

A rate-optimal estimator for the integrated covariance of nonsynchronously observed diffusion processes with endogenous noise

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Abstract

We will focus on estimating the integrated covariance of two diffusion processes observed in a nonsynchronous manner. The observation data is contaminated by some noise, which is possibly correlated with the returns of the diffusion processes, while the sampling times also possibly depend on the observed processes. This situation is much more realistic than those in which both of the noise and the sampling times are independent of the diffusion processes. In a high-frequency setting, we construct an estimator for the integrated covariance, and we show that such a kind of estimators has the consistency and the asymptotic mixed normality, and attains the optimal rate of convergence. The proposed estimator becomes a modified version of the pre-averaged Hayashi-Yoshida estimator introduced and studied by Christensen et al. [1] and Christensen et al. [2].

Key words: Endogenous noise; Hayashi-Yoshida estimator; Integrated covariance; Market microstructure noise; Nonsynchronous observations; Pre-averaging; Stable convergence; Strong predictability

References

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