Discussion: The Scars of Supply Shocks

Albert Queralto
Federal Reserve Board

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Overview of paper

- Develop model in which temporary supply shocks have scarring effects
- Central mechanism: endogenous investment in productive capacity $\rightarrow$ endogenous productivity growth g
- Key insights:
  - Optimal monetary policy response to temporary supply shock is the *opposite* of the conventional exogenous-g setup
    - Lower i_t after supply disruption, rather than raise it
  - Inflation can be *more persistent* due to endogenous g (!)
    - Lower investment today $\rightarrow$ g slows, but wage growth not as much (assuming not fully indexed to productivity)
  - Tight monetary policy can backfire (!!)
    - Weakens economy today $\rightarrow$ g glows $\rightarrow$ higher inflation in the future

My comments

- Elegant analysis, no need for approximations, clean theoretical results
- Simple model setup with surprisingly rich implications and powerful insights
- Comments focused on
  1. Some surprising aspects of key results
  2. Evidence on scarring and thoughts on the broader agenda

Comment 1: "Knife-edge" nature of main proposition

Proposition 3: *Assume* $Z_0 < 1$, $\rho > 0$. *Then the interest rate path that implements the optimal policy is characterized by* $i_t < \bar{i}$ *for all* $t \geq 0$.

- Starkly contrasts exogenous-g case, which calls for $i_t > \bar{i}$
- Holds *regardless of parameter values*
- Somewhat puzzling: would have expected cases with optimal policy in-between (e.g. g is endogenous, but responds very little to shocks)
- Related to linear innovation technology?

Comment 2: Does endogenous g change nature of optimal policy?

Proposition 1: *Consider a central bank that operates under discretion and maximizes households' expected utility, subject to (19), (20), (21), and* $L_t \leq \overline{L}$. *The solution to this problem satisfies* $L_t = \overline{L}$ *for all* $t \geq 0$.

- Resulting allocation is the same as under flexible wages $\rightarrow$ monetary policy undoes rigid-wage distortion
- **The same is true with exogenous** g
- Role of growth externality?
- Does the result hold under commitment?

Comment 3: How strong is the evidence?

Effect of crises on real GDP

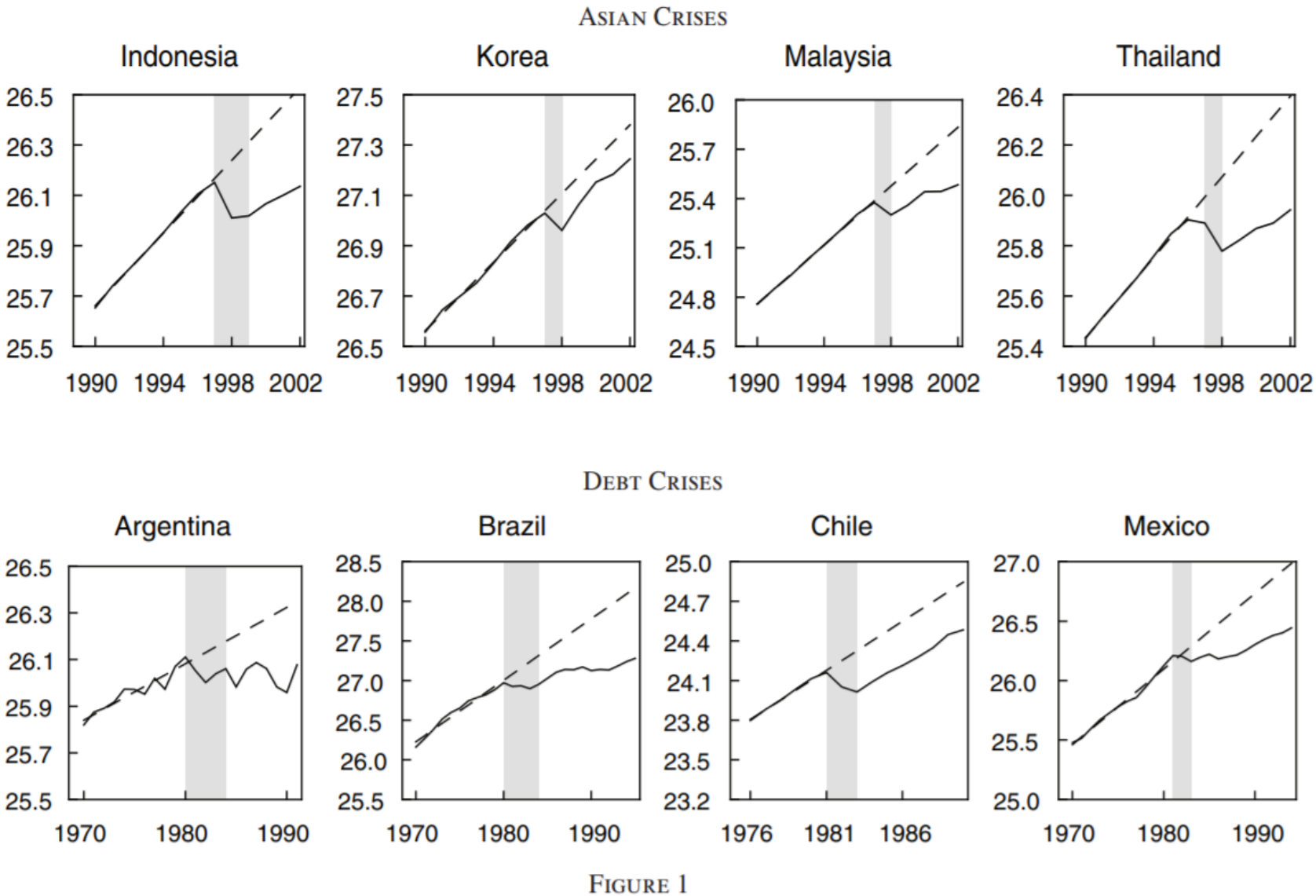


Figure 1

Source: Cerra & Saxena (2008)

Effect of crises on real GDP

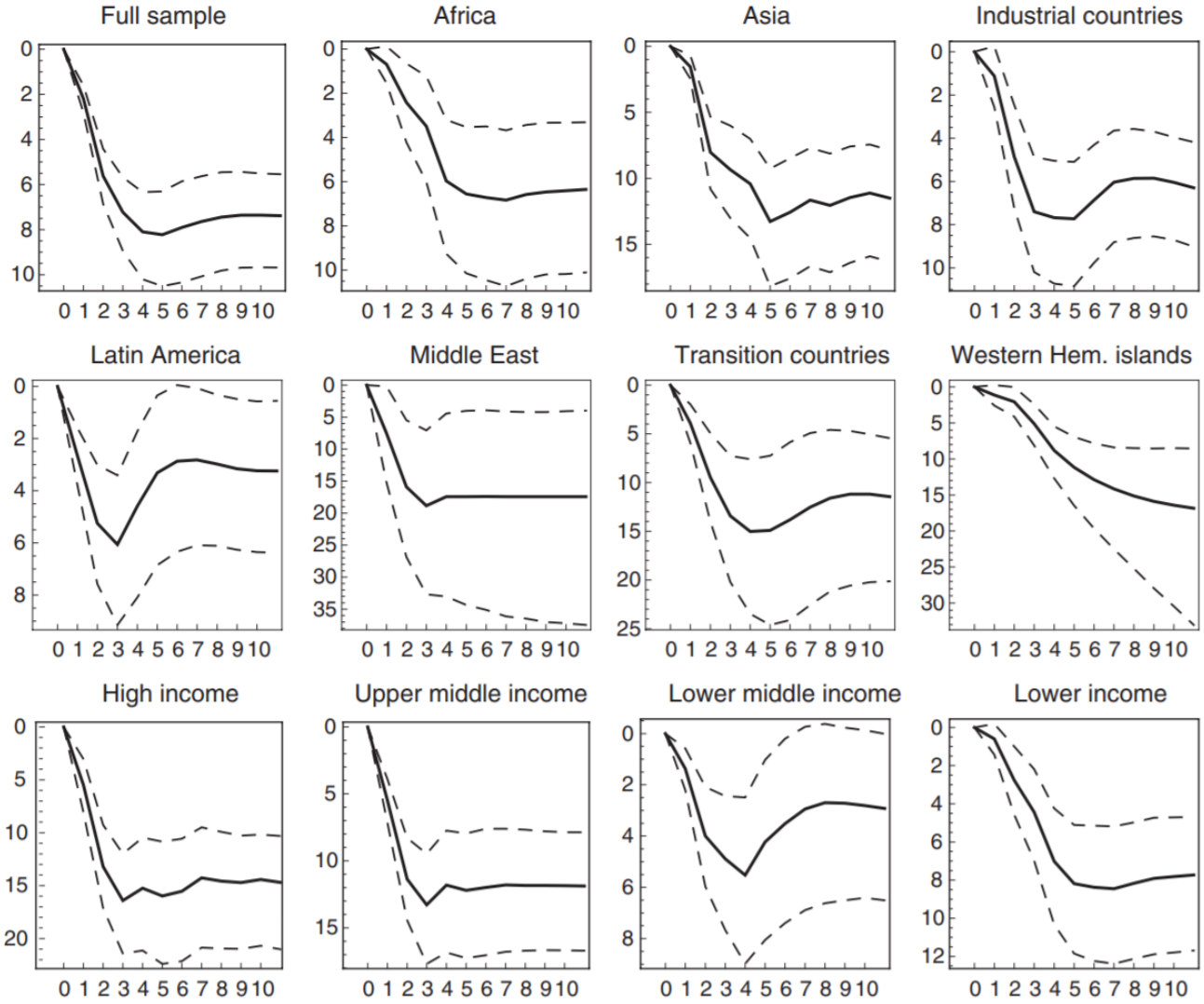


FIGURE 4. IMPULSE RESPONSES: BANKING CRISES

Source: Cerra & Saxena (2008)

Effect of crises on productivity

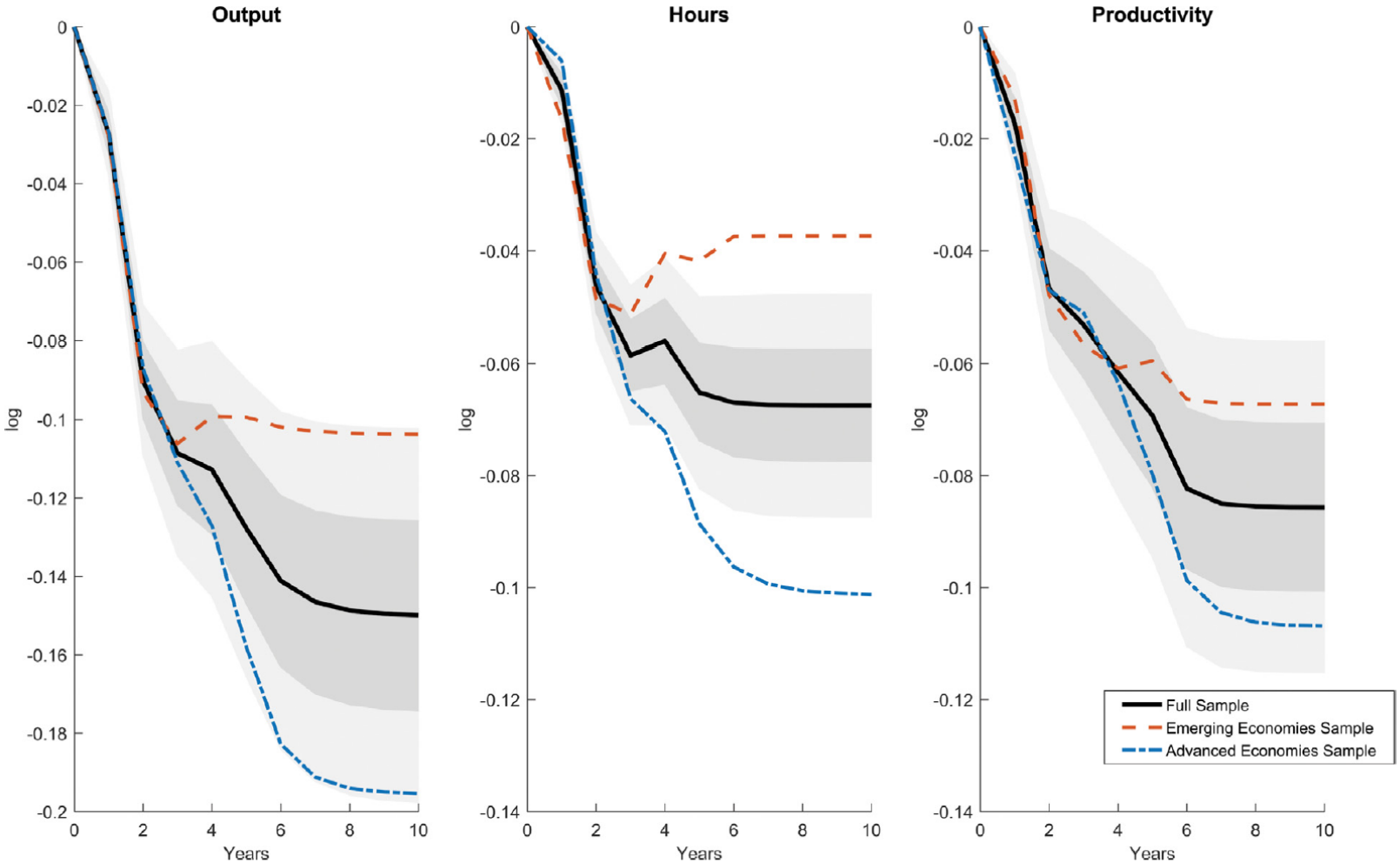
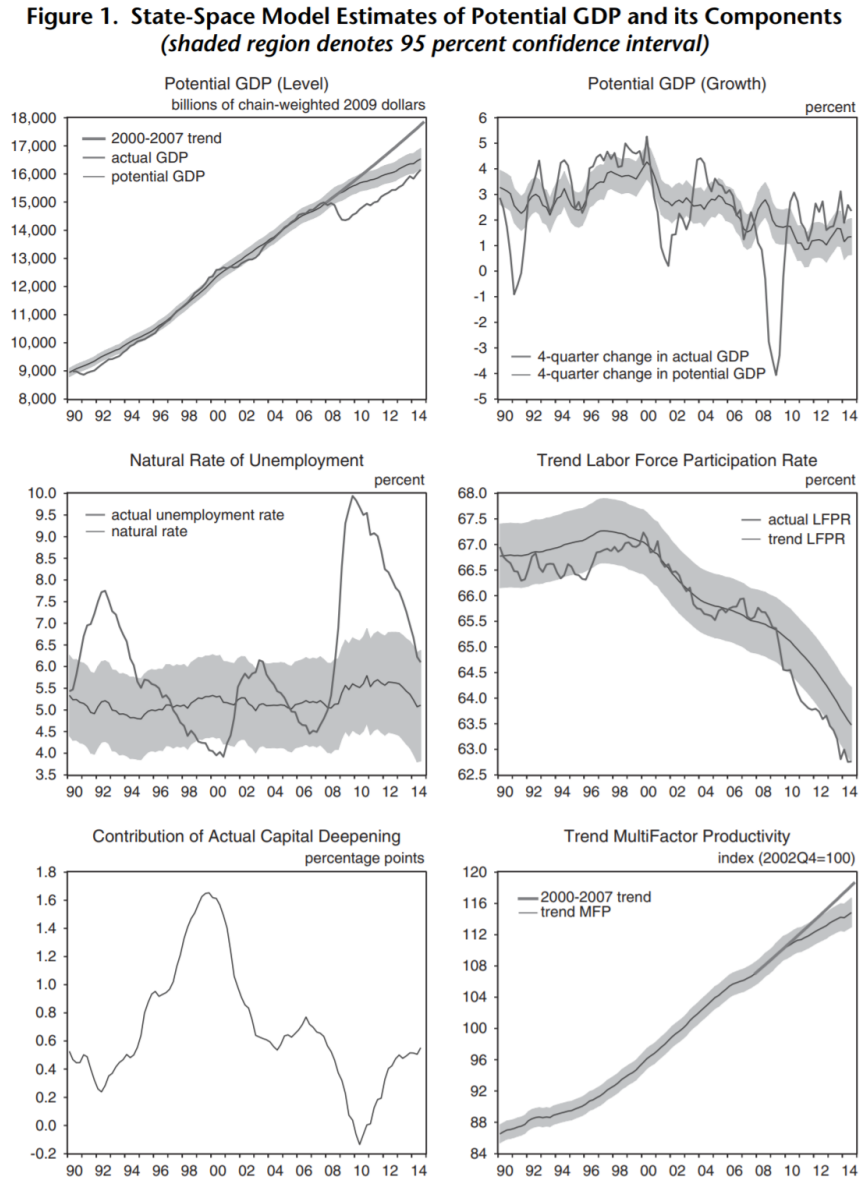


Fig. 1. Impulse responses to a banking crisis.
Note: The figure reports impulse responses of output, hours, and productivity to a banking crisis, obtained by estimating Eq. (1). The black solid line represents the full sample, the orange dashed line restricts the sample to emerging market crises, and the blue dash-dotted line restricts the sample to advanced economy crises. Dark and light shaded regions indicate 1 standard deviation and 95% confidence intervals respectively, computed by drawing 100,000 realizations of the coefficients in Eq. (1) from a multivariate normal with covariance given by the estimated coefficient covariance matrix, and computing the impulse responses for each set of coefficients.

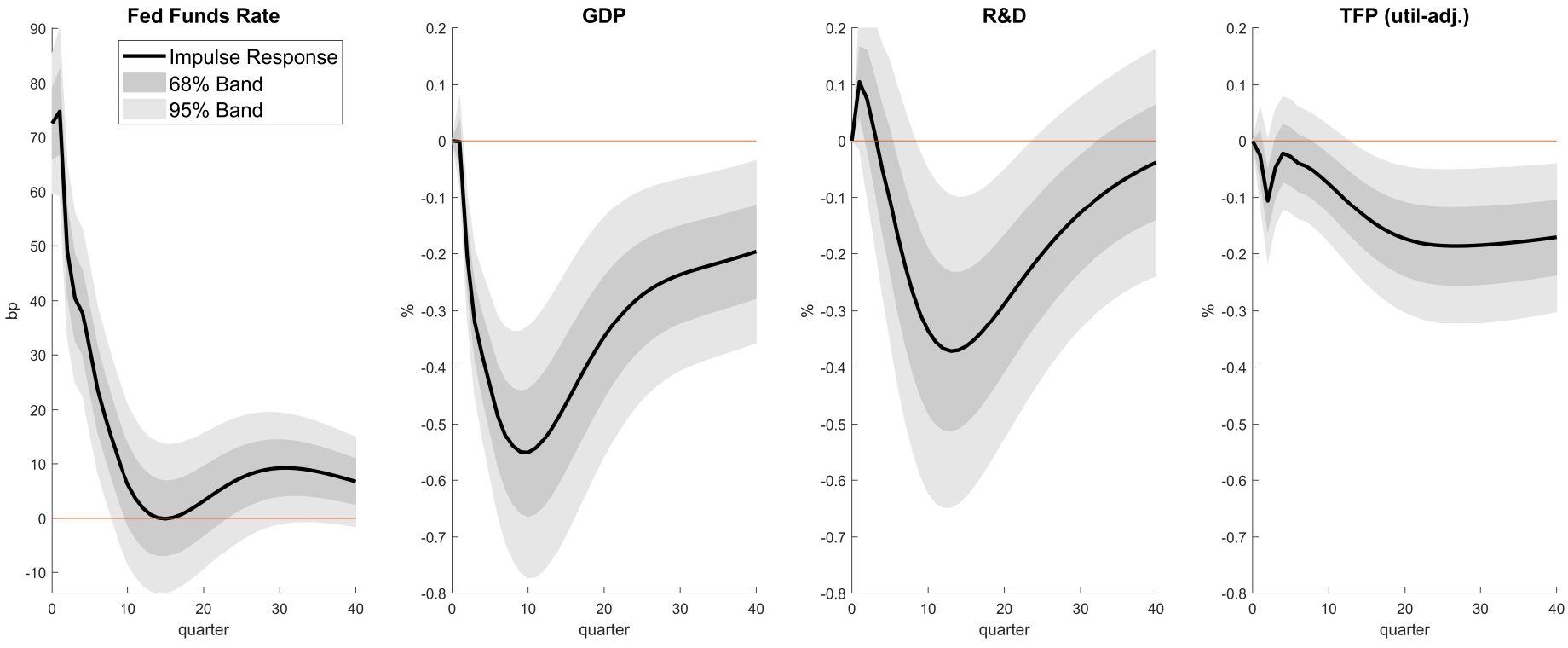
Source: Queralto (2020)

Potential GDP and MFP in the United States



Source: Reifschneider, Wascher, & Wilcox (2015)

VAR-based effects of a monetary shock

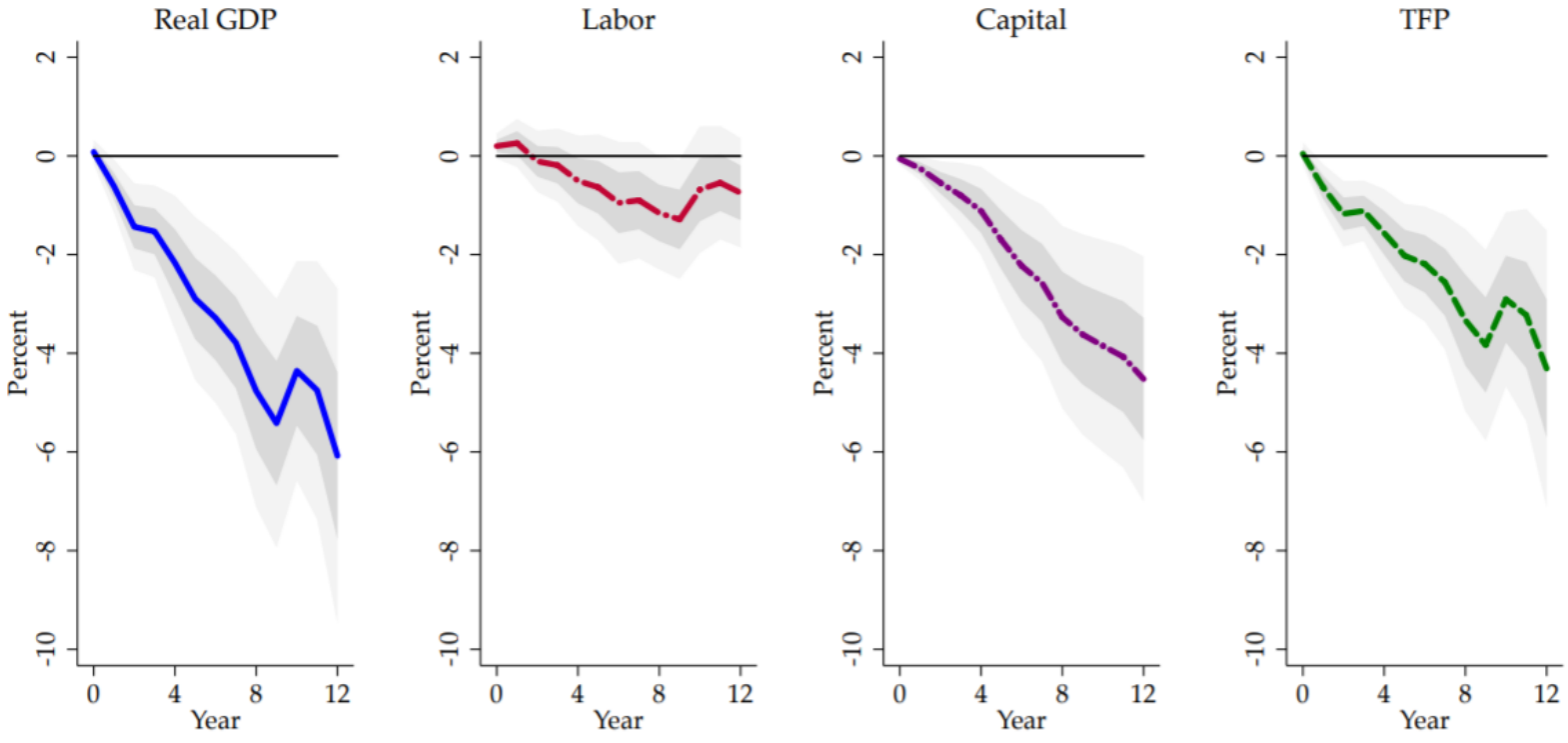


Source: Moran & Queralto (2018)

Identified effects of a monetary shock using the trilemma

Figure 3: *Baseline response to 100 bps shock: Real GDP and Solow decomposition. Full sample, 1890–2015.*

(a) *Estimates using raw data*



Source: Jordà, Singh, & Taylor (2020)

Comment 4: Comparability to textbook NK model

- Simplifying assumptions (e.g. inelastic labor supply, exogenous wage process) help deliver sharp insights

- But useful to study settings closer to conventional texbook NK model (e.g. Gali 2015)

Comment 4: Comparability to textbook NK model

- Queralto (2021) augments textbook NK model with endogenous g
  - Final output: $Y_t(i) = \left(\int_0^{A_t} Z_t(i,j)^{\frac{\vartheta}{\vartheta+1}} dj \right)^{\frac{\vartheta+1}{\vartheta}}$, $\vartheta > 0$
  - Varieties created with "skilled" labor, s.t. *externalities*

- Equilibrium takes form

$$y_t = -\left[i_t - \mathbb{E}_t \left\{ \pi_{t+1} \right\} - \mathbf{r_t^*} \right] + \frac{1}{\vartheta} g_t + \mathbb{E}_t \left\{ y_{t+1} \right\}$$

$$\pi_t = \lambda y_t + \beta \mathbb{E}_t \left\{ \pi_{t+1} \right\}$$

$$g_t = \mathbf{g_t^*} + \eta y_t + \delta \mathbb{E}_t \left\{ y_{t+1} \right\} + \beta\gamma \mathbb{E}_t \left\{ g_{t+1} \right\}$$

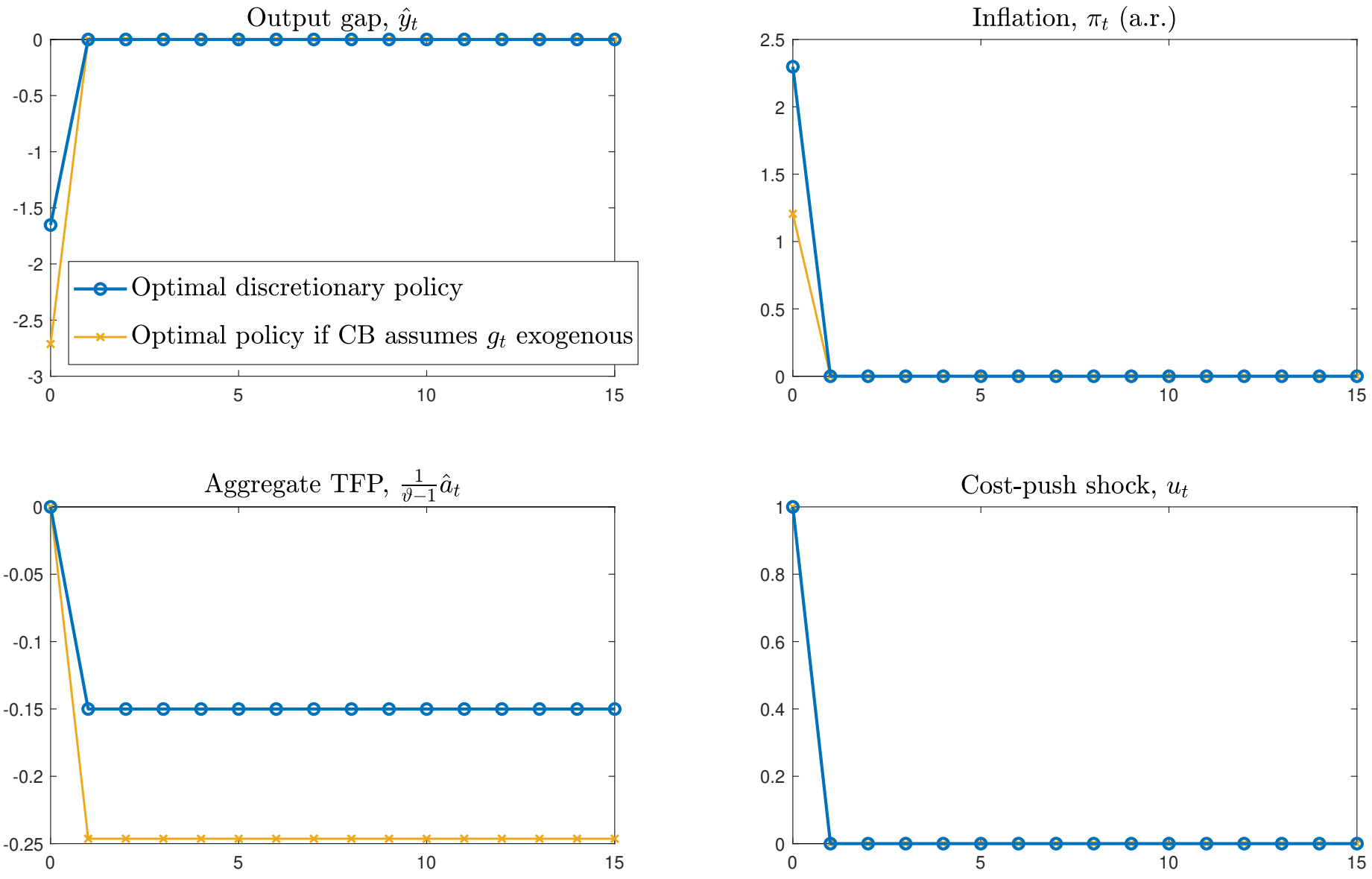
  $\delta > 0$: expected monopoly profits; $\eta \geq 0$: learning from current production

- Price stability $\pi_t = 0$ generally *not* optimal

- Instead, optimal to let $\pi_t > 0$ when growth externality high
  - If $\eta = 0$, requires commitment

- Add *cost-push shock* $\rightarrow$ optimal to allow higher π_t than with exogenous g

Figure: Dynamic responses to a cost-push shock



Conclusion

- Paper delivers highly relevant insights in a clean and elegant setup
- Part of a broader agenda that continues to develop