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Background

Current Occupation PhD Candidate in Economics at Harvard University.

I am in my fourth year in the program. My main fields are Game Theory/Mechanism Design and Industrial Organization. I am also interested in Behavioral Economics.

Course work

Graduate-level Game Theory and Decision Theory classes, Market Design and Electronic Marketplaces (Econ 2056a), Econometrics classes, IO classes.

Research Interests and Pursued Projects

Among the fields relevant to the tutorial, my interests include electronic marketplaces, in particular sponsored search advertising and display ads. Online advertising market is multi-sided and involves bringing together consumers, advertisers and publishers on one platform. I would like to study how these markets operate and how they can be improved in terms of social welfare, revenue, stability, security, etc.

The rest of the document briefly describes two projects I am currently working on and which will contribute to my PhD dissertation. The first project is “How does Intermediation Design Affect Market Efficiency and Revenues?” jointly with Greg Lewis. The second project is “Learning and Experimentation with Misspecified Beliefs,” jointly with Drew Fudenberg.

How does Intermediation Design Affect Market Efficiency and Revenues?

Platforms help to overcome several key frictions: (1) they provide market thickness; (2) they reduce transaction costs; and (3) they reduce search costs (Hagiu (2009)). The first two functions are relatively well-explored, while the consequences of search within platforms, are less well understood, in spite of the growing importance that search facilitation seems to be

playing on many platforms. In situations where match quality is a central part of platform outcomes, a platform also has a role in making desirable matches easier to achieve.

The purpose of this project is to shed light on the role of consumer search costs in platform markets, its effect on welfare, consumer surplus, sellers profits and as a result on the platform's incentives to manipulate them.

The implicit intuition behind platforms' efforts to facilitate search within platforms is that lower search costs represent a "win-win" situation for the agents on both sides of the platform and lead to Pareto-improving outcomes. This "win-win" logic implicitly requires that the agents on the one side are not competing for the goods on the other (e.g. book buyers on Amazon do not interact). Yet in many markets, such competition is the norm (think eBay).

To the best of our knowledge, this is the first project to examine the implications of search and search costs on outcomes and welfare, in a platform setting where *agents on one side compete for goods on the other side*.

We set up a model with two goods and horizontally differentiated consumers. A consumer incurs a search cost if he is willing to switch his default allocation. The competition on the buyers side with imperfect matching is modeled via a direct allocative mechanism: each buyer who participates in market for good j reports their value v , and is allocated a good with probability $p_j(v) < 1$. *We show how positive search costs can be used to manipulate the relative thickness of the markets, so the intermediary who takes a cut of sellers revenue may optimally maintain search frictions.*

Learning and Experimentation with Misspecified Beliefs

This project studies the environment with four key ingredients: 1) there is an objective reality in which agents operate. 2) Each agent has a subjective view of the his environment, a class of models parametrized by some parameter θ . 3) An agent is misspecified in the sense that there is no θ such that $\text{subjective_model}(\theta) = \text{objective_reality}$. 4) An agent is not myopic, and so he faces exploration-vs-exploitation tradeoff.

The situation when an agent is misspecified is widespread. Because of the complexity of its environment, a firm can ignore the important details of the market it sells on. Behavioral biases in individual decision making is another prominent source of misspecification, e.g. winner's curse in common value auctions. In financial markets, traders at stock exchange operate in the highly complex environment. Hong, Stein and Yu (2007) show how traders acting according to a simplified model of the world can generate observable market outcomes like forecastable variation in the magnitude of the value-glamour return differential, in volatility, and in the skewness of returns.

This project is a first step towards study of active learning with misspecification. We note that in many situations of interest the steady states are numerous and serve as a poor prediction. Additional complications arise because in general we don't know that beliefs converge (Dubins and Freedman (1966), Nyarko (1991)). When agent's model is wrong, the convergence of beliefs becomes a key part of the analysis. In this project we 1) find conditions for convergence of beliefs when the agent is misspecified and experiments actively; 2) characterize the limit points of learning process when the agent's discount factor δ is between 0 and 1.