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A consistent test for the functional form of a regression based on a difference of variance estimators. (English) Zbl 0957.62036

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Summary: We study the problem of testing the functional form of a given regression model. A consistent test is proposed which is based on the difference of the least squares variance estimator in the assumed regression model and a nonparametric variance estimator. The corresponding test statistic can be shown to be asymptotically normal under the null hypothesis and under fixed alternatives with different rates of convergence corresponding to both cases. This provides a simple asymptotic test, where the asymptotic results can also be used for the calculation of the type II error of the procedure at any particular point of the alternative and for the construction of tests for precise hypotheses. Finally, the finite sample performance of the new test is investigated in a detailed simulation study, which also contains a comparison with the commonly used tests.

MSC:

62G10 Nonparametric hypothesis testing
62G20 Asymptotic properties of nonparametric inference
62J02 General nonlinear regression
62G08 Nonparametric regression and quantile regression

Keywords:

variance estimation; model checks; least squares estimator; limit theorems for quadratic forms

Software:

KernSmooth; nlmdl

Full Text: DOI

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