Discussion: "Optimal Unconditional Monetary Policy"

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Executive Summary

Sergio revisits policy design under ZLB with two interesting twists:

- First, let planner internalize impact on prob. of ZLB.

  $\rightarrow$ It induces precautionary motives in policy making.

- Second, take into account lowering of natural interest rate.

  $\rightarrow$ At low rate/low Π target, "price level targeting,"

  $\rightarrow$ Otherwise, convoluted rule.

- Too much demand accommodation increases likelihood of ZLB.

- Rising Π target may not help if secular stagnation persists!

Motivating Evidence I

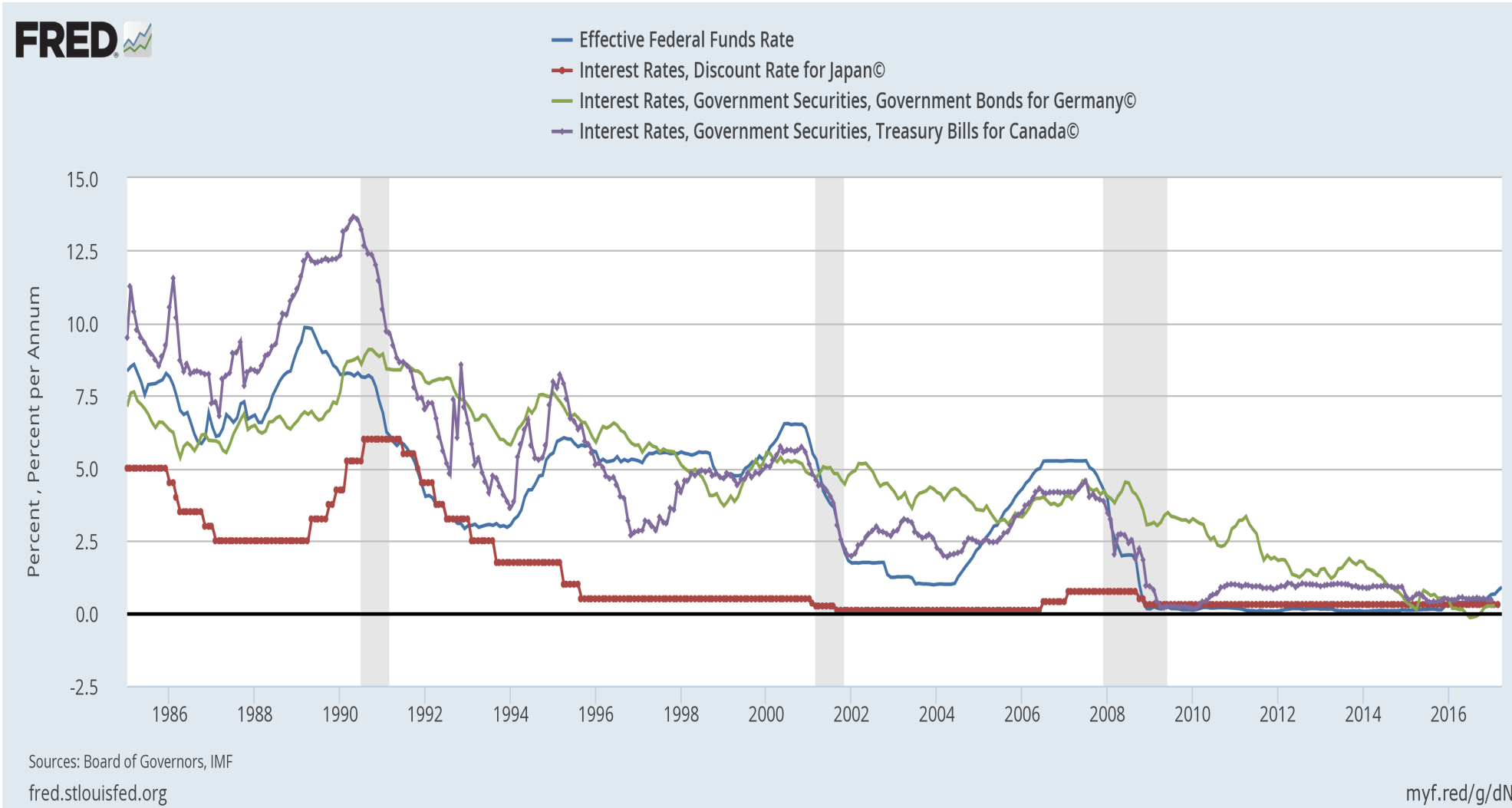

Figure: ZLB is alive and kicking!

Motivating Evidence II

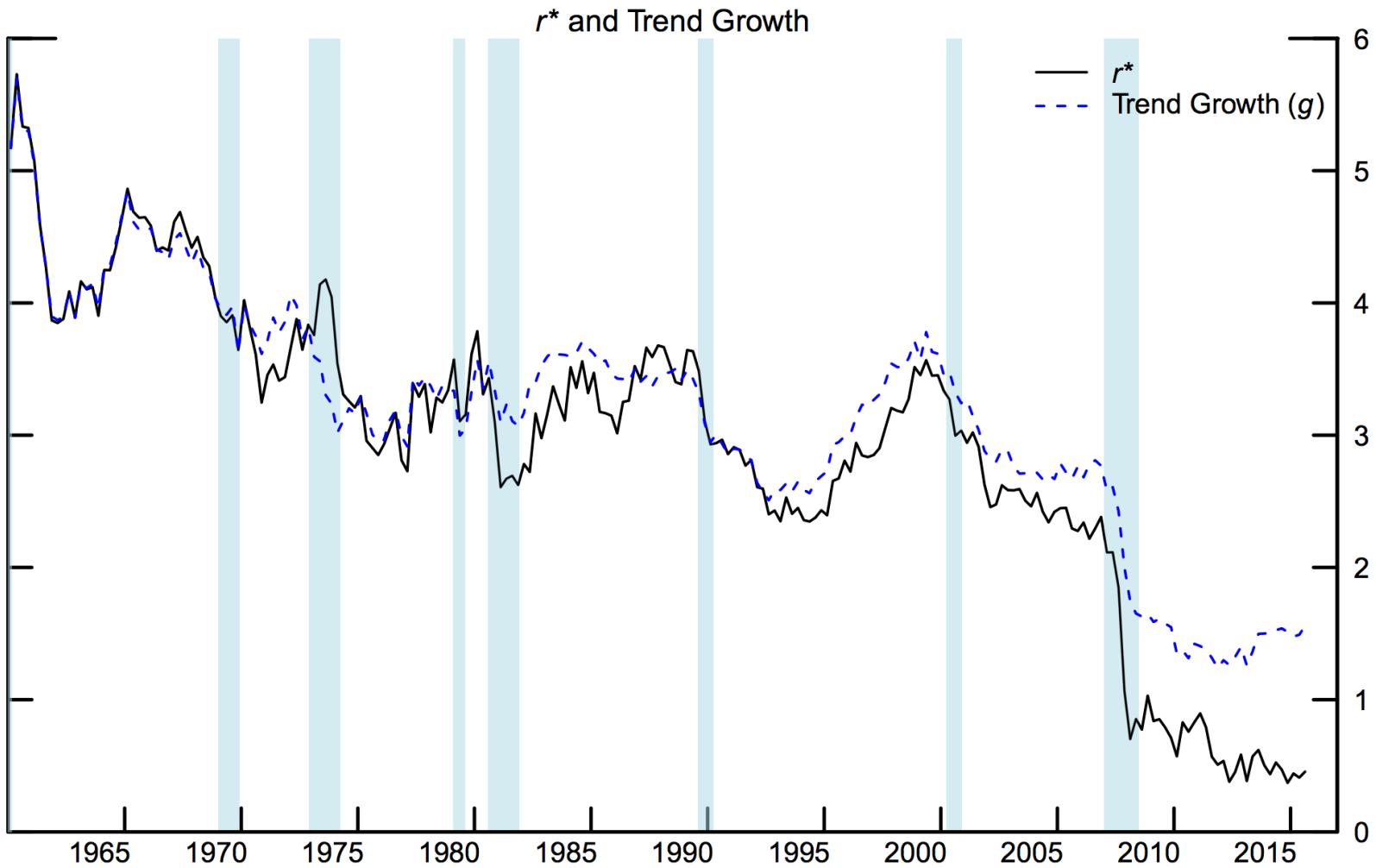

Figure: Real rates keep going down: US (Holston, Laubach and Williams; 2016)

Motivating Evidence III

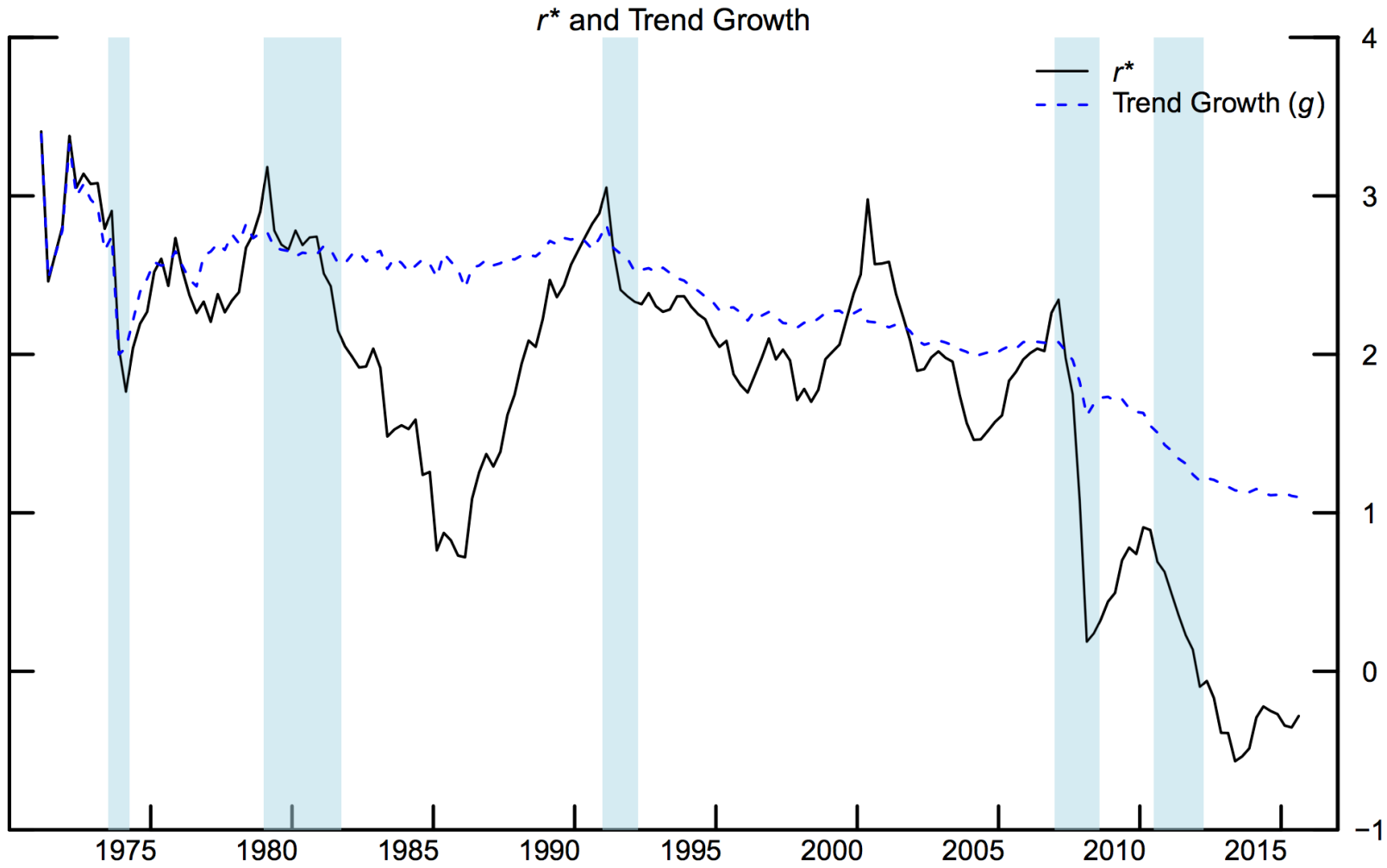

Figure: Real rates keep going down: Euro (Holston, Laubach and Williams; 2016)

Into the woods I

- Take a small NK DSGE model a la Woodford (2003) with trend inflation.
- Linearized model results in familiar IS equation:

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

- and a generalized Phillips curve:

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

- 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**"

$$p^n_{o,t} = \mathbb{F}_{u,a} \left(\frac{\beta}{\Pi} (\epsilon_{t-1})^{-\frac{\omega \rho_u (1-\rho_u)}{\omega+\sigma}} (\mathcal{A}_{t-1})^{\frac{\sigma(1+\omega)\rho_a(1-\rho_a)}{\omega+\sigma}} \right)$$

When is probability low?

$\rightarrow$ High inflation target Π or high discount factor (low β).

$\rightarrow$ Post Great Recession, β looks high.

Into the woods III

Now, two novel concepts

- In linearized form, we obtain

$$p^n_{o,t} = \bar{p}^n_o - \underbrace{\phi_\epsilon}_{>0} \left[\frac{\omega \rho_u (1-\rho_u)}{\omega + \sigma} \widehat{\epsilon}_{t-1} - \frac{\sigma(1+\omega)\rho_a(1-\rho_a)}{\omega+\sigma} \widehat{\mathcal{A}}_{t-1} \right]$$

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

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

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

- **Risk**: Linearization may render $p^n_{o,t} \notin (0,1)$.

Into the woods IV

- Consider case of "unconditionally committed central banker":

$$\min \ \mathbb{E}\left[\left(\widehat{\pi}_t - \widehat{\pi}_t^{ind} + \phi_\pi\right)^2 + (1-p_{o,t})\chi(\widehat{x}_t - \phi_x)^2 + p_{o,t}\chi(\iota + \tfrac{1}{\sigma} r_t^n - \phi_x)\right]$$

  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 $p_{o,t}\chi(\iota + \frac{1}{\sigma} r_t^n - \phi_x)$ captures precautionary motives!

Insights/Comments I

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

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

- Don't respond as fast to bad shocks and stay low for longer.
- Would we be better off if ι_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 ca
- However, strong disagreement at extreme events

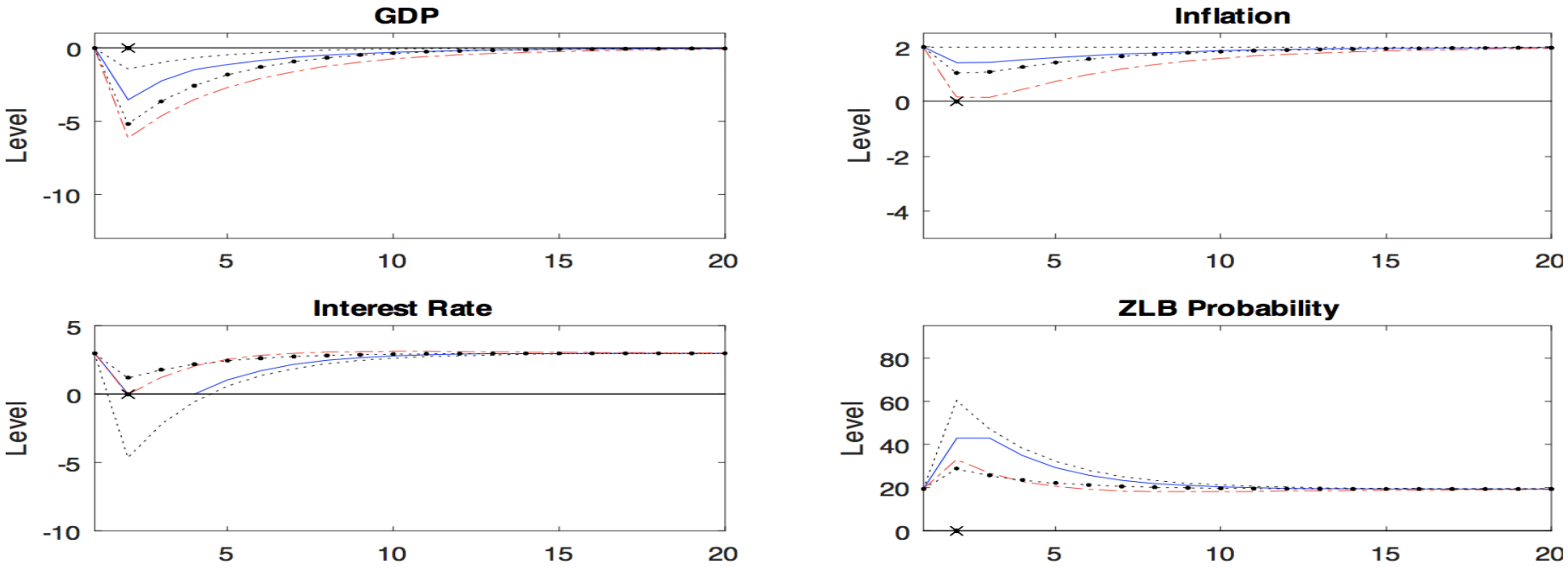

Figure 5: Responses to a one-period negative demand shock of 3.0 Std. Dev.

Note: $\bar{r} = 2$, $\epsilon_{u,t} = -(3.0)\mathfrak{s}_u$, 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 $\bar{\pi} = 2$ (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.

  $\rightarrow$ 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).

Insights/Comments II

- What role does **fiscal policy** play?
- Consider useless consumption tax, τ_t, then ZLB prob curve is

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

- Ceteris paribus, higher taxes $\Rightarrow$ lower $p_{o,t}$.
- Interestingly, fiscal consolidation, lower τ, could rise ZLB probability.
- Fiscal and Monetary authorities may have competing goals. Worth exploring it.

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THANKS!