

Abstract

We propose robust methods for inference about the effect of a treatment variable on a scalar outcome in the presence of many regressors. Having many regressors necessitates the need for dimension reduction via regressor selection. However, the standard post-model selection methods -- widely used in every day empirical work -- fail to provide uniformly valid inference. We propose and develop a novel, uniformly valid inference method for the treatment effect in this setting, called the “post-double-selection” method. The main attractive feature of our method is that it allows for imperfect selection of the regressors and provides confidence intervals that are valid uniformly across a large class of models. We illustrate the failure of the standard methods and success of the new methods with numerical simulations and applications that consider the effect of abortion on crime rates and the impact of the quality of institutions on economic growth.

*-The talk overviews the results in the following papers, co-authored with A. Belloni, C. Hansen, I. Fernandez-Val, and M. Spindler:

"High-Dimensional Methods and Inference on Treatment and Structural Effects in Economics," 2014, *J. Economic Perspectives*.

"Inference on Treatment Effects After Selection Amongst High-Dimensional Controls (with an Application to Abortion and Crime)," ArXiv 2011, *The Review of Economic Studies*, 2013.

"Program Evaluation with High-Dimensional Data," ArXiv 2013.

"Post-Selection and Post-Regularization Inference: An Elementary, General Approach," *Annual Review of Economics*, 2015.