The Dominant Role of Expectations and Broad-Based Supply Shocks in Driving Inflation By Beaudry, Hou & Portier

Discussion at the NBER Macroeconomics Annual

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London School of Economics

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Background: the Flat Phillips Curve before 2020

The Phillips Curve:

$$\pi_t = \beta \pi^e_{t,t+1} - \kappa \tilde{u}_t + \varepsilon_t$$

Background: a flat Phillips Curve from 1978-2020, κ positive but near zero

(e.g. Kiley 2015; Blanchard 2016; Stock & Watson 2019; Ball & Mazumder 2011, 2019; Del Negro et al 2020; Hazell et al 2022)

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Explains major inflation episodes during 1978-2020:

- Missing Disinflation during the Great Recession
- Missing Reinflation during late 1990s and late 2010s
- Fall in inflation during Volcker Disinflation from changes in π^e

The Flat Phillips Curve: Post Hoc Theorizing?

> *"Unfortunately, researchers have repeatedly needed to modify the Phillips curve to fit new data. Friedman added expected inflation to the specification in Samuelson and Solow (1960). Subsequent authors have added supply shocks, time variation in the Phillips-curve slope, and time variation in the natural rate of unemployment. Each modification helped explain past data, but, as Stock and Watson (2010) observe, the history of the Phillips curve "is one of apparently stable relationships falling apart upon publication."*"
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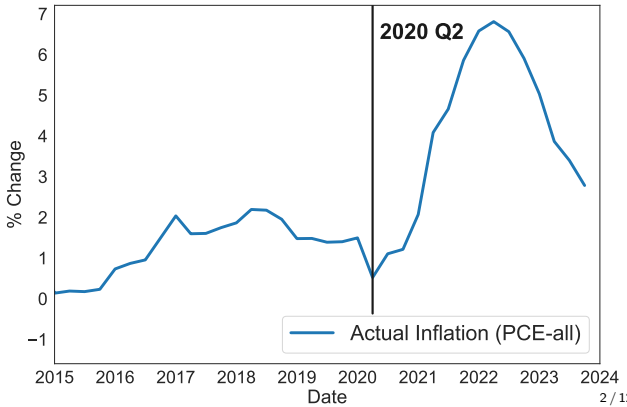
This paper: can the flat pre-2020 Phillips Curve explain the 2020s inflation?

- Or post hoc theorizing that "falls apart"?
- If so, Phillips Curve of questionable value ...



The Flat Phillips Curve before 2020: An Illustration

Estimate by OLS:

$$\pi_t = \beta \pi^e_{t,t+4} - \kappa \tilde{u}_t + \gamma e_t + \varepsilon_t$$

- π_t: PCE headline inflation
- $\pi^e_{t,t+4}$: 1 year expectations (Michigan)
- $\tilde{u}_t$: Unemployment gap (CBO)
- e_t: PCE energy inflation
- Sample: 1984Q1-2020Q1

Note: ignores omitted variable bias from ε_t

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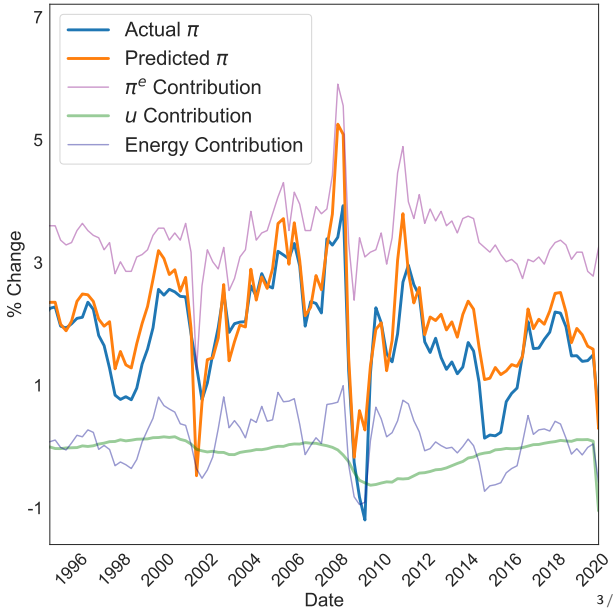
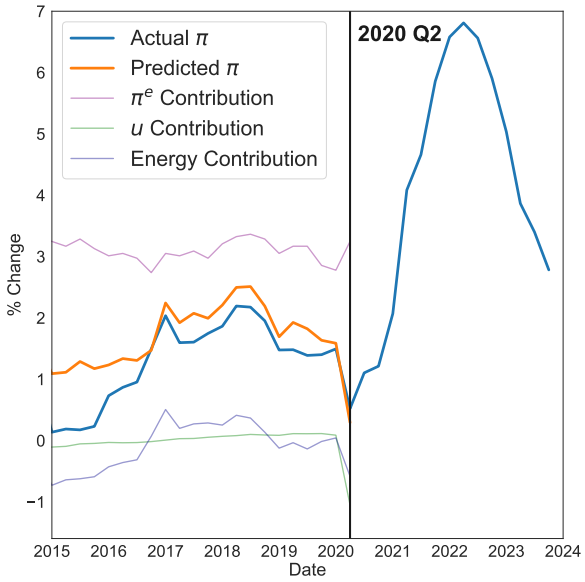
Flat Phillips Curve: u_t contribution to π_t small

- Despite big changes in u_t



Contribution #1: the Flat Phillips Curve Fits After 2020

Does pre-2020 Phillips Curve fit post-2020?



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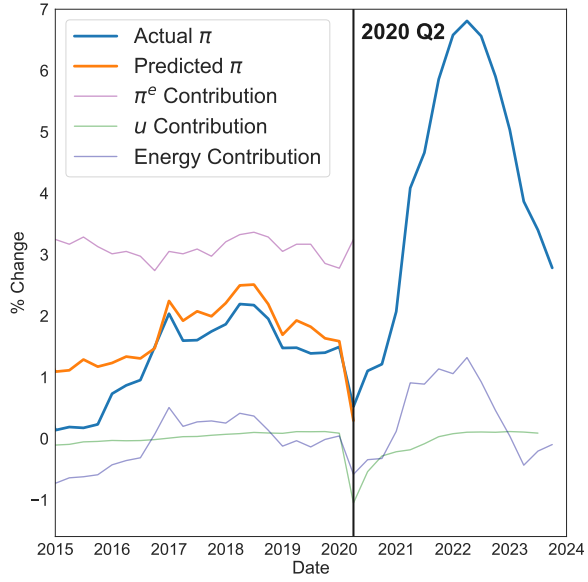
- u_t or energy contribution is small



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Should we modify the Phillips Curve to fit 20s?

- Nonlinear Phillips Curve?
  (Benigno & Eggertsson 2023; Blanco et al 2024)
- New measures of slack, e.g. tightness?
  (Ball et al 2022)
- New shocks, e.g. bottlenecks?
  (Bai et al 2023; di Giovanni et al 2023)
- New theories, e.g. FTPL?
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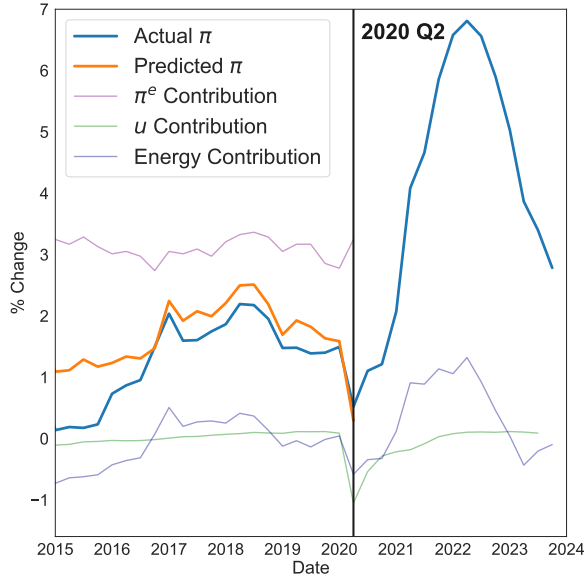

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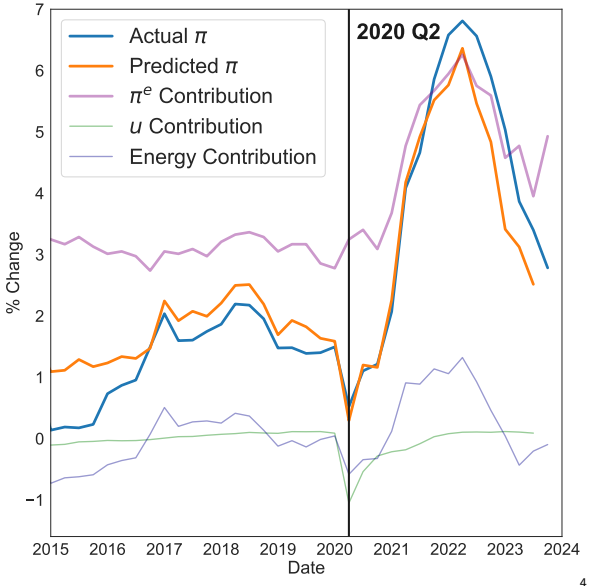
This paper: pre-2020 Phillips Curve fits post 2020 **well + out of sample**

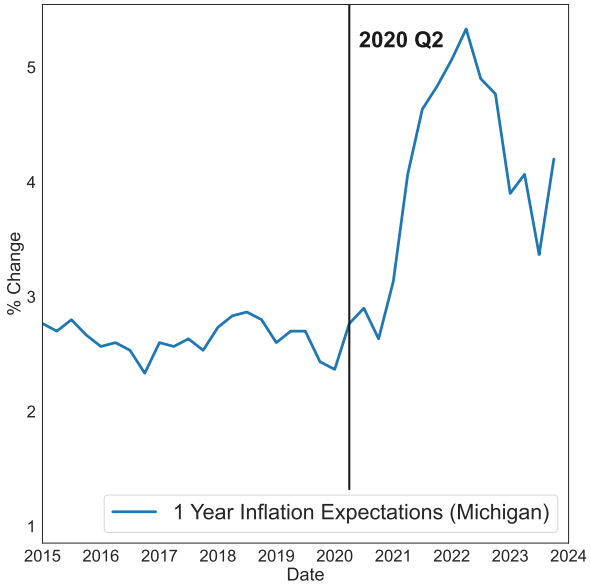
- Rising π^e accounts for rising π

$\rightarrow$ No need for new modifications



Contribution #2: Theory of Rising Inflation Expectations

Proximate cause of higher π is higher π^e



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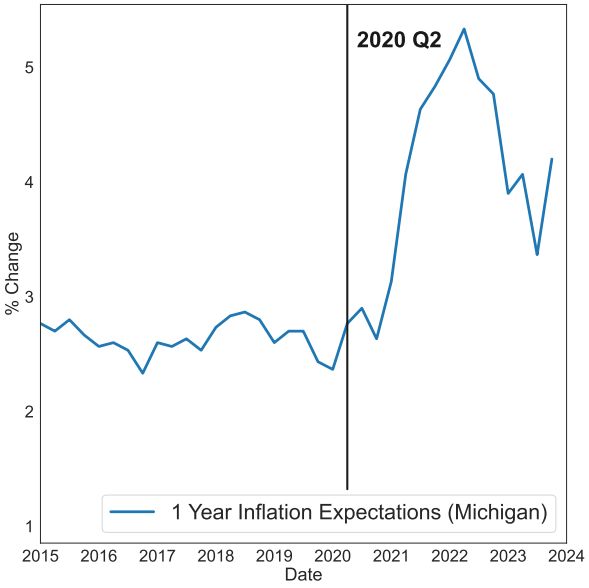
Theory with incomplete info. + bounded rationality:

- People perceive inflation as common component $\tilde{z}_t$ + sectoral supply shocks $\tilde{e}_{jt}$
- Infer $\tilde{z}_t$ based on subset of sectors J
- E.g. people extrapolate overall inflation expectations from rent, food and gas



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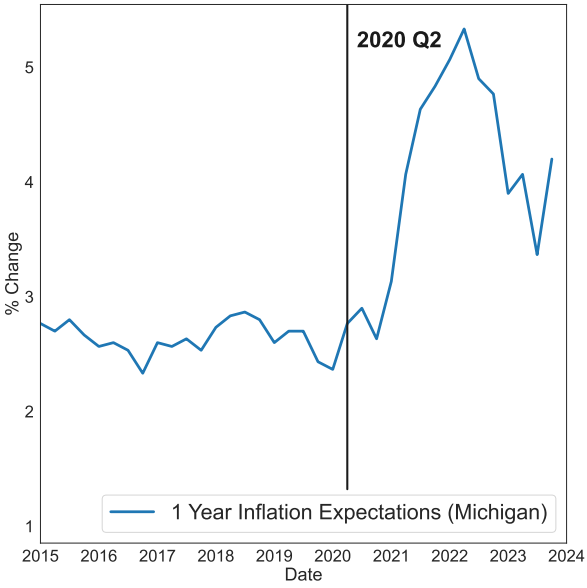
Broad based supply shocks increase π^e

- E.g. supply shocks to rent + food + gas increase overall inflation expectations

Indirect effect of supply shocks on π_t via π^e different from direct effect on marginal costs



Recap of the Paper

This paper is great.

1. The flat pre-2020 Phillips Curve fits the 2020s inflation, due to rising π^e
   - Out of sample explanation using a standard model
   - Contrasts with range of 2020s specific modifications to Phillips Curve

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Advantages:

- Pre-2020 model avoids post hoc theorizing
- Parsimonious model remarkably successful
- Unified equation for all major inflation episodes post 1960s

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- Pre-2020 model avoids post hoc theorizing
- Parsimonious model remarkably successful
- Unified equation for all major inflation episodes post 1960s

2. *Why did inflation expectations rise?*
   - Novel, plausible and quantitatively successful theory of rising π^e due to broad based supply shocks

Some Comments

1. Choice of Michigan household inflation expectations matters, but reasonable choice ex ante

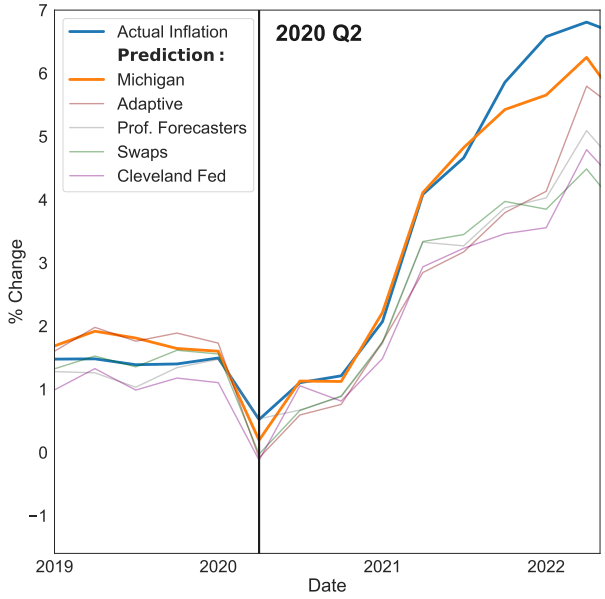
2. Fiscal stimulus potentially matters even with flat Phillips Curve

3. What are the "broad based supply shocks"?

Choice of Michigan Household Survey Expectations Matters

Pre-2020 Phillips Curve with various π^e:

- Michigan fits post 2020 best π_t
- Other measures of π^e may require nonlinearity (Benigno & Eggertsson 2023)



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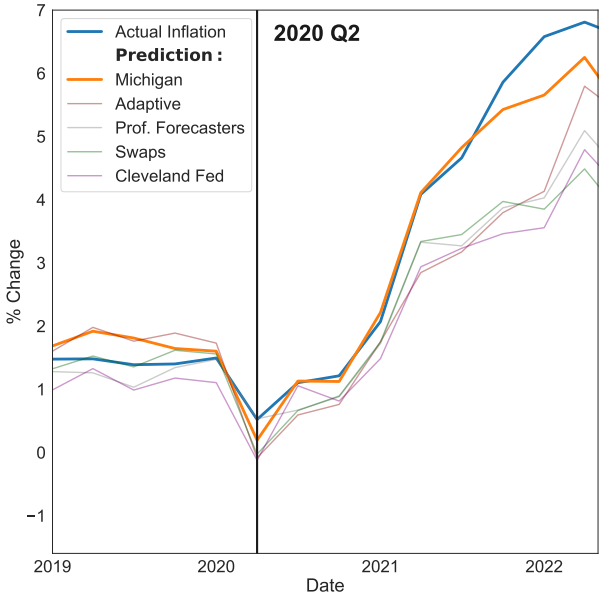
Michigan ex ante reasonable measure

- Better performance prior to 2020s inflation (Coibion & Gorodnichenko 2015)
- Household π^e arguably better proxy than professional π^e for firm π^e
- Not post hoc theorizing



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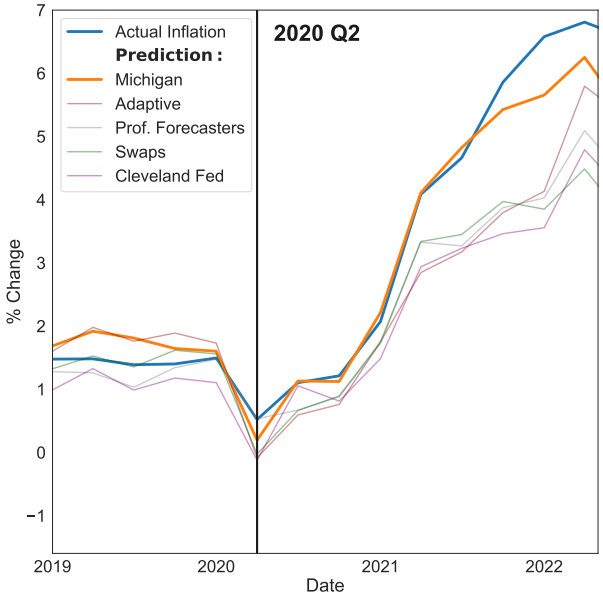
Takeaway: Michigan is reasonable

→ Important for future research



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Fiscal stimulus:

- 13% of annual 2020 GDP in late 2020 + early 2021 stimulus (Consolidated Appropriations + American Rescue)
- Inflation rises afterwards

\+ 10% of 2020 GDP in early 2020 (CARES Act)

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Possible alternative cause of inflation:

- Large and persistent demand shock from fiscal stimulus caused π, π^e to (rationally) rise
- Given a flat but positive sloped Phillips Curve

Fiscal Stimulus Potentially Matters Even With Flat Phillips Curve

Phillips Curve—in terms of output + solving forward π^e term

$$d\pi_t = \kappa_y \mathcal{M} E_t \sum_{j=0}^{\infty} \beta^j \frac{dG_{t+j}}{\bar{Y}} \quad \mathcal{M} \equiv \frac{E_t \sum_{j=0}^{\infty} \beta^j dY_{t+j}}{E_t \sum_{j=0}^{\infty} \beta^j dG_{t+j}}$$

where $\mathcal{M}$ is "cumulative multiplier" (Ramey & Zubairy 2018)

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Annual calibration w/ flat Phillips Curve, $\kappa_y = 0.08$ (Hazell et al 2022; Beaudry et al 2024)

- Fiscal shock $= 0.13$ (excludes Mar 2020 stimulus, includes Dec 20 + Mar 21 stimulus)
- $\mathcal{M}$ potentially as high as 2—Fed "behind the curve" + deficit financing (Auclert et al 2024; Angeletos et al 2024)

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Implies effect of fiscal stimulus on inflation $\approx$ 2.2pp vs. PCE inflation in 2022 of $\approx$ 6.4%

$\rightarrow$ Fiscal stimulus potentially important for inflation even w/ flat Phillips Curve

- Because fiscal stimulus was very large (Blanchard 2021, Summers 2021)

Hazell & Hobler (2024): fiscal stimulus important for post 2020 inflation even w/ flat Phillips Curve

- Using "high frequency narrative evidence" + two agent bond-in-utility model (Auclert et al 2024)

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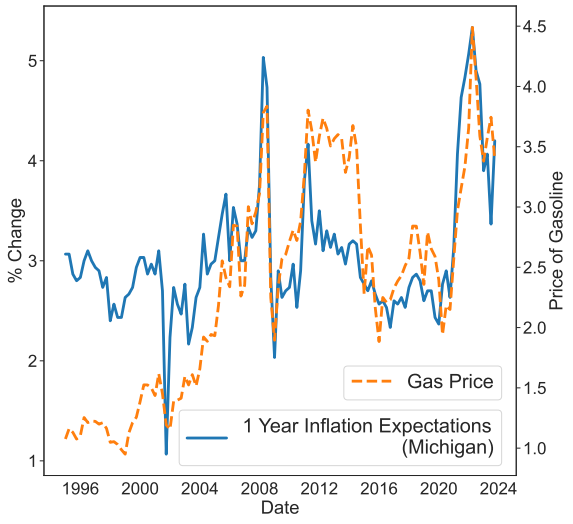
What Are the Broad Based Supply Shocks?

Conventional view:

- Higher gas prices unanchor π^e
  (e.g. Coibion & Gorodnichenko 2015)



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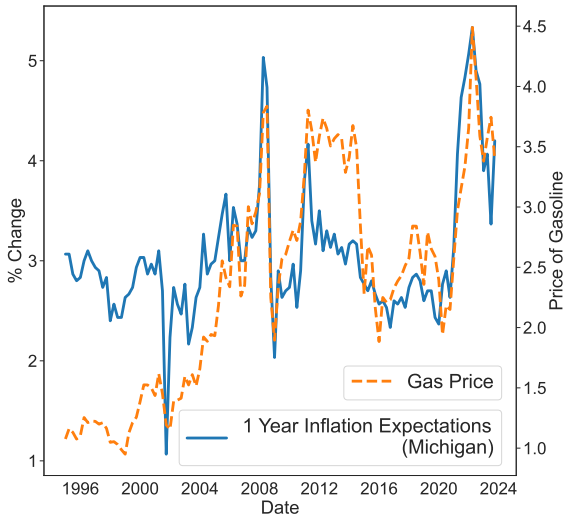
- Also food and housing? Others?



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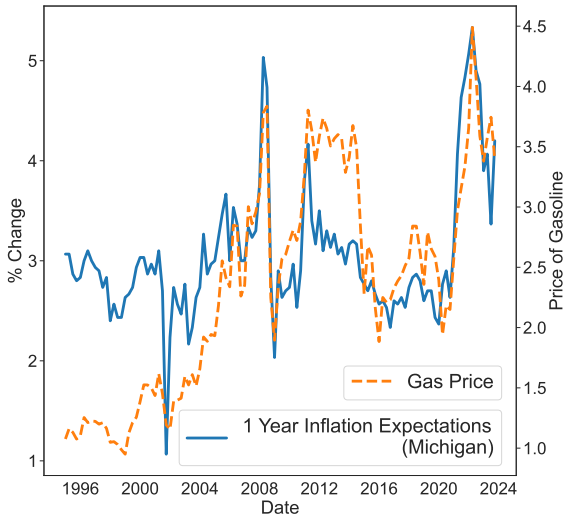
Important which sectors matter:

- Determines which inflation index matters (e.g. core vs. headline)
- Useful for policymakers detecting unanchoring



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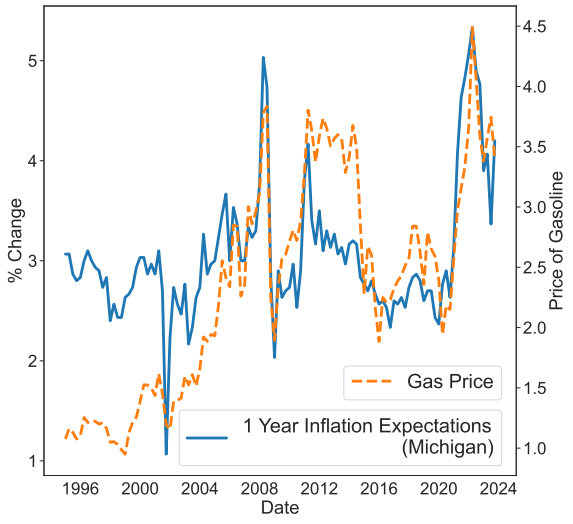
→ Another great direction for the future



Conclusion

This is a great paper.

- Flat pre 2020 Phillips Curve explains post 2020 inflation
- Higher inflation expectations proximate cause of higher inflation
- New theory links inflation expectations to "broad based supply shocks"

Some comments:

- Household expectations matters and the correct choice ex ante
- Fiscal stimulus important for inflation even with flat Phillips Curve
- What are the "broad based supply shocks"?