Model-Based Regression Trees in Economics and the Social Sciences

Achim Zeileis

Institut für Statistik
Fakultät für Volkswirtschaft und Statistik
Leopold-Franzens-Universität Innsbruck

Regression models are the workhorse for empirical analyses in economics and the social sciences. For a wide variety of standard analysis problems, there are useful specifications of regression models, validated by theoretical considerations and prior successful empirical studies. However, in non-standard problems or in situations where data on additional variables is available, a useful specification of a regression model involving all variables of interest might not be available. Here, we explore how recursive partitioning techniques can be used in such situations for modeling the relationship between the dependent variable and the available regressors. We show how different models (linear regression via OLS or WLS and the Bradley-Terry model) can be embedded into a common framework of model-based recursive partitioning. The resulting regression trees are grown by recursively applying techniques for testing and dating structural changes in parametric models. They are compared to classical modeling approaches in three empirical applications: (1) The demand for economic journals is investigated. (2) The impact of professors' beauty on their class evaluations is assessed. (3) Differences in rating scales are captured for students' choice of a university in exchange programmes.