

Covariance estimation for non-synchronous noisy high-frequency observations

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An estimator for the integrated covariance of two Itô processes is presented in the statistical model of discrete non-synchronous high-frequency observations with additive microstructure noise. The estimator is based on a convenient combination of methods to deal with non-synchronous sampling schemes and sub-sampling and multi-scale techniques to handle the effect of observation noise. In an analysis of the asymptotic properties stable weak convergence of the estimation error to a centered mixed Gaussian distribution with optimal rate is shown on adequate regularity assumptions. A closed-form expression and a consistent estimator for the asymptotic variance lead to a feasible central limit theorem. In a simulation and real-data study the finite sample size characteristics of the estimator are examined and discussed.