Sieve “Parametric" Likelihood Ratio Bootstrapped Confidence Sets for Semiparametric Likelihood Models Under Partial Identification

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Proposal Description:

We provide methods for inference on a finite-dimensional parameter of interest, *? ? Rd?* , in a semiparametric probability model when an infinite-dimensional nuisance parameter, *g*, is present. We construct confidence sets for ? that are robust to the model parameter (?, g) being partially-identified or irregular (i.e., slower than root-n estimable). This allows practi- tioners to examine the sensitivity of their estimates of ? to more relaxed assumptions on g in a general likelihood setup. To construct these robust confidence sets for ?, we invert a (penal- ized) sieve (log-)likelihood ratio (LR) statistic. We derive the asymptotic null distribution of the sieve LR under partial-identification, which is nonstandard when ? is not point-identified. We present conditions under which a sieve “parametric” bootstrapped LR statistic consis- tently estimates the complicated limiting null distribution of the original-sample sieve LR. Our robust confidence sets are asymptotically efficient when the true ? parameter belongs to the interior of the parameter space and is by chance point-identified and regular.

This proposal seeks a Tobin RA (or Robin RAs) to run some Monte Carlo studies to check the performance of the bootstrapped LR procedure in finite samples.

Requisite Skills and Qualifications:

a good programmer in R or Matlab; knows some basic statistics and econometrics.

Award: Shawn Luciani
Tobin Application Link: Tobin Application
Project Type: Tobin RA
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Source URL: https://economics.yale.edu/undergraduate/tobin-ra/spring-2019/sieve-parametric-likelihood-ratio-bootstrapped-confidence-sets