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Estimating the quadratic covariation matrix from noisy observations: local method of moments and efficiency

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(Submitted on 25 Mar 2013)

An efficient estimator is constructed for the quadratic covariation or integrated covolatility matrix of a multivariate continuous martingale based on noisy and non-synchronous observations under high-frequency asymptotics. Our approach relies on an asymptotically equivalent continuous-time observation model where a local generalised method of moments in the spectral domain turns out to be optimal. Asymptotic semiparametric efficiency is established in the Cram\'er-Rao sense. Main findings are that non-synchronicity of observation times has no impact on the asymptotics and that major efficiency gains are possible under correlation. Simulations illustrate the finite-sample behaviour.

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