

Parameter estimation for a generalized semiparametric model with repeated measurements

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Abstract In this paper, we propose a flexible generalized semiparametric model for repeated measurements by combining generalized partially linear single-index models with varying coefficient models. The proposed model is a useful analytic tool to explore dynamic patterns which naturally exist in longitudinal data and also study possible nonlinear relationships between the response and covariates. We then employ the quadratic inference function and develop an estimation procedure to estimate unknown regression parameters and nonparametric functions. To select variables and estimate parameters simultaneously, we further obtain penalized estimators. Moreover, we establish theoretical properties of the parametric and nonparametric estimators. Both simulations and an empirical example are presented to illustrate the use of the proposed model.

Keywords Quadratic inference function · Partially linear single-index model · Penalized estimator · Repeated measurements · Varying coefficient model · B-splines

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