Pricing Kernels with Stochastic Skewness and Volatility Risk

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Abstract

I derive pricing kernels in which the market volatility is endogenously determined. Using the Taylor expansion series of the representative investor’s marginal utility, I show that the price of market volatility risk is restricted by the investor’s risk aversion and skewness preference. The risk aversion is estimated to be between two and five and is significant. The price of the market volatility is negative. Consistent with economic theory, I find that the pricing kernel decreases in the market index return and increases in market volatility. The projection of the estimated pricing kernel onto a polynomial function of the market return produces puzzling behaviors, which can be observed in the pricing kernel and absolute risk aversion functions. The inclusion of additional terms in the Taylor expansion series of the investor’s marginal utility produces a pricing kernel function of market stochastic volatility, stochastic skewness, and stochastic kurtosis. The prices of risk of these moments are restricted by the investor’s risk aversion, skewness preference, and kurtosis preference. The prices of risk of these moments should not be confused with the price of risk of powers of the market return, such as co-skewness and co-kurtosis.

JEL Classification Codes: G11, G12, G13, C5, D24, D34.

Key words: pricing kernels; risk aversion; skewness preference; volatility risk

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