



Tests for the equality of conditional variance functions in nonparametric regression

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Abstract

In this piece of research we are interested in checking whether the conditional variances are equal in two or more location-scale regression models. Our procedure is fully nonparametric and is based on the comparison of the error distributions under the null hypothesis of equality of variances and without making use of this null hypothesis. We propose four test statistic based on empirical distribution functions (Kolmogorov-Smirnov and Cramér-von Mises type test statistics) and two test statistics based on empirical characteristic functions. The limiting distributions of these six test statistics are established under the null hypothesis and under local alternatives. We show how to approximate the critical values using either an estimated version of the asymptotic null distribution or a bootstrap procedure. Simulation studies are conducted to assess the finite sample performance of the proposed tests. We also apply our tests to data on household expenditures.

Keywords: empirical characteristic function; empirical distribution function; kernel smoothing; regression residuals.