GMM Efficiency and IPW Estimation for Nonsmooth Functions *

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Abstract

In a GMM setting this paper analyzes the problem in which we have two sets of moment conditions, where two sets of parameters enter into one set of moment conditions, while only one set of parameters enters into the other, extending Prokhorov and Schmidt’s (2009) redundancy results to nonsmooth objective functions, and obtains relatively efficient estimates of interesting parameters in the presence of nuisance parameters. One-step GMM estimation for both set of parameters is asymptotically more efficient than two-step procedures. These results are applied to Wooldridge’s (2007) inverse probability weighted estimator (IPW), generalizing the framework to deal with missing data in this context. Two-step estimation of $\beta_o$ is more efficient than using known probabilities of selection, but this is dominated by one-step joint estimation. Examples for missing data quantile regression and instrumental variable quantile regression are provided.

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