

The Kernel Block Bootstrap

Paulo M.D.C. Parente

(ISEG-U. Lisboa & CEMAPRE)

Abstract

This talk introduces and discusses a new bootstrap method for time-series data, the kernel block bootstrap. The bootstrap method, although akin to, offers an improvement over the tapered block bootstrap of Paparoditis and Politis (2001), admitting kernels with unbounded support. Given a suitable choice of kernel, a kernel block bootstrap estimator of the spectrum at zero asymptotically close to the optimal Parzen (1957) estimator is possible. We show the large sample validity of the kernel block bootstrap and derive the higher order bias and variance of the kernel block bootstrap variance estimator. We also apply the kernel block bootstrap to quasi-maximum likelihood estimation of dynamic models with stationary strong mixing data. We investigate the first order asymptotic properties of the KBB method for quasi-maximum likelihood demonstrating, in particular, its consistency and the first-order asymptotic validity of the bootstrap approximation to the distribution of the quasi-maximum likelihood estimator. A set of simulation experiments for the mean regression model illustrates the efficacy of the kernel block bootstrap for quasi-maximum likelihood estimation.

Joint work with Richard J. Smith (University of Cambridge).