Essays on Empirical Matching Models with Unobserved Heterogeneity
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1  Matching Games with Unobserved Heterogeneity: A Structural Analysis of Online Labor Markets (job market paper)
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Empirical studies of two-sided matching markets reveal that sorting patterns between employers and workers may be driven by unobserved heterogeneity on both sides and preferences over multi-dimensional contracts. In this paper, I study a two-stage model where employers firstly set wage contracts for their jobs, workers then match with the jobs in a decentralized way. I propose a strategy that exploits the variation in agent- and match-specific characteristics from finite-sized repeated markets to identify and estimate the preference primitives in the presence of two-sided unobserved heterogeneity, assuming employers share a vertical preference over workers. I apply this model to a leading online tournament-based labor market, TopCoder.com, which matches workers worldwide with short-term programming tasks, and find a multidimensional preference beyond cash motives when workers consider which job to take in the market. Using the results from the estimation, I further study the elements regarding market design that could leverage off the matching mechanisms to improve the total surplus generated from such markets.

2  Identification of Bidders’ Sorting Patterns in Simultaneous All-Pay Auctions (in progress)

This paper studies the identification and estimation of simultaneous all-pay auctions, with an emphasis on the sorting of bidders’ unobservable types into heterogeneous auctions in the market. I develop a two-stage structural model, in which bidders firstly make a discrete choice of entering one of the multiple all-pay auctions, with limited knowledge of his competitors, then bidders place their bids in the auction he chooses to enter. This model could be applied to a variety of real-life markets such as the tournament-based online contests.

3  Beyond the Mere Money: Incentives in the Online Labor Markets (with Jian Ni and Xinlei Chen)

Online platforms that crowdsourcet talents to solve business problems widely adopt cash prizes to incentivize workers, whereas other schemes are much under-explored. Using a unique quasi-experimental setting induced by a reward-scheme change in a leading online labor-market, we find potential employees behave differently in response to the monetary rewards. The higher cash prizes do not necessarily lead to better quality of work. We then devise a stylized theoretical model to explain such phenomena. The nature of loving the job is an important factor for some workers decision to participate. Providing a high cash prize might attract the wrong people into the task and therefore reduce the quality of the average submissions. Not considering such worker heterogeneity could lead to misaligned incentives for the potential employers. We further use post-experiment data to test the models implications. We conclude that without incorporating these indirect incentives, online labor markets designed to attract the best employees could undermine the intentions of the platform and the employers.