

Multivariate realized stochastic volatility model with leverage

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Abstract

A joint model of multivariate returns and realized measures of covariance is proposed. The model of returns is described by a multivariate stochastic volatility model with leverage. The matrix exponential transformation is used to keep the time varying covariance matrices positive definite. The measurement equation of the multivariate realized measure is formulated as a matrix log-linear form, which is a matrix-variate extension of Takahashi, Omori, and Watanabe (2009). An efficient Bayesian estimation method using Markov chain Monte Carlo is discussed. The proposed model and the estimation method are applied to five dimensional stock return data.