Discussion of "Micro and Macro Cost-Price Dynamics in Normal Times and During Inflation Surges" by Luca Gagliardone, Mark Gertler, Simone Lenzu and Joris Tielens

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Overview

Main takeaways:

- Flat adjustment probability seems to be good assumption for regular sized shocks
- Increasing adjustment proba is needed for large cost shocks

  $\Rightarrow$ Non-linear pass-through of marginal costs to prices
- Random menu cost model can deliver this non-linearity

  $\Rightarrow$ Can match dynamics of π_t over time – including 2022 inflation surge

Approach:

- Use quarterly Belgian firm-level data on prices and costs (1999–2023) to construct empirical price gaps between firms' actual and desired prices
- Use these price gaps to estimate firms' pricing policies and implied responses to shocks, inflation dynamics

Position in the Literature

- Direct evidence of state-dependent price adjustment is very limited
  - cost + price data - Eichenbaum, Jaimovich & Rebelo (2011) US retail (2004-06)
  - quasi-experimental evidence - *e.g.*, Karadi & Reiff (2019) large ΔVAT in Hungary
  - prices in high vs. low inflation settings - *e.g.*, Gagnon (2009) for Mexico, Alvarez, Beraja, Gonzalez-Rozada & Neumeyer (2019) for Argentina

- Most work on pricing frictions relies on distribution of price changes only
  - under certain conditions that can be enough to recover underlying $\Lambda(x)$ and $f(x)$ - Alvarez, Lippi & Oskolkov (2022)

Position in the Literature

$\rightarrow$ Very valuable to have disaggregated cost and price data across a wide range of firms, during a period of relatively high inflation variability

$\rightarrow$ Very valuable to have clear method for mapping disaggregated price and cost data to $\Lambda(x)$ and $f(x)$

$\Rightarrow$ Paper both anchors and opens door to large future agenda on micro price-cost dynamics

- In short: paper offers a very careful, transparent analysis, tackling a big gap in the literature

My Discussion

1. Estimating the probability of adjustment
2. Disciplining the quantitative model
3. Are we ready for implications for monetary policy?

The Probability of Adjustment

The Probability of Adjustment

- Estimate an adjustment probability that is quadratic in firms' price gaps and a reset price policy that nearly closes the price gaps

Figure 6: Empirical GHF and distribution of price gaps

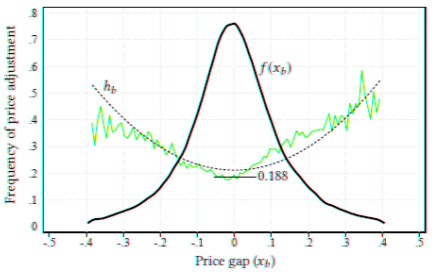
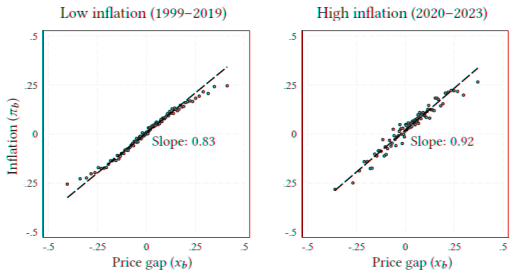
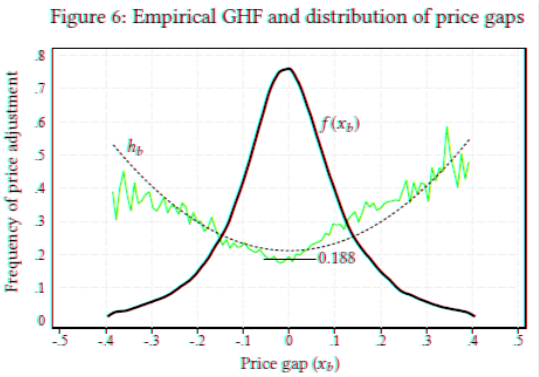


Figure 8: Price changes and price gaps, conditional on adjusting



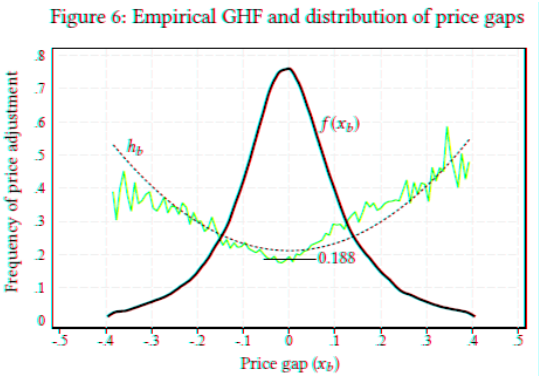
The Probability of Adjustment



- Q1: How well does this fitted GHF (based on 1999-2019 data) fit the 2020–23 adjustment data?
- Q2: How does the model-implied GHF derived from calibrated primitives compare to this empirically estimated one?

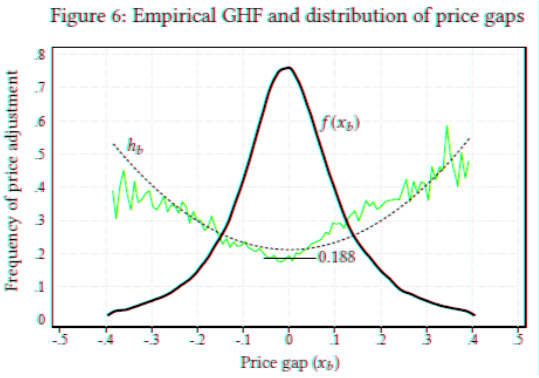
  - Could integrate the empirical and quantitative sections more

The Probability of Adjustment



- Q3: Does the average GHF mask more non-linear firm-level hazard functions?
- Pooling firms that might be heterogeneous in production technologies, nominal frictions, demand or cost variability could weaken implied state dependence
  - Could estimate hazard functions separately by industry, firm size, cost volatility...

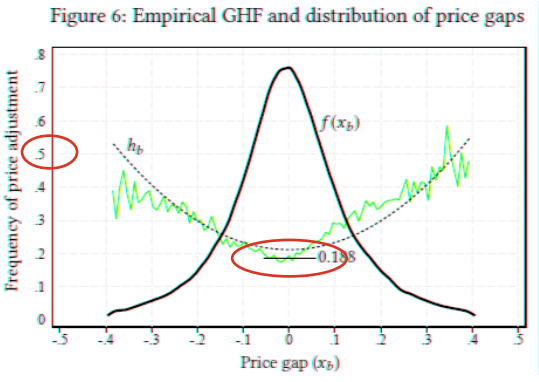
The Probability of Adjustment



- Q4: Does time aggregation reduce estimated state-dependence in normal times?
- If shocks occur and pricing decisions are made at a higher frequency, then using quarterly data could understate the sensitivity of adjustment probabilities to price gaps

  - Could simulate how much of the nonlinear adjustment might be lost when aggregating from monthly to quarterly frequency

The Probability of Adjustment



- Q4: How to define a good fit in this context?
- Empirical GHF shows partially state-dependent price adjustment: high hazard near 0 and relatively low slope

→ Menu cost distribution or measuring our ignorance about when and why firms adjust?

The Probability of Adjustment

- Weak state dependence in normal times:
  - So far: cross-sectional heterogeneity and time aggregation [within the model]
  - Additionally: adjustments orthogonal to current price gap [outside the model]
    - experimentation - Ilut, Valchev & Vincent (2020), Argente & Yeh (2022)
    - price discrimination - *e.g.*, Guimaraes & Sheedy (2011)
    - mistakes - *e.g.*, Woodford (2009), Morales-Jiménez & Stevens (2025)
    - balance sheet constraints - *e.g.*, Gilchrist, Schoenle, Sim & Zakrajšek (2017)
    - inventory adjustment - *e.g.*, Kim, Morales-Jiménez & Stevens (2025)
  - Can we use cost data to get a sharper prediction for when and why firms adjust?

The Probability of Adjustment

- Currently: Obtaining the GHF requires a series of assumptions and approximations
  - ex-ante homogeneous firms, CRTS, permanent idio and aggregate shocks
  - quadratic loss from deviating from static desired price, zero reset gap
  - uniform distribution of menu costs, exogenous proba of free price adjustment
  - full closing of price gap conditional on adjustment

- But if you are going to impose all the Alvarez, Lippi & Oskolkov (2022) assumptions (and more), then there is no need for the cost data

- Instead, cost data should enable you to relax some of these assumptions
  - especially on the menu cost distribution and on the closing of price gap
  - in US price data, Morales-Jiménez & Stevens (2025) estimate incomplete closing of price gap but strongly SD adjustment proba; moreover, omitting the former substantially dampens the latter

The Quantitative Model

Disciplining the Quantitative Model

- Parameterize a random menu cost model:
  - set variance of idio shocks, free adjustments frequency, and max menu cost
  - to match empirical hazard near 0, frequency, and variance of Δp
- Very reasonable approach
- However, $std(|\Delta p|)$ is super important statistic to fit
  - Morales-Jiménez & Stevens (2025) can't get sizable movements in $freq(\Delta p)$ without varying severity of nominal frictions in a model version similar to RMC
  - Blanco, Boar, Jones & Midrigan (2024) argue basic RMC model cannot match both $std(|\Delta p|)$ and comovement between $freq(\Delta p)$ and inflation

    → Big puzzle: how to reconcile weak SD in normal times (large fraction of exog. price adjustments) with large elasticity of $freq(\Delta p)$ to π_t at high π_t?

    - One resolution: firms' attention to pricing is itself state-dependent

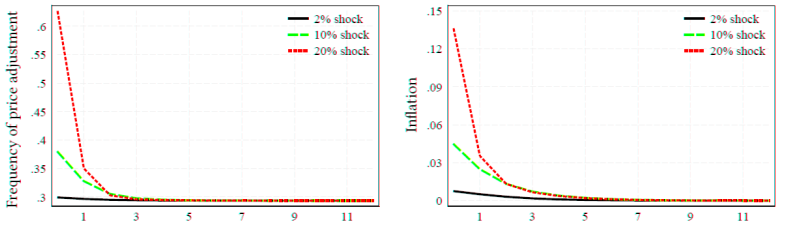
Implications for Monetary Policy?

Aggregate Non-Neutrality

- IRFs to small and large shocks

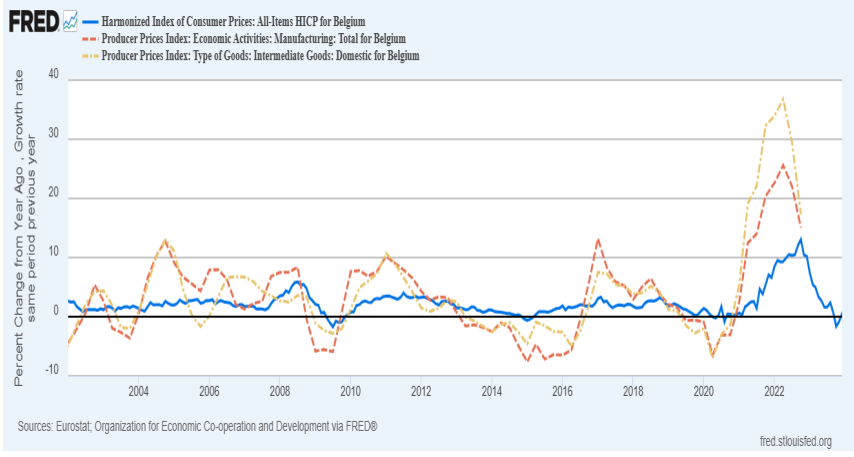
Figure 13: Impact of aggregate cost shocks in state- and price-dependent models

Panel a: State-dependent pricing (Menu costs)



Caution Needed?

- Manufacturing tends to be much more volatile and have higher pass-through than consumer prices $\Rightarrow$ may overstate state dependence of CPI



Concluding Remarks

- Valuable use of cost data to discipline price adjustment models
- Paper offers a very clear way, intuitive to map price and cost data into key underlying objects ($\Lambda(x)$ and $f(x)$)
- Shows strong state dependence in pass-through of shocks to inflation
- Opens the door to analysis of heterogeneity, introduction of other data and price adjustment motives
- Disentangling these will have important aggregate implications

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