

COMMENT TO ANGELETOS, HUO, AND SASTRY'S “IMPERFECT MACROECONOMIC EXPECTATIONS: THEORY AND EVIDENCE”

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LSE

*3rd of April, 2020
NBER Macroeconomics Annual
NBER, Cambridge via zoom*

COMMENT TO ANGELETOS, HUO, AND SASTRY'S
"IMPERFECT MACROECONOMIC EXPECTATIONS:
THEORY AND EVIDENCE"

YES, BUT, WE DISAGREE

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Yes

Twenty years of progress in modeling expectations

- Models: dispersed private info and higher order beliefs, inattention, sticky info, least-squares learning, memory, over-extrapolation, cognitive discounting, ...
- Empirics: aggregate time-series, survey evidence, disagreement within survey, disagreement across surveys, info treatments, markets vs people, horizons, ...

Current state: wilderness of alternatives

- Two conflicting facts: under-reaction versus over-reaction
- Missing a CRRA, or a Cobb-Douglas, or a Calvo.

Yes: a parsimonious model

Underlying process

$$z_t = R(L)\varepsilon_t$$

Perceived process

Bayesian beliefs with noisy signals

Equilibrium

Yes: a new regression

Survey data to build

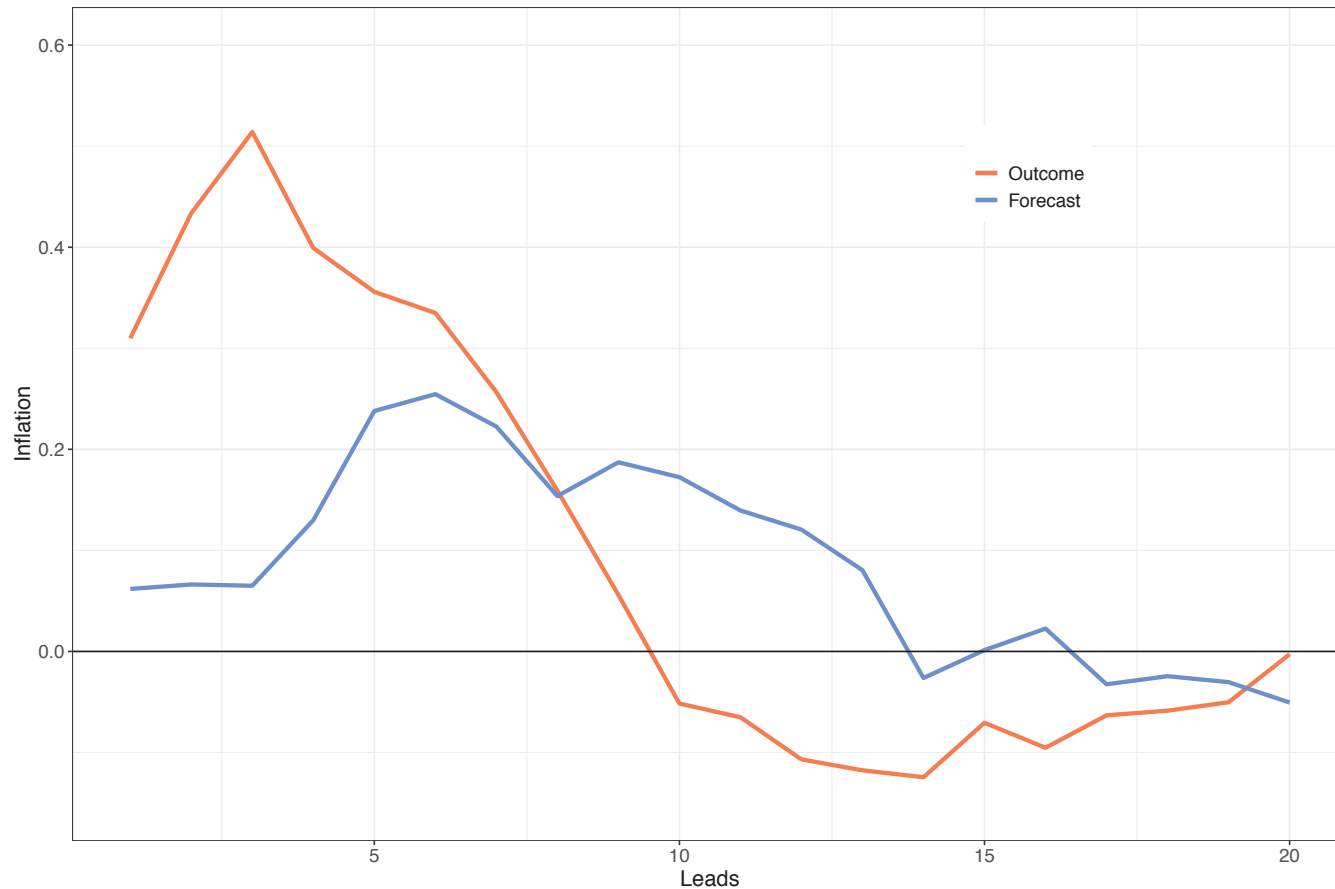
$$Error_{i,t} = z_{t+1} - \mathbb{E}_{i,t} [z_{t+1}]$$

Regression

Intuition (on the conflicting fact: under-react versus over-react)

- If average over agents, get $\kappa > 0$ the “stickiness of expectations”.
- If forget the average, get $\chi < 0$ the over-reaction or over-representativeness.
- Together: *time-series versus cross-sectional variation!*

Yes: new empirical pattern



- Forecast crosses outcome from below
- Errors first +, then -.

Caveats:

- 1) not precisely estimated
- 2) interpretation

$$\mathbb{E}_t \left[\frac{\partial}{\partial \varepsilon_t} \hat{E}_{i,t+h}(z_{t+h+4}) \right]$$
$$\neq \frac{\partial}{\partial \varepsilon_t} \mathbb{E}_{i,t}(z_{t+h+4})$$

Yes, **but**, we disagree

But

Needed features to fit the inflation data

- With an exogenous autoregressive model, find:
 1. Slow learning: τ is small
 2. Over-extrapolation:

Intuition for why using the exogenous AR model:

- From regression estimates:
- From the crossing fact: expectations on average first under react because of learning, but then overreact because of over-extrapolation

But, can see persistence from horizon

In their model, outcomes versus expectation

$$\mathbb{E}_{i,t}(z_{t+1}) = \hat{\rho}\mathbb{E}_{i,t}(z_t)$$

Long-horizon expectations:

- Redo regression using 5-year-ahead expectations from same survey
- *Still support for over-extrapolation:*

But, look further

$$\pi_t = \pi_t^P + \pi_t^T$$

$$\pi_t^P = \pi_{t-1}^P + u_t^P$$

$$\pi_t^T = u_t^T$$

$$\Rightarrow \pi_t = \pi_{t-1} + \varepsilon_t - \theta\varepsilon_{t-1}$$

Long-horizon outcome
reveals persistent RW

Long-horizon expectation
mistake transitory WN

People under-extrapolate

Yes, but, **we disagree**

Disagreement in the literature

Important part of the expectations literature of the last twenty years

- Disagreement, Communication, and Transparency
- In theory: strategic complementarities, inattention models. In policy: policy statements, changes in regime. In data: look at second moment of surveys

From that literature learned that:

- Shocks raise disagreement temporarily
- Policy communication lowers disagreement that results from the shock
- Regime changes that raise transparency can permanently lower disagreement
- So, need model where disagreement is endogenous

Disagreement in the current model

Equations:

$$V_t = \int \left(\mathbb{E}_{i,t}(z_{t+1}) - \int \mathbb{E}_{i,t}(z_{t+1}) di \right)^2 di$$

No shocks, so stay forever in steady state

- Disagreement is constant: does not depend on $\boldsymbol{\varepsilon}_t$.
- Communication makes no difference: does not depend on r .
- Transparency regime switch: raises disagreement as blow-up differences, lower λ

Disagree constructively

Modified model (still very parsimonious)

- Fraction θ knows current state, makes unbiased forecasts of future:

$$\mathbb{E}_t^I(z_{t+1}) = \rho z_t$$

- Fraction $1-\theta$ looks just like the Angeletos-Huo-Sastry agents
- Added one parameter (had subtracted one earlier)
- In literature this is: neoclassical model; canonical imperfect information model

Law of of motion for disagreement:

Disagree constructively

Law of motion for disagreement:

$$(1 - \hat{\lambda})^2 V_t = \theta(1 - \theta) \hat{\lambda}^2 r^2 \varepsilon_t^2 + (1 - \theta)(\hat{\rho} - \hat{\lambda})^2$$

Predictions:

- **Disagreement varies over time and is affected by shocks:** it follows an AR(2) after a shock ε_t .
- **Policy communication lowers disagreement:** lower r lowers disagreement on impact and in the steady state
- **Transparency regime switch:** lower λ but higher θ will lower disagreement

Conclusion

YES, BUT, WE DISAGREE