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Nonparametric quantile regression with missing data using local estimating equations.
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Summary: In this paper, we propose augmented inverse probability weighted (AIPW) local estimating equations in dealing with missing data in nonparametric quantile regression context. The missing mechanism here is missing at random. To avoid the problem of misspecification, we adopt nonparametric approach to estimate the propensity score and conditional expectations of estimating functions. The asymptotic properties of our proposed estimator are studied. Majorisation-minimisation algorithm is used to circumvent the nonsmoothness of check function at the origin. When it comes to the choice of bandwidth, the theoretical expression of local optimal bandwidth is derived based on asymptotic properties. Moreover, we apply smoothed bootstrap method to obtain the empirical mean square error and use cross-validation to determine the bandwidth in practice. Simulations are conducted to compare the performance of our proposed methods with other existing methods. Finally, we illustrate our methodology with an analysis of non-insulin-dependent diabetes mellitus data set.

MSC:
62G08 Nonparametric regression and quantile regression
62Gxx Nonparametric inference

Keywords:
missing data; augmented inverse probability weighted method; local estimating equations; nonparametric quantile regression

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References:


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