

ESTIMATION OF INNOVATION VARIANCE FOR IRREGULAR TIME SERIES DATA

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Abstract: For a stationary time series nonparametric estimators of the innovation variance can provide useful information to judge the fit of various parametric models. In this paper we extend the nonparametric estimator of Davis and Jones (1968) to the case when the time series is sampled at irregular times or has missing values. The key idea is to use the Szegő-Kolmogorov formula for the innovation variance and replace the unknown spectral density by the periodogram and/or the smoothed periodogram. We rely on the Matsuda and Yajima's (2009) modified periodogram for the irregular case and study the asymptotic properties of the ensuing estimator. Its finite-sample performance is assessed through simulation and application to a real dataset.