Ann Inst Stat Math (2019) 71:1–28
https://doi.org/10.1007/s10463-017-0622-0

Semiparametric efficient estimators in heteroscedastic error models

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Received: 8 November 2016 / Revised: 20 September 2017 / Published online: 13 October 2017

Abstract In the mean regression context, this study considers several frequently encountered heteroscedastic error models where the regression mean and variance functions are specified up to certain parameters. An important point we note through a series of analyses is that different assumptions on standardized regression errors yield quite different efficiency bounds for the corresponding estimators. Consequently, all aspects of the assumptions need to be specifically taken into account in constructing their corresponding efficient estimators. This study clarifies the relation between the regression error assumptions and their, respectively, efficiency bounds under the general regression framework with heteroscedastic errors. Our simulation results support our findings; we carry out a real data analysis using the proposed methods where the Cobb–Douglas cost model is the regression mean.

Keywords Heteroscedasticity · Semiparametric method · Standardized regression error · Variance function

Electronic supplementary material The online version of this article (doi:10.1007/s10463-017-0622-0) contains supplementary material, which is available to authorized users.

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