# Testing for the Common Volatility Process in Bivariate Time Series Model

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January 22, 2015

**Abstract**

The authors consider the problem whether financial returns have the common volatility process in the framework of stochastic volatility models suggested by Harvey et al. (1994), and propose a stochastic volatility version of the ARCH test proposed by Engle and Susmel (1993), who investigated whether international equity markets have the common volatility process. It also checks the hypothesis of frictionless cross-market hedging, which implies perfectly correlated volatility changes, as suggested by Fleming et al (1998). Technically, the authors used Chesher's method (1984) of differentiating an integral that contains a degenerate density function in deriving the Lagrange multiplier test statistic.