On L_1-norm estimators in nonlinear regression and in nonlinear error-in-variables models

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Abstract: Strong consistency results for the L_1-norm estimator of the parameter of interest are shown in nonlinear models, namely in the nonlinear regression model, in the nonlinear error-in-variables model and in a nonlinear semiparametric model.

Key words: Nonlinear semiparametric regression, nonlinear functional relation, minimum contrast estimates, L_1-norm, consistency.

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1 Introduction

In regression models the L_1-norm estimators receive their justification from robustness theory. For the error distribution only assumptions on the behavior around the median, which should be zero, are required for consistency results.

For nonlinear regression the consistence of the L_1-norm estimators is shown by Oberhofer (1982). Richardson and Bhattacharyya (1987) extended this result to general noncompact parameter sets by using a sieves method. The general approach of M-estimators in Liese and Vajda (1994) for nonlinear regression models includes also the L_1-norm estimator. They obtained a similar result as Richardson and Bhattacharyya (1987) with a different method and conditions that are statistically more transparent.

The concept of minimum contrast estimators and the method of sieves are studied in the nonparametric theory by van de Geer (1990), van de Geer (1995), Birge and Massart (1991) and Birge and Massart (1994). They