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## Economics 201

**Description:** Econ 201 is a topics class. Normally this means that different instructors pick different topics. I will modify this approach and bundle several loosely related topics together. "Information" is a unifying theme.

**Objectives:** I want the class to organize some ideas that have been on my mind and provide research topics to interested students.

**Organization:** The class meets on Mondays and Wednesdays at noon.

**Requirements:** The formal requirements are subject to negotiation, but I propose three things: class participation, solutions to problem, and a paper. Class participation comes in two forms: being active and engaged when I talk and actually leading discussions on particular papers. I probably will not create formal problem sets, but I plan to raise questions in class. Some of these questions may represent details that I do not wish to present in class and others may be novel problems. The class will be a success if someone gets a solid start on a research paper. Requiring a research paper is a way to push you in that direction.

**Outline** This outline is tentative. I will start at the beginning, but I will make changes based on how things are going.

1. Communication in Organizations

The issue is how to organize decision making in groups when different group members have different information. What makes an organization good? Who should make decisions? Will larger firms be less able to adapt to new opportunities? From a modeling perspective, there are two forces that make the problem difficult: conflicts of interest and costs of communication. Communication costs are both old fashioned and new. I am interested in studying approaches that add costs into these models.

Arrow [3], Garicano-Prat [16], Marschak-Radner [19], Milgrom-Roberts [20], and Prat-Dessein [22] are overviews. Marschak and Radner in the seminal text in team theory, but I cannot point to a result in it that you need to know. Arrow's book is somewhat dated and informal, but it is Arrow. Milgrom and Roberts is a text on communication in organizations. Garicano and Prat and Prat and Dessein are survey articles. Garicano and Prat cover a broader range of topics than Prat and Dessein, which focuses primarily on the authors' papers.

I will begin with a discussion of Crémer, Garicano, and Prat [9], which permits a simple model on communication in teams with complexity costs. This inspired me to write a paper, Sobel [27]. This leads naturally to a treatment of how to allocate decision authority in an organization. The papers that are most related are by Alonso, Dessein, and Matouschek [2], Dessein, Galeotti, and Santos [11], Dessein and Santos [12], and Rantakari [23]. ADM and R are extremely similar. DS introduces a slightly different model. DGS uses the DS model but models cost of communication differently than CGP and me.

2. Information Aggregation

I wrote two papers (Roux-Sobel [24] and Sobel [26]) that contain a simple decision-theoretic model of group decision making. These papers led to predictions that were similar to stylized facts about polarization. The models abstract from how individuals deliberate. I hope that the Dessein, Galeotti, and Santos's method of modeling communication cost will permit one to build a model of information aggregation under time constraints.

3. Communication as Joint Production

This is basically a tribute to Jean Tirole. A subset of his papers add costs of acquiring, understanding, or exchanging information into small models. Aghion and Tirole [1] and Dewatripont and Tirole [13] are broadly related to the first topic. Caillaud and Tirole [6] is related to information aggregation topic. Tirole [28] is a stimulating attempt to study the structure of models in which production and control of information is central.

4. Information Theory and Applications.

I plan to give a short introduction to information theory. Cover and Thomas [8] is a good text. On the surface, the class is about information theory. Why isn't the class entirely about Information Theory? There are good reasons why what economists care about isn't Information Theory, but we do have something to learn from it.

There are three places in which real Information Theory is influencing economics. There is a literature on limited attention initiated by Sims (Sims [25] is an overview). I am not going to pretend to be a macroeconomist, but the work on limited attention has stimulated research in behavioral economics and decision theory that is perhaps within my pay grade. Caplin and Dean [7], de Oliveira, Denti, Mihm, and Ozbek [10], and Ellis [15] are examples.

Oliver Gossner and co-authors have demonstrated the relevance of ideas from Information Theory to economics (Cabrales, Gossner, and Serrano [4] and [5], Gossner [17], and Gossner and Tomala [18]). These are tangential to the other topics in the class, but demonstrate the power of the underlying mathematics.

Finally, the formulations in some of the applied papers (Crémer, Garicano, Prat and Dessein, Galeotti, and Santos in particular) parallel some of the information theory literature. I would like to figure out whether the connections are coincidental or deeper.

5. Privacy

If time permits (or if the earlier topics do not appeal), I would like to study the economics of privacy. I will provide more details as necessary. Posner introduced the topic and studied it from the perspective of Law and Economics (Posner [21] is a short review). These papers precede the internet age and do not provide formal results. Varian [29] is a brief, informal discussion of economic issues. Dwork and Roth [14] provide an overview of a Computer Science/Mechanism Design Approach, which focuses on "differential privacy." The Computer Science literature looks for results under which any one agent's report has a limited impact on what a mechanism can do. This is an interesting question, but far from investigating under what conditions it is possible to protect individual information and the economic costs and benefits of efforts to insure privacy.

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