Discussion of "Inflation, Price Dispersion, and Welfare: The Role of Consumer Search" by Francisca Sara-Zaror

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Overview

- Sticky price models: staggered price adjustment $\Rightarrow$ inefficient price dispersion
  - Relative price diffs not due to technology or prefs, but bc. of nominal rigidity
- Inflation **increases** inefficient price dispersion $\Rightarrow$ increases welfare losses of nom. rig.
- This paper: Not if it triggers additional consumer search!
  - Search incentivizes low-cost producers to reprice, in order to capture extensive margin of demand $\Rightarrow$ increases price flexibility $\Rightarrow$ lowers welfare losses
- Supporting evidence: AC Nielsen data
  - Indirect: Without consumer search, sticky price models $\not\Rightarrow$ Y-shaped rel. between product-level inflation and price dispersion near zero inflation
  - Direct: Shoppers visiting more retailers pay lower prices

Discussion

- Basic menu cost model
- Search model and quantitative assessment
- Important aggregate implications

Basic Menu Cost Model

Basic menu cost model

- Firms' environment
  - Monopolistic competition $\Rightarrow$ firms have some market power (eos η)
  - Subject to heterogeneous productivity shocks $\Rightarrow$ efficient price dispersion
  - Subject to fixed cost of price adjustment $\Rightarrow$ inefficient price dispersion

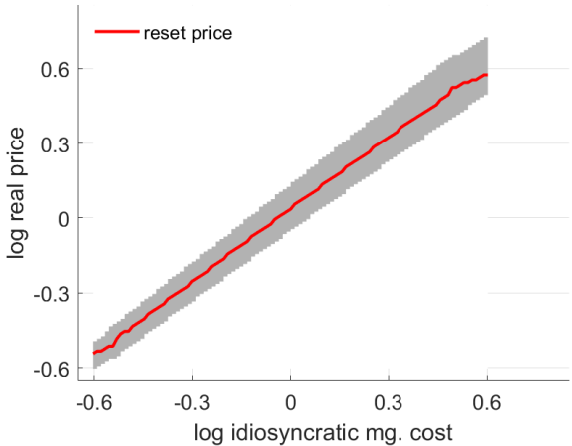
    $\Rightarrow$ Realistic price setting patterns

- Firms' policy
  - Adjustment proba: adjust w.p. 1 if $V(\text{adjust}) - \kappa > V(\text{don't adjust})$, 0 otherwise
  - Pricing rule: set $p^* = \arg\max V(\text{adjust})$

    $\Rightarrow$ Endogenous inaction bands

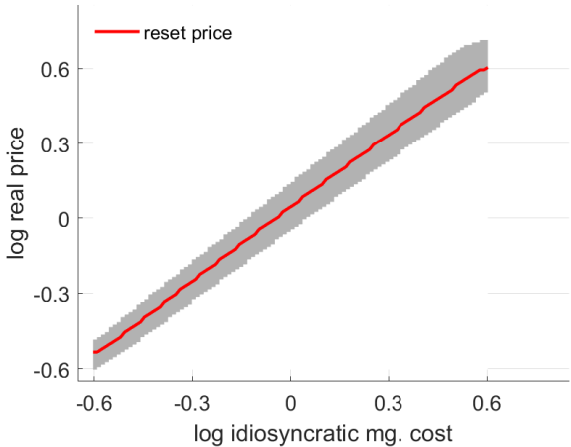
How Inflation Widens Adjustment Bands

$\pi_{ss} = 0\%$



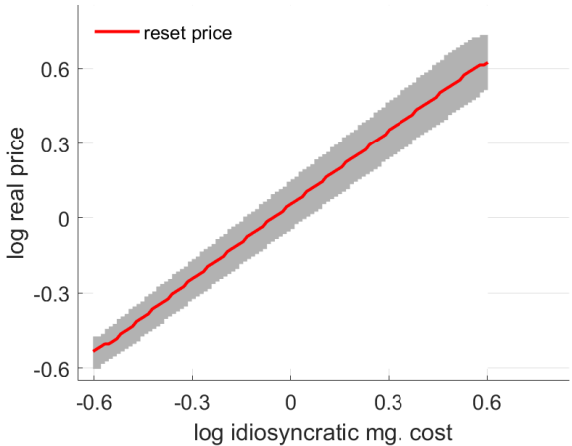
How Inflation Widens Adjustment Bands

$\pi_{ss} = 5\%$



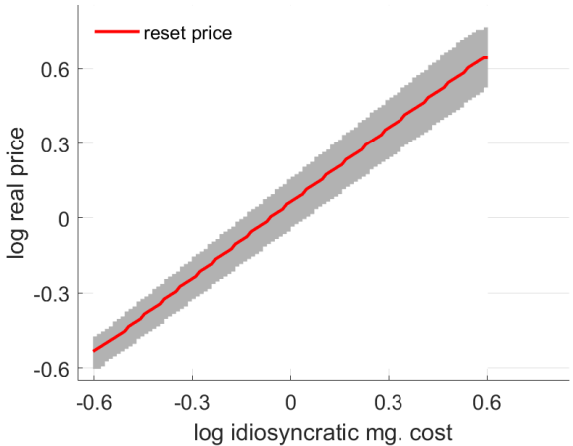
How Inflation Widens Adjustment Bands

$\pi_{ss} = 12\%$



How Inflation Widens Adjustment Bands

$\pi_{ss} = 20\%$



Inflation and Welfare Losses

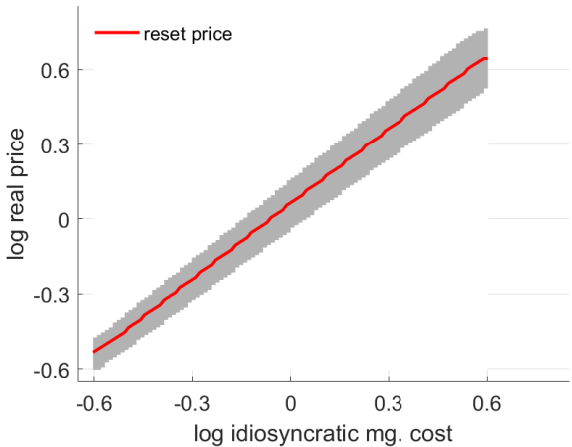
- Inflation widens Ss bands, increasing relative price dispersion
- As a result, it increases misallocation across firms, lowering consumer welfare
- Side note: menu cost model = lower bound on price dispersion effect
  - Calvo (exogenous adj. proba) is at the other extreme
  - Woodford (2009): in between, empirically desirable model: endogenous, smoothly increasing adjustment proba

Inflation, Elasticity, and Welfare Losses

- What if consumers become more price sensitive with inflation?

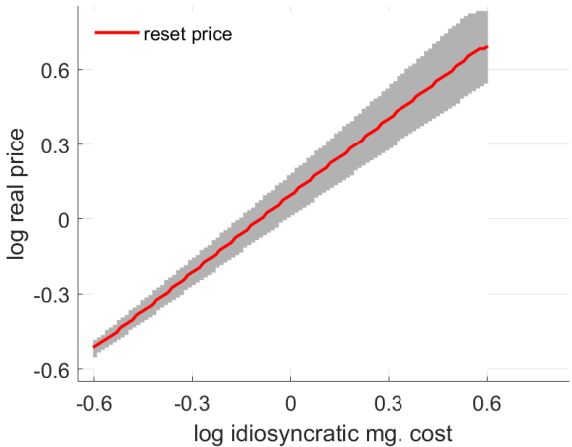
How Elasticity Changes Adjustment Bands

$\eta = 3$



How Elasticity Changes Adjustment Bands

$\eta = 3 \rightarrow 5$



Inflation, Elasticity, and Welfare Losses

- What if consumers become more price sensitive with inflation?

  $\Rightarrow$ narrower Ss bands at low marginal cost $\Rightarrow$ counteracting effect

  - \- higher inflation $\Rightarrow$ higher inefficient price dispersion
  - \+ higher elasticity $\Rightarrow$ higher efficient price dispersion

- Here: endogenized à la Benabou (1992)
  - consumers know distribution of prices, search sequentially for good prices
  - are heterogeneous in search costs $\Rightarrow$ distribution of reservation prices
  - inflation increases dispersion $\Rightarrow$ increases search

- Side note: worth comparing to Guimaraes & Sheedy (2011) : heterogeneous eos + Calvo

Endogenizing Consumers' Price Sensitivity

- Elasticity faced by a firm : intensive + extensive margin

$$\epsilon_D(p) = \begin{cases} \eta & p < \underline{r} \\ \eta + \epsilon_N(p) & p > \underline{r} \end{cases}$$

$$N(p) \equiv \int_{\Gamma(p)}^{\overline{\gamma}} \frac{g(\gamma)}{F(R(\gamma))} d\gamma.$$

- For firms with prices $>$ lowest reservation price, some shoppers will search again $\Rightarrow$ elasticity jumps up as soon as a firm goes epsilon above lowest reservation price
- The jump depends on the mass of shoppers at and near the lowest reservation price
- The higher the price, the higher the mass of shoppers who search again and the higher is the elasticity

Search Friction & Quantitative Assessment

- Zero inflation result: if there is enough mass at the lowest search cost $\Rightarrow$ bunching at the lowest reservation price $\Rightarrow$ low dispersion
  - Chahrour & Stevens (2020) get no bunching : firms with low mg costs price at constant markup over mg cost, markup decreasing to 0 until hit reservation price
    $\Rightarrow$ Result here sensitive to η, distribution of mg costs?
- Positive inflation: pre-review, some prices have become too low (eroded by inflation) ; but erosion is small so some firms won't find it worthwhile to adjust their prices up
  - With lower prices available $\Rightarrow$ consumers now search more - how many?
    $\Rightarrow$ Discipline with evidence on shape of the distribution of search costs?

Important Aggregate Implications

Implications (1)

- Small positive inflation rate may be welfare-maximizing
  - Optimal inflation rate in standard models tends to be 0
  - Yet central banks around the world target 2% inflation — why?
  - Typical explanation: reduces risk of hitting zero lower bound on policy rate
  - This paper offers an additional rationale

- Open question: At what level of inflation do consumers start paying attention and searching more?
  - Here: At 0. Also, distribution of search costs is fixed - sensible starting point
  - But prior evidence: **people often ignore inflation rates below approx 3%**
  - So: Can you get a change in behavior at inflation above zero?
  - If so $\Rightarrow$ compelling link between inattentive consumer behavior and state-dependent welfare costs of inflation

Implications (2)

- Consumers play a key role in determining the severity of inefficient price dispersion
  - In standard models: severity determined by firm-side factors (production, pricing frictions) and market structure (e.g. factor market segmentation)
  - Households treated as largely passive buyers
  - This paper:brings households back to the center
- Prior evidence on consumer search: intensity differs
  - Across the business cycle
  - Across demographic groups
- Raises new questions
  - How much does variation in consumer search behavior dampen aggregate rigidities over the cycle?
  - How much does it contribute to heterogeneous welfare losses of inflation across demographic groups?

Summary

- Work on the welfare costs of inflation tends to focus on costs of relative price dispersion brought about by nominal price rigidities
- This paper: Modest positive inflation can improve welfare by triggering enhanced competition for price sensitive customers
- Key: Consumer search
- Lots of open questions about aggregate and cross-sectional implications beyond steady state inflation costs

References

Benabou, Roland (1992), "Inflation and efficiency in search markets," *The Review of Economic Studies* 59(2): 299–329.

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Guimaraes, Bernardo & Kevin D Sheedy (2011), "Sales and monetary policy," *American Economic Review* 101(2): 844–876.

Woodford, Michael (2009), "Information-constrained state-dependent pricing," *Journal of Monetary Economics* 56(S): 100–124.