

Location-scale invariant Bickel-Rosenblatt tests and their application to assessing multivariate normality

Carlos Tenreiro
CMUC, Department of Mathematics
University of Coimbra
e-mail: tenreiro@mat.uc.pt
<http://www.mat.uc.pt/~tenreiro/>

Abstract

Location-scale invariant Bickel-Rosenblatt goodness-of-fit tests (IBR tests) are considered in this talk to test the hypothesis that f , the common density function of the observed independent d -dimensional random vectors, belongs to a null location-scale family of density functions. The asymptotic behaviour of the test procedures for fixed and non-fixed bandwidths is studied by using an unifying approach. We establish the limiting null distribution of the test statistics, the consistency of the associated tests and we derive its asymptotic power against sequences of local alternatives. These results show the asymptotic superiority, for fixed and local alternatives, of IBR tests with fixed bandwidth over IBR tests with non-fixed bandwidth. From a finite sample point of view the behaviour of the IBR tests strongly depends on the choice of a smoothing parameter h (bandwidth). In the important case of assessing multivariate normality we give a theoretical and finite sample based description of the role played by the smoothing parameter in the detection of departures from the null hypothesis and we propose an easy to use rule for choosing h that produces a test with the omnibus property.