What Does Anticipated Monetary Policy Do?

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[1] The views expressed herein are not necessarily those of the Chicago Fed or the Federal Reserve System.

Research Question

Do expectations of future monetary-policy easing stimulate the economy today?

- Communication about likely future policy is now routine for central banks.
  - Forward guidance has been an active policy tool at the ZLB.
- There is little evidence on the effects of these measures.
  - Theory predicts large effects, but no model-free tests exist.
- More broadly, policy expectations change in ways that are not spanned by the target rate (Gurkaynak et al., 2005).
  - Is this an important source of macro fluctuations?

We address these questions by identifying policy-expectations shocks in a survey-augmented VAR and simulating forward-guidance scenarios.

In Theory: Qualitatively

- In a NK model, if agents expect a low nominal short rate in the future, all else equal, they increase current consumption:

$$\begin{aligned} y_t &= E_t\left[y_{t+1}\right] - \frac{1}{\sigma}\left(i_t - \pi_t - r_t\right) \\ &= E_t\left[y_{t+T}\right] - \frac{1}{\sigma} E_t\left[\sum_{h=0}^{T}\left(i_{t+h} - \pi_{t+h} - r_{t+h}\right)\right] \end{aligned}$$

  - This also produces inflation through the NKPC.
  - The inflation feeds back to real rates and consumption through the Euler equation.

- This mechanism drives Krugman (1998), Eggertsson and Woodford (2003), Del Negro et al. (2011), Werning (2011), Campbell et al. (2012), etc.

Does this actually happen?

To test whether expectations for future accomodation increase output and inflation, Campbell et al. (2012) ran regressions of the form

$$E_t\left[x_{t+h}\right] = bE_t\left[i_{t+h}\right]$$

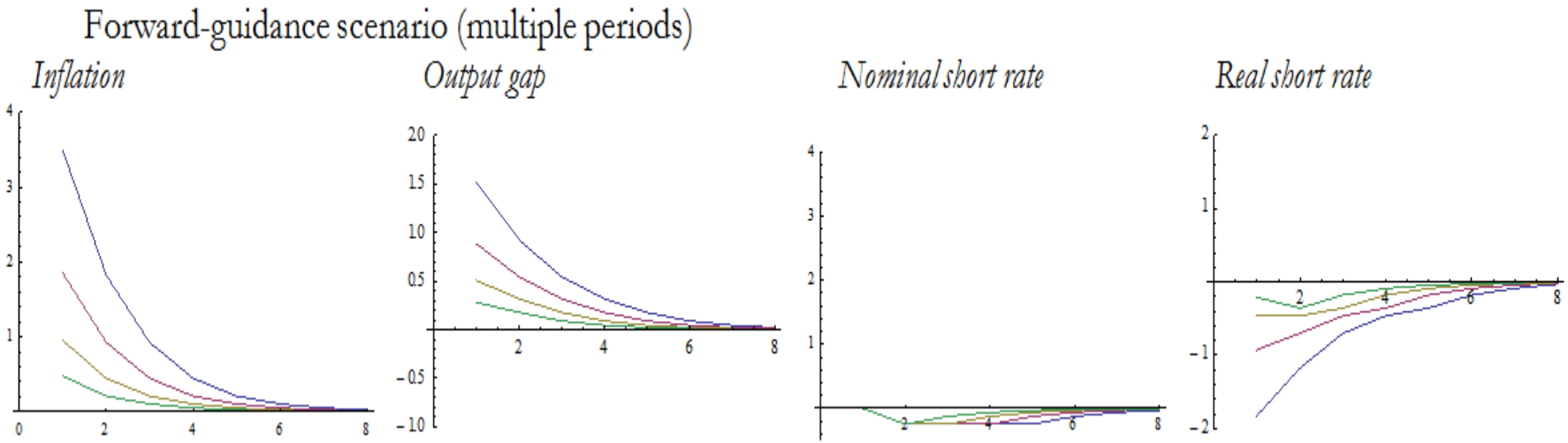
where $E_t\left[.\right]$ is a direct measure of expectations (survey or futures).

- They found the *opposite* of what the theory predicts:
  - When expectations of short rates fall, people expect the economy to do worse.
- Their explanation:
  - Theory focuses on *Odyssean* forward guidance (commitment to deviate from policy rule).
  - But most Fed communication is *Delphic* (providing a signal about future macro performance).

No one has isolated the Odyssean component to see whether it works as advertised.

In Theory: Quantitatively

Embedding "expectations shocks" in a standard NK model (Gali, 2008):



- -25 bp FG for 1 year $\longrightarrow$ +1.5% output; +3.5% inflation in the short run
  - Both responses are persistent.
- Responses are larger for FG farther in the future.

Does this actually happen?

- These results seem implausibly large and counter-intuitive.
- But, since there are no model-free estimates of the effects of (Odyssean) forward guidance, how do we know for sure?
- Similarly, modifications to the basic NK model (Levin et al. 2011; McKay et al., 2015) can result in big changes in the quantiative effects of FG.
- How do we know which model is right?

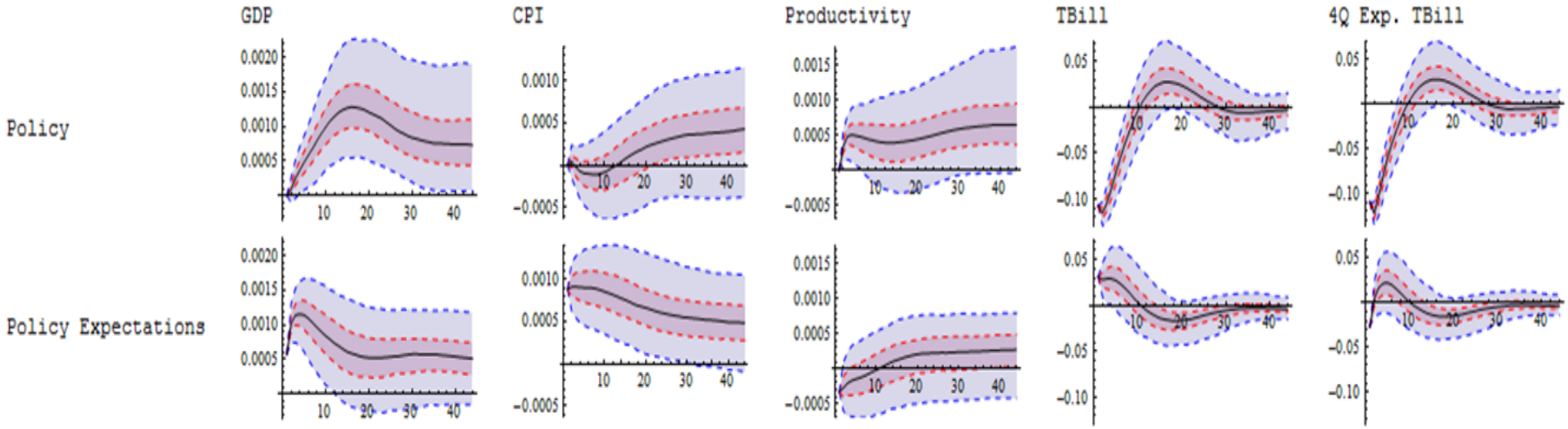
Our approach

- Measure expectations with survey data since early 1980s
- Embed survey data in VAR with macro data
- Consider shocks to expectations – innovations to survey forecasts that cannot be explained by macro data.
- Isolate expectations for exogenous policy changes using sign restrictions:
  - An expected easing must *lower* the survey forecast of the average short rate and *raise* the survey forecast of average GDP growth and inflation.
  - We also impose that the contemporaneous short rate cannot fall when such a shock occurs.
- Identify conventional policy shocks using standard short-run restrictions in the same VAR.

VAR details

- Baseline uses Blue Chip survey since 1983.
  - Forecasts of GDP, CPI, and average Tbill rate
  - Observed at 1-, 6-, and 11-year horizons
- Also includes GDP, CPI, labor productivity, 3m Tbill, M2, corporate profits
- Also includes long-term Treasury yield matching horizon of the forecast
- Specification and ordering follows Christiano et al. (2005)
- Arias et al. (2014) algorithm imposes sign and exclusion restrictions simultaneously.

Baseline Results: 1-Year Expectations



- 1-stdev "expectations shock" raises output, employment, and (quarterly) inflation by about 0.1% in the short run.
- Effects are larger and more persistent than those of a 1-stdev conventional policy shock.

Some obvious concerns

- Are our "expections shocks" really picking up postitive aggregate-demand shocks that induce changes in expectations?
  - No. Such shocks would lead to expectations for policy tightening.

- Are our "expections shocks" really picking up accomodative conventional monetary policy shocks that do not obey the timing restrictions?
  - No. Such shocks would lower the time-t short rate.

- Are our "expectations shocks" really picking up news about stuff that would have happened anyway?
  - Maybe, but we show that accounting for this makes at most a small difference.

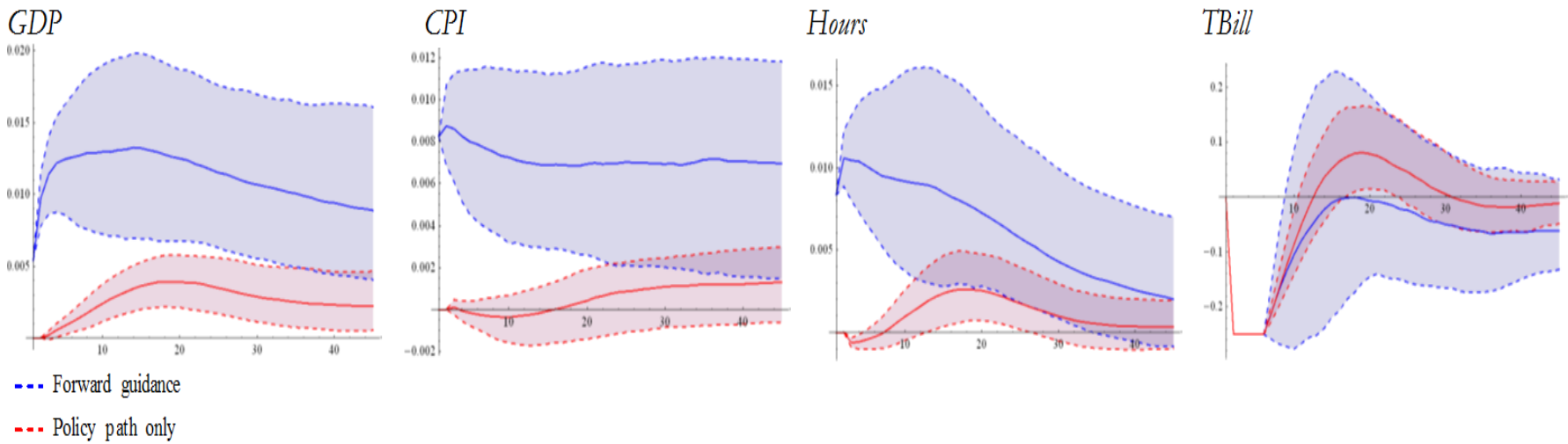
Do the expectations shocks make sense?

Std. Dev.	Date	FOMC Events
		Expected-Easing Shocks
-2.5	2000Q3	"Expansion of aggregate demand may be moderating"
-2.1	2001Q3	[Sept. 11]
-1.1	2001Q1	Balance of risks shifted to downside; easing cycle begins
-1.1	2006Q1	"Some further policy firming may be needed" (rather than likely)
-1.1	2002Q3	Balance of risks shifted to downside
-1.0	2004Q1	"Committee believes it can be patient…"
-1.0	2006Q3	Removal of phrase "some further policy firming may yet be needed"; "Economic growth has moderated"
-1.0	2008Q1	"Economic growth is slowing… Recent developments... have increased the uncertainty surrounding the outlook"; 75 bp intermeeting cut and downside risks
		Expected-Tightening Shocks
1.9	2005Q4	"Committee judges that some further policy firming is likely" (removed "measured pace" language)
1.5	2001Q4	???
1.5	2004Q3	Started tightening cycle
1.5	2005Q2	"Pressures on inflation have picked up in recent months", changed balance of risks from "roughly equal" to "should be kept roughly equal" with "appropriate monetary policy"
1.4	2006Q4	???
1.3	2002Q2	"Economy is expanding at a significant pace," downside balance of risks removed
1.2	2000Q2	50bp tightening. "The Committee is concerned that this disparity in the growth of demand and potential supply will continue, which could foster inflationary imbalances."
1.2	2007Q1	"Committee's predominant concern remains the risk that inflation will fail to moderate."

Modeling Forward Guidance

- A forward-guidance policy is one that
  1. Convinces agents that the short rate will follow a particular path
  2. Introduces subsequent short-rate shocks sufficient to achieve that path
- Thus, we can compute the consequences of foward guidance by combining an expectations shock with a series of conventional policy shocks.

Effects of One-Year Forward Guidance



Robustness Checks

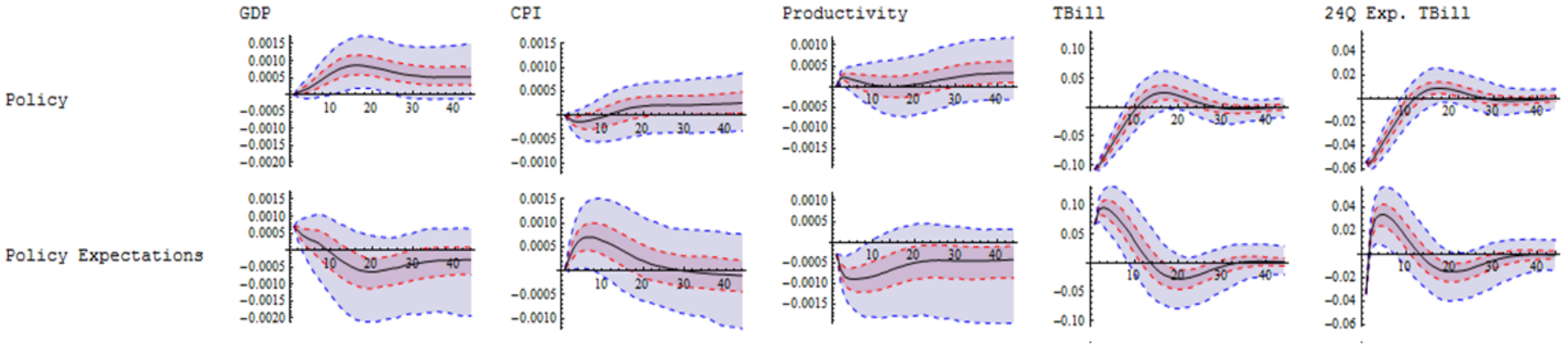
	GDP		CPI		Hours	
	1Y	5Y	1Y	5Y	1Y	5Y
Baseline	1.2%*	0.9%*	0.9%*	0.7%*	1.3%*	0.6%*
Pre-ZLB period	1.2%*	1.0%*	0.9%*	0.9%*	0.8%*	0.3%
More lags	1.3%*	1.2%	0.9%*	0.7%	1.4%*	0.6%
SPF instead of BCS (begins 1981)	1.6%*	1.1%*	1.4%*	1.1%*	1.5%*	0.9%*
1Y and 6Y surveys both included	1.0%*	0.7%	0.9%*	0.7%*	0.7%*	0.1%
Expectations shocks use sign restriction on real yield	1.3%*	1.0%*	0.9%*	0.8%*	1.3%*	0.6%
Policy shocks identified by sign restrictions	1.0%*	0.7%	1.0%*	0.7%	1.0%*	0.4%
Minnesota prior	1.0%*	1.2%	1.4%*	1.1%*	1.4%*	0.8%

- All of these specifications give similar results.

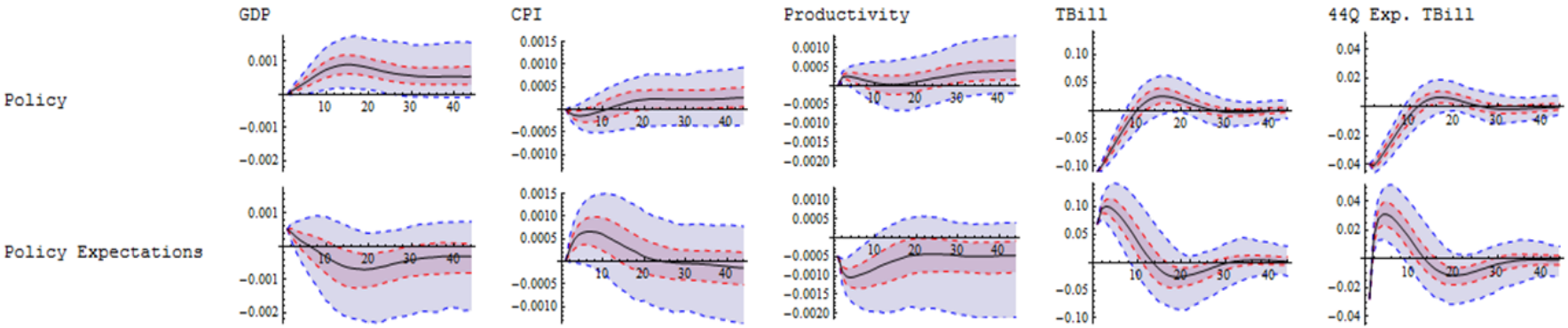
Longer Horizons

- Using 6- and 11-year expectations, the macro responses are smaller:

Using 6-year expectations

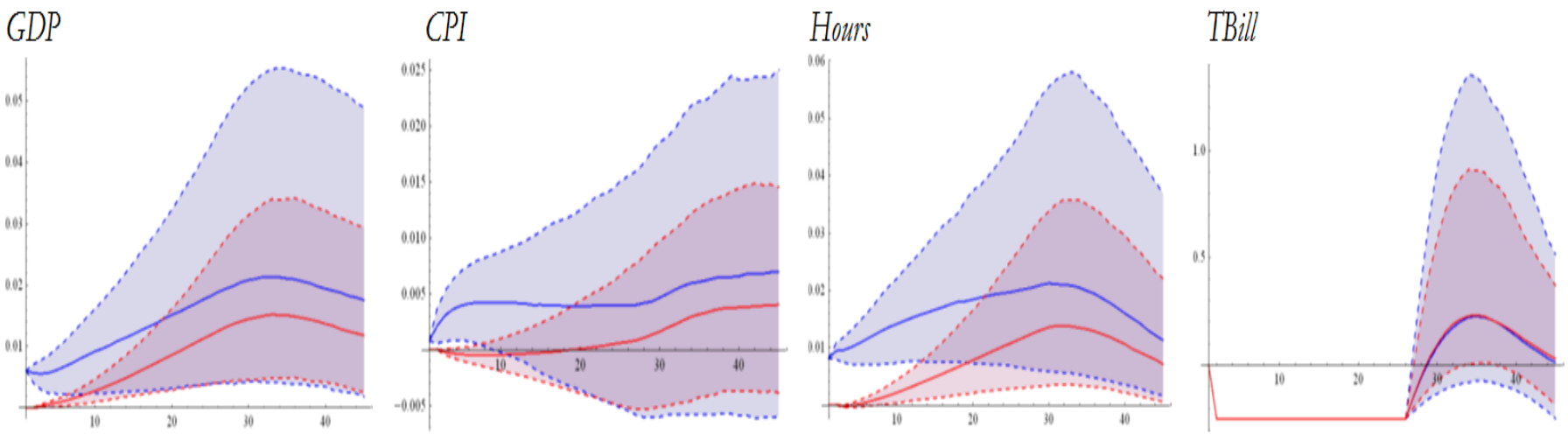


Using 11-year expectations



Longer Horizons

Using 6- and 11-year expectations, forward guidance is less effective:



Conclusions

1. Policy expectations have a powerful influence on economic outcomes.
   - A 1-std 1-year expectations shock has a similar effect on output as a 1-std conventional policy shock.
   - The effects on inflation and hours are larger.
   - The effects occur much faster.
   - The basis-point size of the the expectations shocks are smaller.
2. Forward guidance at the 1-year horizon has short-term effects close to what simple NK models predict:
   - -25 bp $\rightarrow$ +1% GDP, prices, and hours
3. The effects on the *levels* of output, prices, and employment persist for several years.

Conclusions

However,...

1. The response of inflation is not persistent.
   - Sticky-price models imply gradual decay after the initial shock.
2. Expectations farther in the future are less powerful than near-term expectations.
   - Quantifies the "forward guidance puzzle."