Discussion of:
Ambiguity Aversion: Implications for the Uncovered Interest Rate Parity Puzzle

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Summary: Motivation and Mechanism

The Puzzle

- **UIP Failure:** High interest rate currencies tend to *appreciate* rather than depreciate.
- **Related Puzzles:** Carry trade profitability, Asymmetric "crash risk", and Time-series momentum.

The Mechanism: Ambiguity Aversion

- Agents are **Uncertainty Averse** regarding the signal-to-noise ratio of interest rate shocks.
- **Endogenous Pessimism:**
  - *Good News* (supports position): Treated as **Noise** (High σ_V) $\rightarrow$ Low Kalman Gain $\rightarrow$ **Underreaction**.
  - *Bad News* (hurts position): Treated as **Structural** (Low σ_V) $\rightarrow$ High Kalman Gain $\rightarrow$ **Overreaction**.
- **Result:** Gradual appreciation creates momentum; sudden reversals create crash risk.

Setup: Notation and Definitions

Before critiquing, let us clarify the definitions used in the paper.

1. **The Exchange Rate (s_t)**
   - Defined as Log USD per Foreign Currency unit.
   - **High s_t:** Depreciation of Home Currency.
   - **Low s_t:** Appreciation of Home Currency.
2. **The Interest Differential (r_t)**
   - $r_t = i_t - i_t^*$ (Home minus Foreign).
3. **The UIP Regression**

$$s_{t+1} - s_t = \alpha + \beta(i_t - i_t^*) + \epsilon_{t+1}$$

- **Theory:** $\beta = 1$ (High rates $\rightarrow$ Depreciation).
- **Data (Puzzle):** $\beta < 0$ (High rates $\rightarrow$ Appreciation).
- **Goal:** The model must generate $\beta < 0$.

The Dynamic Filtering Problem

The Data Generating Process (DGP) The agent observes the interest differential r_t, composed of a hidden persistent component x_t and a temporary shock:

$$r_t = x_t + \sigma_{V,t} v_t \qquad \text{(Observation Equation)}$$
$$x_t = \rho x_{t-1} + \sigma_U u_t \qquad \text{(Hidden State Equation)}$$

The Structure of Uncertainty:

- **Known:** The persistence ρ and the structural shock volatility σ_U.
- **Ambiguous:** The variance of the temporary shock, $\sigma_{V,t}$.

The Kalman Filter Update: The agent estimates the hidden state $\hat{x}_{t,t}$ using the Kalman Gain K_t:

$$\hat{x}_{t,t} = \rho \hat{x}_{t-1,t-1} + \underbrace{K_t}_{\text{Signal-to-Noise}} (r_t - \rho \hat{x}_{t-1,t-1})$$

- **High σ_V (Noise) Belief** $\rightarrow$ Low $K_t \rightarrow$ Ignore innovation.
- **Low σ_V (Signal) Belief** $\rightarrow$ High $K_t \rightarrow$ Full update.

Critique I: Endogenous Beliefs ("Flip-Flopping")

The Issue: Beliefs are enslaved to Portfolio Positions

The agent's belief about the *physics of the economy* (the variance of temporary shocks, σ_V) toggles instantly based on the sign of their holding b_t.

Illustrative Scenario:

- Consider two agents observing a rate hike ($r_t \uparrow$):
- **Agent A (Long Foreign):** "Bad news. This hike is **Persistent**. σ_V is Low."
- **Agent B (Short Foreign):** "Good news. This hike is **Noise**. σ_V is High."

The Concern

Is it plausible that an investor's fundamental view of the Data Generating Process changes simply because they bought or sold a bond?

Critique I: The Discontinuity at Zero

Corollary 1 Implications

- The model requires a "razor's edge" shift at $r_t \approx 0$.
- A trivial change in position ($+\$1$ to $-\$1$) inverts the Kalman filter parameters.

Why this matters:

- Standard theory: Positions change because beliefs change.
- This model: Beliefs change because positions change.
- This "Schizophrenic" behavior drives the negative skewness, but raises questions about behavioral realism.

Critique II: Sensitivity to Persistence

The Mechanism relies on a Multiplier Effect
From Lemma 2, the exchange rate follows the RE structural form:

$$s_t = a_1 \hat{x}_{t,t} + a_2 r_t$$

The coefficient a_1 (sensitivity to the hidden state) is:

$$a_1 = -\frac{\rho}{1-\rho}$$

The Benchmark Leverage:

- With $\rho = 0.98$ (Benchmark), Multiplier ≈ 49.
- A small ambiguity distortion is magnified 50x to override UIP.

Critique II: Robustness Results

What happens if persistence drops?

- Referencing **Table 4, Column 4**:
- When ρ is lowered to 0.7:

$$\text{Multiplier} \approx 2.3$$

- **Result:** The UIP coefficient becomes **Positive** ($\beta \approx 0.38$).

Implication:

- The "solution" to the puzzle is fragile. It disappears if the economy is not extremely slow-moving (Unit Root).
- While this fits Emerging Markets (Bansal and Dahlquist, 2000), it suggests the mechanism may not be robust for Developed Markets during periods of lower persistence.

Conclusion and Suggestions

Positives:

- A unified explanation for three distinct puzzles: UIP, Momentum, and Skewness.
- Rigorously endogenizes "market sentiment" (pessimism) without relying on irrationality.

Constructive Suggestions:

- **Smooth the Discontinuity:** Introduce transaction costs or a "neutral zone" where beliefs do not flip instantly at $b_t = 0$.
- **Alternative Ambiguity:** Model ambiguity regarding the *trend* (ρ) rather than the variance to reduce sensitivity to the $\frac{\rho}{1-\rho}$ multiplier.

References I

Ilut, C. (2012). Ambiguity aversion: Implications for the uncovered interest rate parity puzzle. *American Economic Journal: Macroeconomics*, 4(3):33–65.