

Versatile estimation in censored single-index hazards regression

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Abstract One attractive advantage of the presented single-index hazards regression is that it can take into account possibly time-dependent covariates. In such a model formulation, the main theme of this research is to develop a theoretically valid and practically feasible estimation procedure for the index coefficients and the induced survival function. In particular, compared with the existing pseudo-likelihood approaches, our one proposes an automatic bandwidth selection and suppresses an influence of outliers. By making an effective use of the considered versatile survival process, we further reduce a substantial finite-sample bias in the Chambless-Diao type estimator of the most popular time-dependent accuracy summary. The asymptotic properties of estimators and data-driven bandwidths are also established under some suitable conditions. It is found in simulations that the proposed estimators and inference procedures exhibit quite satisfactory performances. Moreover, the general applicability of our methodology is illustrated by two empirical data.

Keywords Accuracy measure · Conditional survival function · Cross-validation · Kaplan–Meier estimator · Pseudo-integrated least squares estimator · Pseudo-maximum likelihood estimator · Single-index hazards model · U-statistic

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