

SAMPLING ADJUSTED SEMIPARAMETRIC REGRESSION FOR PANEL DATA

Yanqing Sun, Liuquan Sun, and Jie Zhou

Preprint no. 2012-06

Abstract

This paper studies the generalized semiparametric regression model for longitudinal data where the covariate effects are constant for some and time-varying for others. Different link functions can be used to allow more flexible modelling of longitudinal data. The nonparametric components of the model are estimated using a local linear estimating equation and the parametric components are estimated through a profile estimating function. The method automatically adjusts for heterogeneity of sampling times, allowing the sampling strategy to depend on the past sampling history as well as possibly time-dependent covariates without specifically model such dependence. Large sample properties of the proposed estimators are investigated. Large sample pointwise and simultaneous confidence intervals for the regression coefficients are constructed. A formal hypothesis testing procedure is proposed to check whether the effect of a covariate is time-varying. A simulation study is conducted to examine the finite sample performances of the proposed estimation and hypothesis testing procedures. The method is illustrated with a data set from a HIV-1 RNA data set from an AIDS clinical trial.