-beige book release
Abs. unemp. gap (β_u^N)	0.349	0.253	0.447*	-0.393
Abs. unemp. gap *x* voting (γ^N)		0.337**	0.288**	0.402
Voting status (β_v^N)		-0.123	-0.135	-0.130
Abs. unemp. gap, voters ($\beta_u^N+\gamma^N$)		**0.589*** **	**0.735*** **	0.010
Period FE	Yes	Yes	Yes	Yes
President FE	Yes	Yes	Yes	Yes
Observations	1,570	1,570	1,485	733

– Voting dummy insignificant; otherwise support for motivation hypothesis

Speech behavior

- Responsiveness of tone of speeches
  - H0: $\beta_u^\tau < 0$; Loss-compensation:$\beta_v^\tau < 0; \gamma^\tau > 0$; motivation: $\beta_v^\tau > 0;\ \gamma^\tau < 0$

	(1) Without voting status	(2) Benchmark	(11) Pre-beige book release	(12) Post-beige book release
Regional unemp. ($\beta^\tau{}_u$)	-0.148	-0.112	-0.167	0.808
Regional unemp. x voting (γ^τ)	--	-0.156**	-0.202***	-0.100
Voting status ($\beta^\tau{}_v$)	--	1.139**	1.556***	-0.097
Regional unemp., voters ($\beta^\tau{}_u$+γ^τ)	--	**-0.268****	**-0.369****	0.708
Period FE	Yes	Yes	Yes	Yes
President FE	Yes	Yes	Yes	Yes
Observations	586	586	470	116
R2	0.615	0.625	0.665	0.864

  - Support for motivation hypothesis

Speech behavior

- Before and after Beige Book
  - Once Beige Book is released, informational content of a speech is reduced
  - Our results stem from the pre-Beige Book period
- Following dissent
  - Dissent is rare; raises marginal returns from any persuasive effort
  - After dissent, inclination to speak and tone of voters responds much more to regional economic conditions
- Robustness (until 2018, different mon pol thresholds,…)

3 Deliberations in the meeting

Deliberations in the meeting

- No differences in length of contributions (set duration of meeting?)
- Results for tone support motivation hypothesis
  - For 1st contributions, during economy go-round

	First intervention		All interventions	
	(1)	(2)	(5)	(6)
Regional unemp. (β^T_u)	-0.425***	-0.583*	-0.052	-0.154
Regional unemp. x voting (γ^T_{uv})	-0.135*	-0.282**	-0.042	-0.094
Voting status (β^T_v)	0.550	1.756*	0.269	0.780*
Regional unemp., voters ($\beta^T_u+\gamma^T_u$)	**-0.560*** **	**-0.865*** **	-0.094	-0.248*
Period FE	Yes	Yes	Yes	Yes
President FE	Yes	Yes	Yes	Yes
R2	0.145	0.333	0.472	0.568
Observations	1,714	582	1,714	582

4 Market reaction to speeches

Market reaction to speeches

- Explain absolute daily change in constant maturity Treasury yields
  - President and day of week fixed effects, voter dummy
  - For days with only one speech
- Sizeable vote discount (!)
  - Various robustness tests
  - Pre-Beige Book
- Consistent with regional content of speeches being less informative to price nationwide assets

	3-month rates	6-month rates	12-month rates	2-year rates	5-year rates
Panel A: benchmark					
Voting	-0.006*	-0.004	-0.005*	-0.006*	-0.005
Observations	585	585	585	585	585
R-squared	0.064	0.134	0.163	0.118	0.072
Panel B: pre-Beige Book					
Voting	-0.008**	-0.007***	-0.008**	-0.008**	-0.007
Observations	483	483	483	483	483
R-squared	0.069	0.144	0.176	0.128	0.070

5 Summary and conclusions

Summary and conclusions

- Exogenous rotation of voting right shows that
  - Having or not having voting right affects behavior
  - Evidence supports motivation hypothesis, goes against loss compensation hypothesis
  - Markets care about this difference, and arguably in the right way
- Note: positive, not normative analysis!

Thank you!

Data

- Speeches
  - 2887 speeches between 1994-2013 (3846 until 2018)
  - Fed websites, BIS archive, FedInPrint
  - Speech tone: share of negative words (Loughran and McDonald 2011; Schmeling and Wagner 2017; Tietz 2018)
    - Sentence by sentence, adjusted for unemployment
  - Monetary policy speech: based on topic estimation techniques from computational linguistics (Gentzkow and Shapiro 2010)
  - Aggregate to FOMC frequency for each speaker in the rotation scheme
  - 1735 president-meeting observations, 875 speeches (typically 1 or 2 per period)