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High-frequency sampling and kernel estimation for continuous-time moving average processes

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Interest in continuous-time processes has increased rapidly in recent years, largely because of the high-frequency data available in many areas of application, particularly in finance and turbulence. We develop a method for estimating the kernel function of a continuous-time moving average (CMA) process Y which takes advantage of the high-frequency of the data. In order to do so we examine the relation between the CMA process Y and the discrete-time process Y^Δ obtained by sampling Y at times which are integer multiples of some small positive Δ. In particular we derive asymptotic results as $\Delta\downarrow 0$ which generalize results of \cite {bfk:2011:1} for high-frequency sampling of CARMA processes. We propose an estimator of the continuous-time kernel based on observations of Y^Δ, investigate its properties and illustrate its performance using simulated data. Particular attention is paid to the performance of the estimator as $\Delta\downarrow 0$. Time-domain and frequency-domain methods are used to obtain insight into CMA processes and their sampled versions.

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