D I S S E R T A T I O N P R O P O S A L

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“Essays on Market/Mechanism Design”

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For the first chapter of the dissertation, we extend the preference domain of the assignment problem to accommodate ordinal preferences and cardinal preferences together and thereby allow the mechanism designer to elicit different levels of information about individuals' preferences. We assume that every individual has a complete and transitive preference order over objects and we study the preferences over lotteries of these objects consistent with the original ordering over objects. We restrict our attention to the consistent preference relations which are continuous and satisfy irrelevance of independent alternatives. The stochastic dominance order is the coarsest element of this domain while a vNM preference order is a finest element according to a natural coarseness relation on preferences over lotteries. We show that this domain is characterized by the meet of a collection of consistent vNM preferences where the stochastic dominance order is the meet of the collection of all vNM preferences. We show how this representation relates to the incomplete reports of cardinal preferences assuming a usual preference reporting structure. We introduce ordinal and cardinal mechanisms and show that restricting our attention to the former may lead to efficiency losses. We then extend the pseudo market mechanism of Hylland, A. and Zeckhauser, R. (1979). to this domain. We show that pseudo market prices exist in this extended domain and show that any allocation that can be supported with a pseudo market price is efficient. We present a particular pseudo market mechanism which is also envy free. We show that this mechanism is not strategy proof to the extent that instead of reporting true cardinal preferences, an agent may weakly be better off by only reporting ordinal preferences. We finally show that the impossibility results concerning the incompatibility of incentive compatibility and efficiency of Zhou, L. (1990) and Bogomolnaia, A. and Moulin, H. (2001) for cardinal and ordinal preferences respectively applies to our domain as well.

For the second chapter, we propose to study strategic trading under ambiguity. Condie, S. and Ganguli, J. V. (2011) shows that rational expectations equilibria may be only partially revealing when some traders have non-smooth ambiguity-averse preferences. When prices are fully revealing, it is impossible for Bayes rational agents to benefit from their private information as Milgrom, P. and Stokey, N. (1982) among others have shown in a series of results which are referred as no trade theorems. Because of this, theoretical literature on strategic trading often assumes noise traders, most notably as in Kyle, A. S. (1985). We propose to work on a model where agents are ambiguity averse and therefore the prices are potentially not revealing to study how ambiguity averse agents may benefit from their private information in expense of uninformed.

For the last chapter, we study market micro-structure of call auctions which are used to determine open prices in stock exchanges from a mechanism design perspective. In practice of call auctions, investors send different types of market and limit orders to the market maker and the market maker executes these orders at a pre-determined time which is typically right on time of the stock market opening. Different stock exchanges follow different rules of disseminating information and restricting the ability of investors in terms of putting and canceling different types of orders. For example, NYSE starts to disseminate information about market imbalance well before than NASDAQ. Furthermore, NASDAQ is more

restrictive in terms of the order limitations. We want to employ a mechanism design approach to understand these discrepancies between different stock exchanges and provide a welfare improvement to existing market mechanisms. Building upon the pioneering idea of Budish, E., Cramton, P., and Shim, J. (2015), we conjecture that by letting investors to put and cancel orders at discrete time periods for a small time period right before the market opening, we can improve the efficiency of the prices and therefore the market mechanism.