Discussion of

"Understanding Post-COVID Inflation Dynamics"

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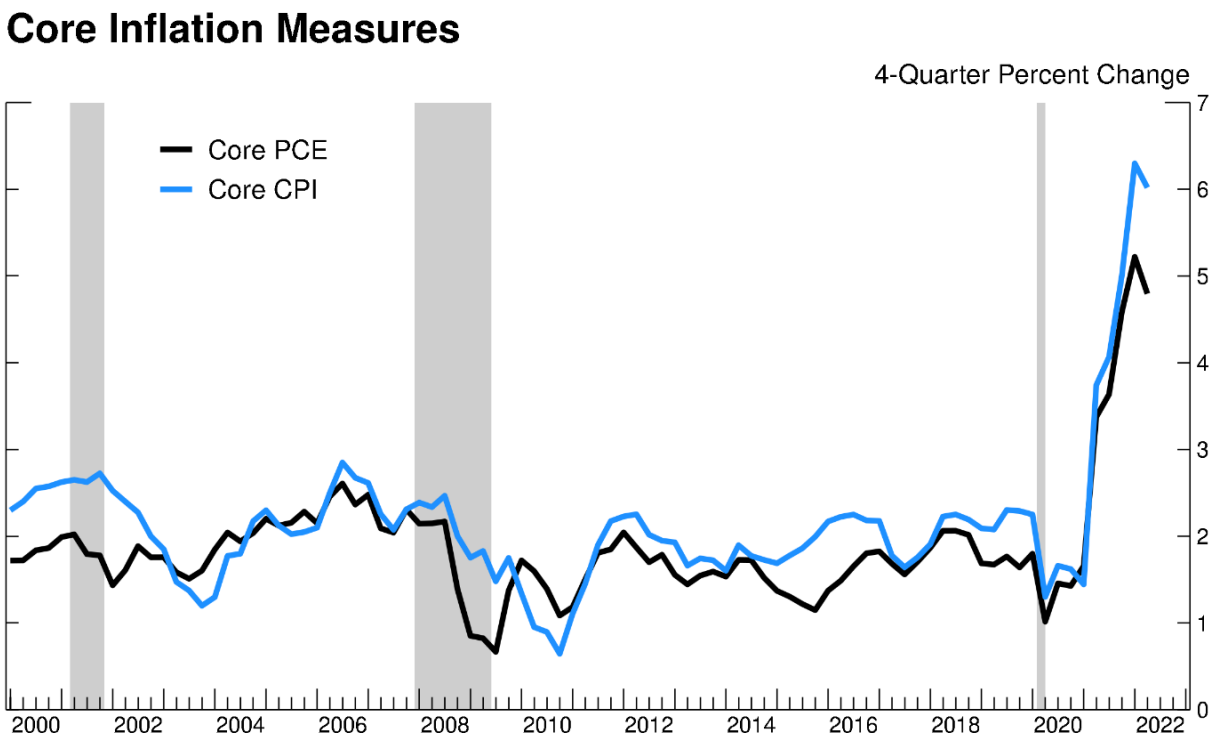
Understanding inflation dynamics remains first order



post-GFC (2008-2019) and COVID (2020)

- subdued inflation
- missing deflation at ZLB

post-COVID (2021-?)

- Rapid change of dynamics
- Confluence of supply and demand factors

Very timely paper:

Main question: What explains post-COVID inflation dynamics?

Possible answers:

1. Large exogenous demand factors
2. Large exogenous supply factors
3. Change in slope of Phillips curve

My discussion:

1. Brief review and assessment of the mechanism
2. Quantitative results and possible extensions

Mechanism in the paper (1)

- Cannonical NK model with CES preferences:

$$\frac{p_i}{P} = \frac{\epsilon}{\epsilon - 1} \times \zeta^{\epsilon} \times mc$$

$mc =$ **marginal cost**, $\zeta^{\epsilon} =$ **cost-push shock**, $\epsilon =$ **demand elasticity**

- First-order approximation eliminates interaction between mc and ζ^{ϵ}
- Pricing under Kimball (1995):

$$\frac{p_i}{P} = \frac{\eta(p_i, P)}{\eta(p_i, P) - 1} \times \zeta^{\epsilon} \times mc$$

$$\eta(p_i, P) = -\frac{\partial q(p_i, P)}{\partial p_i} \frac{p_i}{q_i}$$

Mechanism in the paper (2)

$$\frac{p_i}{P} = \frac{\eta(p_i, P)}{\eta(p_i, P) - 1} \times \zeta^{\epsilon} \times mc$$

Theory of inflation = theory of endogenous variable markups: $\frac{\partial \eta(pi,P)}{\partial p_i} > 0$

- Low price firms have low demand elasticity $\rightarrow$ high markups
  - High markups reduce incentives to adjust prices: reduce exposure deflation risk
  - Low markups greater incentive to adjust prices: increase upside risk to inflation

Assessment of the mechanism

- Nonlinearity of supply side is a natural starting point, but competing theories:

1. Nonlinear optimal pricing (this paper)
    - Non-CES demand: state-dependent elasticity plays central role
    - How much did firms adjust desired markups during and post-COVID?
2. Capacity constraints (Boehm and Pandalai-Nayar, 2022)
    - CES demand + capacity constraint: endogenous increase in markups
    - Could this mechanism explain aggregate inflation post-COVID?

Open question: What evidence do we have on the underlying mechanism?

Quantitative model

- Embed nonlinear pricing in New Keynesian model (Smets and Wouters, 2007)
- Nonlinear solution needed for:
    1. Interaction of cost-push-shocks and state-dependent markups
    2. Deflationary pressures from ZLB constraint (2008-2015, 2020)
- Bayesian full information estimation of linear and nonlinear versions

Main results

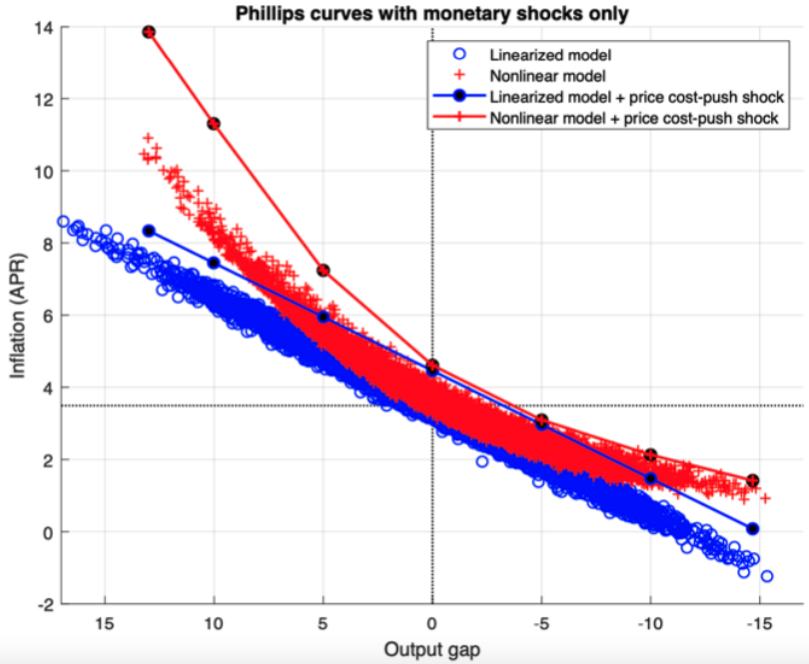
1. Cost-push shocks have different transmission in linear and nonlinear model
2. Nonlinear model features conditional heteroskedasticity in inflation
3. Post-COVID period presents stronger trade-off for monetary policy

Result 1: Transmission of cost-push shocks

- When does nonlinearity to kick in?
  - For high inflation need output gap $> 5\%$
  - For muted inflation need output gap $< -10\%$

Suggestion 1: Clarify if states and shocks that trigger the mechanism are plausible.

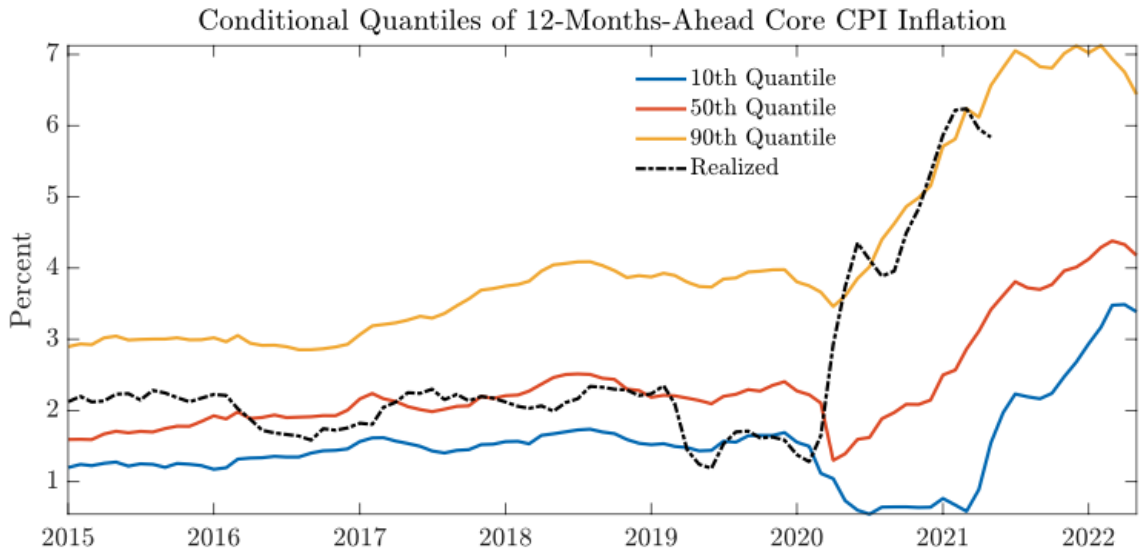
Figure 2: Linear and Nonlinear Phillips Curve with Cost-Push Shocks



Result 2: Conditional heteroskedasticity and inflation risk

Suggestion 2: Show if nonlinear model can detect upside and downside risk using predictive distribution.

Lopez-Salido and Loria (2019): quantile Phillips curve. GFC downside risk from financial factors. COVID upside risk from pandemic variables (savings, delivery times).



Result 3: Monetary policy trade-off

- Condition on 2021:Q4 states:
  - Explore the effects of cost-push shock: inflation ↑, output gap ↓
  - How costly is inflation stabilization following a cost-push shock?

Trade-off: Lowering inflation requires lowering output

Sugestion 3:

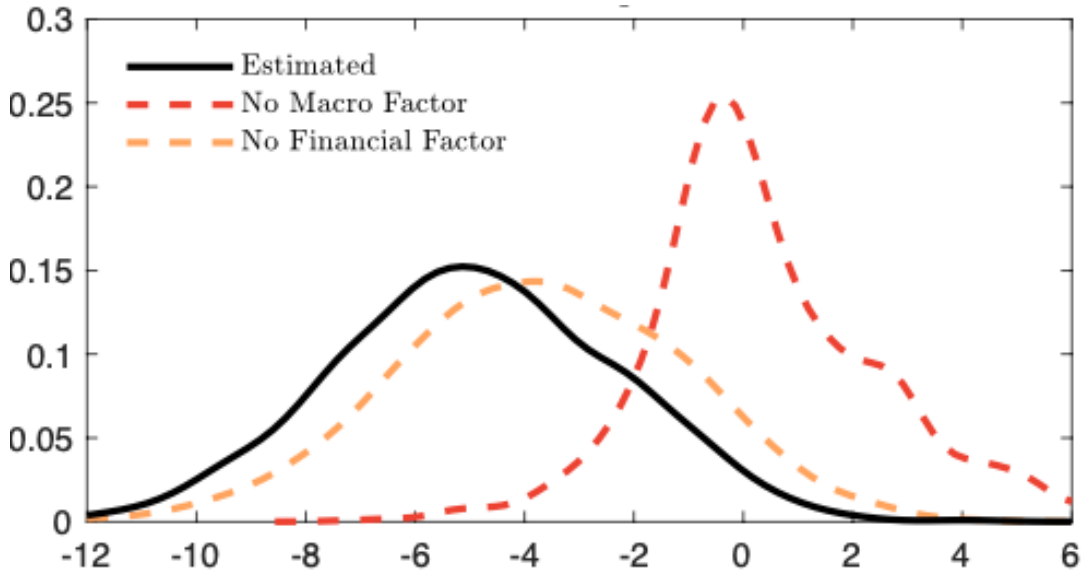
- Clarify why is it important to analyze 2021:Q4?
- If state-dependence is main contributor to post-COVID inflation, could think about policy trade-offs at different moments in time, not only in 2021:Q4.

Additional room for analisys in nonlinear model

Suggestion 4: Nonlinear model well suited to offer structural decomposition or real-time assessment of inflation risks.

Example with Growth-at-Risk:

Apr-2020: 1-year-ahead average GDP growth



Cascaldi-Garcia, Caldara, Cuba-Borda and Loria (2020)

Final thoughts

- Very timely and carefully explained paper
- Unifying mechanism to account for inflation dynamics pre- and post-COVID.
- Nonlinear modeling plays crucial role for quantitative results
- Could use the model to further explore additional features of inflation
  - Structural decomposition of downside and upside risk
  - Monetary policy trade-off in real time
- Great paper! Raises the bar for modelling inflation dynamics in NK setting.