UNIVERSITÀ DEGLI STUDI DI MILANO BICOCCA

Dipartimento di Statistica e Metodi Quantitativi

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Costationary inference for locally stationary time series

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Abstract

In this presentation, we illustrate a novel inferential approach to estimate time-varying parameters of locally stationary time series. This approach is based on costationary combinations, that is, time-varying deterministic linear combinations of locally stationary time series that are second-order stationary. We first review the theory of costationarity and formalize a Generalised Method of Moments estimator for the coefficient vectors. We then use this new framework to derive an estimator for the (time-varying) covariance of locally stationary time series and we show that the new covariance estimator is more efficient than classical estimators exclusively based on the evolutionary cross-periodogram. We confirm our theoretical findings through a simulation experiment. We then present a new analysis of financial log-returns showing that our new estimator is capable to highlight well known economic shocks. As a second example of our approach we finally discuss forecasting of locally stationary time series based on costationary combinations.

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