

General rank-based estimation for regression single index models

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Abstract This study considers rank estimation of the regression coefficients of the single index regression model. Conditions needed for the consistency and asymptotic normality of the proposed estimator are established. Monte Carlo simulation experiments demonstrate the robustness and efficiency of the proposed estimator compared to the semiparametric least squares estimator. A real-life example illustrates that the rank regression procedure effectively corrects model nonlinearity even in the presence of outliers in the response space.

Keywords Single index · Rank-based objective function · Strong consistency · Asymptotic normality · Nonparametric kernel estimation

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