Likelihood ratio tests for the structural change of an AR(p) model to a threshold AR(p) model

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Abstract

This paper considers the likelihood ratio (LR) test for the structural change of an AR model to a threshold AR model. Under the null hypothesis, it is shown that the LR test converges weekly to the maxima of a two-parameter vector Gaussian process. Using the approach in Chan and Tong (1990) and Chan (1991), we obtain a parameter-free limiting distribution. This distribution is novel and its percentage points are tabulated via a Monte Carlo method. Simulation studies are carried out to access the performance of the LR test in the finite sample and a real example is given.