

Risk Management-Driven Policy Rate Gap

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¹The usual disclaimer applies.

Uncertainty and policy

"[...] uncertainty is not just a pervasive feature of the monetary policy landscape; it is the defining characteristic of that landscape. [...] the conduct of monetary policy in the United States has come to involve, at its core, crucial elements of risk management."

(Greenspan 2004)

"We formally define risk management as the principle that policy should be formulated taking into account the dispersion of shocks around their means."

(Evans et al. 2015)

Research questions

- ▶ **Q1: Fed as a risk manager?**
- ▶ **Q2: Common behavior across policy regimes?**
- ▶ **Q3: Quantitative implication for the policy rate?**

What we do

- ▶ Estimate **Taylor rule** with **real time Greenbook data** over the period **1969-2008**
 - ▶ rolling window
 - ▶ regime-specific subsamples
- ▶ Consider (without imposing) **a systematic response to uncertainty** (stock mkt volat.)
- ▶ Use the estimated Taylor rule to quantify the **risk management-driven policy rate gap**
- ▶ **Identify its largest realizations** via historical events
- ▶ Propose **narrative evidence** from the FOMC minutes

Findings

- ▶ **Q1: Fed as a risk manager?**
- ▶ **Yes!** Evidence in favor of a systematic response to the VXO/realized volatility on top of the "usual suspects"
- ▶ **Q2: Common behavior across policy regimes?**
- ▶ **No.** Evidence limited to the Greenspan-Bernanke regime
- ▶ **Q3: Quantitative implication for the policy rate?**
- ▶ **Median value** of the policy rate gap \approx **25bp**
- ▶ **Larger material effect - up to 75bp - after identified spikes in uncertainty** (e.g., Black Monday, 9/11, credit crunch)

Plan of the presentation

- ▶ Literature review
- ▶ Taylor rule, full and subsample investigations
- ▶ Policy rate gap
- ▶ FOMC minutes
- ▶ Conclusions

Risk management

► Theory

- * Asymmetric loss function (Dolado et al. 2004, Surico 2007, Cukierman and Muscatelli 2008, Kilian and Manganelli 2008)
- * ZLB: **Evans et al. (2015)**
- * Non linear Phillips/IS curve (Laxton, Rose, and Tambakis 1999, Dolado et al. 2005)
- * Parameter uncertainty (Brainard 1967, Sack 2000)

► Data

- * *Taylor rules*: Clarida et al. (2000), Orphanides (2001, 2003, 2004), Gnabo and Moccero (2015), Fernandez-Villaverde et al. (2015); **Evans et al. (2015)**
- * VAR: Bekaert et al. (2013), Caggiano et al. (2014), Leduc and Liu (2016), Aastveit et al. (2017), Basu and Bundick (2018), Pellegrino (2018), Caggiano et al. (2018)

Taylor rule

Taylor rule

$$\begin{aligned}R_t^* &= R^* + \alpha_\pi E_t \bar{\pi}_{t+2} + \alpha_{\Delta y} E_t \Delta y_t + \alpha_{\tilde{y}} E_t \tilde{y}_t + \alpha_s Unc_t \\R_t &= [1 - \rho(L)] R_t^* + \rho(L) R_{t-1} + v_t\end{aligned}$$

↓

$$\begin{aligned}R_t &= b_0 + \alpha_\pi E_t \bar{\pi}_{t+2} + \alpha_{\Delta y} E_t \Delta y_t + \alpha_{\tilde{y}} E_t \tilde{y}_t + \alpha_s s_t \\&\quad + \rho(L) R_{t-1} + v_t\end{aligned}$$

Data

- ▶ **Sample:** 1969M1-2008M10
- ▶ **Greenbook data** as in Evans et al. (2015); Orphanides (2001, 2003, 2004), Coibion and Gorodnichenko (2011, 2012), Mu-Jeung Yang and Wieland (2017)
 - ▶ $E_t \bar{\pi}_{t+2}$, $E_t \Delta y_t$, $E_t \tilde{y}_t$: GDP deflator inflation (avg. expectations), output gap and output growth (nowcasts)
- ▶ **Fred data**
 - ▶ R_t : Federal funds rate/each FOMC meet
 - ▶ Unc_t : **Uncertainty** as proxied by the **VXO** (avg. 30dd before FOMC meeting), stock market volat. pre-1986 as in Bloom (2009)
- ▶ Measures available **before** FOMC meetings, OLS consistent

VXO as a proxy

- ▶ **VXO** (aka "fear index"): Measure of market participants' **expectations of S&P100 stock index volatility** over the next 30 days [▶ VXO](#)
- ▶ Produced in since 1986 by Chicago Board Options Exchange, **available in real time**
- ▶ **Popularized by Bloom (2009) as a measure of time-varying uncertainty**
 - ▶ Pre-1986, constructed with realized volatility of stock market returns - correlation post-1986 = 0.874
 - ▶ Correlated with cross-sectional spread of firm- and industry-level earnings and productivity growth, other uncertainty proxies (Bloom 2014)
- ▶ Correlated with **financial market uncertainty à la Ludvigson et al. (2018)** [▶ Ludvigson et al. \(2018\) vs. VXO](#)
- ▶ **Reflects unc. about GDP gr. outlook** (Evans et al. 2015)

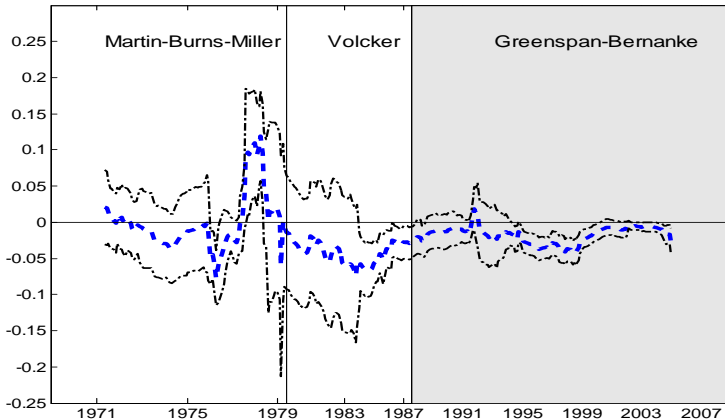
Fed's chairmen, 1969M2-2008M10

Chairman	Term of office	FOMC m's	VXO**
Martin, W.M.	04/02/1951-02/01/1970	15*	15.99 [2.33]
Burns, A.F.	02/01/1970-01/31/1978	98	19.11 [5.57]
Miller, G.W.	03/31/1978-08/06/1979	15	18.10 [3.05]
Volcker, P.	08/06/1979-08/11/1987	67	20.30 [3.83]
Greenspan, A.	08/12/1987-01/31/2006	149	20.84 [7.86]
Bernanke, B.	02/01/2006-10/22/2008	22*	20.71 [12.14]

- ▶ Meetings: 12 -14 in [1969,1978], 9 in 1979, 11 in 1980, 8/year afterwards
- ▶ * = number of FOMC meetings in 1969M1-2008M10
- ▶ ** = VXO mean [st. dev] values

Taylor rule evidence

Response to the VXO - chairmen

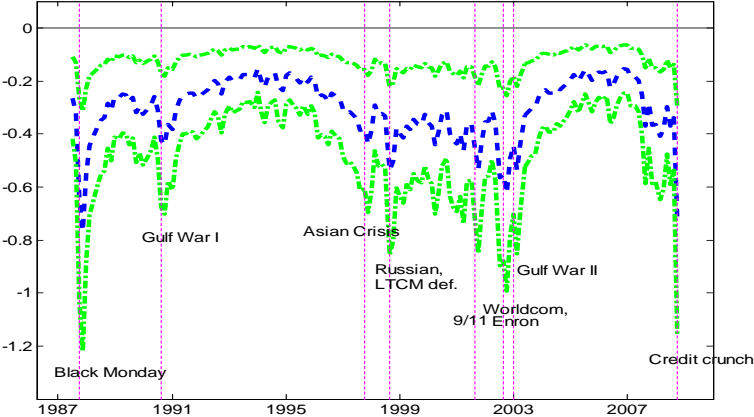


Estimated Taylor rules - chairmen

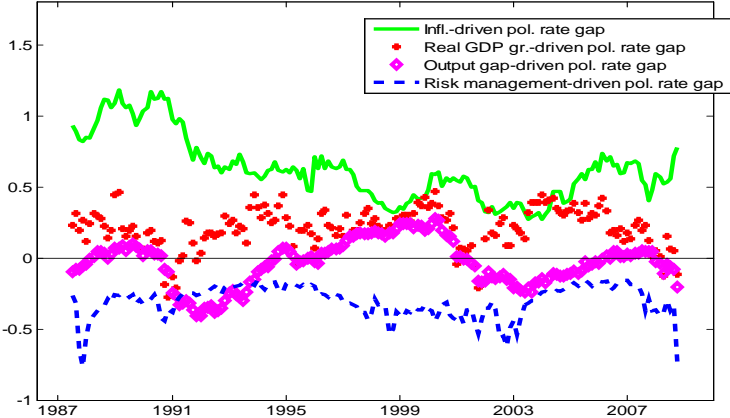
	Full sample	Martin-Burns-Miller	Volcker	Greenspan-Bernanke
α_π	0.19 *** (3.33)	0.14 *** (3.48)	0.48 *** (3.61)	0.26 *** (3.51)
$\alpha_{\Delta y}$	0.07 *** (2.62)	0.04 *** (2.23)	0.18 (1.64)	0.11 *** (4.85)
$\alpha_{\tilde{y}}$	0.06 *** (3.33)	0.07 *** (3.28)	-0.03 (-0.55)	0.11 *** (4.73)
α_s	-0.01* (-1.74)	-0.01 (-0.17)	-0.03 (-0.61)	-0.02 *** (-2.81)
ρ_1	0.91 *** (24.83)	0.88 ** (18.56)	0.70 *** (7.65)	0.68 *** (7.81)
ρ_2	—	—	—	0.20 *** (2.25)
\overline{R}^2	0.93	0.91	0.79	0.97
Obs.	365	127	67	171

Risk management-driven policy rate gap

Risk management driven-policy rate gap



Policy rate gaps: Comparison



Risk management: Narrative evidence

FOMC minutes: 9/11

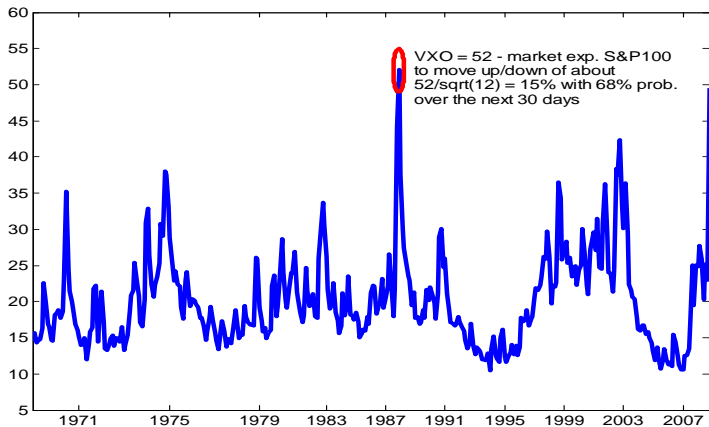
"[...] The staff forecast prepared for this meeting emphasized the continuing **wide range of uncertainty surrounding the outlook in the wake of the September attacks.** [...] In the Committee's discussion of policy for the intermeeting period ahead, **all the members indicated that they could support a proposal calling for further easing in reserve conditions consistent with a 50 basis point reduction in the federal funds rate** to a level of 2 percent."

[FOMC meeting, 11/06/2001]

Conclusions

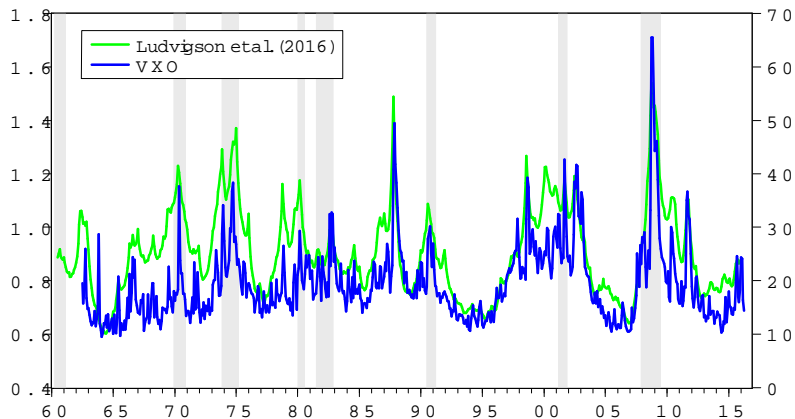
- ▶ Evidence of risk management by the Federal Reserve during the Greenspan-Bernanke regimes
- ▶ Median short-term impact on ffr \approx 25bp, with peaks of 75bp
- ▶ Historical realizations of the risk management-driven policy rate gap interpretable via spikes in uncertainty, FOMC minutes
- ▶ Breaks in preferences over and above those identified by Clarida et al. (2000)

VXO as a proxy



▶ [back to VXO explanation](#)

Ludvigson et al. (2016) vs. VXO



► Correlation: 0.74 (0.84 since 1986) [► back to VXO explanation](#)