# How much should life-cycle investors adapt their behavior when confronted with model uncertainty?

Tilburg University

Understanding Society

Sally Shen[1]

Discussion by Ferenc Horváth[2]

[1]Capital University of Economics and Business and Netspar

[2]Tilburg University

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# Summary of the paper

- dynamic investment and consumption problem under uncertainty (about the inflation rate and the income growth)
- in general, the effect of uncertainty is not straightforward: it depends on age, risk-aversion level, income stability and the level of state variables
- e.g., when the instantaneous inflation rate is low, uncertainty increases the demand for long-term bonds

# General remarks

- interesting extension of the non-robust model, since the effects of robustness are not clear-cut
- precise mathematical treatment and calibration
- more economic intuition on results (do not just state, but also explain the economic intuition behind them)
- more intuition on assumptions (why exactly you need them)
- exploit the opportunities: even though they are not straightforward, you can say more about the effects of uncertainty (one nice example: lower instantaneous inflation $\rightarrow$ higher demand for long-term bonds)

# Remark: minimax vs. maximin

Model 2 and Model 4: the optimal distortion (i.e., "mother nature's optimal decision") depends on the investor's optimal investment decision.

- surprising result (this kind of dependency is not common in the robust dynamic asset allocation literature)
- does this mean that the min and max operators are not interchangeable?
- does Sion's/Neumann's minimax theorem not hold in your model?
- if not, which requirements are violated?

# Remark: model calibration (data)

- why bonds with 1, 3 and 6 years of maturity? 1, 5 and 10 years seem a better choice due to them being more liquid. (Moreover: 10 years of maturity $\rightarrow$ more variation in maturities.)
- I suggest that you include a short-term bond as well (3 months T-bill is a good choice due to its liquidity) for more precise estimation of the parameters that determine the short end of the yield curve

# Remark: model calibration (estimation)

- $\sigma_{\pi_3} = -1.09\% \leftarrow \sigma_{\pi_3}$ and $\sigma_{S_4}$ have to be assumed to be positive to assure model identification (this will probably effect your other quantitative results only slightly if at all)
- "due to a large number of parameters to be estimated, the nonlinear optimization problem can hardly converge"
  Although big, the number of your parameters might be still small enough to use grid search techniques (especially since for several parameters you can give reasonable starting values)
- half-life of nominal rate under multi-factor affine models: why does only the largest eigenvalue of the mean reversion matrix matter?

# Remark: Uncertainty Set and Penalty Valuation

Proposition 5.1: $\kappa^2$ acts as an upper bound.

- how is this related to detection error probabilities?
- can we directly translate $\kappa^2$ into a concrete detection error probability and vice versa?

**Thank you for your attention!**