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Inflation Expectations

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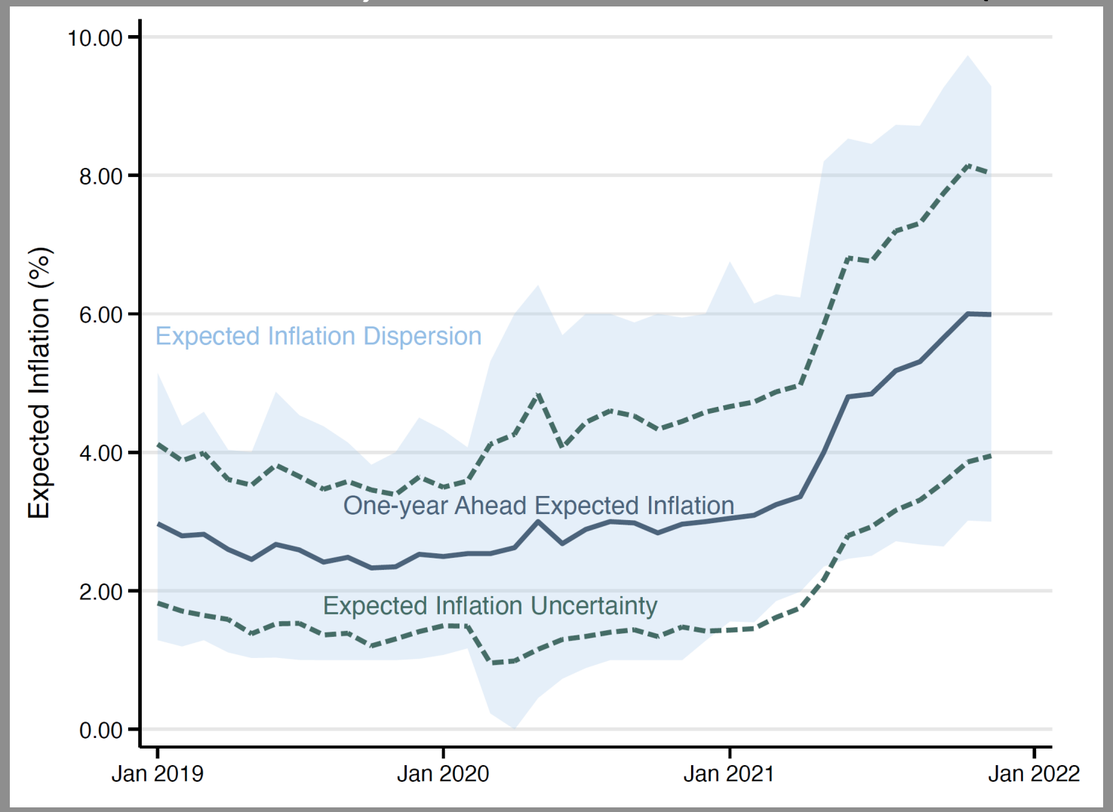
PRINCETON

Inflation Anchor

- Forward not backward looking, but interlinked
- How long are inflation expectations anchored?
  - Belief: Anchored = inflation is temporary and returns to target inflation
  - Allows central bank to **smooth out shocks**
    ⇒ Resilience (bounce back)
  - **Overstretch** it and anchor breaks
    ⇒ Resilience breaks (Amplification)
- High cost of “re-anchoring”
  - Rebuilding trust/reputation
  - Volcker recession

Inflation Anchor: Uncertainty and Disagreement

- Higher order **beliefs coordination**
  (convention, common knowledge (David Lewis))
  - *Disagreement*
  - *Uncertainty* what others' belief (about others' beliefs …)



Source: NYFed

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- Strengthening the inflation anchor:
  - Focal point on anchor
  - + no other focus point:
    creates confusion/uncertainty about alternative beliefs

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  - + no other focus point:

- Trust in/reputation of central bank
  - Policy mistake vs. exogenous/geopolitical shock
  - New unclear monetary policy regime
    ⇒ coordinating to CK beliefs is difficult

Inflation Expectations: Salience

- What drives citizens' inflation expectations?
  - New Keynesian Perspective:
    - Staggered price adjustment + strategic complementarities
  - Salience of certain prices?
    - Milk, gasoline, chocolate (in Germany)
    - Why do energy prices carry so much weight?
      - Geopolitical situation
  - Why are certain prices flexible others not?

Poll

1. What sources do you use to form your inflation expectations?
   a. Media
   b. Professional forecasters
   c. Government
   d. Personal shopping experience
2. What is your best guess about the annual inflation rate that the Federal Reserve tries to achieve on average over long periods of time?
   a. 0% b. 2%
   c. 3% d. 5%
3. What is the price of gas per gallon today in the US?
   a. $2.53 b. $3.53
   c. $4.23 d. $4.53

INFLATION EXPECTATIONS

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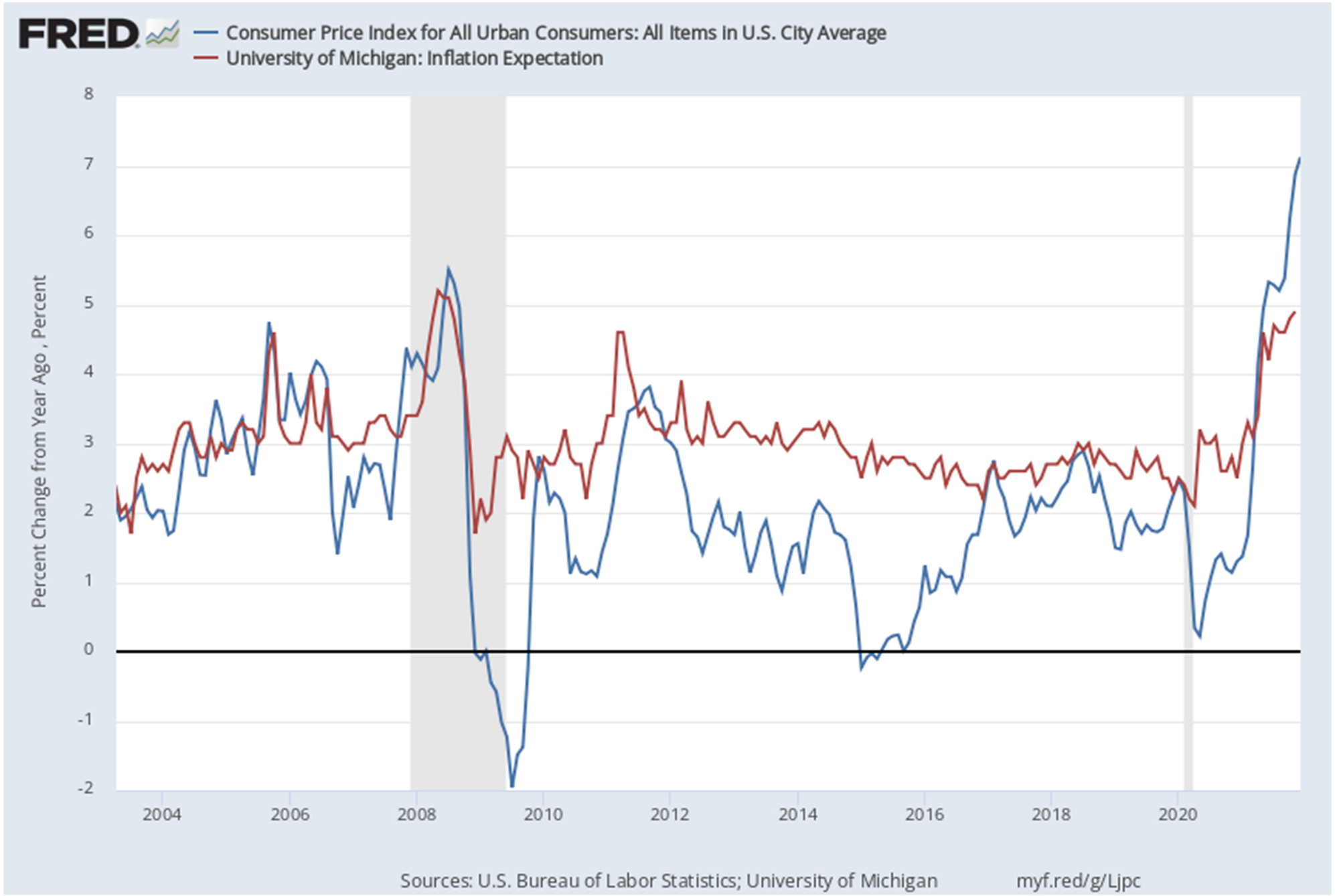
Inflation and Inflation Expectations



WHY SO MUCH TALK ABOUT INFLATION EXPECTATIONS?

Inflation expectations play a central role in almost all key economic decisions

- Prices and wages (Phillips curve): $\pi_t = E_t\pi_{t+1} + \gamma * gap_t$
- Consumption decisions (Euler eqtn): $c_t = E_t c_{t+1} - \sigma[i_t - E_t\pi_{t+1}]$
- Investment decisions (Tobin's Q): $Q_t = MP_K/[i_t - E_t\pi_{t+1} + \delta]$
- Asset prices: $P_t^{stock} = E_t D_{t+1}/(i_t - E_t\pi_{t+1}) + E_t P_{t+1}^{stock}$
- Central bank decisions (Taylor rule): $i_t = \varphi_\pi E_t\pi_{t+h} + \varphi_x E_t x_{t+h}$

INFLATION EXPECTATIONS: STATE OF KNOWLEDGE

- Alan Greenspan (1994): "I am not saying what [inflation expectations] is a function of. We know it's a very difficult issue, but that is the key variable. It's important, but just because we can't make a judgment as to what these driving forces are in an econometric sense doesn't mean that it's not real."

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- Ben Bernanke (2007): "How should we measure inflation expectations, and how should we use that information for forecasting and controlling inflation? I certainly do not have complete answers to those questions, but I believe that they are of great practical importance. … Information on the price expectations of businesses--who are, after all, the price setters in the first instance--… is particularly scarce."

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- Janet Yellen (2016): "Perhaps most importantly, we need to know more about the manner in which inflation expectations are formed and how monetary policy influences them."

HOW DO AGENTS FORM THEIR EXPECTATIONS?

- Frameworks:

- Non-rational expectations (adaptive)

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HOW DO AGENTS FORM THEIR EXPECTATIONS?

- Frameworks:
  - Full-information rational expectations (FIRE)
  - Sticky-information
  - Noisy information

  } Rational Expectations models subject to frictions/costs.

  - Bounded rationality
  - Learning

  } Rationality but no knowledge of the economy structure.

  - Non-rational expectations (adaptive)

MEASURING INFLATION EXPECTATIONS

- Are rational expectations consistent with micro-level evidence provided by survey data?
  - Pervasive deviations from FIRE in survey data
  - FIRE may be a good proxy in the long run

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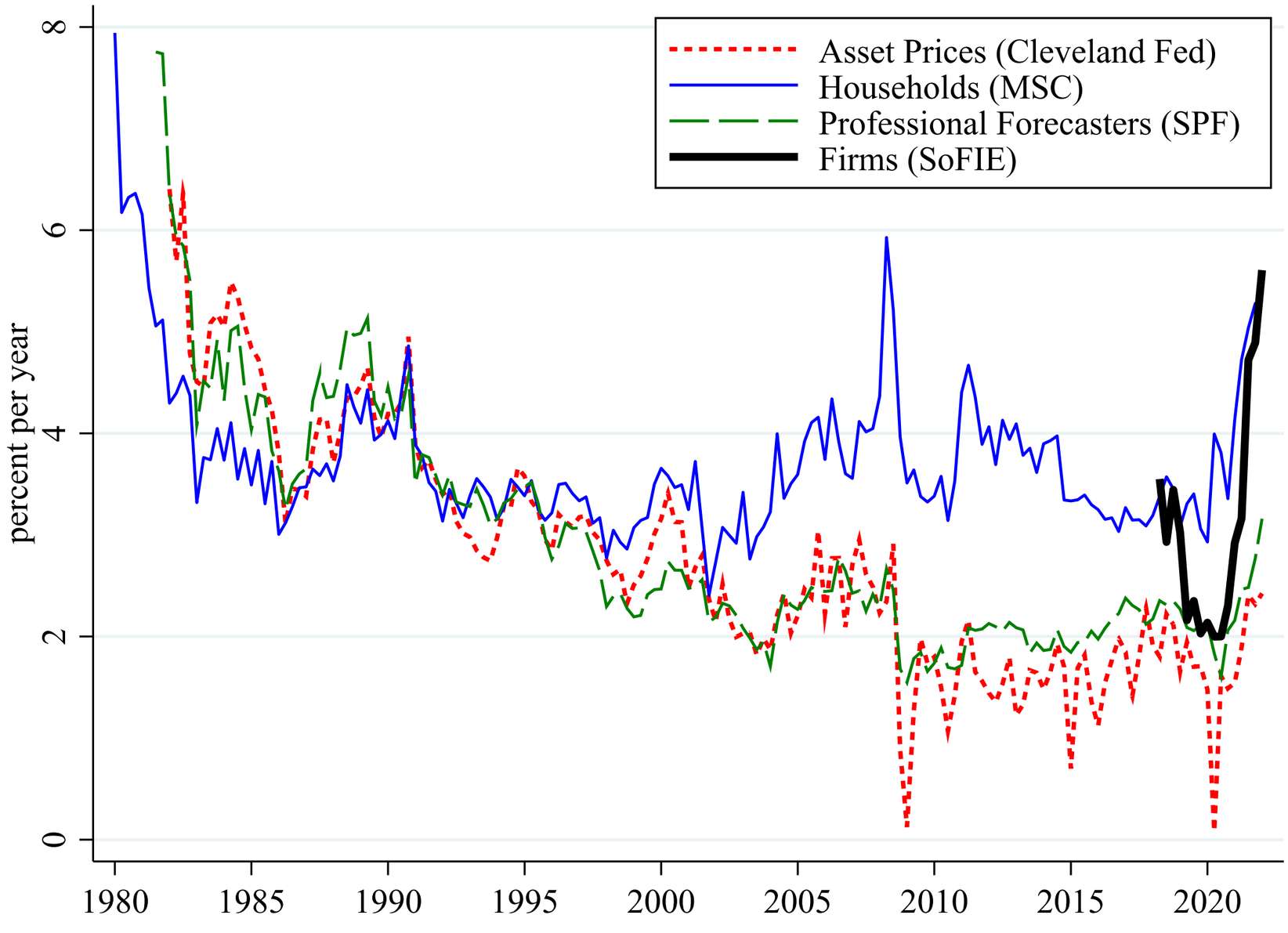
- Are rational expectations consistent with micro-level evidence provided by survey data?
  - Pervasive deviations from FIRE in survey data
  - FIRE may be a good proxy in the long run
- Vast literature but some macroeconomists are skeptical…

Prescott (1977): "Like utility, expectations are not observed, and surveys cannot be used to test the rational expectations hypothesis. One can only test if some theory, whether it incorporates rational expectations or, for the matter, irrational expectations, is or is not consistent with observations"

WHOSE EXPECTATIONS SHOULD WE USE?



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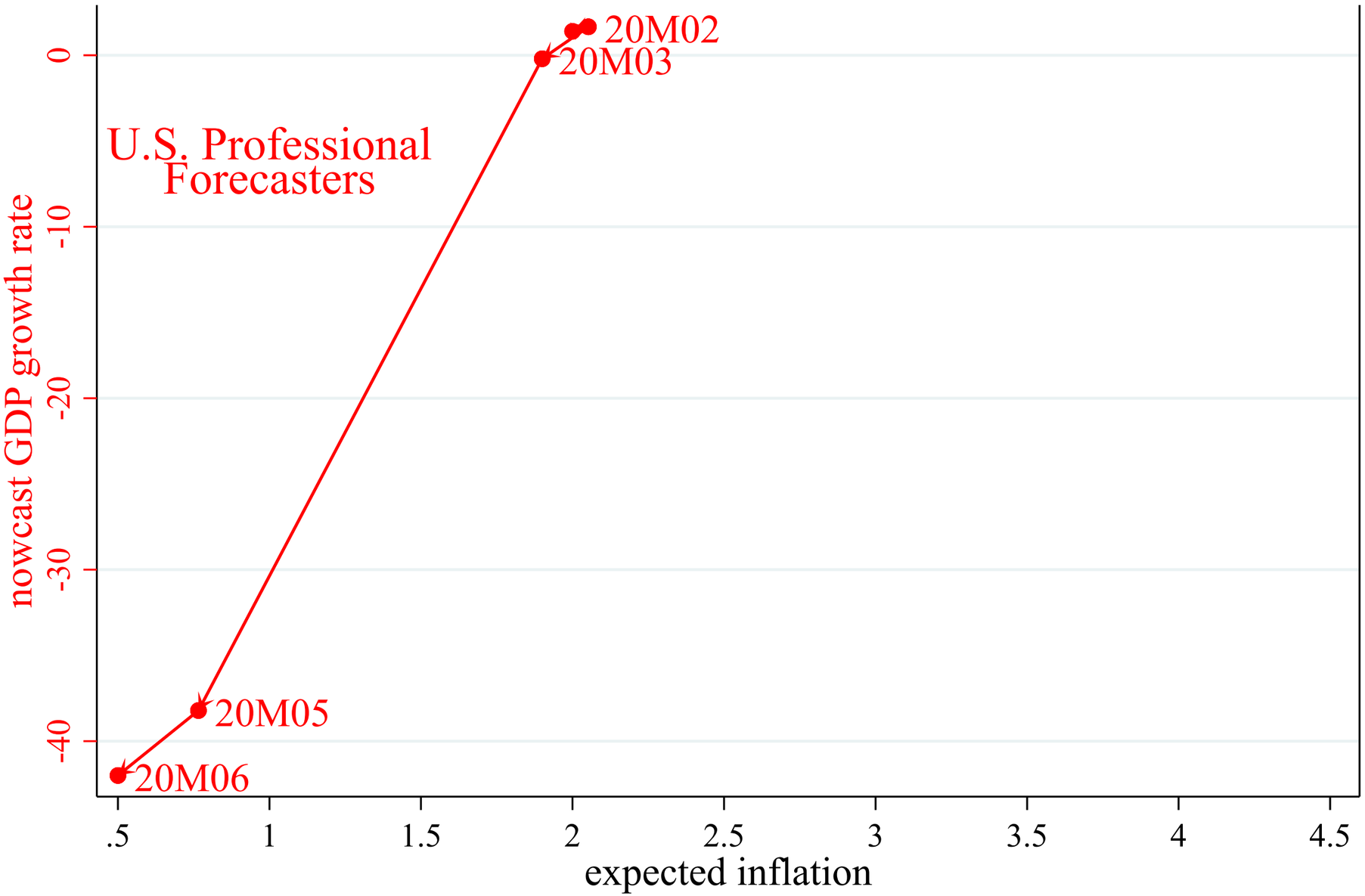

Professionals: Demand shock & a Phillips curve

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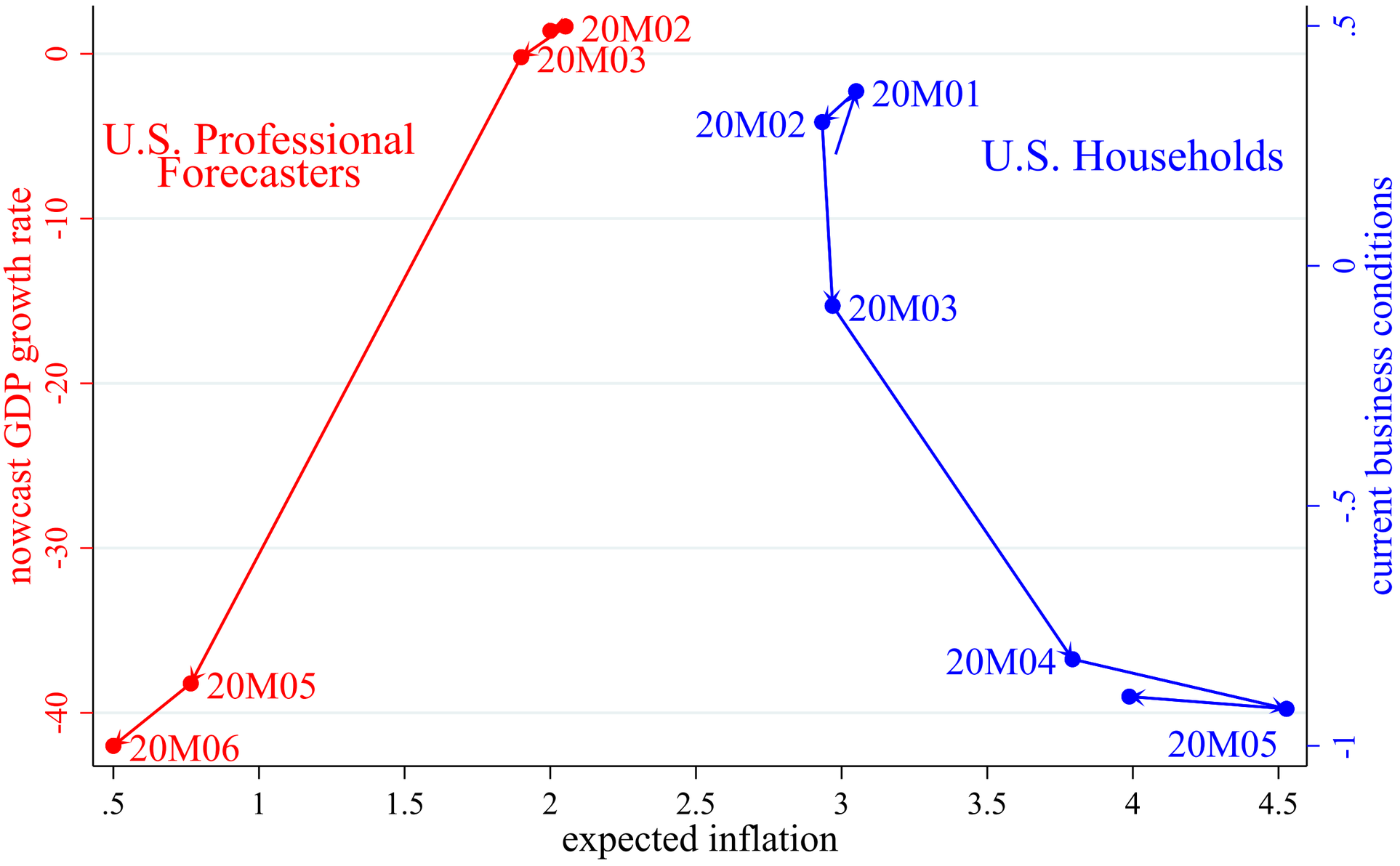
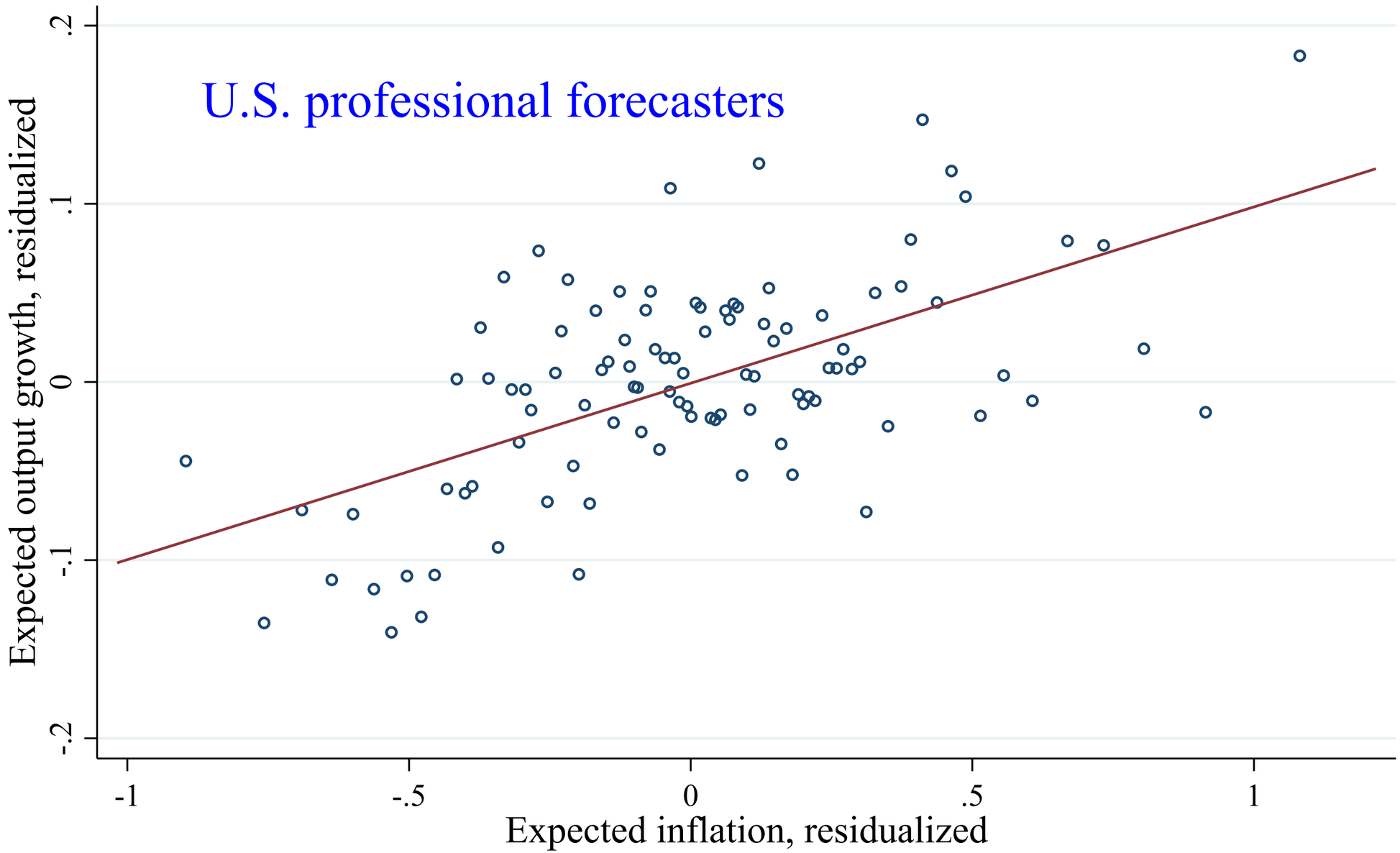


Households: Supply shock & stagflationary view

PROFESSIONAL FORECASTERS AND ECONOMIC ACTIVITY



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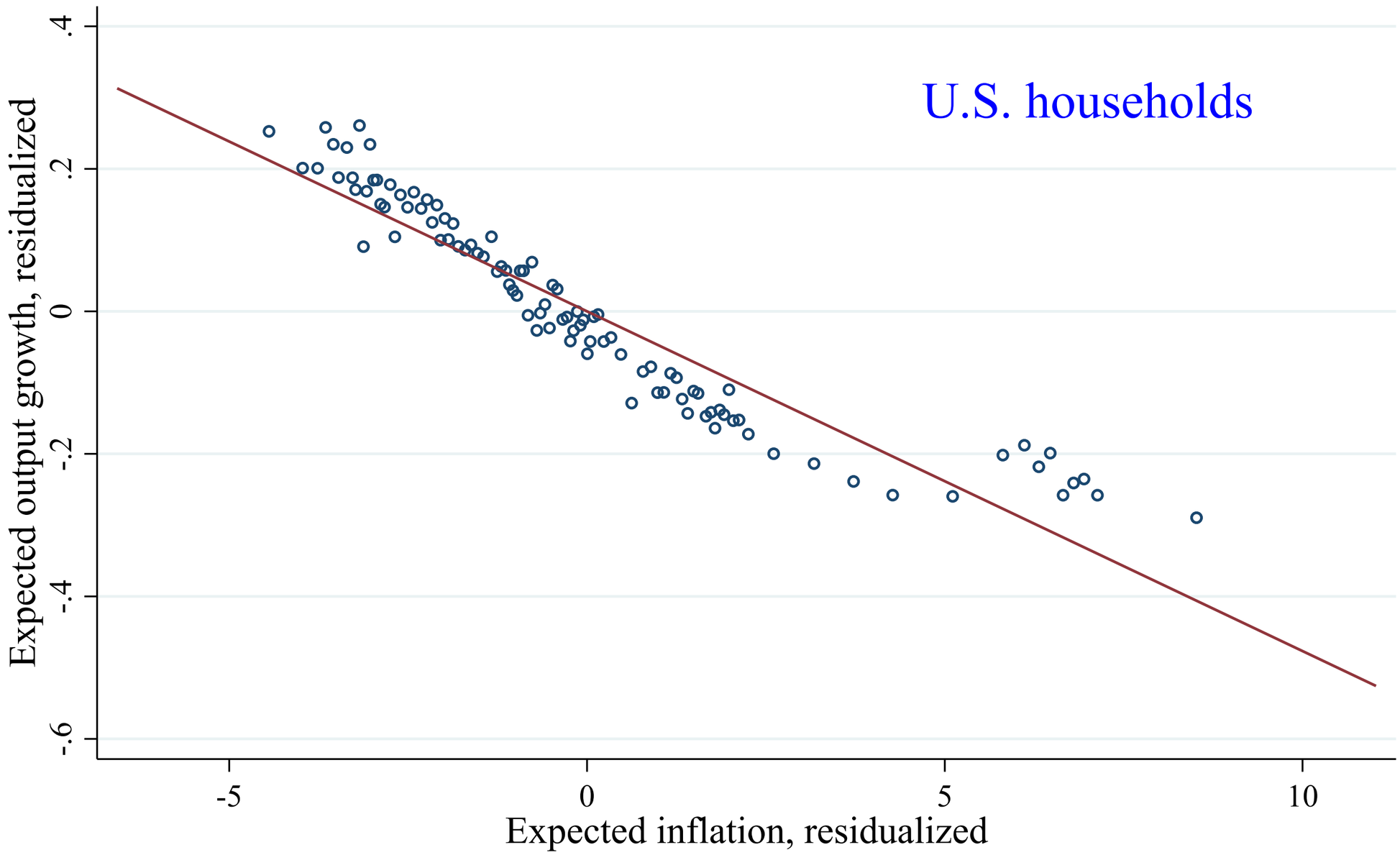

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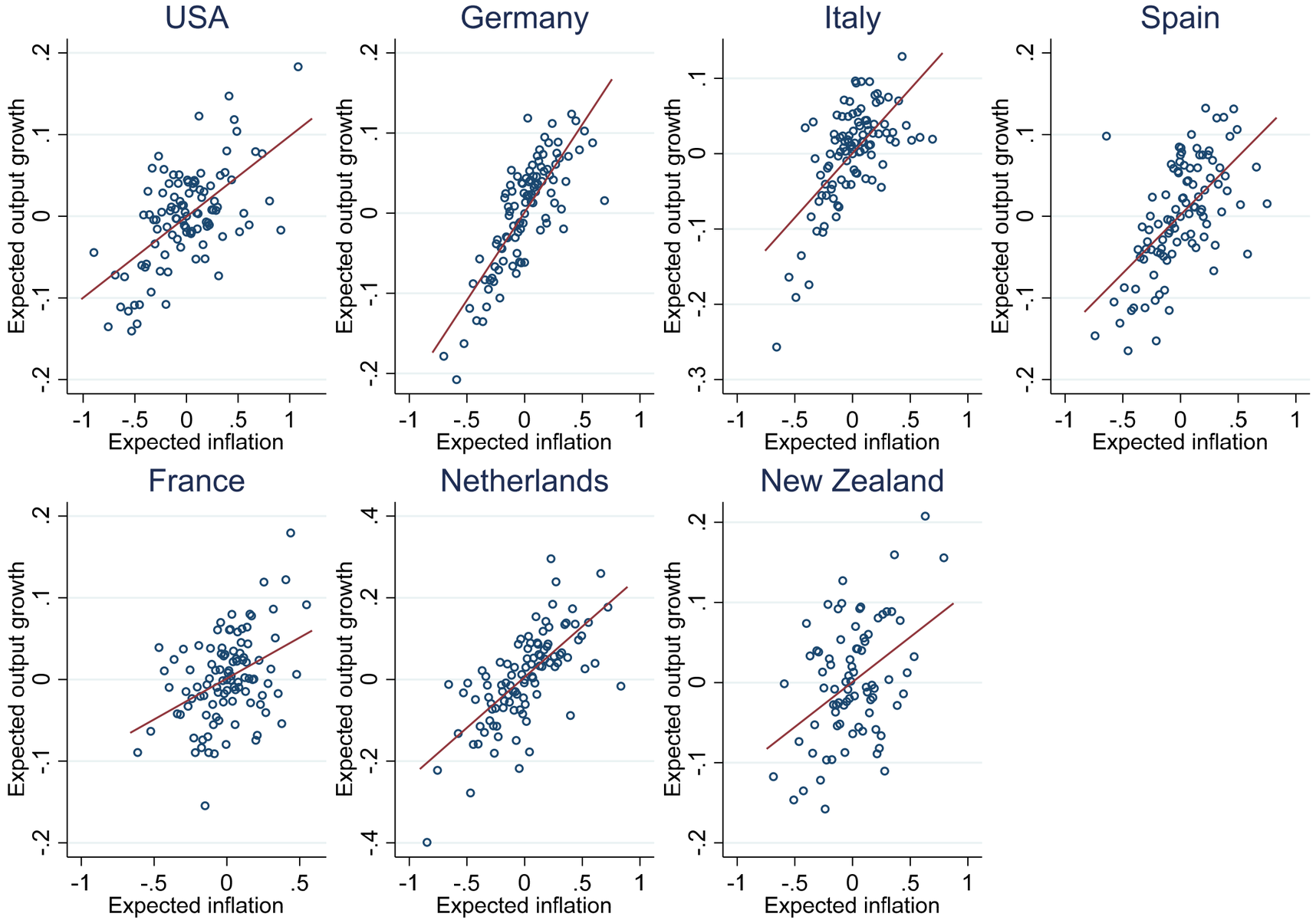

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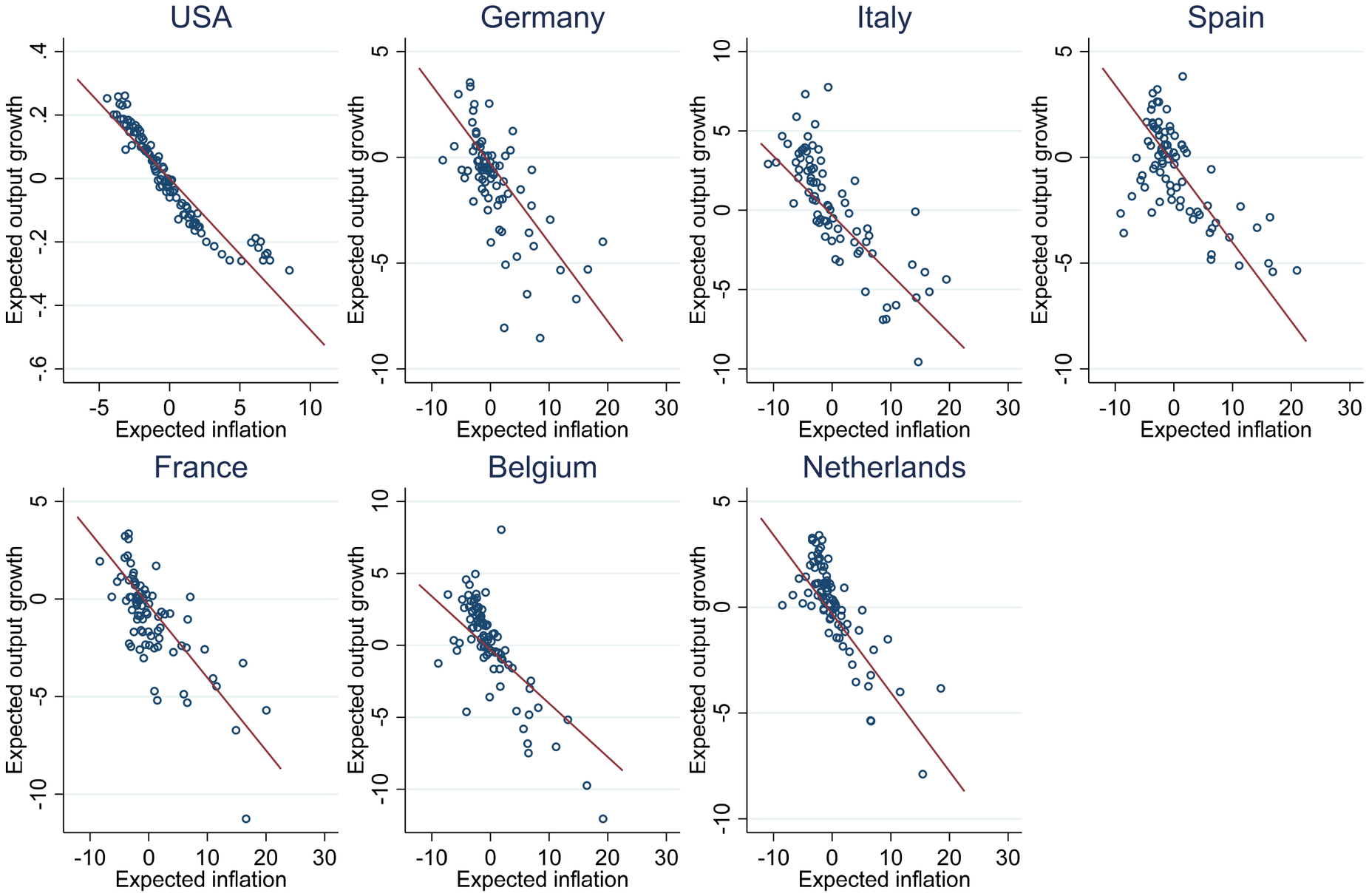
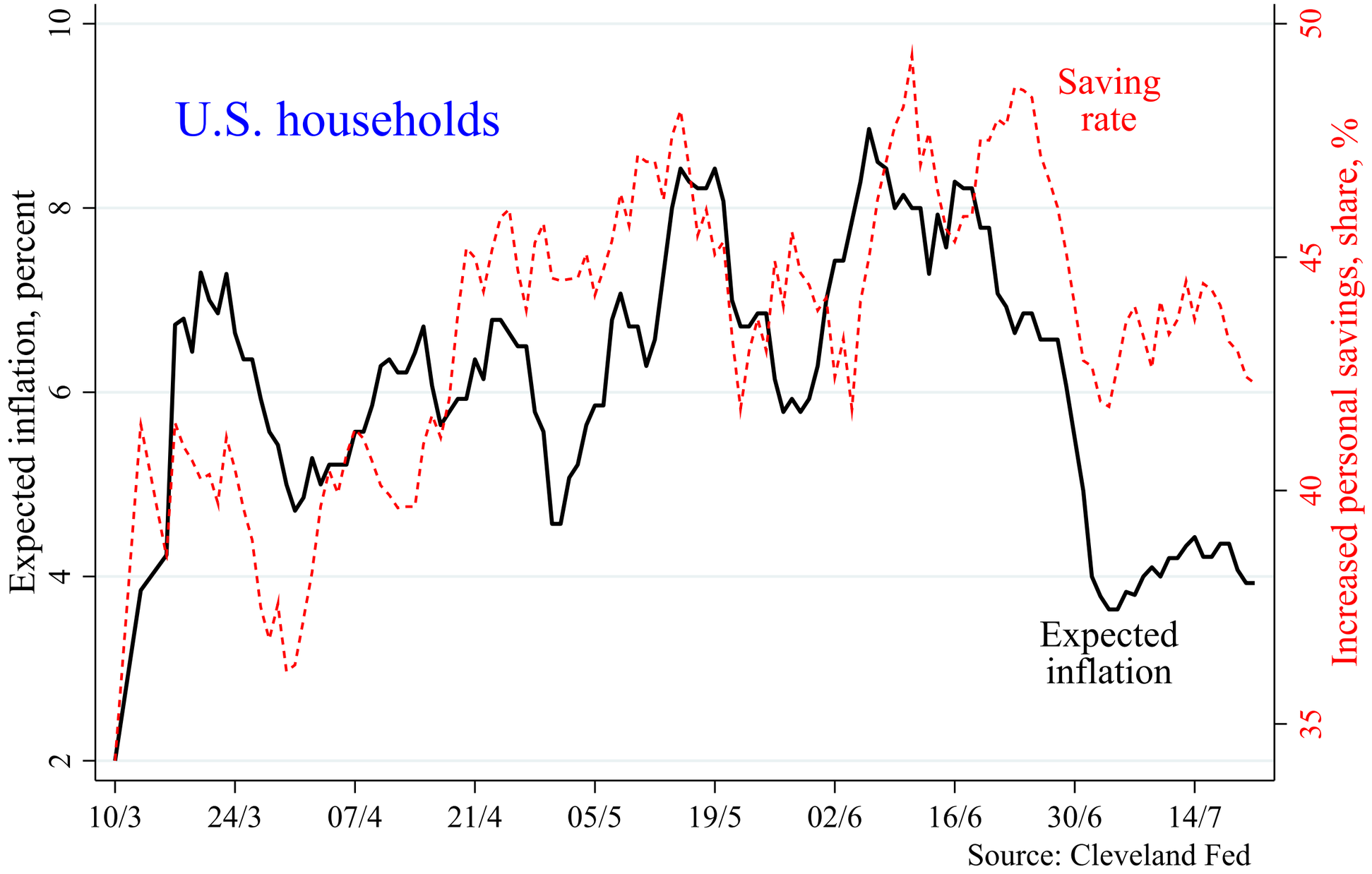


INFLATION EXPECTATIONS AND ECONOMIC ACTIVITY



Willingness to spend declines as inflation increases

HOUSEHOLDS (AND FIRMS) ARE DIFFERENT

- Interpretation of shocks is different
  - The public believes in stagflation
- High sensitivity to salient prices
- Low attention to monetary and fiscal policy
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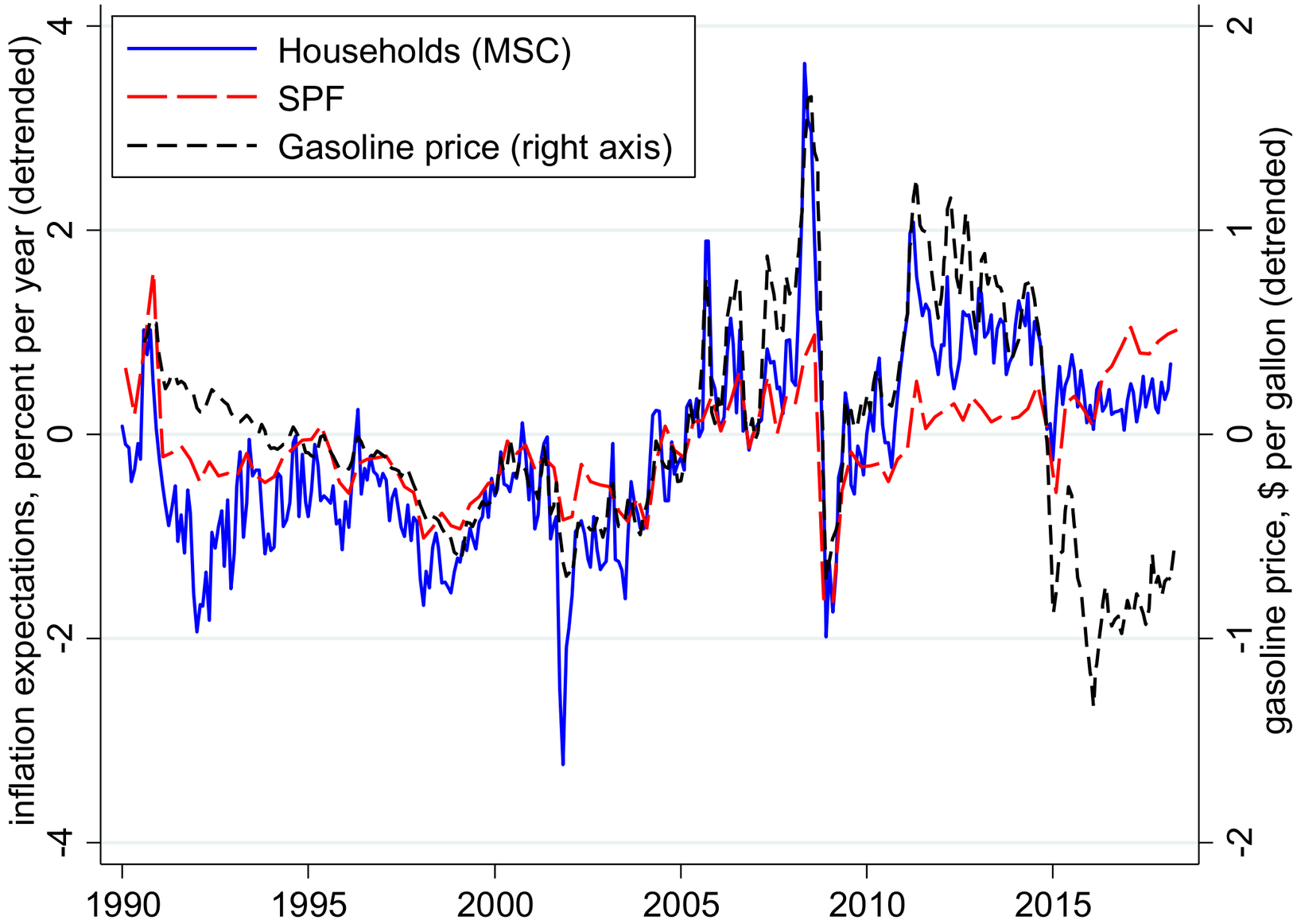
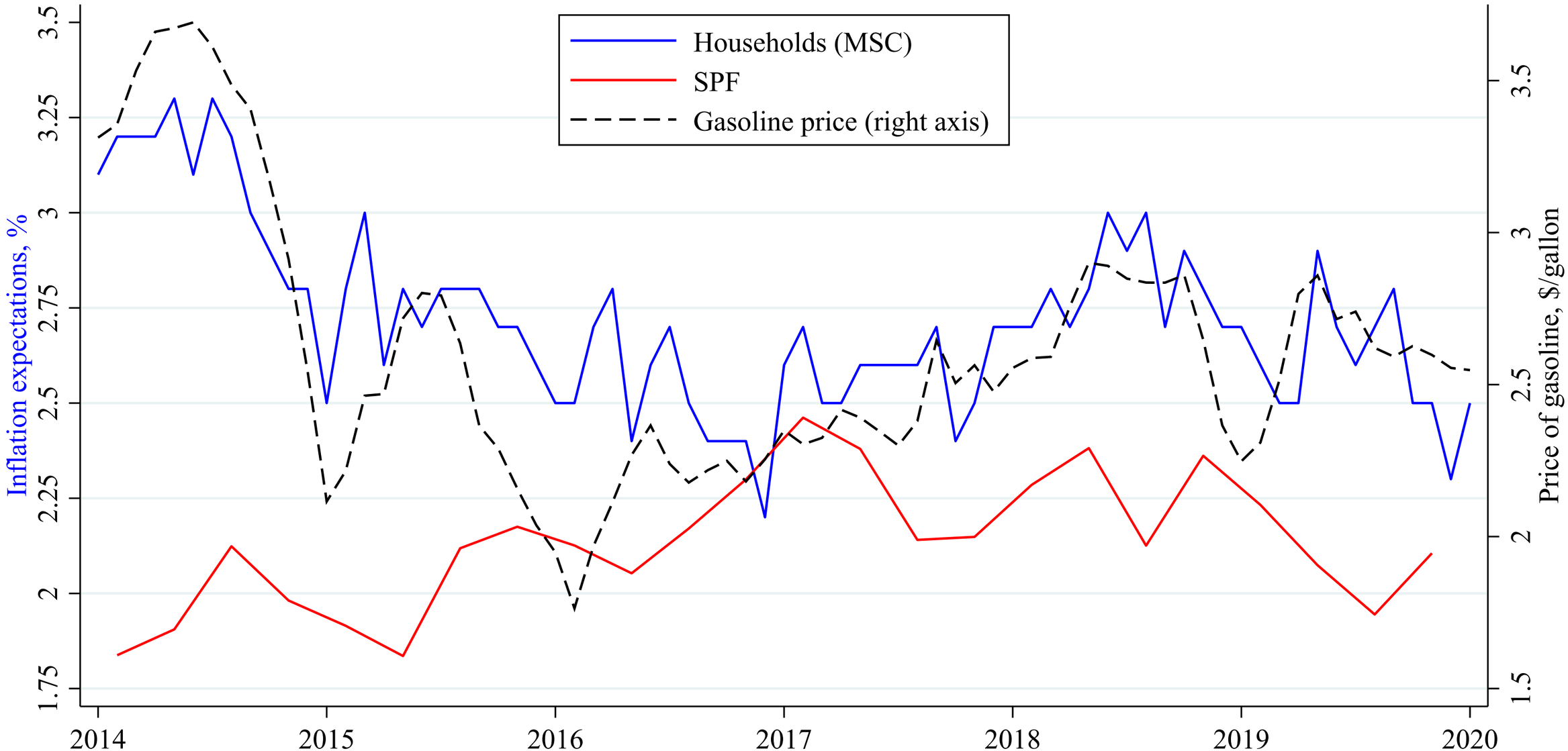
WHAT DRIVES INFLATION EXPECTATIONS



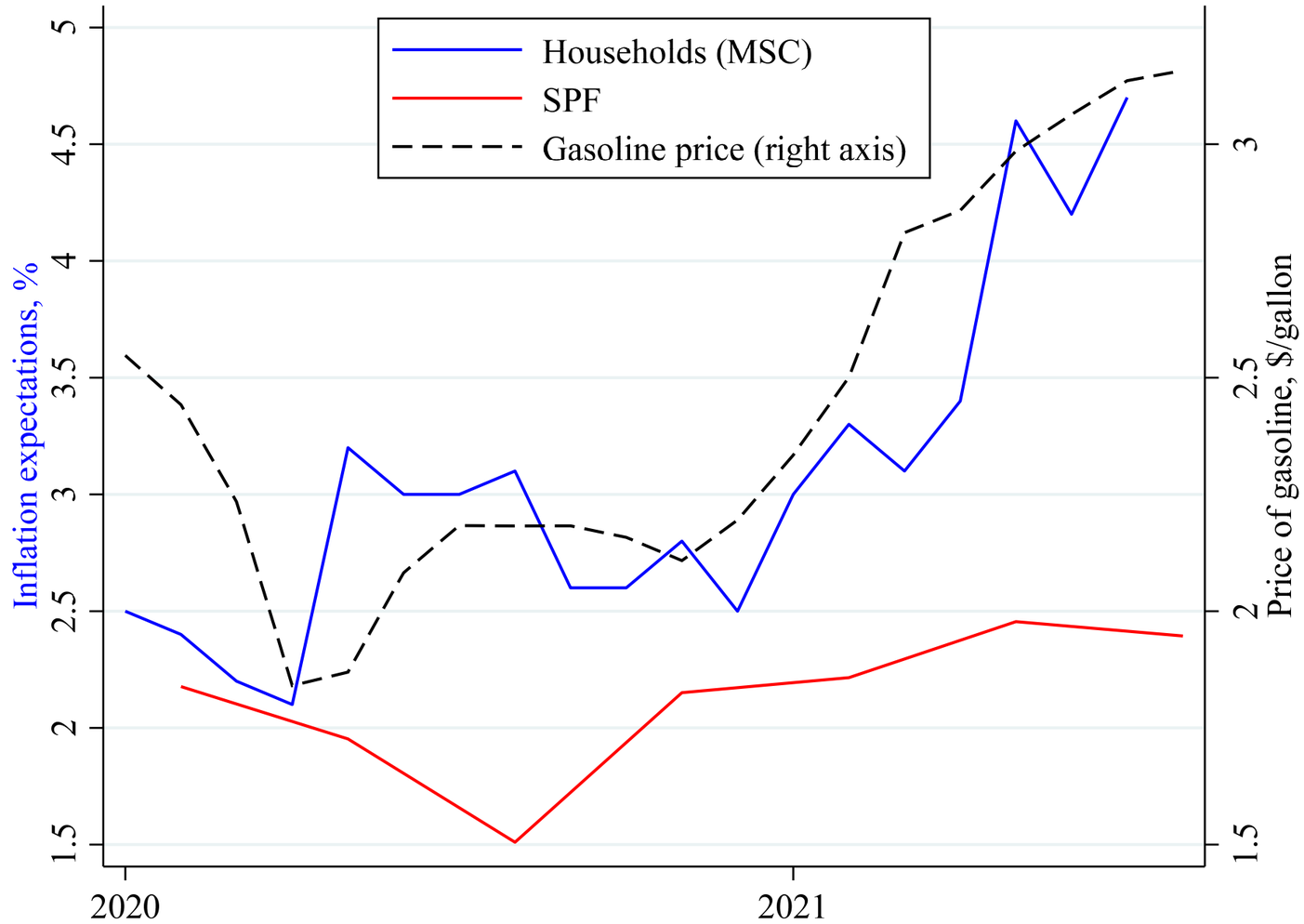
Households can confuse relative prices with inflation

PRE COVID



MSC tracks gas prices but SPF does not

COVID CRISIS



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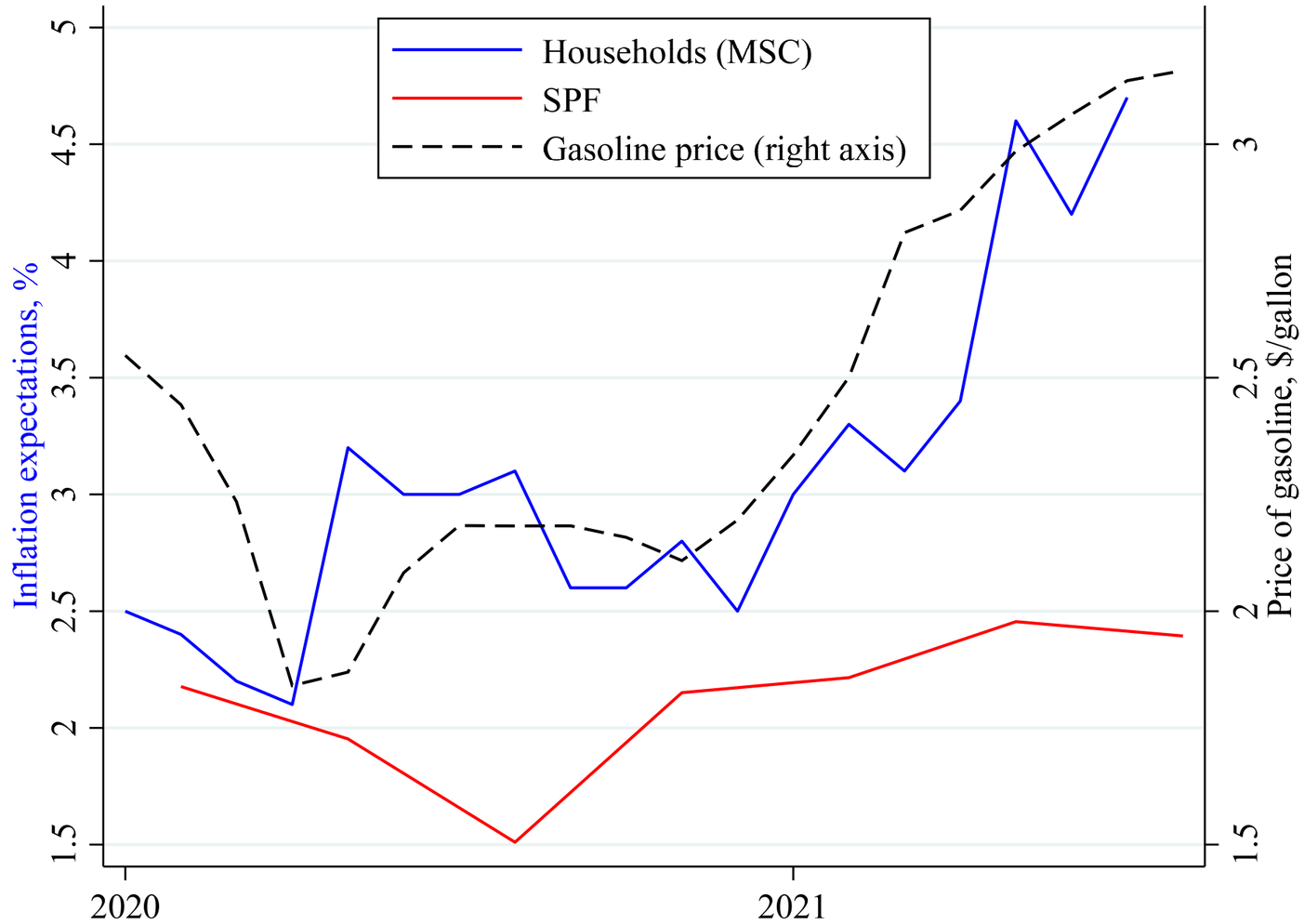

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EPOP is low, inflation expectations are anchored

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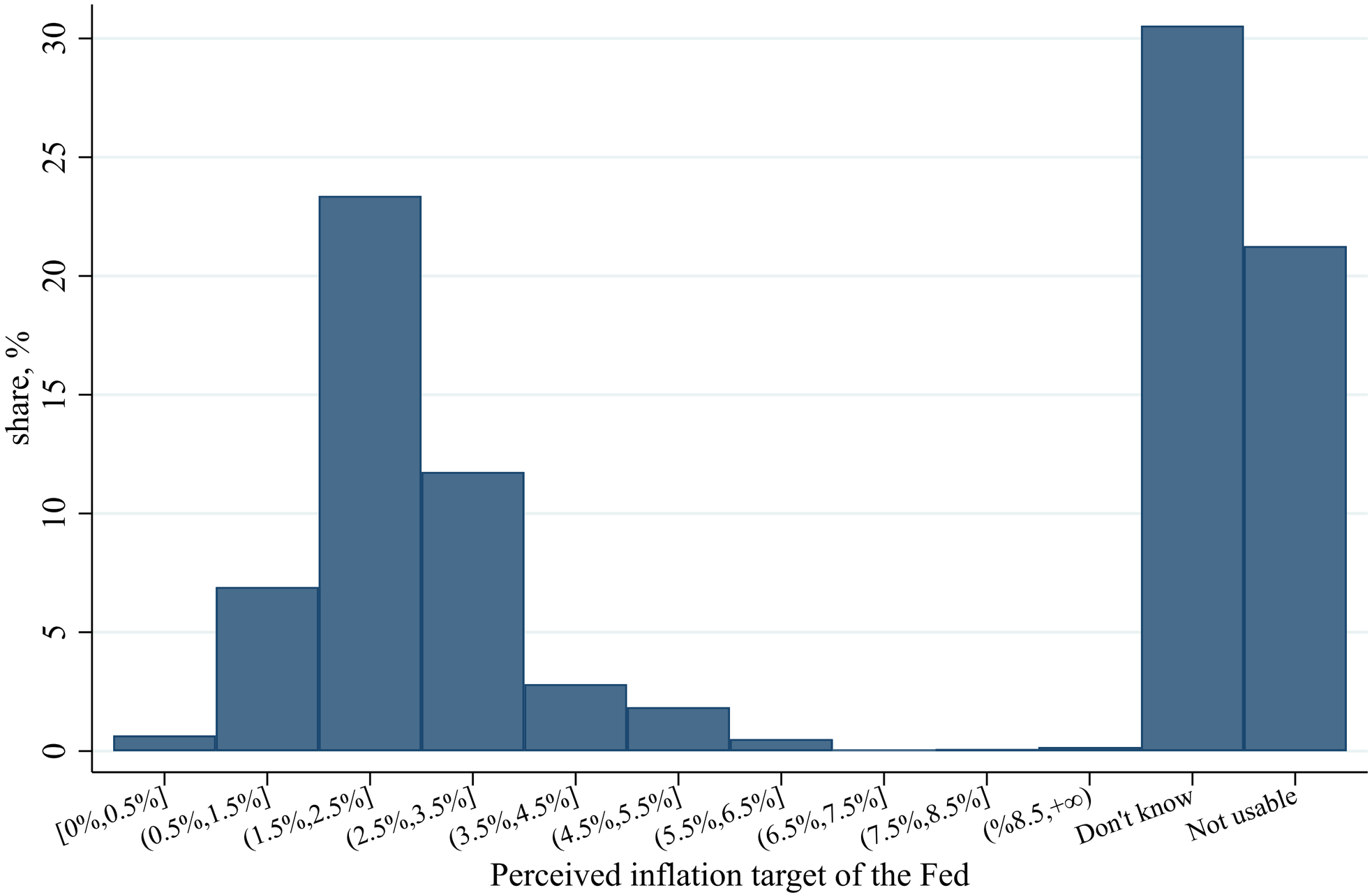
CEO'S PERCEPTIONS ABOUT THE INFLATION TARGET



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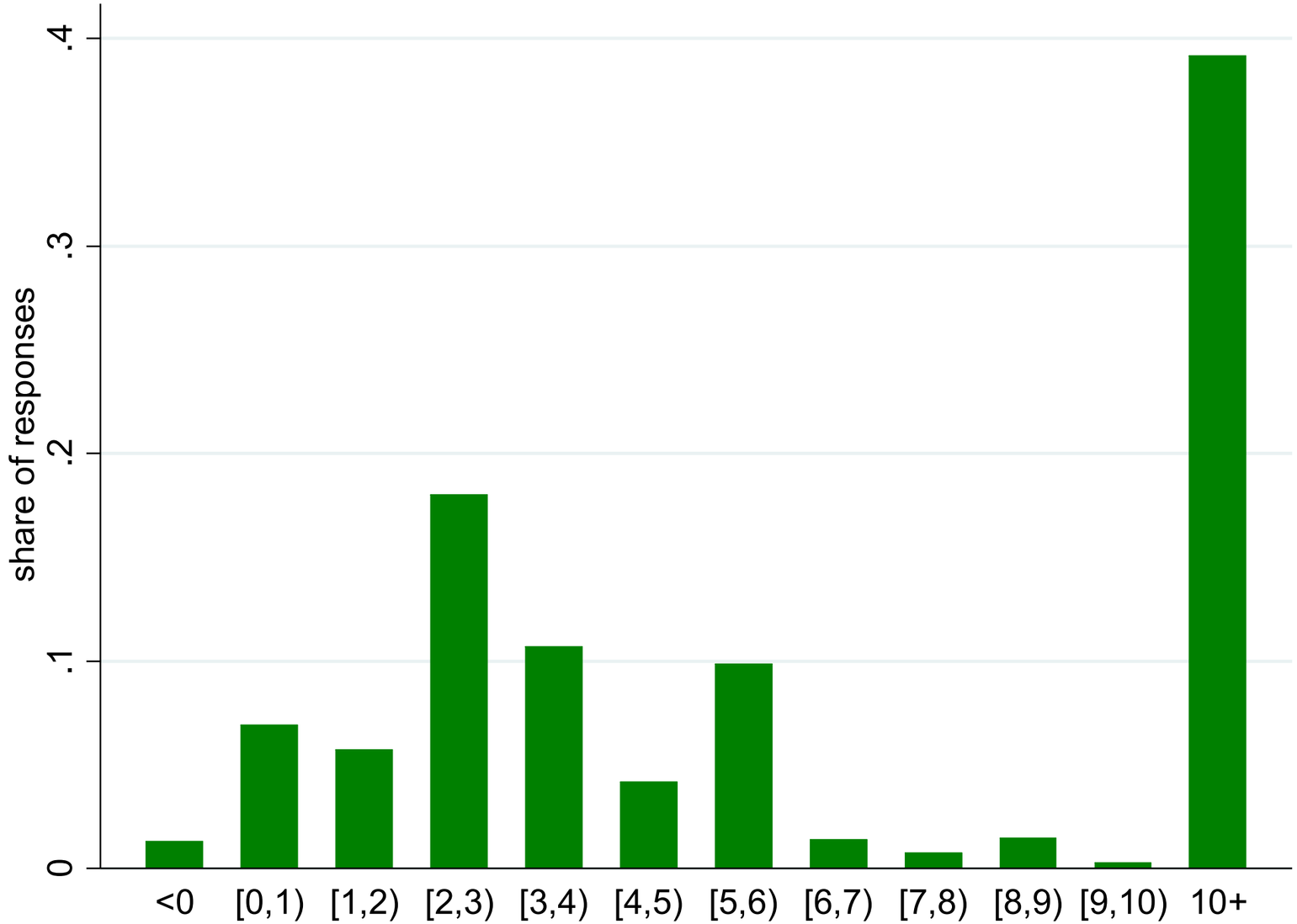

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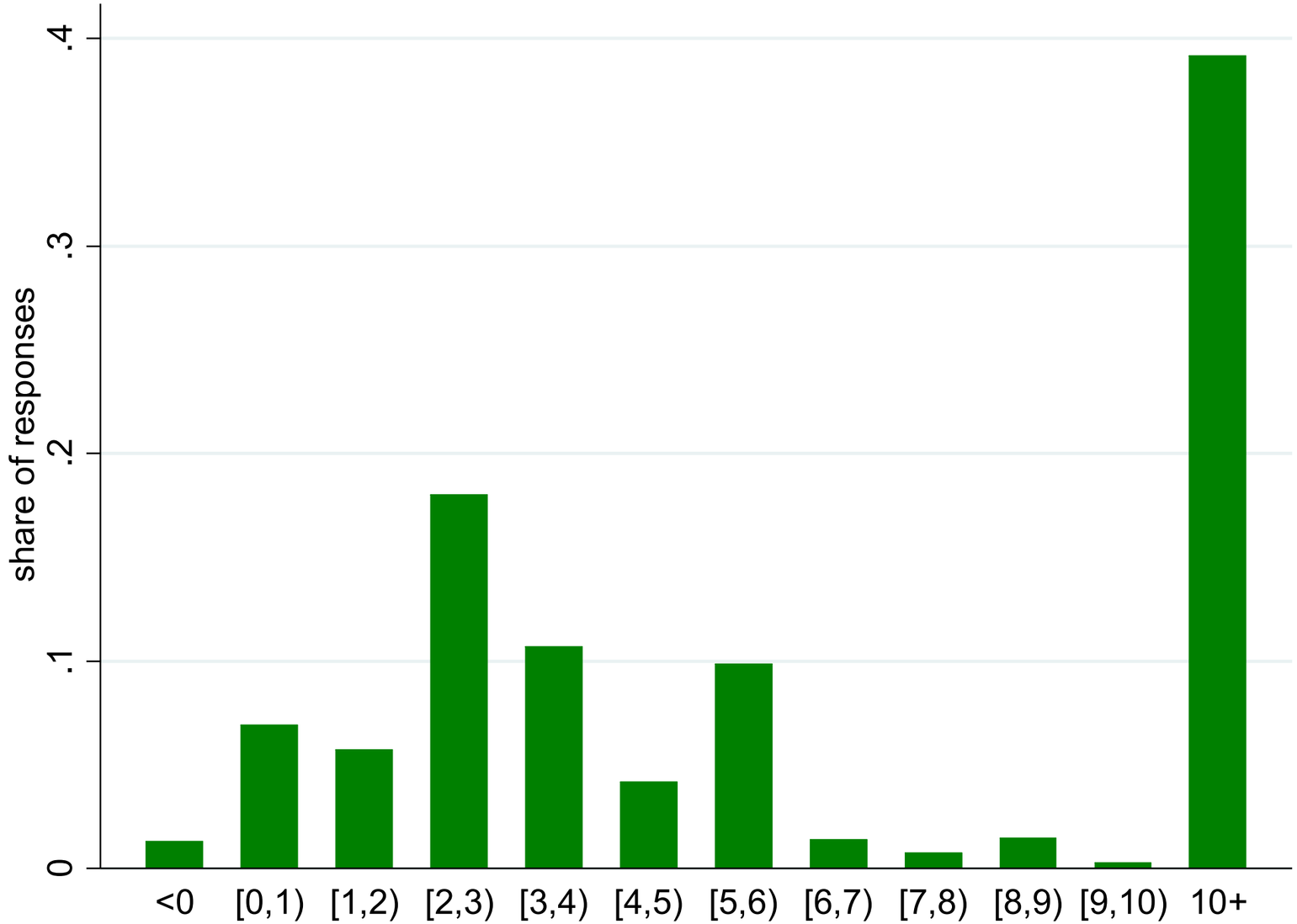

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Policy announcements (forward guidance, quantitative easing, average inflation targeting, etc.) are unlikely to move households' inflation expectations.

BREAKING THROUGH THE VEIL OF INATTENTION

On August 27th, 2020, Chairman Powell announced Average Inflation Targeting at Jackson Hole annual conference:

> "If inflation runs below 2% following economic downturns but never moves above 2% even when the economy is strong, then over time inflation will average less than 2%. Households and businesses will come to expect this result, which means that inflation expectations would tend to move below our inflation goal and bring realized inflation down…. Therefore, following periods when inflation has been running below 2%, appropriate monetary policy will likely aim to achieve inflation moderately above 2% for some time."

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- High sensitivity to salient prices
  - Price of gasoline is a strong predictor of HH inflation expectations
- Low attention to monetary and fiscal policy
  - Most households and managers don't know the inflation targets
- Behavioral response to policy changes may be different from predictions of full-information rational expectations (FIRE) models

THE SCIENCE OF INFLATION EXPECTATIONS

Thought experiment: $ConsumerSpending_h = b \times \pi_h^e + controls + error$

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- Compare control group to treatment group ⇒ causal effect

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Examples of treatments:

- Inform about the inflation target
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None of these should work in full-information rational expectations (FIRE) because treatments provide publicly available information.

WILL HIGHER INFLATION EXPECTATIONS GENERATE A CONSUMPTION BOOM?

Treatment: Forward guidance

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	(1)	(2)
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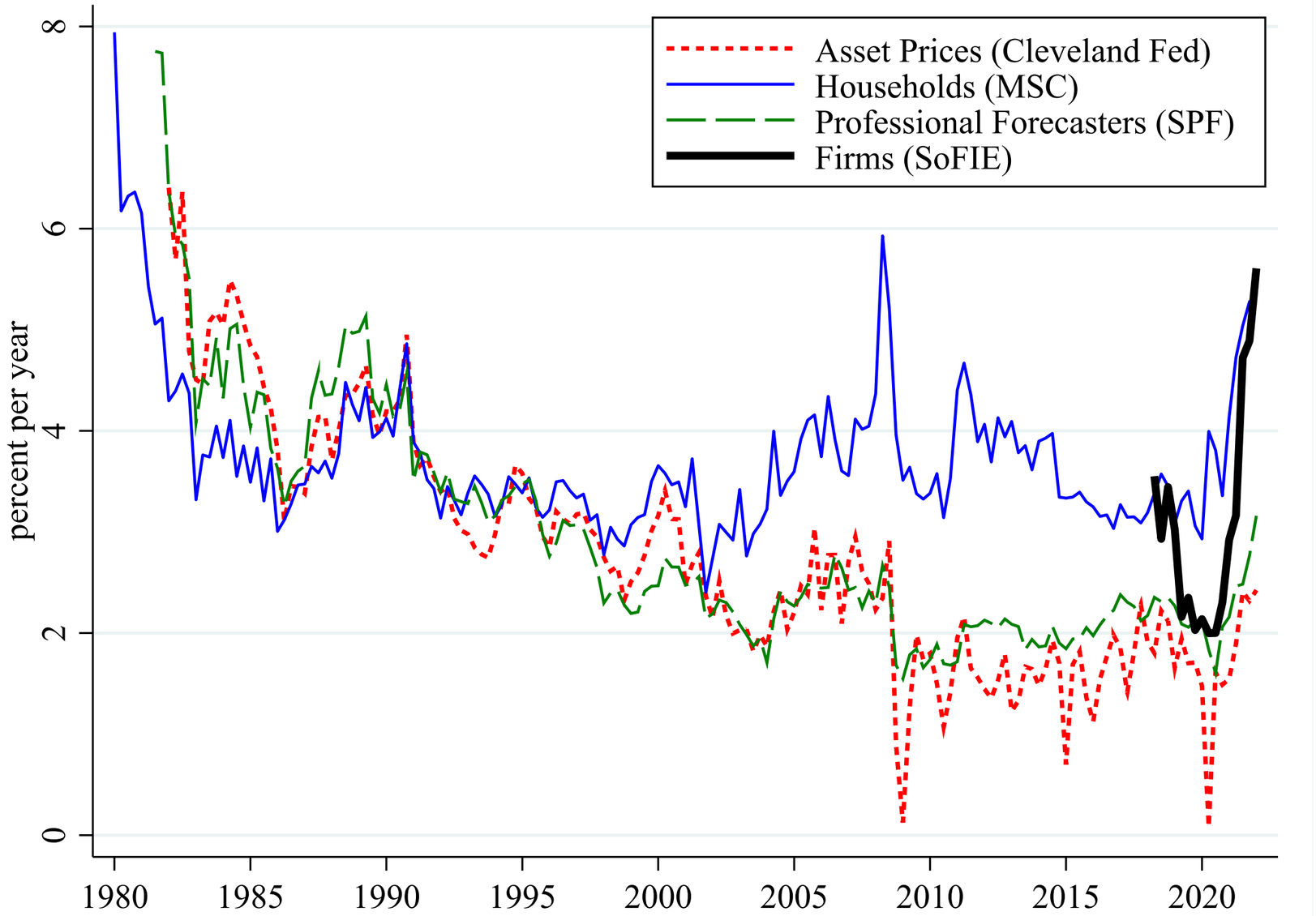
FIRMS' INFLATION EXPECTATIONS



Firms' inflation expectations are between households' and professional forecasters'.

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  - Few measures of real-time beliefs of firms and other price setters
  - How to rule out many alternative deviations from FIRE
    - Impose discipline on non-FIRE models
    - Derive testable implications and test them

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- Prepare sustained information campaigns