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

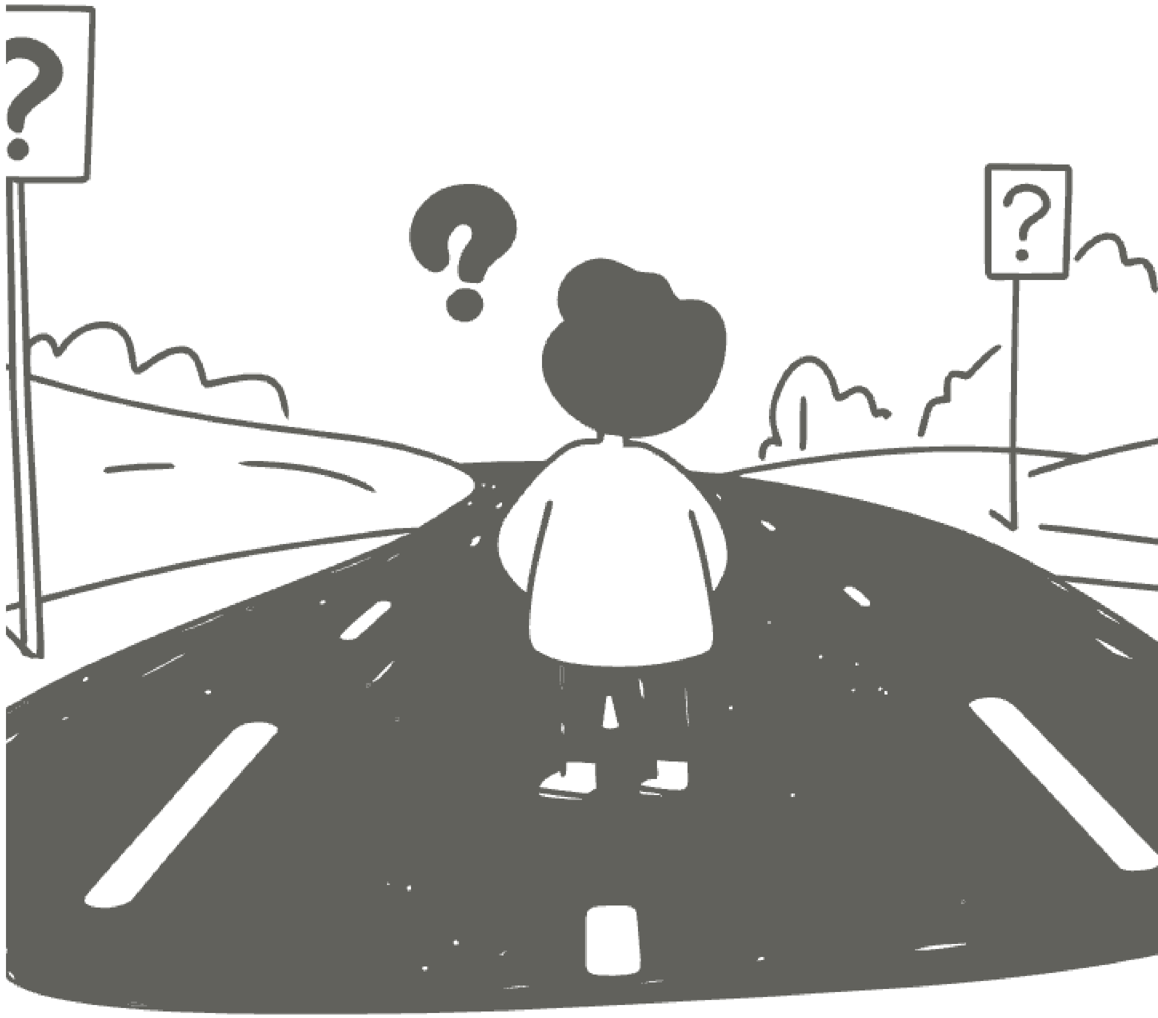
Extends literature on distorted conditional mean forecasts to higher-order moments.

Methodological advancement

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

Uncertainty distortions

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

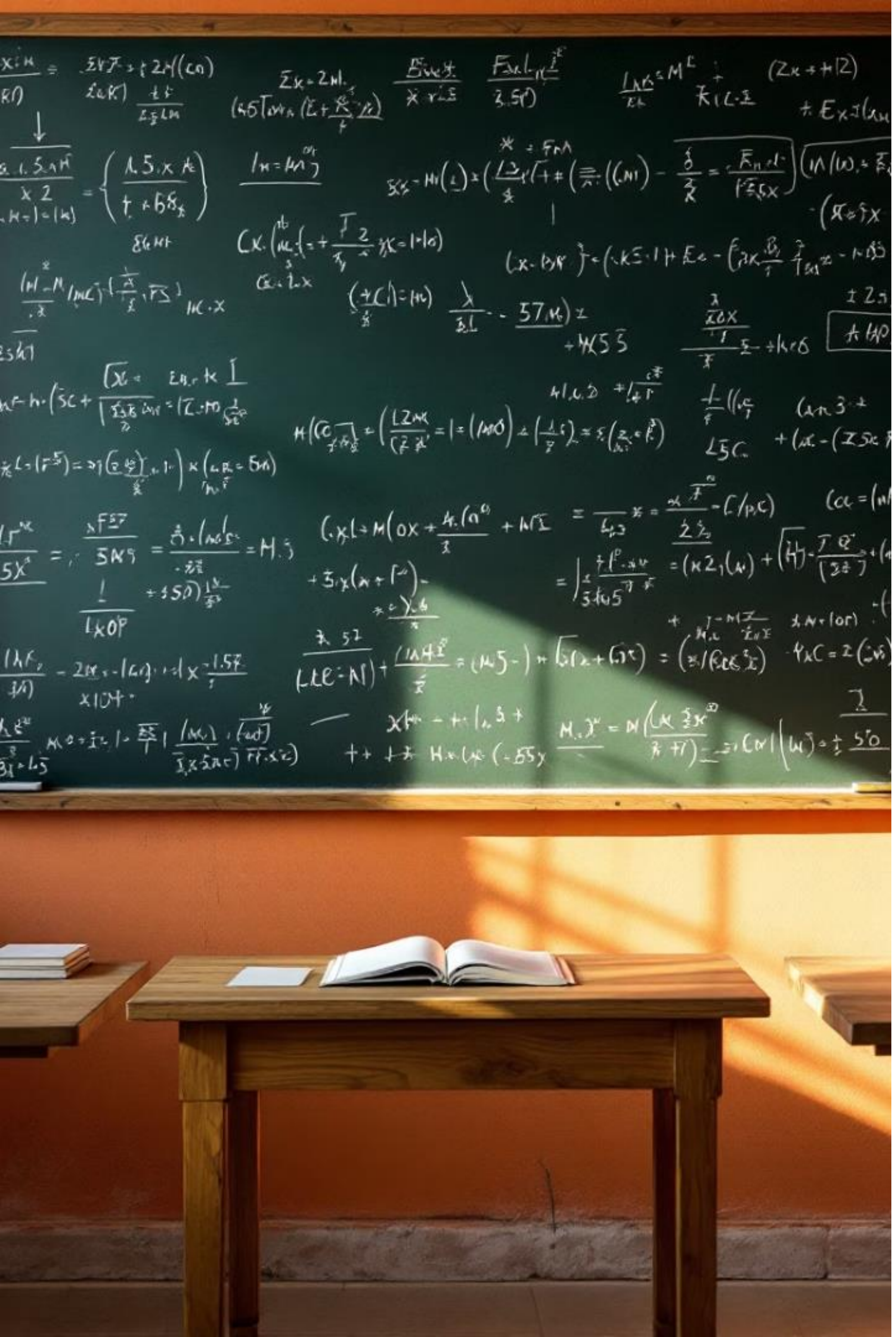
Smooth DE adapts dynamically to uncertainty uncertainty levels, unlike standard DE.

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.

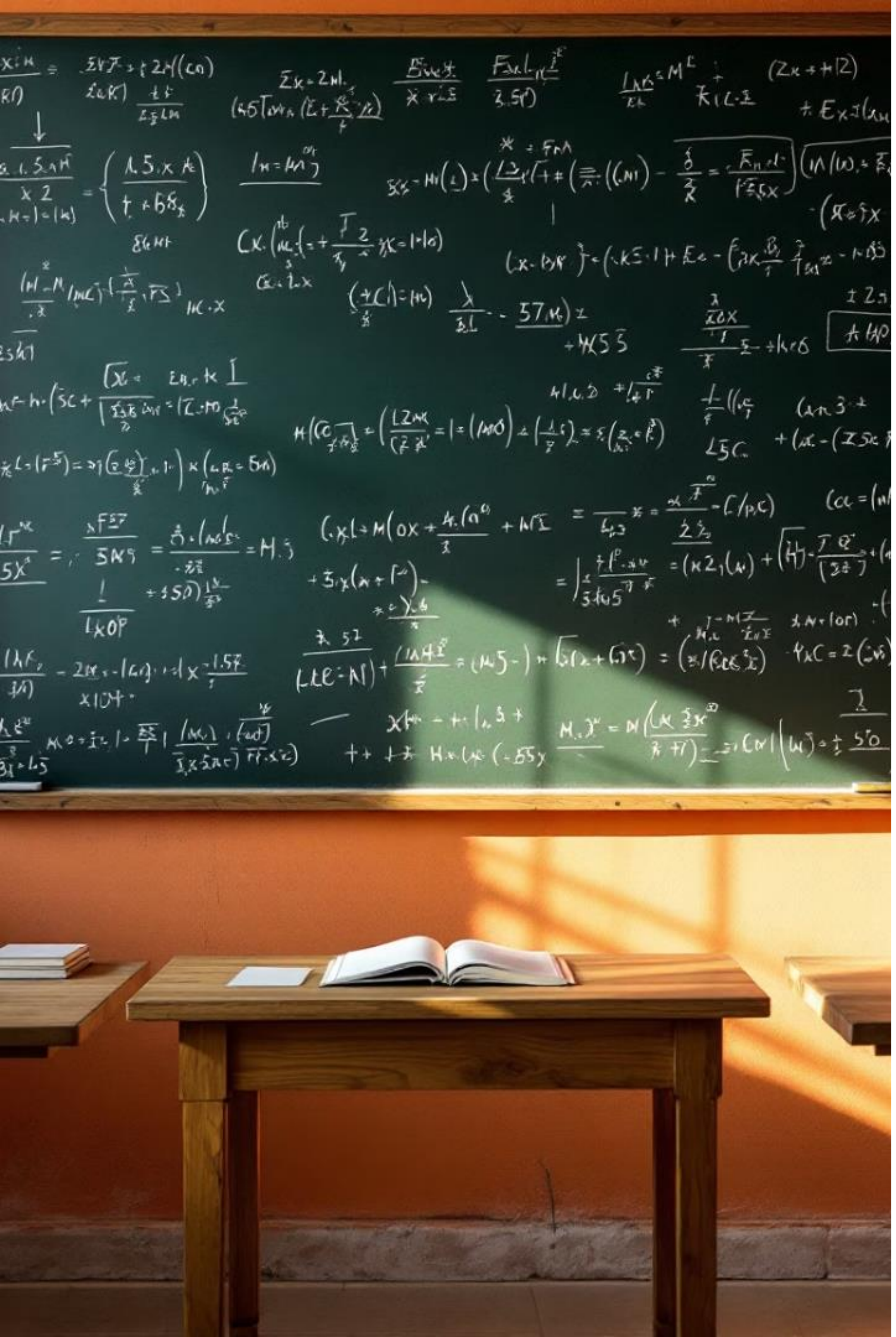


Key Equations

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

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

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



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 $R_{t+h|t,t-J} > 1$.

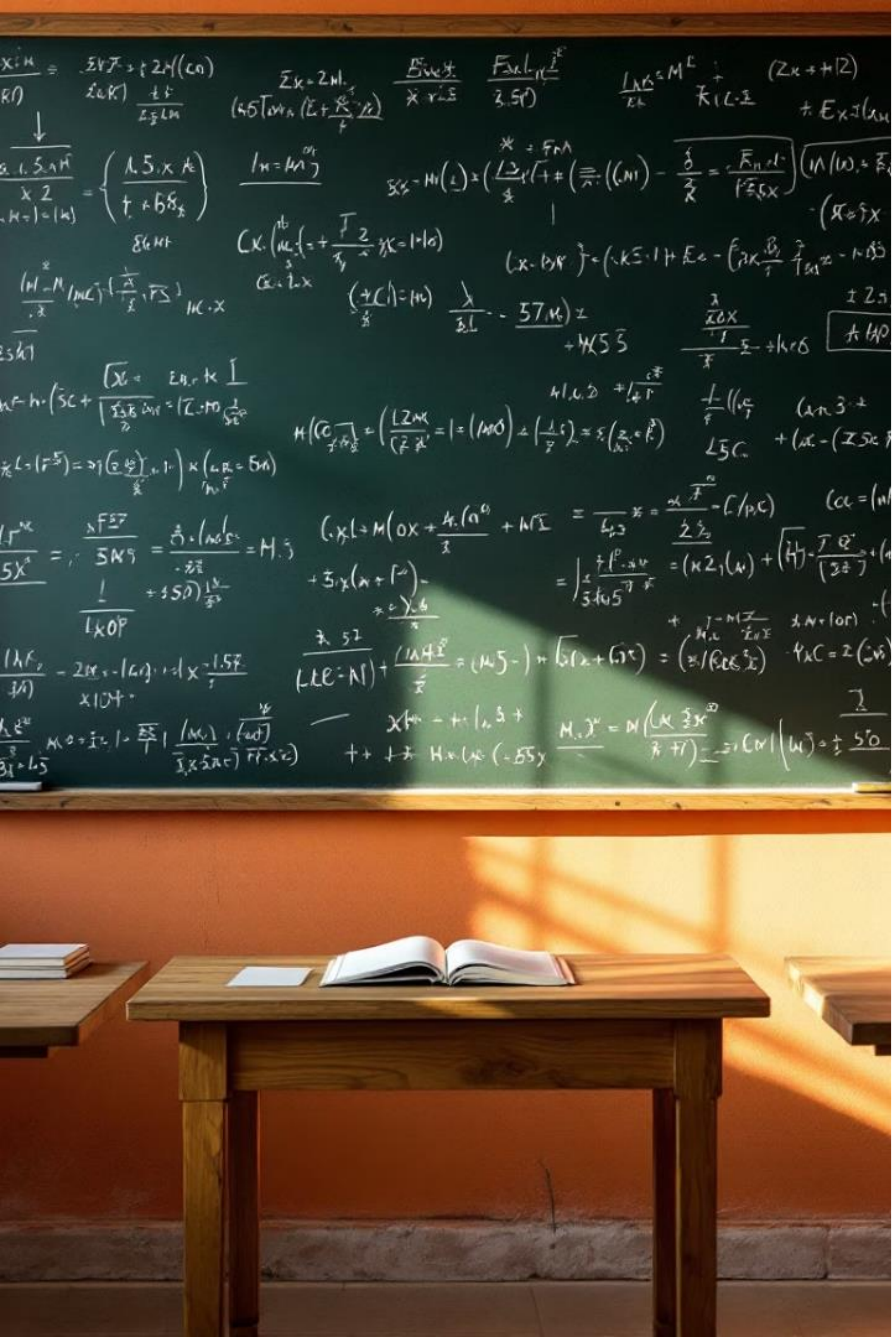
Insights from an AR (1) example

- 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:

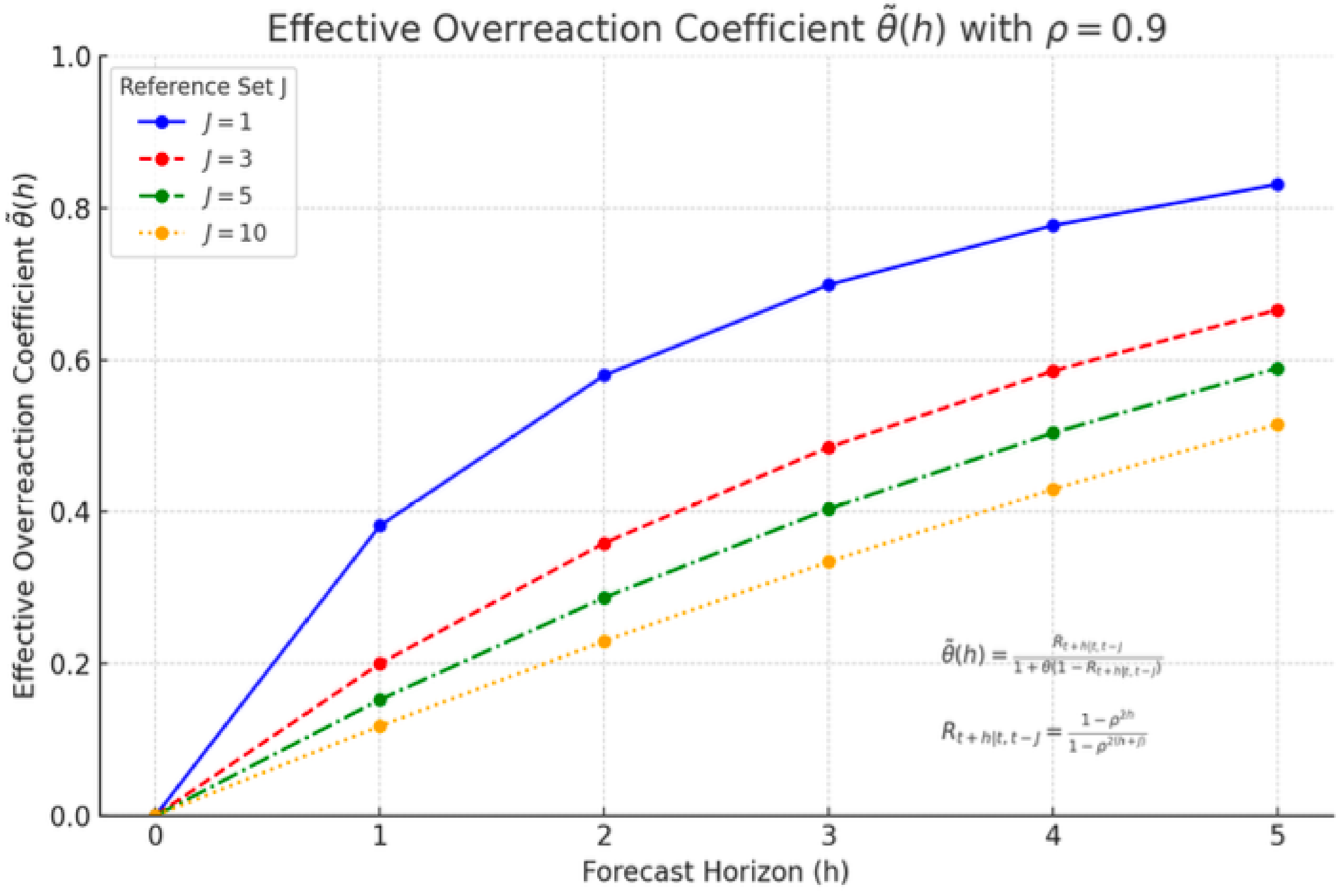
$$R_{t+h|t,t-J} = \frac{1 - \rho^{2h}}{1 - \rho^{2(h+J)}}.$$

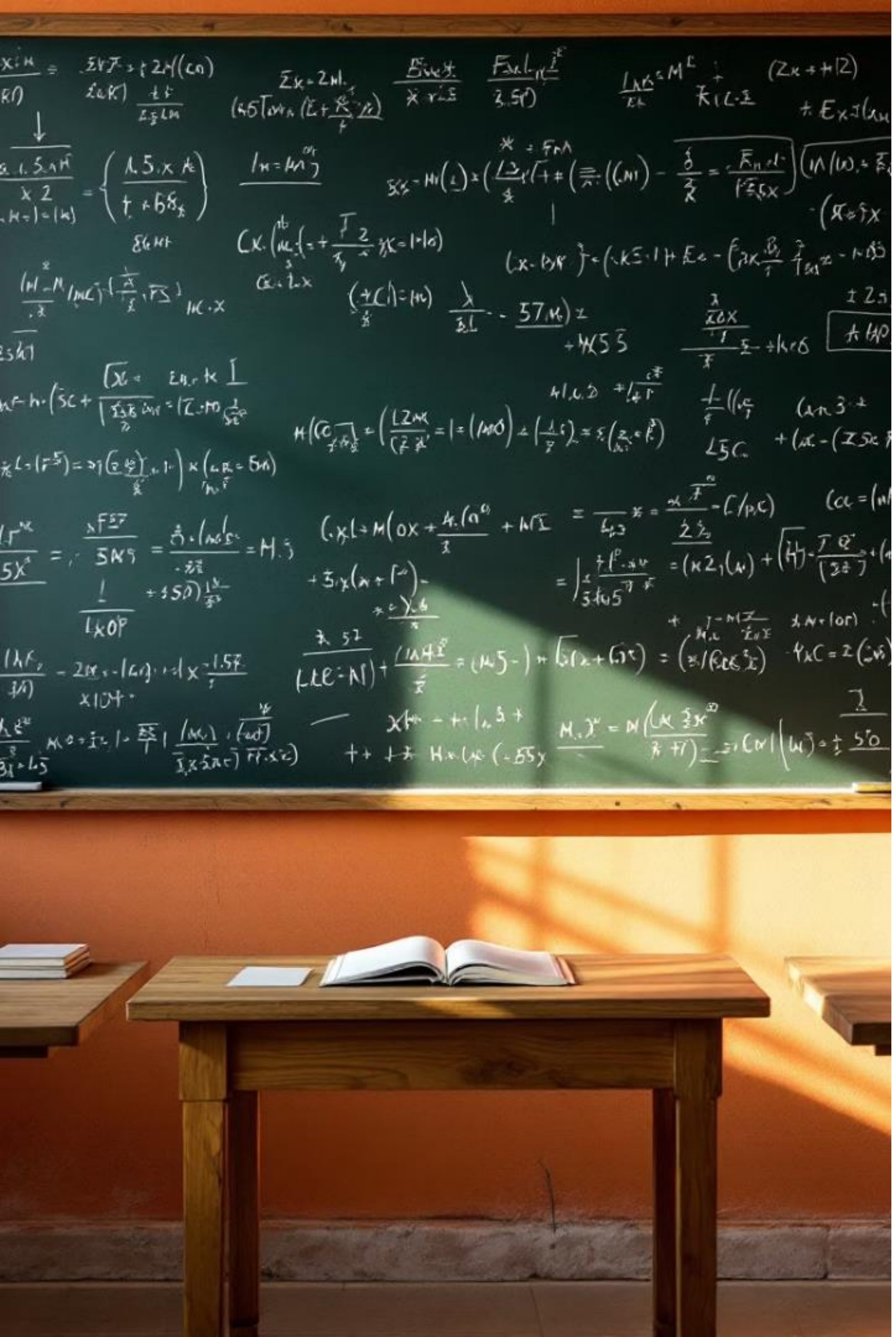
- Predictions:
  - Overreaction increases with forecast horizon h.
  - Subjective overconfidence ($V_t^\theta < V_t$) typical in stationary settings.
  - Explains survey findings: stronger overreaction for long-term forecasts.

$R_{t+h|t,t-J}$ as a Function of J and h



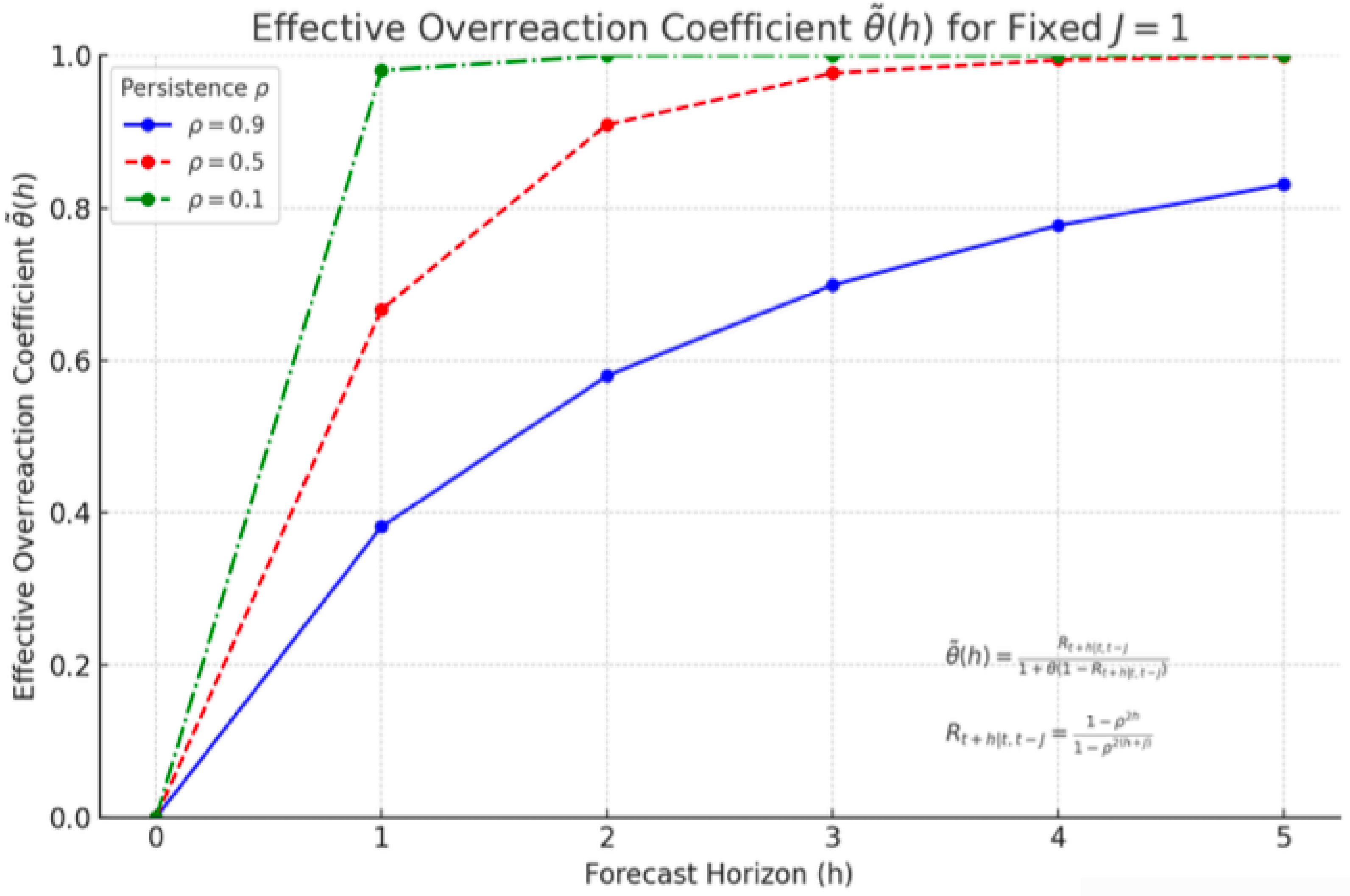
- Vary J (e.g., $J = 1, 3, 5, 10$).
- Fix $\rho = 0.9$ and compute $\tilde{\theta}_t^{h,J}$.

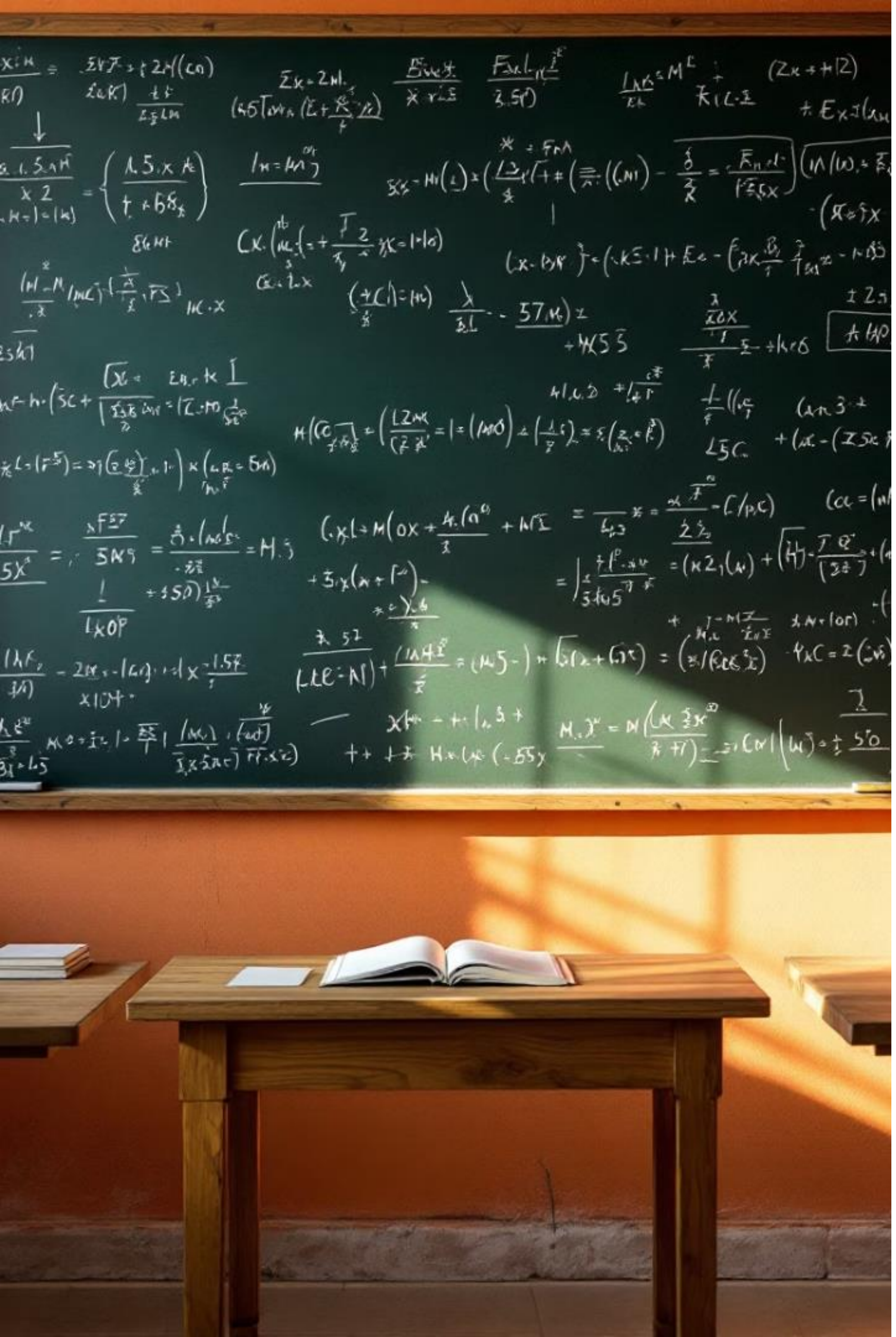




$R_{t+h|t,t-J}$ as a Function of ρ and h

- 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 $h = 1$

- For $J = 1$:
  - $\frac{\partial R}{\partial \rho} < 0$: R decreases with ρ.
  - Sensitivity decreases at higher ρ values.
- For $J = 2$:
  - $\frac{\partial R}{\partial \rho} < 0$: R continues to decrease with ρ.
  - Negative derivative becomes more pronounced for small ρ.
- For $J = 3$ and $J = 4$:
  - $\frac{\partial R}{\partial \rho} < 0$: Similar trends observed.
  - Higher J values amplify the rate of decrease.
- Implication: For small horizons h, R is consistently decreasing in ρ across 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!