BU-BC Joint Workshop in Econometrics 2021

Friday, November 19, 10:00am-5:15pm

Zoom link:
https://bostonu.zoom.us/j/96007328539?pwd=K2NwdUhPK2NRRWV4Yms1ZVdNdFIxdz09

Gather Town link for breakout sessions:
https://gather.town/events/grNWc0uMeeXSLMrHbGxQ

Program:

Morning

10:00-10:45 -- Div Bhagia (Boston College, paper)

"Duration Dependence and Heterogeneity: Learning from Early Notice of Layoff"

10:50-11:35 -- Shuowen Chen (Boston University, paper)

"Indirect Inference for Nonlinear Panel Models with Fixed Effects"

Lunch Break

12:15-1:00 -- Xiaoying Lan (Boston College, paper)

"Estimation and Inference of High-Dimensional Semiparametric Binary Choice Model"

1:05-1:50 -- Deniz Ozabaci (University of New-Hampshire, no paper)

"Estimating Nonparametric Sample Selection Models allowing for Endogenous Regressors"

Coffee Break

2:00-2:45 -- Qingsong Yao (Boston College, no paper)

"Robust Nonparametric Estimation and Inference for Treatment Effects in Panel Data Using Quantile Random Forest"

2:50-3:35 -- Yinchu Zhu (Brandeis University, paper)

"Phase transition of the monotonicity assumption in learning local average treatment effects"

3:40-4:25 -- Jean-Jacques Forneron (Boston University, no paper)

"Noisy, Non-smooth, Non-convex Estimation of Moments Condition Models"

Abstracts

Dib Bhagia, "Duration Dependence and Heterogeneity: Learning from Early Notice of Layoff"
Why is the reemployment rate lower for long-term unemployed workers? It is possible that longer time out of work reduces the odds of exiting unemployment. However, long-term unemployed are also composed of job seekers who do not exit unemployment early. In the presence of heterogeneity across workers, this would imply that the composition of long-term unemployed differs from that of newly unemployed workers. In this paper, I use variation in the length of time a worker knows about their impending layoff to disentangle the role of duration-dependent forces from heterogeneity across job seekers. I find that an individual's likelihood of exiting unemployment declines initially, but then increases up until unemployment insurance exhaustion, and remains constant thereafter. My findings are consistent with a standard search model where the returns to search decline early in the spell.

Shuowen Chen, "Indirect Inference for Nonlinear Panel Models with Fixed Effects"

Fixed effect estimates of nonlinear panel data models suffers from the incidental parameter problem. This leads to two undesirable consequences in applied research: (1) point estimates are subject to large bias, and (2) confidence intervals have incorrect coverage. This paper proposes a simulation–based method for bias reduction. The method simulates data using the model with estimated individual effects, and finds values of parameters by equating fixed effect estimators obtained from observed and simulated data. The asymptotic framework provides consistency, bias correction and asymptotic normality results. An application and simulations to labor force participation illustrates the finite–sample performance of the method

Jean-Jacques Forneron, "Noisy, Non-Smooth, Non-Convex Estimation of Moment Condition Models"

This paper proposes and studies an algorithm for finding GMM estimates using only the assumptions required to prove consistency and asymptotic normality. As in many empirical settings, the sample objective function can be noisy, non-smooth, and non-convex (even locally). The main idea is to combine smooth Jacobian estimates with non-smooth moments in a modified Gauss-Newton algorithm. The implementation requires only *two moment evaluations per iteration for local optimization and three for global optimization*. Using non-asymptotic bounds, the paper studies the optimization and statistical properties of the estimation simultaneously. First, a convergent solution does not have any first-order smoothing bias asymptotically, unlike methods that use smoothed moments for estimation. Second, the algorithm is shown to converge quickly from distant starting values with high probability. In particular, the results highlight the role of 1) sampling uncertainty, 2) smoothing, 3) the weighting matrix, and 4) the

degree of non-linearity in the population moments on convergence. The results are illustrated and benchmarked against popular optimizers using simulated and empirical examples.

Xiaoying Lan, "Estimation and Inference of High-Dimensional Semiparametric Binary Choice Model"

Binary choice models can be easily estimated (using, e.g. maximum likelihood estimation) when the distribution of the latent errors is known, as in Logit or Probit. In contrast, most estimators with unknown error distribution (e.g., maximum score, maximum rank correlation, or Klein-Spady) are computationally difficult, making estimation impractical with more than a few regressors. This paper proposes an estimator that is convex at each iteration, and so is numerically well behaved even with large numbers of regressors and large sample sizes. The proposed estimator, which is root-n consistent and asymptotically normal, is based on batch gradient descent, while using a sieve to estimate the unknown error distribution function. In high-dimensional setting, the estimator is p^2/n consistent when $p/n \to 0$ and asymptotic normal when $p^2/n \to 0$, where p is the number of regressors and n is the number of observations. An application of proposed estimator to predict bankruptcy is shown.

Deniz Ozabaci, "Estimating Nonparametric Sample Selection Models allowing for Endogenous Regressors"

This paper presents estimators for nonparametric sample selection models, allowing for both discrete and continuous endogenous regressors, and with and without additive separability assumptions. We also consider a semiparametric extension via a partially linear version of the models, which may be preferable in microeconomic applications with many control variables. We show that the estimators we propose are consistent and asymptotically normal. Furthermore, under the full additivity constraint, the estimators are oracle efficient. The estimators of the semi-parametric partially linear model parameters, on the other hand, are n consistent. Using Monte Carlo simulations, we also present the finite sample properties of the estimators, which support our large sample results. Finally, we apply our estimators to an empirical problem and analyze how maternal employment and child care affect children's cognitive ability development.

Qingsong Yao, "Robust Nonparametric Estimation and Inference for Treatment Effects in Panel Data Using Quantile Random Forest"

Approaches to estimate treatment effects in panel data with only one treated unit have become popular in applied work, which include synthetic control method (Abadie et al., 2010), regression control method (Hsiao et al., 2012), and other variants. However, no pointwise standard errors or confidence intervals with rigorous theoretical justification have appeared in the literature until

very recently. In this paper, we propose a direct construction of confidence intervals via quantile regression, and exploits cross-sectional correlation to construct counterfactuals. We allow for flexible cross-sectional structures and use the quantile random forest (QRF) to construct robust confidence intervals for the treatment effects. Our method allows large number of units and thus accommodates high dimensional covariates. We call this approach "quantile control method" (QCM). We prove the asymptotic validity of quantile random forest for our panel/time-series setting under appropriate regularity conditions. Monte Carlo simulations show that confidence intervals via QCM have excellent coverage probability for the true treatment effects even in small samples, which are robust to heteroskedasticity, autocorrelation, and model misspecification. We then apply QCM to study the effect of the economic integration between Hong Kong and mainland China on Hong Kong's economy (Hsiao et al., 2012).QCM can be easily implemented in forthcoming packages qcm in both R and Stata.

Yinchu Zhu, "Phase transition of the monotonicity assumption in learning local average treatment effects"

We consider the setting in which a strong binary instrument is available for a binary treatment. The traditional LATE approach assumes the monotonicity condition stating that there are no defiers (or compliers). Since this condition is not always obvious, we investigate the sensitivity and testability of this condition. In particular, we focus on the question: does a slight violation of monotonicity lead to a small problem or a big problem? We find a phase transition for the monotonicity condition. On one side of the boundary of the phase transition, it is easy to learn the sign of LATE and on the other side of the boundary, it is impossible to learn the sign of LATE. Unfortunately, the impossible side of the phase transition includes data-generating processes under which the proportion of defiers tends to zero. This boundary of phase transition is explicitly characterized in the case of binary outcomes. Outside a special case, it is impossible to test whether the data-generating process is on the nice side of the boundary. However, in the special case that the non-compliance is almost one-sided, such a test is possible. We also provide simple alternatives to monotonicity.