

Penalized generalized empirical likelihood with a diverging number of general estimating equations for censored data

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Abstract: This article considers simultaneous variable selection and parameter estimation as well as hypothesis testing in censored regression models with unspecified parametric likelihood. For the problem, we utilize certain growing dimensional general estimating equations and propose a penalized generalized empirical likelihood using the folded concave penalties. We first construct general estimating equations attaining the semiparametric efficiency bound with censored regression data and then establish the consistency and oracle properties of the penalized generalized empirical likelihood estimators. Furthermore, we show that the penalized generalized empirical likelihood ratio test statistic has an asymptotic standard central chi-squared distribution. The conditions of local and restricted global optimality of weighted penalized generalized empirical likelihood estimators are also discussed. We present an two-layer iterative algorithm for efficient implementation, and rigorously investigate its convergence property. The good performance of the proposed methods are demonstrated by extensive simulation studies and a real data example is provided for illustration.