Stochastic volatility implies fourth-degree risk dominance: Applications to asset pricing

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Stochastic volatility implies fourth-degree risk dominance: Applications to asset pricing

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Abstract

What is the contribution of stochastic volatility to the resolution of asset pricing puzzles? I demonstrate that increasing the risk surrounding the variance of future consumption does not change its unconditional variance, but it generates a fourth-degree risk deterioration in future consumption, yielding in particular an increase in its excess kurtosis. If shocks to the volatility of consumption growth are persistent, the term structure of annualized excess kurtosis is increasing. In a Lucas economy with a EU representative agent, this increases the aggregate risk premium if and only if the fourth derivative of the utility function u is negative, and it makes its term structure increasing. Persistent stochastic volatility also reduces the interest rate if and only if the fifth derivative of u is positive, and it makes its term structure decreasing. These conditions are satisfied under constant relative risk aversion, and these results are robust to Epstein-Zin preferences. We show that persistent stochastic volatility is supported by the evidence that the excess kurtosis of consumption growth is positive and has an increasing term structure, using quarterly growth data in the U.S. between 1947 and 2016.

Keywords: Long run risks, fourth-degree risk dominance, temperance, edginess, recursive utility, kurtosis ratio.

JEL codes: D81

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