Selecting Models in both Location-Scale and Non-Location-Scale Families with Goodness-of-Fit Techniques

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Abstract

Goodness-of-fit (GOF) techniques are frequently used for assessing whether a distribution is appropriate to describe a data set or not. New distributions have been proposed to enhance the properties of the well-known models, but such distributions in general do not belong to the location-scale (LS) family. This is the case of the Birnbaum-Saunders and the generalized inverse Gaussian distributions. GOF tests for distributions in the non-location-scale (NLS) family are not easy to find. For testing distributions in the LS family, the well-known Kolmogorov-Smirnov and Anderson-Darling statistics are frequently used. Therefore, it is important to have new tests or adapt the existing ones to the new variety of distributions now available considering NLS distributions. In the present work, we present GOF tests for distributions in both LS and NLS families based on different statistics and discuss the possibility of selecting models based on hypothesis testing considering such distributions. We apply these tests and model selection to real-world data sets.

Keywords: GOF tests; Non-Location-Scale Family.