Efficient Shrinkage Estimation in Partially Linear Models

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This paper is concerned with commonly used semiparametric partial linear model with ill conditioned parametric part and correlated errors. We propose analyzing this model using a difference-based approach. The procedure estimates the linear component based on the differences of the observations and then estimates the nonparametric component by a kernel method using the residuals of the linear fit. We employ Liu-type shrinkage estimation to handle multicollinear parametric part. This estimator is also generalized to the case when the linear stochastic constraint $r = R\beta + \varepsilon$ is assumed to hold. When the sample information and prior information are to be assigned not necessarily equal weights, we introduce a new estimator by combining ideas underlying the weighted mixed regression estimation and difference-based Liu estimator. We call this new estimator as generalized difference-based weighted mixed Liu estimator. This estimator is a generalization of the estimators proposed in [**?**] and [**?**]. The proposed estimator is analysed and compared in the sense of mean-squared error. The efficiency properties of the difference-based weighted mixed regression method is analyzed. Numerical performance of the procedure is studied using both simulated and real data.
Keywords: Semiparametric Partial Linear Model; Difference-based; Stochastic Restriction; Correlated Error.

References

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