Discussion of “Monetary Policy and Inflation Scares” by Linde, Erceg & Trabandt

Jean-Paul L’Huillier
(thanks to Ina Hajdini)

Inflation: Drivers and Dynamics 2024
Federal Reserve Bank of Cleveland

October 25th, 2024

Assessment

- Paper looks at the consequences of cost-push shocks in the context of a NK DSGE model
- Very important paper: well-executed, clear answer, policy relevant
- Comment: We need to re-think how we model price and wage stickiness in these models

Summary and Main Contributions

- Non-linear price and wage Phillips curves
  Kimball + endogenous indexation
  VERY NICE AND VALUABLE TECHNICAL CONTRIBUTION
- If monetary policy is slow to react, it creates a demand shock, and hence we won't observe output go down
  Nice and much needed insight!
- Welfare analysis

Main Comment

> "Note that the shock to marginal cost is scaled by the inverse of the slope of the price Phillips curve" (p. 9) $TC_{t,i} = {\tau_t}^{1/\kappa} W_t n_{t,i}$

- Paper uses a Phillips curve (PC) with reduced form cost-push shocks (linear for sake of argument):

$$\pi_t = \beta \mathbb{E}_t[\pi_{t+1}] + \kappa(1 + \beta\varkappa)x_t + \tau_t$$

- But the structural PC is:

$$\pi_t = \beta \mathbb{E}_t[\pi_{t+1}] + \kappa(1 + \beta\varkappa)x_t + \kappa\mu_t$$

$$\implies \tau_t = \kappa\mu_t$$

- $\mu_t = \frac{1}{\kappa}\tau_t$ is the structural shock.
  - This looks like a cosmetic issue. But it is not. Why is this important?

Why is this important?

- Suppose we take microfoundations seriously and the structural PC:

$$\pi_t = \beta \mathbb{E}_t[\pi_{t+1}] + \kappa(1 + \beta \varkappa)x_t + \kappa \mu_t$$

- The casuality of output gaps into inflation is tenuous in the data:
  - Great Housing Bubble pre-GFC: inflation didn't rise by a lot
  - GFC: no deflation ("missing disinflation")
  - QE 1, 2, 3, 4: lowflation

- By implication, κ is estimated to be very small
  - $\kappa = 0.0020$ (Del Negro et al. 2020; Hazell et al. 2020)
  - So the structural shock $\mu_t = \frac{1}{\kappa}\tau_t$ is huge

Implications of a quasi-flat PC

$$\pi_t = \beta \mathbb{E}_t[\pi_{t+1}] + \kappa(1 + \beta\varkappa)x_t + \kappa\mu_t$$

1. Cannot fit both a flat PC and inflation coming from cost-push shocks
   - $\implies$ If you have a flat PC, cost-push shocks cannot cause inflation (unless they are unreasonaly large).
     In other words, structural shock μ_t has to be gigantic:
     If $\kappa = 0.0020$, $\mu_t = 500$ for 1 pp. of inflation.

2. A small fraction of firms increase prices by $1/\kappa$: Seems odd, and no evidence of this

3. The welfare effects of cost-push shocks, in the NK model, could be badly miscalibrated. Open question...

By the Way, Non-Linear Phillips Curves Don't Solve This

$$\pi_t = \beta \mathbb{E}_t[\pi_{t+1}] + \kappa(1 + \beta\varkappa)x_t + \kappa\mu_t$$

- $1/\kappa = 500$: So structural cost-push shocks μ_t need to be 2-3 order of magnitude bigger
- Non-linearity in this paper: slope increases between 3 times, not 500 times
  Roughly consistent with Gitti (2024)
- I'd be happy to be convinced otherwise!
  (Today, we will see two more papers on non-linearities)

Let's Get the Rescaling/Normalization from First Principles

- Idea: capture multidimensionality of firm's problem:
  - Trigger to adjust prices does not necessarily implies a global re-evaluation of the price
  - If adjust:
    React to higher costs?
    React to lower/higher demand?
    Adjust to everything?
  - Maybe won't sit down and consider *everything*. Form of "narrow" thinking.

- How to model?
  Instead of Poisson, consider Poisson-Binomial process:
  - Poission probability θ, Binomial probability α
    Equivalent to model with 2 Calvo Fairies: A supply fairy, and a demand fairy

- Nests standard NK model, but can estimate α in the data
  - $\alpha = \frac{1}{2}$ means extra parameter is irrelevant

Phillips Curve with Poisson-Binomial Process

- Closed form solution:

Proposition

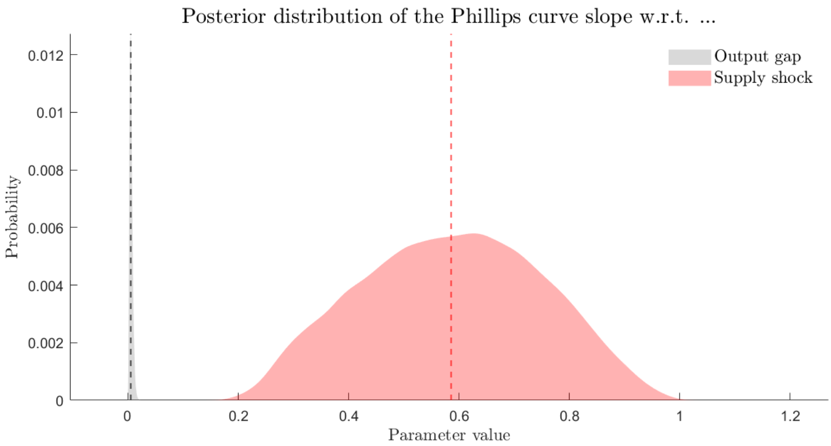
With a Calvo-Binomial process that determines price adjustment, the NK PC is

$$\pi_t = \beta \mathbb{E}_t[\pi_{t+1}] + \alpha\kappa(1 + \beta\varkappa)x_t + (1 - \alpha)\kappa\mu_t$$

- As always, θ is the fraction of adjusters

- Novelty: $1 - \alpha$ is the fraction of adjusters that adjust to cost-push shocks

Bayesian Estimation: Two Very Distinct Phillips Curve Slopes!



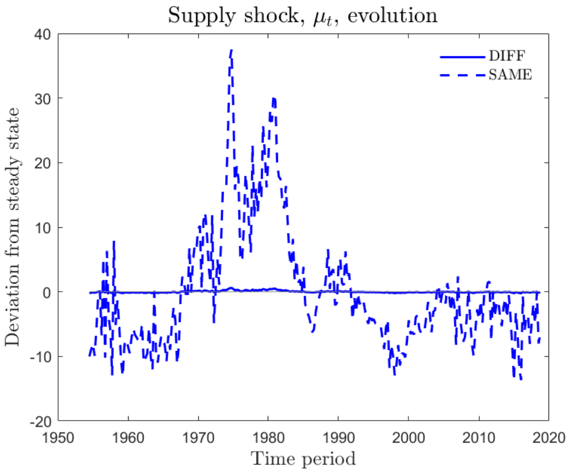
Note: Back out estimate for $\alpha \approx .01$

Comparison w/ Standard PC Model

- Re-estimate the model assuming same slope (SAME)
- All else is the same as in the model different slopes (DIFF)
- Data clearly prefers DIFF:

	SAME	DIFF
Laplace	-379.067	-371.018
Modified Harmonic Mean	-379.067	-371.018

Comparison w/ Standard PC Model: Cost-Push Shocks



- Shocks have to be much larger (!) in the standard PC to fit inflation

Back to the Paper

- How big are your structural cost-push shocks?
  - Related: Estimating model instead of calibrating would give us more confidence on the results
- Authors very transparent about modeling choices, and about the rescaling
  - And: Old and well-known problem (related to Chari, Kehoe, McGrattan 2013)
    This is a general shortcoming of our models
    But... **it is an important one...**
- Given the recent relevance of cost-push shocks, no longer a good idea to sweep under the rug
  - Shortcoming of Calvo model, and all models that treat shocks symmetrically
  - An invitation! "**Let's sit down and re-think our pricing models**"

Great Paper!

- Asking and answering an important question
- I expect it to be influential
- More work on this line is needed, how do we make sense of cost-push inflation in our models?