
HeiKaMEtrics-Seminar

Joint Heidelberg, Karlsruhe and Mannheim research seminar in Econometrics

Semiparametric Analysis of Network Formation

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Abstract:

We consider an extension of the Holland and Leinhardt (1981) model for directed network formation that features both node-specific parameters that capture degree heterogeneity and common parameters that reflect homophily among nodes. The goal is to perform statistical inference on the homophily parameters while treating the node-specific parameters as fixed effects. Jointly estimating all the parameters leads to bias and incorrect inference. As an alternative, we develop an approach based on a sufficient statistic that separates inference on the homophily parameters from estimation of the fixed effects. This estimator is easy to compute and is shown to have desirable asymptotic properties under sequences of growing networks. We illustrate the improvements over maximum likelihood and bias-corrected estimation in a series of numerical experiments. The technique is applied to explain the import and export patterns in a cross-section of countries and to estimate a social network among attorneys in a corporate law firm.