

Firm dynamics, demand amplification, and endogenous price flexibility

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These comments are personal views of the discussant and do not represent the views of the Eurosystem or the Banco de España.

This paper: How much will higher inflation and uncertainty raise investment in price flexibility?

- **State-dependent pricing** literature analyzes variation in price adjustment probability, depending on current economic conditions
- This paper looks at state-dependence from a different angle: **investment in price flexibility**.
 - Firms may pay a cost to **adopt a technology** that allows them to **adjust their prices more easily**.
 - This can be considered a form of **state-dependent pricing**, viewed from a **long-term perspective**.
- Applications:
 - Adopting electronic price tags
 - Establishing on-line sales or advertising
 - Adopting pricing via contingent contracts

- Static model of a monopolistically-competitive firm, subject to productivity shocks A
 - Closely based on Devereux (JEEA, 2006)
- Firm ω chooses between **two possible technologies**:
 - 1 Choose price **without observing the shock**
 - 2 Pay a fixed cost Ψ ; then can choose price **conditional on the shock**

- **Households:**

- Households consume a CES aggregate of products
- Households supply labor; wage W is flexible
- **Equilibrium wage** must be consistent with household's marginal utilities

- Endogenizing **fraction of firms adopting flexible pricing technology**

- Assume the fixed cost of flexibility is **firm-specific**, $\Psi(\omega)$
- **Fraction z of flexible firms** is calculated from **threshold level** of the fixed cost at which the firm is indifferent between the two technologies

- Aggregate price level averages over sticky price \bar{P} and flexible price $\tilde{P}(A)$:

$$P^{1-\theta} = \left[z\tilde{P}(A)^{1-\theta} + (1-z)\bar{P}^{1-\theta} \right]$$

- Now endogenize the number of firms N , assuming there is a **fixed cost of production** f
 - Based on Bilbiie-Melitz (2020)
- **Sequence of events:**
 - 1 Firm ω observes its fixed cost $\Psi(\omega)$, chooses **whether to adopt** flexible technology
 - 2 Sticky price firms set their prices
 - 3 Cost shock A observed
 - 4 Flexible price firms set their prices
 - 5 Firms choose whether to pay **fixed cost** f to produce
- Aggregate price level averages sticky and flexible prices, and decreases in number of entrants N :

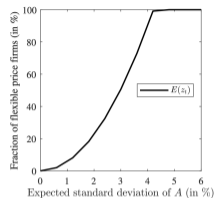
$$P^{1-\theta} = N \left[z \tilde{P}(A)^{1-\theta} + (1-z) \bar{P}^{1-\theta} \right]$$

Main findings with exogenous degree of flexibility

- For simplicity, first assume fraction z of flexible firms is **exogenous**
- How do **price flexibility** and the **entry/exit margin** alter the impact of productivity shocks?
- **Fall in output** caused by negative productivity shock **decreases with price flexibility** z if number of firms is **endogenous**
 - Instead **increases** with z if number of firms is fixed
- **Rise in prices** caused by negative productivity shock **decreases with price flexibility** z if number of firms is **endogenous**
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- Hence, allowing for **entry/exit margin reverses impact of flexibility** on economic fluctuations

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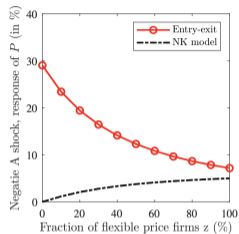
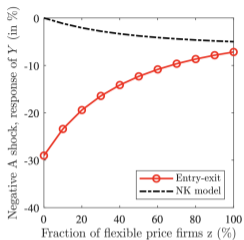
- Now **endogenize** fraction z of flexible firms
 - More volatile shocks A implies that z increases:



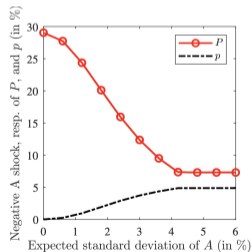
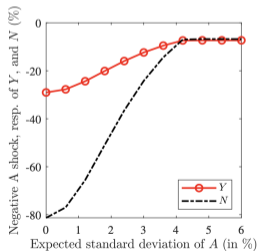
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Main findings: how price flexibility and entry/exit interact

- If z exogenous:



- If z endogenous:



Long run interpretation

- Fixed cost of permanently **adopting more flexible technology**
 - Adopting electronic price tags
 - Establishing on-line sales or advertising
 - Adopting pricing via contingent contracts
- Empirical applications of this model interpretation?
 - Direct **evidence of adoption** of pricing technologies during/after pandemic?
 - Explain cross-industry **patterns of firm exit** (and relation to adoption)
 - Evidence of **hysteresis in price adjustment** frequencies in aftermath of pandemic?

Question: Is this paper addressing long-run or short-run facts?

Short run interpretation

- Fixed cost, each period, of **buying information** about current shocks
 - That's the “**observation costs**” framework of Alvarez/Lippi/Paciello (JEEA 2018)
- Interpretation: “**price reviews**”
- Empirical applications of this model interpretation?
 - Direct evidence on **frequency of price reviews** during/after pandemic?
 - Explain cross-industry **patterns of firm exit** (and relation to price reviews)
 - Over the long run, **frequency of price reviews** should vary systematically with trend inflation or indicators of uncertainty
- Might need to reinterpret fixed cost of production, or assume different timing
 - Assume f is cost of operating a shift → study capacity utilization instead of entry?

- The paper fuses two tractable frameworks for policy analysis:
 - Devereux's (2006) model of the choice of price flexibility
 - Bilbiie and Melitz's (2020) model of the entry and exit
- Unlike Devereux, this paper does *not* analyze **optimal monetary policy**
- But paper shows that including the Bilbiie/Melitz entry/exit block **reverses** the impact of price flexibility on the transmission of shocks
 - Hence might **reverse some of Devereux's policy conclusions?**
 - Seems like studying optimal monetary policy here could be fruitful

- **An elegant model, but underemployed**
- It's true that flexibility and entry/exit interact, but *endogenous* flexibility is not needed to make that point
- **Many potential empirical implications**
 - But be more specific about time-frame you have in mind
 - Possibly explore changes in sequencing of decisions
- **Seems tractable enough for policy analysis**
 - Study optimal monetary policy

THANKS FOR YOUR ATTENTION!