

Efficient estimation of quasi-likelihood models using B -splines

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Abstract We consider a simple yet flexible spline estimation method for quasi-likelihood models. We approximate the unknown function by B -splines and apply the Fisher scoring algorithm to compute the estimates. The spline estimate of the nonparametric component achieves the optimal rate of convergence under the smooth condition, and the estimate of the parametric part is shown to be asymptotically normal even if the variance function is misspecified. The semiparametric efficiency of the model can be established if the variance function is correctly specified. A direct and consistent variance estimation method based on the least-squares estimation is proposed. A simulation study is performed to evaluate the numerical performance of the spline estimate. The methodology is illustrated on a crab study.

Keywords B -spline · Least-squares estimation · Quasi-likelihood model · Semiparametric efficiency

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