AISM (2008) 60:367–406
DOI 10.1007/s10463-007-0138-0

Asymptotic normality of a covariance estimator for nonsynchronously observed diffusion processes

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Received: 4 November 2005 / Revised: 24 May 2006 / Published online: 3 October 2007

Abstract We consider the problem of estimating the covariance of two diffusion-type processes when they are observed only at discrete times in a nonsynchronous manner. In our previous work in 2003, we proposed a new estimator which is free of any 'synchronization' processing of the original data and showed that it is consistent for the true covariance of the processes as the observation interval shrinks to zero; Hayashi and Yoshida (*Bernoulli, 11*, 359–379, 2005). This paper is its sequel. Specifically, it establishes *asymptotic normality* of the estimator in a general nonsynchronous sampling scheme.

Keywords Diffusions · Discrete-time observations · High-frequency data · Nonsynchronicity · Quadratic variation · Realized volatility