

Adaptive Partial Identification of Treatment Effects

Abstract: I propose multivariate random forests for partial identification of treatment effects with theoretical guarantees. Under monotonic treatment selection and response assumptions, this study identifies treatment effect bounds and estimates them by using the conditional method of moments estimator. To estimate possibly heterogeneous parameters, multivariate random trees adaptively search for subsets of data that exhibit the highest variation in the coefficients of interest. Investigation of the large sample theory shows that the method recovers asymptotically normally distributed parameters. To empirically validate the approach, I consider two different settings, average treatment effects with an endogenous treatment, and local average treatment effects with an endogenous instrument. Based on the National Longitudinal Survey of Youth and U.S. Census data, the results suggest significant heterogeneity in the effect of the Head Start program on years of schooling, and in the effect of the family size on the mother's labor supply. Additional calibrated experiments show the advantages of multivariate random forests.