

Quasi-Maximum Likelihood Estimation of Seasonal Long-Memory Limiting Aggregate Processes

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Abstract:

We study the autocorrelation structure and the spectral density function of aggregates from a discrete-time process. The underlying discrete-time process is assumed to be a stationary Seasonal AutoRegressive Fractionally Integrated Moving-Average (SARFIMA) process, after suitable number of differencing if necessary, and the seasonal periods of the underlying process are multiples of the aggregation size. We derive closed-form expressions for the normalized spectral density of the aggregates, as the aggregation size goes to infinity. The limiting aggregate seasonal long-memory model is then estimated by maximizing the Whittle likelihood. It is shown that the maximum likelihood estimator is asymptotically normal, and its finite-sample properties are studied through simulation. The efficacy of the proposed approach is illustrated by a real-life Internet traffic example.

(Joint work with Kung-Sik Chan)