Subvector Inference in Partially Identified Models with Many Moment Inequalities

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Abstract

In this work we consider bootstrap-based inference methods for functions of the parameter vector in the presence of many moment inequalities where the number of moment inequalities, denoted by $p$, is possibly much larger than the sample size $n$. In particular this covers the case of subvector inference, such as the inference on a single component associated with a treatment/policy variable of interest. We consider a min-max of (centered and non-centered) Studentized statistics and study the properties of the associated critical values. In order to establish that we provide a new finite sample analysis that does not rely on Donsker's properties and establish new central limit theorems for the min-max of the components of random matrices. Furthermore, we consider the anti-concentration properties of the min-max of the components of a Gaussian matrix and propose bootstrap based methods to estimate them. In turn this provides a valid data-driven to set the tuning parameters of the bootstrap-based inference methods. Importantly, the tuning parameters generalize choices of literature for Donsker's classes (and showing why those would not be appropriate in our setting) which might better characterize finite sample behavior. This is co-authored with Federico Bugni and Victor Chernozhukov.