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A consistent diagnostic test for regression models using projections. (English) Zbl 1170.62318
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Summary: This paper proposes a consistent test for the goodness-of-fit of parametric regression models that overcomes two important problems of the existing tests, namely, the poor empirical power and size performance of the tests due to the curse of dimensionality and the subjective choice of parameters such as bandwidths, kernels, and integrating measures. We overcome these problems by using a residual marked empirical process based on projections (RMPP). We study the asymptotic null distribution of the test statistic, and we show that our test is able to detect local alternatives converging to the null at the parametric rate. It turns out that the asymptotic null distribution of the test statistic depends on the data generating process, and so a bootstrap procedure is considered. Our bootstrap test is robust to higher order dependence, in particular to conditional heteroskedasticity. For completeness, we propose a new minimum distance estimator constructed through the same RMPP as in the testing procedure. Therefore, the new estimator inherits all the good properties of the new test. We establish the consistency and asymptotic normality of the new minimum distance estimator. Finally, we present some Monte Carlo evidence that our testing procedure can play a valuable role in econometric regression modeling.

MSC:

- 62F03 Parametric hypothesis testing
- 62E20 Asymptotic distribution theory in statistics
- 62F40 Bootstrap, jackknife and other resampling methods
- 62G08 Nonparametric regression and quantile regression

Cited in **45** Documents

Full Text: [DOI](#)

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