

Understanding Post-Covid Inflation Dynamics

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The question

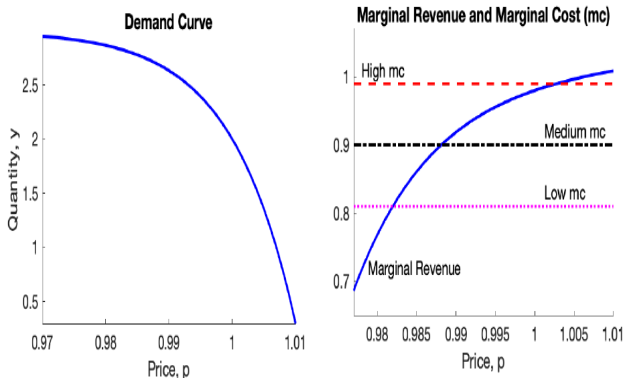
- How to explain the post-Covid rapid increase in inflation?
 - Steepening of the Phillips curve...
 - ...or exceptionally large demand and supply shocks?

The methodology

- Smets and Wouters (2007) model
 - nominal and real rigidities
 - including Kimball aggregator in goods markets
 - 7 shocks
- Kimball aggregator generates
 - Low sensitivity of prices to MC when inflation is low
 - But high sensitivity when inflation is high
- More prominent role of Kimball aggregator in this paper due to
 - Model estimated on 1965Q1-2007Q4 and with different priors
 - Non-linear solution
- The model resolves the missing deflation puzzle during the GFC (JME, 2022) and helps understand the post-Covid inflation dynamics

Main mechanism: quasi-kinked demand

- Demand elasticity is increasing with the price
- Optimality condition: $MR = MC$ and MR curve is concave



- If MC falls (rises), small drop (large rise) in p is needed to shift MR

Main findings

- The model generates a non-linear PC
 - PC is flat when inflation is subdued and steepens when inflation rises
- All 7 shocks have a stronger impact on inflation when inflation is high
- Cost-push shocks play a key role
 - they propagate particularly strongly when inflation is high
 - but also transmit less to inflation when inflation recedes
 - generating conditional heteroschedasticity in inflation
- MP faces worse trade-off from cost-push shocks with high inflation
 - CB needs to hike rates more strongly
 - exerting a stronger negative impact on output

1. How well does the model fit the macro evidence?
2. How well does the model fit the micro evidence?
3. What role for MP when cost-push shocks are main drivers of inflation?

1. Does the model fit the macro evidence?

- Low inflation and small shocks: linear PC captures inflation dynamics

$$\hat{\pi}_t - \iota_p \hat{\pi}_{t-1} = \beta E_t \hat{\pi}_{t+1} - \iota \hat{\pi}_t + \kappa \hat{m} c_t + \hat{\epsilon}_{p,t}$$

where

$$\kappa = \frac{(1 - \xi_p \beta)(1 - \xi_p)}{\xi_p (1 + (1 - \phi_p) \epsilon_p)}$$

- Bayesian estimation over 1965Q1-2007Q4:
 - $1 - \xi_p = 0.33$ (frequency p adjustment)
 - $\phi_p = 1.34$ (steady-state gross markup)
 - $\epsilon_p = 64.5$ (curvature of aggregator)
- PC is flat and slope is lower than in SW, $\kappa = .008$ vs $.026$
 - Due to longer sample or different priors?
- This helps explain the "missing deflation puzzle" (JME paper)

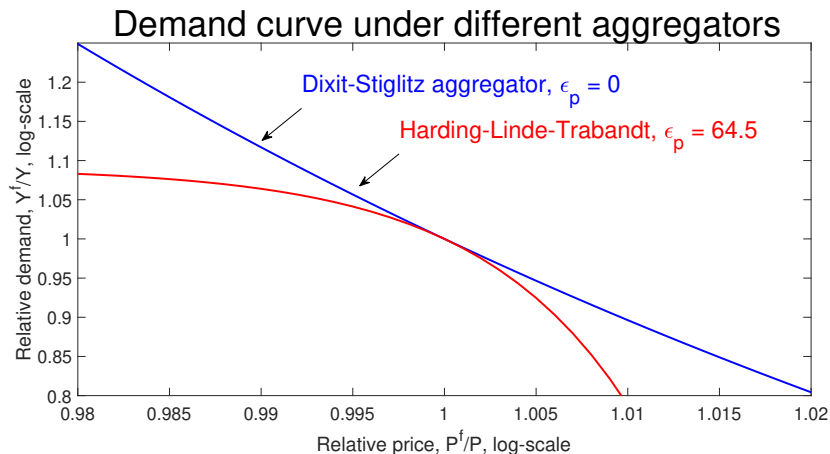
1. Does the model fit the macro evidence? [cont'd]

- Can the model also account for the post-Covid inflation surge?
 - Not clear despite computation of filtered structural innovations
 - Can the estimated model forecast the recent inflation dynamics?
 - Which innovations played a larger role over time?
- Model generates low impact of cost-push shocks when inflation is low
 - How can it then explain the initial steep rise in inflation?
 - Did other shocks play a role and, if so, which ones: demand, fiscal...
- Answers are needed if aim is to explain post-Covid inflation dynamics

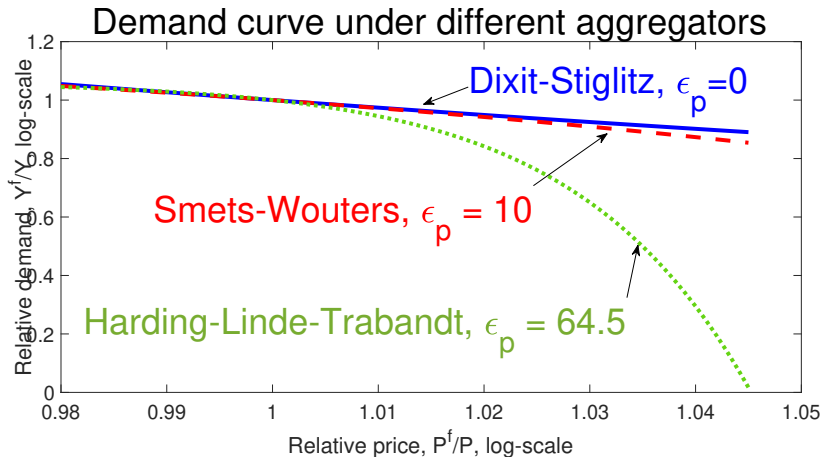
2. How well does the model fit the micro evidence?

- Frequency of price changes does not increase with inflation, size does
 - At odds with recent micro evidence for US and UK (Alvarez et al, 2022)
 - Frequency of price increases rises sharply with inflation
 - Size of price changes remains constant
- Counterfactual implications for price elasticity of demand for goods
 - A relative price change of less than 5% can bring demand to zero
 - Probably at odds with micro-evidence
 - Certainly not the reaction of demand we observed in 2021-22.

1. Dixit-Stiglitz vs Kimball (HLT)



1. Dixit-Stiglitz vs Smets-Wouters vs HLT

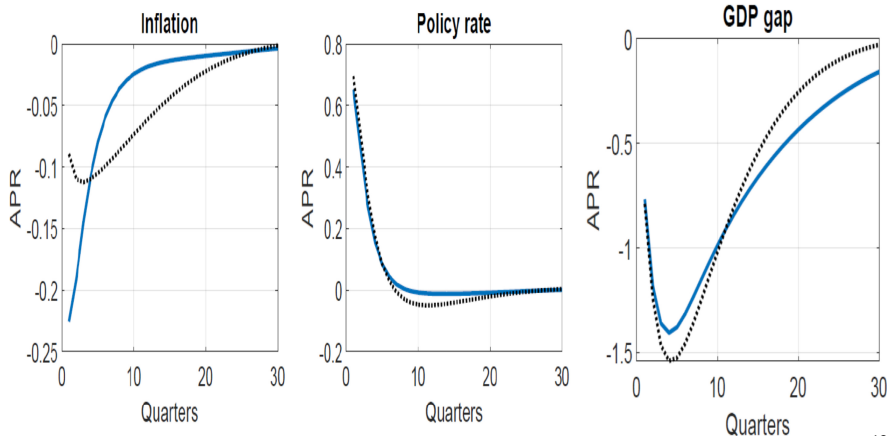


3. Role for MP when cost-push shocks are driving inflation

- Tougher trade-off for MP from cost-push shocks with high inflation.
 - Despite twice the reaction of MP, the increase in inflation and fall in output gap is almost double.
- Weaker (rather than stronger) trade-off faced by MP?
 - Stronger impact of MP on inflation for a given drop in GDP when inflation is high.

3. Role for MP when cost-push shocks are driving inflation

- 1σ MP shock in linear and non-linear model when inflation is high



Conclusions

- Interesting paper
- Real rigidities in price setting help account for
 - missing deflation puzzle during the Great Recession
 - post-Covid surge in inflation
- More evidence on role of various shocks to explain surge in inflation
- Tighter priors around micro estimates in model estimation
- Good news: MP has larger impact on inflation when inflation is high