Essays on Structural Estimation of Dynamic Models with Asymmetric Information

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This thesis studies how asymmetric information and different mechanisms impact market outcomes in a dynamic setting. First, I focus on the welfare effects of asymmetric information and reputation/feedback systems in online credit markets. Second, I provide new identification and estimation methods for dynamic structural models with unobserved choices. In the last chapter, I compare auction formats in a procurement setting when non-price characteristics are also important.

1 Asymmetric Information, Reputation, and Welfare in Online Credit Markets (job market paper)

This paper studies the impact of reputation/feedback systems on the operation of online credit markets using data from Prosper.com. The ability of lenders to recover their loans is one of the main concerns in these markets, where the problems of asymmetric information are two-fold. On the one hand, borrowers differ in their inherent risks; on the other hand, additional incentives are necessary to motivate borrowers to exert effort. In this paper, I investigate the channels through which reputation/feedback systems improve the total welfare of market participants when both adverse selection and moral hazard are present. A finite-horizon dynamic model of a credit market in which borrowers and lenders interact repeatedly over time is developed and then estimated. I prove the identification of the distribution of borrowers’ private types and utility primitives based on variations in borrowers’ repayment histories, transitions of their characteristics, and interest rates. In the counterfactual analysis, I find that 22 percent of welfare loss from asymmetric information is due to adverse selection, while 78 percent is due to moral hazard. Furthermore, I find that 95 percent of the inefficiency induced by asymmetric information is eliminated by the reputation system. I consider a policy intervention that protects borrowers from accidental loss of reputation. My results suggest that incorporating a payment protection insurance to the market further improves total welfare.

2 Identification and Estimation of Dynamic Structural Models with Unobserved Choices

In typical structural dynamic models, agents’ choices are often observed; however, in many other cases, they are not. For example, in the context of contract models, agents’ choices are sometimes inherently unobserved, which is related to the classic issue of moral hazard in information economics. In this paper, I provide new identification and estimation methods for finite-horizon dynamic discrete choice models with unobserved choice variables. The unobserved choice and state transition probabilities are nonparametrically recovered under three scenarios: (1) with a continuous state variable, (2) with a discrete state variable, and (3) with two discrete state variables. In the first case, I specify the state transition process through a nonparametric regression model with additive errors and exploit variations in moments of the state variables at two different periods along the dynamic process. When
there is only one discrete state variable, I connect the unobserved choices with the latent state transition probabilities through agents’ optimization problems and observed state transitions. In the last case, I identify the primitives under certain conditional independence assumptions imposed on the two discrete state variables. My results extend to dynamic models with serially correlated unobserved heterogeneity.

3 Comparing Auction Formats (with Elena Krasnokutskaya)

In this paper we compare the multi-attribute auction mechanism preferred in industry procurement to the standard auction mechanism used in public procurement. The starting point of the analysis is that an auctioneer, both in the public and industry setting, cares about non-price seller characteristics (e.g., quality). Industry procurement directly incorporates this preference into the award rule allowing for the auctioneer to discriminate among bidders on the basis of non-price characteristics. In contrast, public procurement usually incorporates a certification stage at which low quality providers are excluded from participation. In our analysis we specifically consider the impact of the auction mechanism on the competitiveness of the resulting pricing and on the composition of the set of participants in terms of the features needed by the buyer. Despite the concern that the auction mechanism used in public procurement is restricted for accountability reasons, we find that this restriction does not lead to significantly suboptimal outcomes of public procurement.