Title: Random Assignment with Non-Random Peers: A Structural Approach to Counterfactual Treatment Assessment

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Abstract:

Recent efforts by economists to exploit peer effects by creative peer assignment have come up short due in part to endogenous peer selection. That is, even conditional on random assignment, agents choose their peers, and failure to account for this selection may crucially bias predictions of the effects of alternative policies. To address this shortcoming of the literature, I build a two-part model in which (1) agents form a network; (2) conditional on the realized network, outcomes are determined by a process that allows for non-linear peer effects. To overcome difficulties in identification and estimation of network-formation games, agents in my model make continuous linking decisions subject to a budget constraint. I show that, under certain conditions, this model has a unique strictly positive equilibrium, which can then be used for identification and estimation. In modeling peer effects, I explicitly model network endogeneity as an omitted variable problem, and further propose a method to recover these omitted variables in estimating the network-formation game. I estimate the parameters of the two-part model using innovative data on networks and outcomes from a randomized study in Rajasthan, India, then show that the model performs well in matching predictions to realized out-of-sample outcomes. This paper makes important contributions to the methodology of peer effects estimation as well as the theory and econometrics of network formation, while providing an important link between structural and experimental approaches to policy evaluation.