



On the Bickel-Rosenblatt test of goodness-of-fit for the residuals of autoregressive processes

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Résumé en anglais	<p>We investigate in this paper a Bickel-Rosenblatt test of goodness-of-fit for the density of the noise in an autoregressive model. Since the seminal work of Bickel and Rosenblatt, it is well-known that the integrated squared error of the Parzen-Rosenblatt density estimator, once correctly renormalized, is asymptotically Gaussian for independent and identically distributed (i.i.d.) sequences. We show that the result still holds when the statistic is built from the residuals of general stable and explosive autoregressive processes. In the univariate unstable case, we also prove that the result holds when the unit root is located at -1 whereas we give further results when the unit root is located at 1. In particular, we establish that except for some particular asymmetric kernels leading to a non-Gaussian limiting distribution and a slower convergence, the statistic has the same order of magnitude. Finally we build a goodness-of-fit Bickel-Rosenblatt test for the true density of the noise together with its empirical properties on the basis of a simulation study.</p>
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