Tail Risk and Expectations

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Motivation and Research Question

- Tail Risk refers to the probability of extreme negative losses.
- Relationship to Expectations: Endogenously generate persistent changes in beliefs (Kolivakis et al. (2019)).

Prior and Posterior Distribution

Prior Distribution

Posterior Distributions

Larger Overreaction with Higher Uncertainty

Result 1: Forecasters Overreact to First Moment Shocks

Empirical Validation

- Time period: 1978Q1 to 2016Q4
- Data:
  - VIX index: To measure uncertainty.
  - University of Michigan’s Consumer Sentiment Index: To measure expectations.
  - Survey of Professional Forecasts: To measure expectations and overreaction behavior (Following Bordalo et al. (2020))

- Negative coefficient: More overreaction behavior.
- US Bureau of Economic Analysis: To measure tail risk and GDP growth distribution (Adrian et al. (2019)).

- Tail risk measure defined as difference between median and 5th percentile.
- Tail risk episodes: Measure of tail risk exceeding 75th percentile.

Validation of Result 1 and 3: Overreaction in Tail Risk Episodes

- Result 1: Coefficient in Bordalo et al. (2020) is more negative in a tail risk episode (shaded grey area) → larger overreaction in a tail risk episode.
- Result 3: Coefficient in Bordalo et al. (2020) is more negative with higher uncertainty in a tail risk episode. Larger overreaction when uncertainty is higher.

Validation of Result 2: Uncertainty Shocks Decrease Expectations

Table: Regression Results between Expectations and Uncertainty

- \( \gamma_{i,t} \): Overreaction in Tail Risk Episodes
- \( \gamma_{i,t} \): Larger Overreaction with Higher Uncertainty

Notes: This figure presents the posterior distribution of the forecaster’s beliefs about the hidden state with low and high uncertainty by decreasing (increasing) the standard deviation by half its original value. Vertical lines are posterior expectations.

Result 2: Second Moment Shocks Lead to More Pessimism

Notes: This figure presents the posterior distribution of the forecaster’s beliefs about the hidden state with low and high uncertainty by decreasing (increasing) the standard deviation by half its original value. Vertical lines are posterior expectations.

Conclusion

This paper studies how individuals react under tail risk. First, we show that individuals overreact under tail risk. Second, under tail risk, uncertainty shocks lead to more pessimistic expectations. Third, we find that the magnitude of overreaction under tail risk depends on the level of uncertainty in the economy. Our findings shed light on factors driving overreaction in expectations and highlight the importance of uncertainty shocks in propagating macroeconomic stability.