Discussion: “Optimal Unconditional Monetary Policy”

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May 25, 2017
Executive Summary

Sergio revisits policy design under ZLB with two interesting twists:

- First, let planner internalize impact on prob. of ZLB.
  → It induces precautionary motives in policy making.

- Second, take into account lowering of natural interest rate.
  → At low rate/low $\Pi$ target, “price level targeting,"
  → Otherwise, convoluted rule.

- Too much demand accommodation increases likelihood of ZLB.

- Rising $\Pi$ target may not help if secular stagnation persists!
Figure: ZLB is alive and kicking!
Figure: Real rates keep going down: US (Holston, Laubach and Williams; 2016)
Motivating Evidence III

Figure: Real rates keep going down: Euro (Holston, Laubach and Williams; 2016)
Into the woods I

- Take a small NK DSGE model a la Woodford (2003) with trend inflation.

- Linearized model results in familiar IS equation:

$$\hat{x}_t = \mathbb{E}_t \hat{x}_{t+1} - \frac{1}{\sigma} \mathbb{E}_t (i_t - \hat{\pi}_{t+1} - \hat{r}_t^n)$$

- and a generalized Phillips curve:

$$\hat{\pi}_t - \hat{\pi}^{ind}_t = \beta \mathbb{E}_t (\hat{\pi}_{t+1} - \hat{\pi}^{ind}_{t+1}) + \kappa \hat{x}_t + (\bar{v} - 1) \bar{k}_\omega \beta \mathbb{E}_t \omega_{t+1} + u_t$$

- Now, let’s introduce two novel concepts.
Into the woods II

Now, two novel concepts

- Probability of hitting ZLB $p_{o,t} \equiv \mathbb{P}(I_t \leq 1 | \mathcal{I}_t)$

- Depends on economy structure: shocks, policies, real/nominal distortions.

- “Natural probability of hitting the ZLB”

$$p_{o,t}^n = \mathbb{F}_{u,a} \left( \beta \left( \epsilon_{t-1} - \frac{\omega \rho u (1-\rho_u)}{\omega + \sigma} \right) \left( A_{t-1} \right) \frac{\sigma (1+\omega) \rho (1-\rho_a)}{\omega + \sigma} \right)$$

When is probability low?

- High inflation target $\Pi$ or high discount factor (low $\beta$).

- Post Great Recession, $\beta$ looks high.
Into the woods III  
Now, two novel concepts

- In linearized form, we obtain

\[ p_{o,t}^n = \bar{p}_o^n - \phi \epsilon \begin{cases} 0 \\ >0 \end{cases} \left[ \frac{\omega \rho_u (1 - \rho_u)}{\omega + \sigma} \hat{e}_{t-1} - \frac{\sigma (1 + \omega) \rho_a (1 - \rho_a)}{\omega + \sigma} \hat{A}_{t-1} \right] \]

- Put back frictions and trend inflation "ZLB probability curve"

\[ p_{o,t} \approx \bar{p}_o - \phi \epsilon \mathbb{E} \left[ \sigma \left( \hat{Y}_{t+1} - \hat{Y}_t \right) + \hat{\pi}_{t+1} \right] - \phi \epsilon \rho_u (1 - \rho_u) \hat{e}_{t-1} \]

- Low expected growth, low future inflation, or adverse preference shocks rises the ZLB probability.

- **Risk**: Linearization may render \( p_{o,t}^n \notin (0, 1) \).
Consider case of “unconditionally committed central banker”:

$$\min \mathbb{E} \left[ (\hat{\pi}_t - \hat{\pi}_t^{ind} + \phi_\pi)^2 + (1 - p_{o,t})\chi(\hat{x}_t - \phi_x)^2 + p_{o,t}\chi(l + \frac{1}{\sigma}r^n_t - \phi_x) \right]$$

subject to IS, Generalized PC, ZLB, and ZLB probability curve.

Unconditional commitment stronger than commitment and timeless perspective. Think of her as a META planner.

Planner looks at the ergodic behavior of economy rather than conditional on given information.

Term $p_{o,t}\chi(l + \frac{1}{\sigma}r^n_t - \phi_x)$ captures precautionary motives!
Insights/Comments I

- Optimal policy looks like price targeting. Strong response to past deviations.

$$\hat{p}_t \approx \hat{p}_t^{ind} + (1 - p_o)\hat{x}_t + p_o(\hat{x}_{t-1} + \frac{1}{\sigma}\iota_{t-1})$$

- Don’t respond as fast to bad shocks and stay low for longer.

- Would we be better off if $\iota_t$ stayed at, say, 1%? This paper claims Yes!

- Clear tension between short- and long-run stabilization. Think OLG framework.

- Note that model is no longer linear.

- MS structure induces precautionary behavior even if regimes are linear.
Insights/Comments II

- Welfare gains from different policies very similar for standard cal.
- However, strong disagreement at extreme events

Figure 5: Responses to a one-period negative demand shock of 3.0 Std. Dev.
Note: $\bar{r} = 2, \epsilon_{u,t} = -(3.0)s_{u}$, Stars show when shocks hit. Taylor Rule (black circles), Standard commitment (red dash-dotted), Precautionary commitment (blue line), Equilibrium with Flexible Prices with no ZLB Constraints and $\bar{r} = 2$ (black dotted)

- Contradictory fast response. ZLB probability rises significantly.
Insights/Comments II

- If ZLB is a **serious concern**, condition problem on not passing threshold. Think about two equilibria as in Benhabib, Schmidtt-Grohe, and Uribe.

- That is, minimize ZLB encounters explicitly in planner’s problem:
  \[ p_{o,t} \leq \bar{p}. \]

- Paper is silent about **implementation**.

- Alternative: Search for implementable policies that account for ZLB probabilities.
  \[ \rightarrow \text{ Taylor rule with weaker response to output and stronger persistence.} \]

- Results relies on **expectation channel**. But it does not work in reality!

- More ambitious project, use realistic model (Del Negro and coauthors).
What role does fiscal policy play?

Consider useless consumption tax, $\tau_t$, then ZLB prob curve is

$$p_{o,t} \approx \bar{p}_o - \phi \epsilon E \left[ \sigma (\hat{Y}_{t+1} - \hat{Y}_t) + \hat{\pi}_{t+1} + \Delta \hat{\tau}_{t+1} \right] - \phi \epsilon \rho_u (1 - \rho_u) \hat{\epsilon}_{t-1}$$

Ceteris paribus, higher taxes $\Rightarrow$ lower $p_{o,t}$.

Interestingly, fiscal consolidation, lower $\tau$, could rise ZLB probability.

Fiscal and Monetary authorities may have competing goals. Worth exploring it.
Insights/Comments II

○ What role does fiscal policy play?

○ Consider useless consumption tax, \( \tau_t \), then ZLB prob curve is

\[
p_{o,t} \approx \tilde{p}_o - \phi_e \mathbb{E} \left[ \sigma \left( \hat{Y}_{t+1} - \hat{Y}_t \right) + \hat{\pi}_{t+1} + \Delta \hat{\tau}_{t+1} \right] - \phi \epsilon \rho_u \left( 1 - \rho_u \right) \hat{\epsilon}_{t-1}
\]

○ Ceteris paribus, higher taxes \( \Rightarrow \) lower \( p_{o,t} \).

○ Interestingly, fiscal consolidation, lower \( \tau \), could rise ZLB probability.

○ Fiscal and Monetary authorities may have competing goals. Worth exploring it.

THANKS!