

# T-type and Huber-Dutter Regression Estimation for Partial Linear Model

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**Abstract:** For the partial linear  $Y_i = X_i^T \beta_0 + g(t_i) + \epsilon_i$ , this paper considers two class robust estimators of parameter  $\beta_0$  by using t-type regression estimator which maximizes the likelihood of a scaled t-type error t-distribution with B-spline approximation  $B(t)^\tau \alpha$  of  $g(t)$  and Huber-Dutter estimator which minimizes the Huber-Dutter loss function  $\sum_{i=1}^n \{\rho[(Y_i - x_i^T \beta - B(t_i)^\tau \alpha)/\sigma] + A_n\} \sigma$ . It is shown that such t-type regression and Huber-Dutter estimators are consistent and asymptotically normal under some rather general conditions. Efficiency comparisons of two estimators for some model are also presented. Furthermore, estimators of  $\sigma^2$ ,  $g(t)$  are given and their asymptotical properties are discussed.