SEMIPARAMETRIC ESTIMATION OF CONDITIONAL HETEROSCEDASTICITY VIA SINGLE-INDEX MODELING

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Abstract: We consider a single-index structure to study heteroscedasticity in regression with high-dimensional predictors. A general class of estimating equations is introduced, the resulting estimators remain consistent even when the structure of the variance function is misspecified. The proposed estimators also possess an adaptive property in an asymptotic sense. That is, they estimate the conditional variance function asymptotically as well as if the conditional mean function was given a priori. Numerical studies confirm our theoretical observations and demonstrate that our proposed estimator is superior to existing estimators with less bias and smaller standard deviation.

Key words and phrases: Conditional variance, heteroscedasticity, single-index model, volatility.