Can Supply Shocks Be Inflationary with a Flat Phillips Curve? By Jean-Paul L'Huillier & Gregory Phelan

Discussion at the Deutsche Bundesbank Conference on
Structural Change and Implications for Inflation

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The New Keynesian Phillips Curve

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- Inflation depends on:
  - Inflation expectations $\beta E_t \pi_{t+1}$
  - Unemployment deviations $\hat{u}_t$
  - "Supply shocks" $\hat{a}_t$
- Literal interpretation of supply shocks is TFP
  - With minimal extension: shocks to price of non-labor inputs (e.g. oil)
- λ measures nominal rigidity
- φ is "real rigidity" from input markets
  - E.g. search, elastic labor supply, intermediate goods

Background: Supply Shocks Relatively Important for Inflation

This paper's motivation: conditional on π^e, supply shocks more important than demand shocks for inflation

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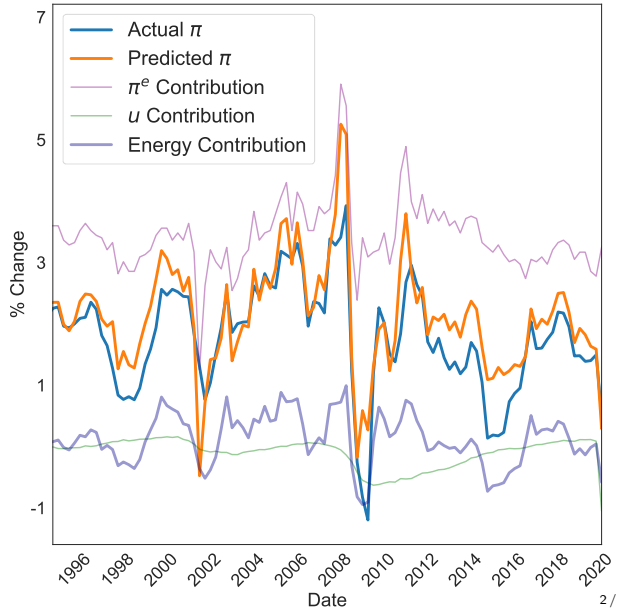
Estimate by OLS:

$$\pi_t = \beta \pi^e_{t,t+4} - \kappa \tilde{u}_t + \gamma e_t + \varepsilon_t$$

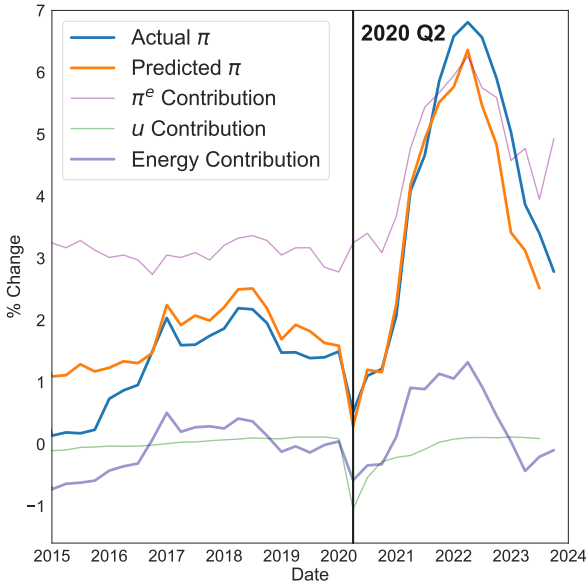
- π_t: PCE headline inflation
- $\pi^e_{t,t+4}$: 1 year expectations (Michigan)
- $\tilde{u}_t$: Unemployment gap (CBO)
- e_t: PCE energy inflation
- Sample: 1984Q1-2020Q1

Flat Phillips Curve: u_t contribution to π_t small

- Despite big changes in u_t
- But bigger contributions from **energy**



Background: Supply Shocks Remain Important Post Pandemic



This Paper: A Shock Dependent Phillips Curve

- **Claim:** hard for standard New Keynesian model to explain relative importance of supply shocks
  - The standard Phillips Curve is

$$\pi_t = \beta E_t \pi_{t+1} - \lambda \varphi \hat{u}_t - \lambda \hat{a}_t$$

  - Existing evidence suggests $\varphi \times \lambda$ is small (the "flat" Phillips Curve)
  - Arguably φ is relatively large
  - Therefore λ is low

$\rightarrow$ Meaning shocks to $\hat{a}$ have tiny effects on inflation

This Paper: A Shock Dependent Phillips Curve

- **Claim:** hard for standard New Keynesian model to explain relative importance of supply shocks
- **Model:** firms are better informed than consumers about aggregate conditions
  - Departure from standard New Keynesian model
  - Two shocks: monetary policy + TFP
  - All firms and subset of consumers observe both shocks
  - Remaining consumers do not observe either shock

  $\rightarrow$ Infer shocks via Bayesian updating
  - Otherwise static economy (dynamics are difficult!)

This Paper: A Shock Dependent Phillips Curve

- **Claim:** hard for standard New Keynesian model to explain relative importance of supply shocks
- **Model:** firms are better informed than consumers about aggregate conditions
- **Result:** a shock dependent New Keynesian Phillips Curve

$$\boxed{\pi_t = \kappa \hat{x}_t + \hat{a}_t}$$

  - Differences from the New Keynesian Phillips:
    - No nominal rigidity term pre-multiplying supply shock $\hat{a}_t$
    - Also: static model does not have inflation expectations
  - **Implication:** can explain relative importance of supply shocks for inflation
    - κ can be low, demand shocks affect inflation little
    - But shocks to $\hat{a}_t$ affect inflation one-for-one

Intuition for Shock Dependence

My pidgin version of the intuition:

- Suppose there is a negative demand shock
  - If the firm were to cut prices, uninformed consumers would realize there is a recession
  - They would lower their demand, meaning lower profits for the firm
  - $\rightarrow$ The firm keeps the price high to "fool" uninformed consumers into keeping demand high
  - Higher demand raises profits for the firm during recessions
  - Sticky prices is a perfect Bayesian equilibrium with enough uninformed consumers

"You can fool some of the people all of the time, and all of the people some of the time, but you can not fool all of the people all of the time." — Abraham Lincoln

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- Suppose there is a supply shock
  - The firm has no incentive to fool anyone
  - With positive supply shocks the firm wants to increase output and lowers prices to raise demand
  - Just as in a frictionless model

Some Thoughts

This is a **really nice paper**

- Well motivated
- Interesting and novel mechanism
- Supporting empirical evidence
- Room for follow up work:
  - Novel mechanism generating nominal rigidity
  - Scope to connect to expectations + micro data

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My main comment: perhaps the standard model can fit the relative importance of supply shocks

- Even without the authors' additional (and appealing) mechanism
- Two ways to do so:
  - Strong "real rigidities"
  - More persistent supply than demand shocks

Strong Real Rigidities

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- Input-output networks
- Sticky wages in New Keynesian model
- Rigid wages in New Keynesian search model

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Direct evidence: Gagliardone, Gertler, Lenzu & Tielens (2024) find $\varphi = 0.25$

- Uses high quality Belgian microdata with measures of marginal cost
- Valid for a range of microfoundations for real rigidity

$\rightarrow$ High real rigidity may allow standard model to fit relative importance of supply shocks

Importance of Supply Shocks in the Standard Model

- Strong "real rigidities"
- **More persistent supply than demand shocks**

Persistent Supply Shocks

Solving forwards the New Keynesian Phillips Curve:

$$\pi_t = -\lambda\varphi E_t \sum_{j=0}^{\infty} \beta^j \hat{u}_{t+j} - \lambda E_t \sum_{j=0}^{\infty} \beta^j \hat{a}_{t+j}.$$

Imposing that $\hat{u}_t$, $\hat{a}_t$ are AR(1) processes:

$$\pi_t = -\lambda\varphi \frac{u_t}{1-\rho_u\beta} - \lambda \frac{\hat{a}_t}{1-\rho_a\beta}.$$

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- Then contribution of supply shocks is larger
- Extreme case: if $\beta, \rho_a \rightarrow 1$ then effect is very large

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In practice: supply shocks thought to be more persistent than demand shocks

- E.g. oil prices and TFP well approximated by random walks

$\rightarrow$ May account for relative importance of supply shocks in standard model

Conclusion

Really nice and **thought provoking paper**

- Motivated by relative importance of supply shocks for inflation
- Argues that New Keynesian model cannot match the data
- Proposes novel and interesting theory w/ incomplete information

My comment: great to "steelman" the standard model to make sure new model is needed