Testing linearity for a regression model with imprecise elements: a power analysis

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SUMMARY

A linearity test for a simple regression model with imprecise random elements is analyzed. The concept of LR fuzzy random variable is used to formalize imprecise random elements. The proposed linearity test is based on the comparison of the simple linear regression model and the nonparametric regression. In details, based on the variability explained by the above two models, the test statistic is constructed. The asymptotic significance level and the power under local alternatives are established. Since large samples are required to obtain suitable asymptotic results a bootstrap approach is investigated. Furthermore, in order to illustrate how the proposed test works in practice, some simulation and real-life examples are given.

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