Price-Setting During the Covid Era

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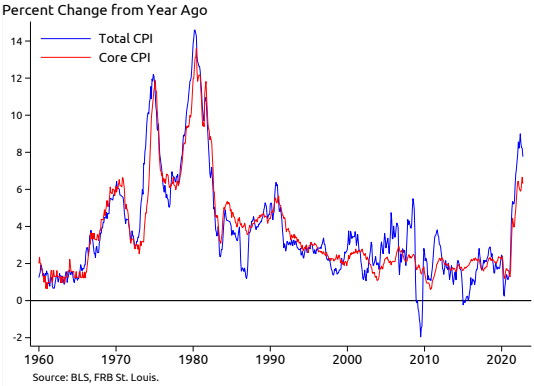
Introduction

Inflation is at 40-year highs:



- What shocks and margins of adjustment on the part of firms are responsible for this increase?
- What can this tell us about the types of price-setting frictions that firms face?

Research Question

For two decades pre-pandemic inflation has been low and stable. During Covid:

- In 2020 inflation was low
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Research Questions

- How flexible are firms at changing prices, and did this change?
- Which factors accounted for the increase in inflation?
- What does this imply for the transmission of monetary shocks?

Topic

How do firms update prices?

- State-dependent: firms change prices when too far from optimal
- Time-dependent: firms update prices depending on how long since last reset, or based on chance

Relevance

- How do firms adjust to demand shocks (i.e. pandemic)?
- What is the passthrough of monetary policy?

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Literature: Consensus approach is state-dependent (with modifications)
Limitation: **Little time variation to pin down different models in the U.S.**
Exceptions: Nakamura et al. (2018) study 1980's U.S., Alvarez et al. (2018) Argentina

This Paper

Use the U.S. CPI micro-data to estimate measures of individual price changes during the pandemic and recovery

Empirical (have results)

- Calculate frequency of price changes
- Study size of price changes
- Decomposes price changes into price increases vs. decreases
- Measure variation in price changes, across and within spending categories.

Theoretical (to come)

- Places facts in a random-cost menu model
- Infer response of the economy to monetary policy and possible changes

CPI Micro Data

Our sample:

- Commodities & Services survey: all spending categories excluding shelter
- Every month, about 90k individual prices

Product categories

- Most granular categorization: Entry Level Item (ELI), over 300 ELIs
- E.g. AA011=men's suits, FJ021=cheese and cheese products
- Calculate most statistics by ELI-month, then aggregate (median) within month using expenditure weights

Data allows us to observe individual price changes:

- BLS agents measure the price of the same item in the same outlet over time
- Exclude temporary sales and substitutions

Price change statistics

Frequency of price change

- Every period, fraction of prices that change (extensive margin)
- Also decompose into frequency of price increases and decreases
- Q: Did this move with inflation? How large was the split between increases and decreases?

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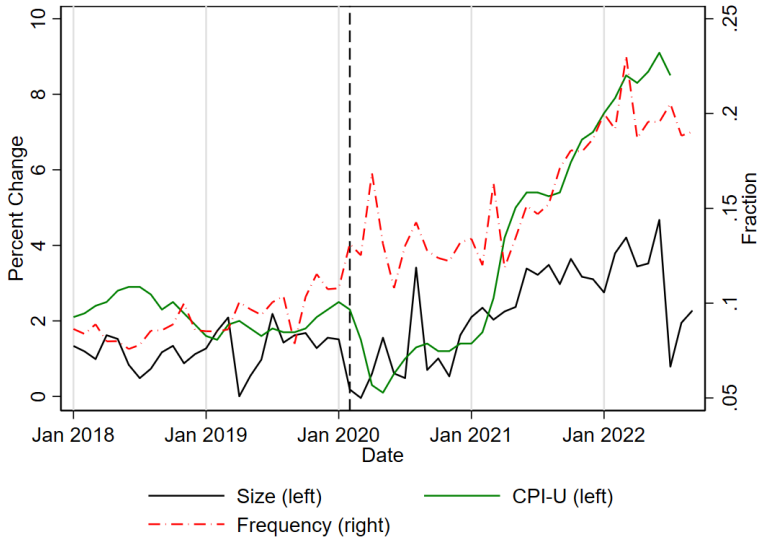
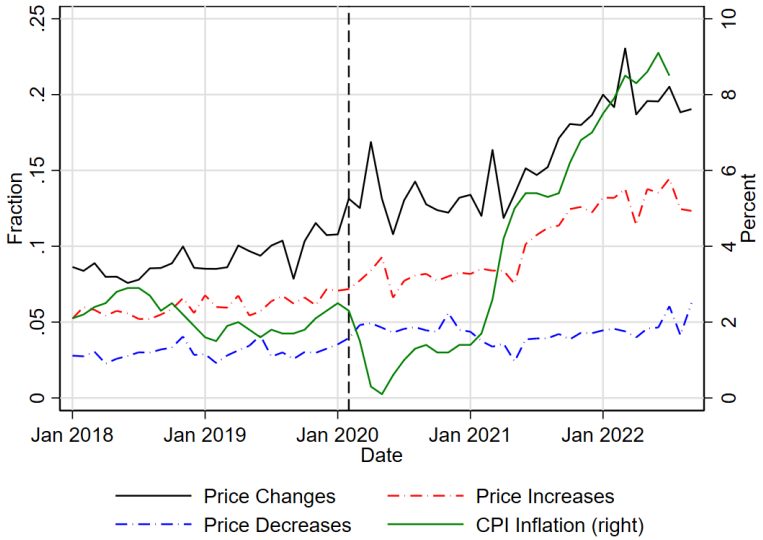
Dispersion of price changes

- Compute within and across category, based on broader ELI2
- Q: What can changes here tell us about importance of agg. vs. sectoral shocks?

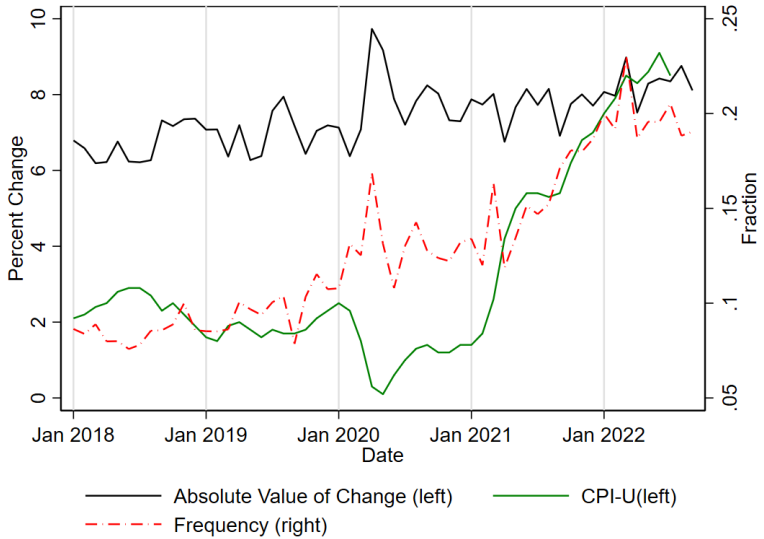
Frequency and Size of Price Change



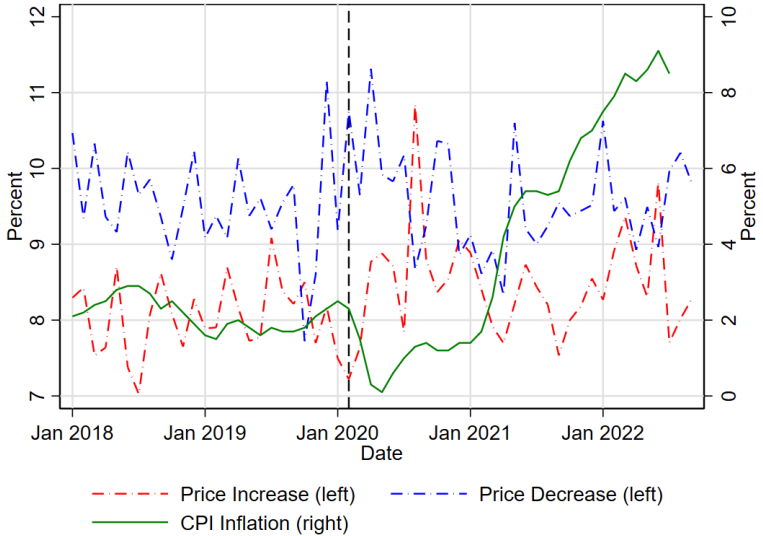
Frequency of Price Increases and Decreases



Frequency and Absolute Value of Price Changes



Size of Price Increases and Decreases



Implications for Sticky Price Models

Results so far:

- Frequency of price change increases meaningfully when inflation takes off
- Absolute value essentially flat since start of the pandemic
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Generally consistent with state-dependent models, not time-dependent

- First two facts support state-dependent, third fact consistent with both
- Similar to what Nakamura et al. (2018) found for moderately high inflation in the U.S.
- Implies that degree of inefficient price diserpsion did not increase

Additional Analysis

Accounting for the increase in inflation

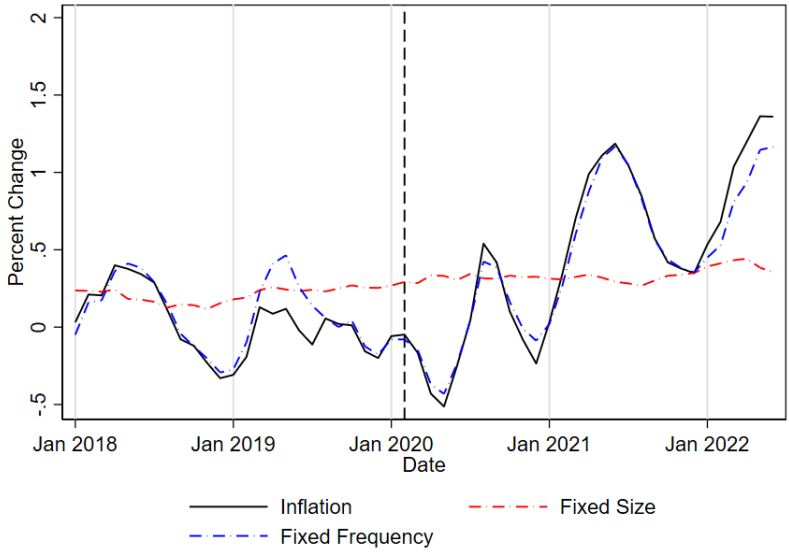
- Inflation can be decomposed into an extensive and intensive margin: $\pi_t = fr_t \cdot dp_t$
- Construct two counterfactual inflation series:

$$\pi_t^f = \bar{fr} \cdot \mathrm{dp}_t$$
$$\pi_t^s = \mathrm{fr}_t \cdot \bar{dp}$$

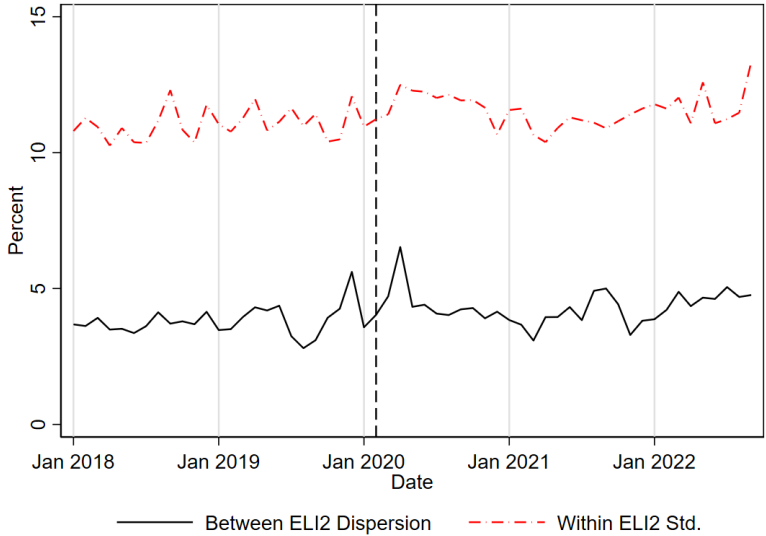
Dispersion of price change

- Under state-dependent pricing in inflation is driven by aggregate shocks, price change dispersion should fall
- If sectoral or firm-specific shocks played an important role, should be visible in dispersion
- Compute dispersion across and within categories separately

Decomposing Inflation



Dispersion of Price Changes



Conclusion

- Surge of inflation represents a massive economic challenge, reflects enormous changes to the economy
- Also a significant test of theories of price setting under frictions
- We document basic facts from the CPI micro data: frequency, size, dispersion of price changes
- Patterns are generally consistent with state-dependent models
- Still to do: apply patterns from the micro data to a quantitative price setting model
- What can we learn about how stickiness has changed? Monetary non-neutrality? The slope of the Phillips Curve?