

Nonparametric censored regression with parametric selection bias

Heuchenne Cédric^{1,2} and Laurent Géraldine¹

- ¹ Center for Quantitative Methods and Operations Management (Quantom)
HEC-Management School of the University of Liège,
University of Liège,
Rue Louvrex, 14,
B-4000, Liège
(E-mail: G.Laurent@ulg.ac.be)
- ² Institut de statistique, biostatistique et sciences actuarielles,
Université catholique de Louvain,
Voie du Roman Pays, 20,
B-1348, Louvain-La-Neuve
(E-mail: C.Heuchenne@ulg.ac.be)

Abstract. Consider the regression model $Y = m(X) + \varepsilon$, where $m(X)$ is some smooth conditional location function (for example, the conditional mean $E[Y|X]$) and the error ε (with unknown distribution) has zero location and smooth conditional scale function $\sigma(X)$ (for example, $\sigma(X) = \sqrt{\text{Var}[Y|X]} = \sqrt{\text{Var}[\varepsilon|X]}$). The pair (X, Y) is subject to parametric selection bias and the response to right censoring. We construct new estimators for $m(X)$ and $\sigma(X)$, and develop a bootstrap technique to select the smoothing parameters involved in the procedures. The asymptotic properties of the proposed estimators are studied as well as their practical behavior through extended simulations and an application to real data.

Keywords: Nonparametric regression, Selection bias, Right censoring, Bootstrap, Bandwidth selection.