Discussion of "Forward Guidance: Communication, Commitment, or Both?"

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Four Comments

- Contribution: A framework to understand Odyssean vs Delphic forward guidance
- Comment 1: Interpreting model results
- Comment 2: Paper seems to apply better to periods outside ELB
- Comment 3: Some Modeling Questions

Campbell, Evans, Fisher and Justiniano (2012)

- Odyssean: "Publicly commit to a future action," conditionally or unconditionally
- Delphic: "Publicly state a forecast of macroeconomic performance and likely or intended monetary policy actions based on the policymaker's potentially superior information about future macroeconomic fundamentals and its own policy goals"

Campbell, Evans, Fisher and Justiniano (2012)

- Is the central bank (CB) saying that economic conditions changed, or that policy response function changed? Answer is crucial when forming expectations of private sector (PS)
- Empirically, evidence of both
  - Tightening shock leads to higher inflation expectations: there must be a Delphic component
  - Large fraction of interest rate variation unexplained by Delphic component: there must be Odyssean component

Paper's Contribution

- Both types of forward guidance are "cheap talk"
- So what is the difference? Paper identifies two key aspects
  - Asymmetric information between CB and PS
  - A role for credibility concerns to tackle time-inconsistency
- Interesting, intuitive and non-obvious takeaways
  - Odyssean and Delphic intrinsically linked: useless to commit without private info and disclosing private info more useful if there is commitment so that credibility is at stake
  - Forward guidance when info is about CB's preferences or beliefs
  - Transparency when private info is about state of the economy
- Very useful framework, should spur discussion and more research

The Model

- The central bank solves

$$\max_{\pi_t \in [\underline{\pi}, \overline{\pi}]} E \sum_{t=0}^{\infty} \beta^t \left[(y_t - y_t^* - k)^2 + \alpha \left(\pi_t - \pi_t^* \right)^2 \right]$$

$s.t.$

$$y_t = \theta y_t^* + (1 - \theta) y_t^e + \lambda \left(\pi_t - \pi_t^e \right)$$

Information structure and messaging

Rational Expectations for y_t^e, π_t^e

Process for exogenous y_t^*, π_t^*

- Implicitly, i_t determined by some aggregate demand equation

Comment 1a: Interpreting model results

- Private information about CB objectives: "While the government could report [...] π_t^*, this is more information than necessary: all they need is [...] π_t"
- Private information about CB beliefs : "the government's report could be about [...] $\tilde{y}_t$ [...]. However, this information is redundant: the only reason households need to know the imperfect signal observed by the government is to form expectations about government policy. It is then easier [...] to report [...] π_t"
- Model has no measure of cost or benefit for "more info than necessary" or "easier"

Comment 1b: Interpreting model results

- Make CB pick i_t instead of π_t and add aggregate demand (AD) equation

$$y_t = -\left(i_t - \pi_t^e - r_t^*\right) + y_t^e$$

- Private sector now also forms rational expectations about i_t
- Forward guidance is message about i_t, not π_t
- π_t^* still part of CB objective and not state of the economy
- Natural rate r_t^* is state of the economy, not CB objective

Comment 1b: Interpreting model results

- Equilibrium payoffs/outcomes are the same
- In optimal commitment equilibrium $i_t = r_t^*$
- Private information about CB's objective: $m_t = \pi_t$ is optimal but not forward guidance
- Conversely, private info about the state of the economy r_t^* can be communicated by forward guidance $m_t = i_t$

Comment 1c: Interpreting model results

- Think about (New Keynesian) microfoundations
- Change variables

$$\pi_t^* = \pi^* + u_t/\lambda \text{ and } \hat{\pi}_t = \pi_t - u_t/\lambda$$

- Then problem is

$$\max_{\pi_t \in [\underline{\pi}, \overline{\pi}]} (1-\beta) E \sum_{t=0}^{\infty} \beta^t \left[(y_t - y_t^* - k)^2 + \alpha (\hat{\pi}_t - \pi^*)^2 \right]$$

$s.t.$

$$y_t = \theta y_t^* + (1-\theta) y_t^e + \lambda (\hat{\pi}_t - \pi_t^e) + u_t$$

- Private info about π_t^* is about cost push shocks u_t
- Is cost push shock state of the economy or CB preferences?

Comment 2: Is paper about ELB?

- Simplify by assuming $\theta = 1$
- Eliminate shocks and inflation bias: $y_t^* = \pi_t^* = k = 0$

$$\max_{\pi_t \in [\underline{\pi}, \overline{\pi}]} E \sum_{t=0}^{\infty} \beta^t \left[y_t^2 + \alpha \pi_t^2 \right]$$

$s.t.$

$$y_t = \lambda \left(\pi_t - \pi_t^e \right)$$

Same information structure and messaging

Rational Expectations for y_t^e, π_t^e

Comment 2: Is paper about ELB?

- Equilibrium with/without commitment and/or messages is $y_t = \pi_t = 0$
- Symmetric (indeed, full) information and time-consistent
- Role for neither commitment nor cheap talk

Comment 2: Is paper about ELB?

- Once $i_t \geq 0$, choosing inflation is not equivalent to choosing interest rates
- Have to explicitly account for aggregate demand

$$\max_{\pi_t \in [\underline{\pi}, \overline{\pi}]} (1-\beta) E \sum_{t=0}^{\infty} \beta^t \left[y_t^2 + \alpha \pi_t^2 \right]$$

$$s.t.$$

$$y_t = -\left(i_t - \pi_t^e - r_t^*\right) + y_t^e$$

$$i_t \geq 0$$

$$y_t = \lambda \left(\pi_t - \pi_t^e\right)$$

Comment 2: Is paper about ELB?

- There a liquidity trap as in Werning (2012)

$$r_t^* = \begin{cases} \underline{r} < 0 & , \quad t \in [0, T) \\ \bar{r} > 0 & , \quad t \in [T, \infty) \end{cases} \tag{1}$$

- Efficient outcome not implementable. If

$$\pi_t = y_t = \pi_t^e = y_t = y_t^e = 0$$

$$\begin{aligned} y_t &= -(i_t - \pi_t^e - r_t^*) + y_t^e \\ \Longrightarrow i_t &= r_t^* = \underline{r} < 0 \end{aligned}$$

which violates ZLB for $t < T$.

Comment 2: Is paper about ELB?

- Optimal policy has $i_t = 0$ for $t \in [0, t^*]$ with $t^* > T$
- Before T, pick $i_t = 0$
  - Same as for CB with discretion
- Between T and t^*, pick $i_t = 0$
  - Optimal policy is time inconsistent
  - If allowed to reoptimize, pick $i_t = \bar{r} > 0$, since this is the equilibrium of simplified model solved for earlier
- After t^*, pick $i_t = \bar{r} > 0$
  - Neither time inconsistency nor asymmetric info
  - Commitment/discretion/talk/no-talk all give same payoffs
  - Repeated static stage Nash is only equilibrium

Comment 2: Is paper about ELB?

- Therefore, no punishment possible after t^*
- At $t^* - 1$, optimal for central bank to deviate since no subsequent punishment
- Optimal to deviate to $i_t = \bar{r} > 0$ irrespective of messages
- Private sector anticipates, sets $\pi_t^e = y_t^e = 0$
- By backward induction, $i_t = 0$ between T and t^* is not subgame perfect
- Commitment equilibrium unravels, as in finite horizon

Comment 2: Is paper about ELB?

- ELB time inconsistency somewhat different from inflationary bias one
- Can introduce new elements to have threat
  - Recurrent visits so "punishment" in next visit to ELB
  - Frequency and length matter
- Reintroducing inflationary bias alleviates ELB, since problem is low inflation
- More generally, ELB was new and unexpected, credibility may be difficult task – or maybe new game gives new opportunity

Comment 3: Modeling of Private Sector

- Household utility is

$$E \sum_{t=0}^{\infty} \beta^t \left[(y_t - y_t^e)^2 + \alpha \left(\pi_t - \pi_t^e \right)^2 \right]$$

- Is it equivalent to rational expectations?
  - RE and second moments
  - Corner solutions (ruled out by assumption)
  - But useful for well-defined game
- In New Keynesian microfounded model
  - CB utility is welfare function
  - PS optimization incorporated in CB constraints

Comment 3: Modeling of Central Bank Objective

- y_t^* is state of the economy and also CB objective
- Some of the results rely on

$$(y_t - y_t^* - k)^2 + \alpha \left(\pi_t - \pi_t^* - f\left(y_t^*\right)\right)^2$$

- Paper states: "We do not consider microfoundations for this example [...] meant as an illustration of [...] government policy depends on [...] information about the exogenous state of the economy."
- Used for some examples, not others
- Interesting to think about correlation between shocks to objective and economy

Comment 3: Modeling of Central Bank Objective

- Private info about k and α may be clean experiment
- Worst "punishment" $\bar{\pi}$ sufficiently high (and bigger than π^h)
- Today: low inflation. Perhaps $k < 0$, but how to microfound?
- Stein (1989): infinite horizon is "somewhat implausible" but I disagree

Comment 3: Modeling of Aggregate Supply

- Output is determined by

$$y_t = \theta y_t^* + (1-\theta)\, y_t^e + \lambda\,(\pi_t - \pi_t^e)$$

- As far as I can tell, θ plays no role in analysis
- θ to allow that "complementarity among private households leads to higher output when private-sector output expectations are more favorable," then belongs in AD equation

Conclusion

- New way to think about Odyssean and Delphic forward guidance
- Fruitful framework that provides interesting answers to important and difficult questions
  - Odyssean and Delphic intrinsically linked: useless to commit unless there is private information and disclosing private information is more useful if credibility is at stake
  - Forward guidance better when private info is about CB's preferences of beliefs
  - Transparency better when private info is about state of the economy
- Framework should spur further discussion and more research