

Discussion of “What Can Measured Beliefs Tell Us About Monetary Non-Neutrality” by Hassan Afrouzi, Joel P. Flynn & Choongryul Yang

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Summary

- Paper studies price setting subject to both nominal frictions + rational inattention
- Delivers very nice set of benchmark analytic results for pricing under uncertainty and monetary non-neutrality \mathcal{M} , emphasizing selection in info acquisition
- Results go to the heart of how monetary economics thinks about **measuring effects of monetary policy** on the economy
- Authors use the theoretical results to **connect \mathcal{M} to survey measures of uncertainty** ← particularly useful advance in a literature that struggles with identification!

Context

- Typically, it is very hard to measure effects of m.p. empirically (measurements are plagued by endogeneity concerns), so we need model-based estimates
- In turn, model-based approaches typically **target pricing moments** to pin down the pricing frictions that determine \mathcal{M}
 - huge literature starting from the seminal papers of Bilal & Klenow (2004) and Golosov & Lucas Jr (2007)
 - under some conditions, steady state pricing moments are **sufficient statistics for \mathcal{M}**
– e.g., Alvarez, Le Bihan & Lippi (2016)
- Paper challenges this approach, elevating role of **firms' uncertainty** around their actual choices (Δp , hiring, etc.) → **we need to collect a lot more micro data!**

My Discussion

- Central results
- Pushing on the identification challenge
- Scope of the results

Central Results

1. In a model with time-dependent nominal frictions and firms rationally inattentive to shocks, \mathcal{M} depends on
 - the average over the distribution of price gaps on impact \times the average duration of price spells, $E_{\mathcal{F}} [y^x + y^b] \times \bar{D} \leftarrow$ usual term
 - the average over distribution of 'belief gaps' (errors) on impact \times residual relative uncertainty, $E_{\mathcal{F}} [y^b] \times U^* / \sigma^2 \leftarrow$ new

New term : Firms never learn the state perfectly, so whatever errors exist once the shock hits persist, adding to non-neutrality, and surviving each subsequent future round of information acquisition with a lower and lower weight, that is determined by the average Kalman gain on each round

Central Results

- Looking at these rounds of revisions of an initial belief gap y^b for a firm that last reviewed h periods ago:
 - after the first review..... $\rightarrow (1 - \bar{\kappa}_h)y^b$ is left
 - after the second review.... $\rightarrow (1 - \bar{\kappa}_0)(1 - \bar{\kappa}_h)y^b$
 - after the third review..... $\rightarrow (1 - \bar{\kappa}_0)^2(1 - \bar{\kappa}_h)y^b$
 - ...
- Each gap lasts an expected duration \bar{D}_0 , which is how long a firm that just reset its price expects to wait until the next review
 \Rightarrow Accumulated belief gaps: $\bar{D}_0 \frac{(1 - \bar{\kappa}_h)}{\bar{\kappa}_0} y^b$
- Somewhat miraculously, the average $\bar{D}_0 \frac{(1 - \bar{\kappa})}{\bar{\kappa}_0}$ collapses to $\frac{U^*}{\sigma^2}$ yielding the result

Central Results

- Surprisingly simple yet puzzling expression - can we perhaps understand it more easily via mutual information?
- Note also how we are learning about the firms' responsiveness to aggregate shocks by looking at their responsiveness to idiosyncratic shocks
 - vs. Maćkowiak & Wiederholt (2009) where firms learn separately about aggregate vs. own conditions
 - testable prediction – in practice, may understate \mathcal{M} since firms tend to respond faster to local conditions

Central Results

2. Even more striking, the distribution of Δp cannot pin down \mathcal{M} at all!
 - While \mathcal{M} depends on U^* , the distribution of price changes does not
 - Echoes calls for acquiring state-dependent stochastic choice data Caplin (2024)
 - But: In the absence of measures of subjective uncertainty, adding other info can help identification
 - Aruoba, Oue, Saffie & Willis (2023) using data on productivity and demand shocks from Foster, Haltiwanger & Syverson (2008) in addition to pricing moments
 - Morales-Jimenez & Stevens (2024) using additional aggregate data in addition to the distribution of Δp

Scope

Setting:

- Gaussian setting, quadratic objective, rational inattention to shocks
- time-dependent adjustment friction

R1: Given exogenous opportunities to reset their price, firms choose to acquire info

- only when these oppts. arise (consistent with results that RI agents tie info to action)
- only to bring posterior uncertainty to a constant U^* (independent of state or prior U)

→ Uneasy tension between Calvo-like exogenous timing of adjustments and endogeneity of info acquisition conditional on adjusting

→ A second uneasy tension between quadratic objective and state-dependent incentives for uncertainty reduction

Scope

- On the first point : hard to rationalize exogenous timing unless figuring out when price has become obsolete is particularly costly
 - Using model with endogenous timing & pricing subject to RI, Morales-Jimenez & Stevens (2024) find U.S. data closer to state-dependent timing with errors in pricing
 - U.S. firms seem to know quite well when their prices are obsolete, especially if they are too low
- On the second point : in practice, profit function asymmetries generate asymmetric losses from mispricing \Rightarrow state-dependent incentives for uncertainty reduction:

Incentives (cyan is full info flex price)

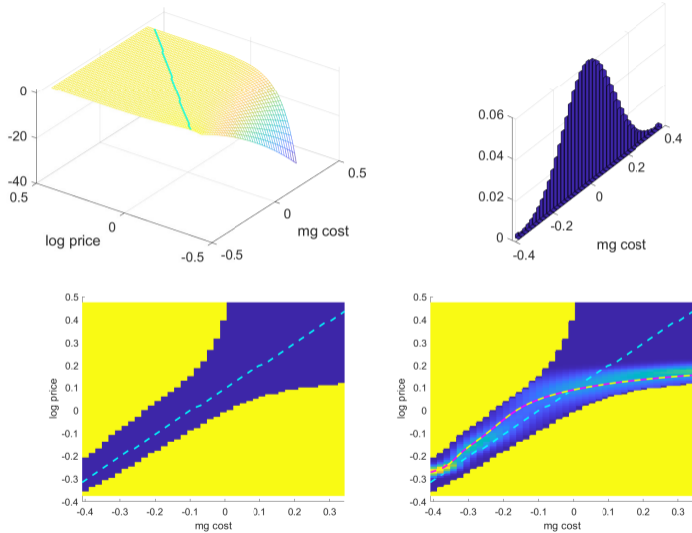


Figure:

Summary: Endogeneity Along Both Timing and Repricing

- Asymmetric inaction region, endogenous frequency of price changes → possibility of mistakes as source of price rigidity
- Strong dampening of price responsiveness for mg cost above average → downward-flex prices
- Distribution of reset prices is most dispersed in the middle
 - low costs worth capturing accurately: highly profitable opportunities
 - high cost states: opportunities to save on info + adjustment costs
 - most of the time firms are in range with widest dispersion

Conclusion

- A very nice paper that emphasizes the need for more data on how firms' beliefs are formed and updated
- Provides a valuable analytic characterization of the decomposition on monetary non-neutrality into pricing and information-based components
- Reinforces importance of errors in pricing and moreover of endogeneity in these errors in determining aggregate inflation dynamics
- More broadly, cautions against using only choice data for identification of frictions

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