ON THE CUSUM OF SQUARES TEST FOR VARIANCE CHANGE IN NONSTATIONARY AND NONPARAMETRIC TIME SERIES MODELS

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Abstract. In this paper we consider the problem of testing for a variance change in nonstationary and nonparametric time series models. The models under consideration are the unstable AR(\(q\)) model and the fixed design nonparametric regression model with a strong mixing error process. In order to perform a test, we employ the cusum of squares test introduced by Inclán and Tiao (1994, J. Amer. Statist. Assoc., 89, 913–923). It is shown that the limiting distribution of the test statistic is the sup of a standard Brownian bridge as seen in iid random samples. Simulation results are provided for illustration.

Key words and phrases: Cusum of squares test, variance change, autoregressive model with unit roots, nonparametric regression model, strong mixing process, weak convergence, Brownian bridge.