Miniproject on: Acquiring Information Prior to Trade
Supervisor: Claudio Mezzetti, Economics, Warwick

The goal of the miniproject is to provide some answers to the following questions. How much information should parties acquire before trading? Are the private incentives of parties and the social goals of efficient trading aligned?

The simplest set-up and starting point of the project is a seminal paper by Myerson and Satterthwaite (1983). (Myerson won the Nobel prize in economics in 2007 for this and other contributions.) They studied a model with a single seller S, a single buyer B, and a single indivisible good. S has cost $c \in [0,1]$ of trading away the good, while B has value $v \in [0,1]$ from obtaining the good.[1] The cost c is private information of the seller, while v is private information of the buyer; it is common knowledge that c is distributed according to the prior $F(c)$ with density $f(c) > 0$, while v is distributed according to the prior $G(v)$ with density $g(v) > 0$. Buyer and seller are risk neutral and if they trade at price p they obtain utilities $U^B = v - p$ and $U^S = p - c$.

Myerson and Sattherthwaite (1983) showed that efficient trade (trade if $v > c$) cannot result in equilibrium. This is because the seller has an incentive to overreport and the buyer to underreport their valuations. For the special case in which F and G are uniform distributions, Chatterjee and Samuelson (1983) showed that the best that can be achieved is that trade takes places if $v > c + 1/4$.

The model assumes that each party has private information. But what if information needs to be acquired? How much information is it optimal for the parties to acquire? Suppose information acquisition is costless, is it optimal for the parties to be fully informed? What are the implication for the efficiency of trading?

A paper by Bergemann and Pesendorfer (2007) suggests that the optimal information structure is one in which each trader discovers where his value is among many possible subintervals of $[0,1]$; e.g., is v in $[0, 0.25]$, $[0.25, 0.5]$, $[0.5, 0.75]$ or $[0.75, 1]$. The question is: How many intervals should we place in the partition if we want to maximize welfare? Would traders agree to subdivide the support $[0,1]$ according to the partition that maximize welfare? Would all traders have the same partition? It is very likely that only computational answers can be given to many of these questions.

While answering questions for the two traders model would be sufficient to complete an excellent mini-project, the more general question of information acquisition by multiple traders in a market could be the topic of a PhD dissertation. The general trade-off is this: To determine whether trade should take place (and, in general, at what price), more information is good (and full information is best). However, more information is also bad, because it gives parties possessing information the ability to extract rents. As for the standard monopolist, the way to extract rents is by restricting trade.

I am currently working with Piero Gottardi from the European University Institute on theoretical research closely related to this mini-project. We have derived

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[1]That the supports of c and v are $[0,1]$ is just a convenient normalization. All that is needed is that the supports overlap, so that it is not publicly known whether it is efficient that trade takes place.

some theoretical results; e.g., it can be shown that acquiring full information is not optimal. I can provide interested students with guidance and survey of the literature. I envision the miniproject as mostly involving computational modeling and simulation.

References

[1] Bergemann Dirk and Martin Pesendorfer (2007) "Information Structures in Optimal Auctions", *Journal of Economic Theory*, 137, pp. 580-609.

[2] Chatterjee, Kalyan and William Samuelson (1983) "Bargaining under Incomplete Information", *Operations Research*, 31, 5, pp. 835-851.

[3] Myerson Roger and Mark Sattherthwaite (1983) "Efficient Mechanisms for Bilateral Trading", *Journal of Economic Theory*, 29, pp. 265–281.