

Smooth Diagnostic Expectations: A Discussion

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Empirical Evidence

1

Overreaction to News

Survey forecasts show consistent overreaction (Bordalo Gennaioli Ma Shleifer 2020).

2

Horizon-dependent Overreaction

Overreaction intensifies at longer forecast horizons.

3

Overconfidence

Subjective uncertainty often underestimates true uncertainty.

4

Uncertainty Amplification

Novel finding: High uncertainty environments amplify overreaction.

What do Smooth DE bring to the table?

State-dependent overreaction

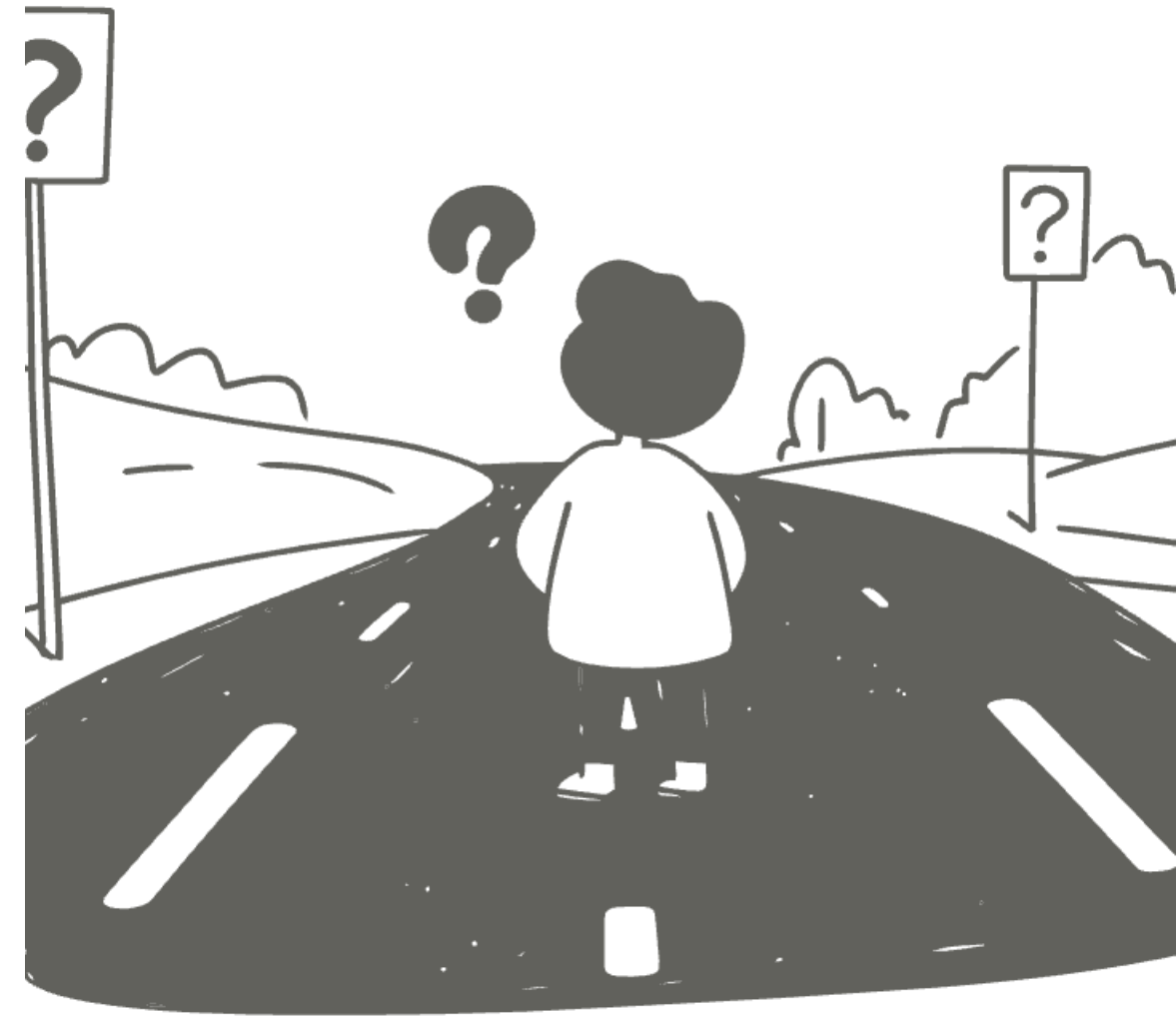
Extends literature on distorted conditional mean forecasts to higher-order moments.

Methodological advancement

Incorporates distortions to higher-order distribution moments in dynamic GE models.

Uncertainty distortions

Explores interactions with the "news shock" channel in economic modeling.



Business Cycle Dynamics with Smooth DE

- 1 Belief Distortions
Connects with time-series dynamics
- 2 Asymmetric Cycles
Sharper recessions than expansions
- 3 Countercyclical Volatility
At micro and macro levels
- 4 Policy Insights
Reducing idiosyncratic uncertainty stabilizes macroeconomy

Smooth DE vs. Standard DE: A Comparison



Flexibility

Smooth DE adapts dynamically to uncertainty levels, unlike standard DE.



Uncertainty Interaction

Smooth DE accounts for interaction with uncertainty, which standard DE ignores.



Overconfidence Explanation

Smooth DE provides a comprehensive explanation for overconfidence in forecasts.



Key Equations

$$R_{t+h|t,t-J} = \frac{\sigma_{t+h|t}^2}{\sigma_{t+h|t-J}^2}$$

$$E_t^\theta(x_{t+h}) = \mu_{t+h|t} + \underbrace{\theta \frac{R_{t+h|t,t-J}}{1 + \theta(1 - R_{t+h|t,t-J})}}_{\equiv \tilde{\theta}_t} (\mu_{t+h|t} - \mu_{t+h|t-J})$$

$$V_t^\theta(x_{t+h}) = \frac{\sigma_{t+h|t}^2}{1 + \theta(1 - R_{t+h|t,t-J})}$$



Corollary 1

- ▶ Overreaction increases with relative uncertainty: $\frac{\partial \tilde{\theta}_t}{\partial R_{t+h|t,t-J}} > 0$.
- ▶ Overconfidence when $R_{t+h|t,t-J} < 1$.
- ▶ Underconfidence when $R_{t+h|t,t-J} > 1$.

Insights from an AR (1) example

- ▶ Smooth DE applied to an AR(1) process: $x_{t+1} = \rho x_t + \epsilon_{t+1}$.
- ▶ Effective overreaction ($\tilde{\theta}_t$) depends on the ratio of conditional variances:

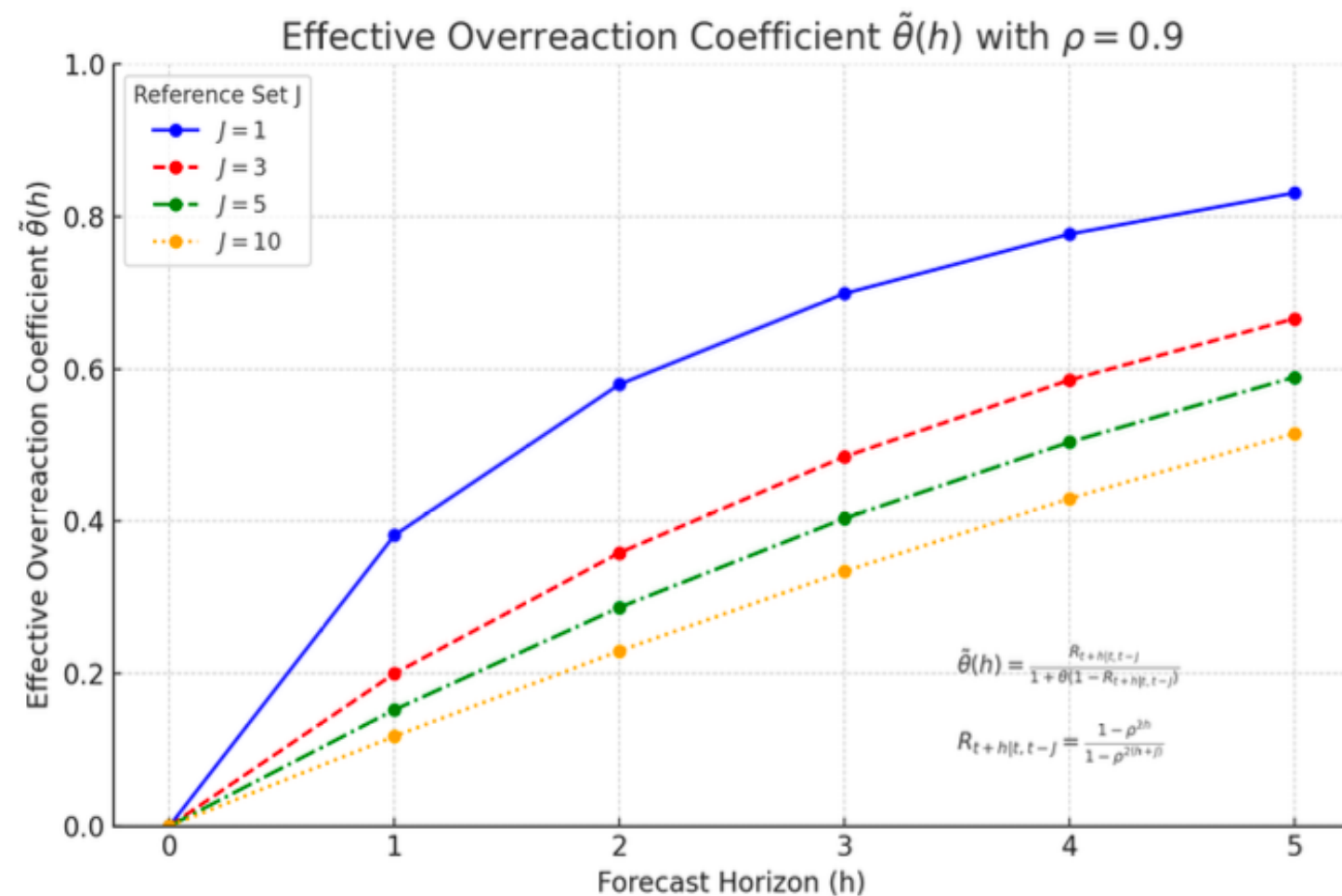
$$R_{t+h|t,t-J} = \frac{1 - \rho^{2h}}{1 - \rho^{2(h+J)}}.$$

- ▶ Predictions:
 - ▶ Overreaction increases with forecast horizon h .
 - ▶ Subjective overconfidence ($V_t^\theta < V_t$) typical in stationary settings.
 - ▶ Explains survey findings: stronger overreaction for long-term forecasts.



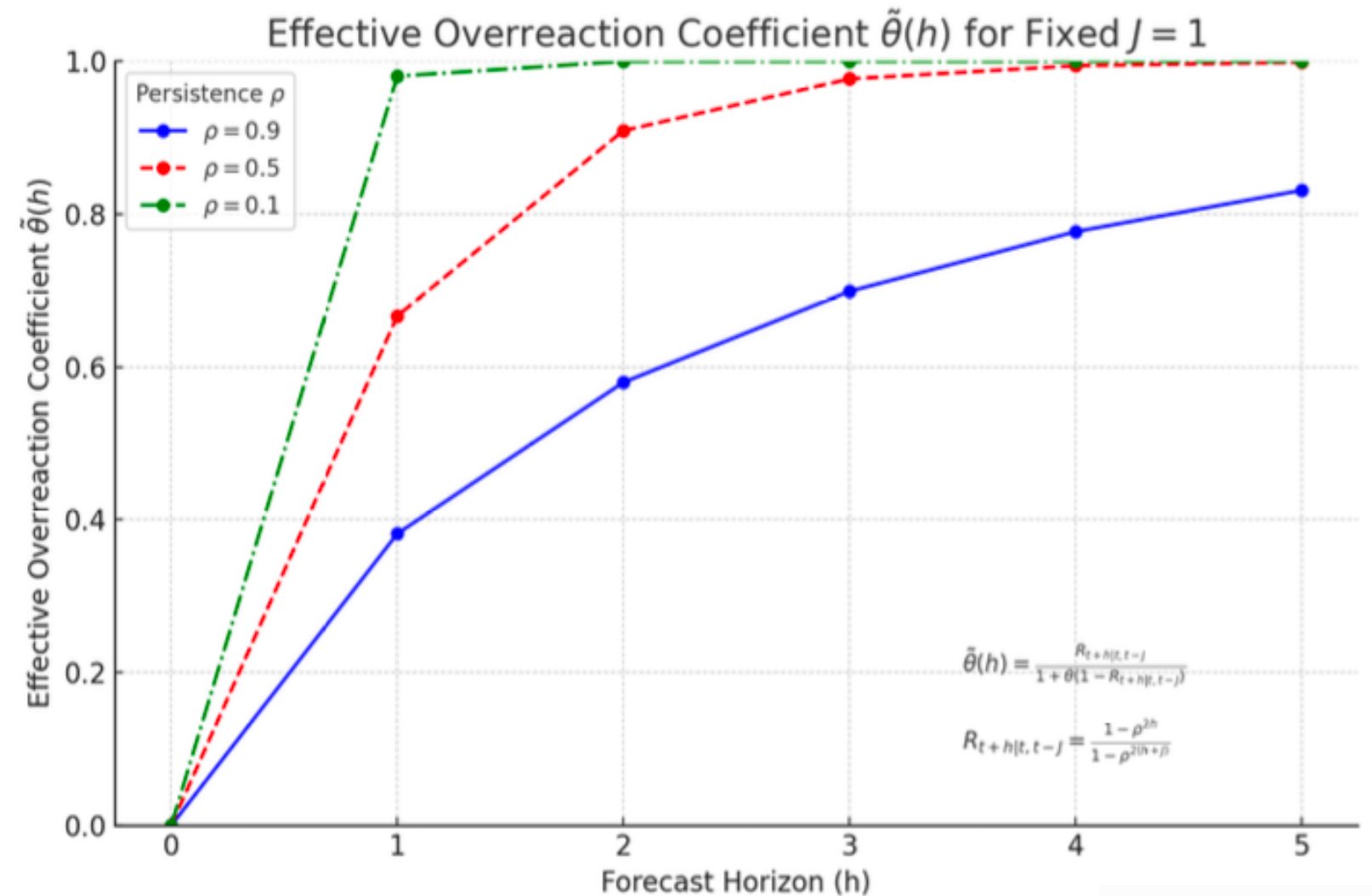
$R_{t+h|t,t-J}$ AS A FUNCTION OF J AND h

- Vary J (e.g., $J = 1, 3, 5, 10$).
- Fix $\rho = 0.9$ and compute $\tilde{\theta}_t^{h,J}$.



$R_{t+h|t,t-J}$ AS A FUNCTION OF ρ AND h

- Fixed $J = 1$.
- Vary ρ across $[0.1, 0.9]$ and compute $\tilde{\theta}_t^{h,J}$.



SIGN OF $\frac{\partial R}{\partial \rho}$ FOR FIXED J

► For $J = 1$:

- $\frac{\partial R}{\partial \rho} > 0$: R increases with ρ .
- Sensitivity is moderate.

► For $J = 3$:

- $\frac{\partial R}{\partial \rho} > 0$: R increases more steeply with ρ .
- Sensitivity grows as J increases.

► General trend:

- Higher J amplifies sensitivity of R to ρ .
- For fixed h , $\frac{\partial R}{\partial \rho} > 0$ for all J .

effective overreaction is decreasing in ρ



Conclusions

1

Unified Framework

Overreaction and overconfidence

Empirical Support

Lot of Applications

2

Comment(s)

Explore a bit more on the simple applications

What does it do for a simple NK model with $J=1$?

Managing micro uncertainty matters for macro-stabilization!!! Huge!

3

Great paper!!

Show that micro uncertainty matters for macro-stabilization with

Smooth DE --- Huge!