

Testing for a Single-Factor Stochastic Volatility in Bivariate Time Series

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Abstract

This paper proposes the Lagrange multiplier test for the null hypothesis that the bivariate time series has a single common stochastic volatility factor. The test statistic is constructed by smoothing algorithm for linear state-space models under the assumption that the log of squared measurement error is normally distributed. The finite sample size and power of the test are examined in Monte Carlo experiments. The test is applied to the empirical factor analysis of Asian stock index volatility. We find evidence that most of the pairs do not have different volatility series.

JEL classification: C12; C32; C58

Keywords: Stochastic volatility model; Kalman filter; Lagrange multiplier test

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