



Advances in Economic Design : Games, voting, information and measurement

Conservatoire National des Arts et métiers

28 novembre 2019

9:00 – 18:30

Amphithéâtre Jean Fourastié (accès 11)

292 rue Saint-Martin

75003 Paris

Laboratoire Interdisciplinaire de Recherche en Sciences de l'Action

Équipe Politiques Publiques : Économie et Management

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Programme

9:00 – 9:30 Accueil

9:30- 11:00 Game-theoretic analysis of electoral competition

- 1. Fabian Gouret** (Université de Cergy-Pontoise) Empirical foundation of valence using Aldrich-Mc Kelvey scaling : *This paper uses data from the 2004 pre-election survey of the American National Election Study to test empirically different ways of incorporating a valence parameter into a Downsian utility function. We call particular attention to the problem of interpersonal incomparability of responses to the liberal-conservative scale, and use the Aldrich-McKelvey's pathbreaking method to obtain accurate distances between respondents and candidates, the key regressors. We find that the utility function the most supported by the empirical evidence, the intensity valence utility function, is the one which permits to make the better predictions for the 2004 presidential election. We also consider counterfactual analyses wherein we test if Bush, the candidate with the highest intensity valence, has dominant strategies which would have insured him to obtain a majority of the popular vote. According to the theory, it is known that the candidate with the highest intensity valence does not have such dominant strategies if the distribution of voters in the policy space is too heterogenous. Nevertheless, we show the distribution of voters in 2004 is sufficiently homogenous for Bush to have dominant strategies.*
- 2. François Durand** (Nokia Bell Labs France) Analysis of approval voting in Poisson games : *We analyze Approval Voting in Poisson games endowing voters with private values over three candidates. We first show that any stable equilibrium is discriminatory: one candidate is commonly regarded as out of contention. We fully characterize stable equilibria and divide them into two classes. In direct equilibria, best responses depend only on ordinal preferences. In indirect equilibria, preference intensities matter. Counter-intuitively, any stable equilibrium violates the ordering conditions, a set of belief restrictions used to derive early results in the literature. We finally use Monte-Carlo simulations to estimate the prevalence of the different sorts of equilibria and their likelihood to elect a Condorcet winner.*
- 3. Mathieu Martin** (Université de Cergy-Pontoise) Electoral spatial competition with valence : the multidimensional case : *In general, there is no pure strategy Nash equilibrium (PSNE) in a spatial majority voting game when we consider at least two dimensions, except in a very particular case (Plott, 1967). Thus, in a two-candidate competition, there is no position in the space such that a candidate is sure to be the winner of the election. However, this negative result is not true when a parameter of valence is added in the model. In this context, Ansolabehere and Snyder (2000) show that a PSNE can exist, depending on the size of the valence (supposed additive) when it is compared to the radius of the yolk, a classical solution concept in social choice theory. In this paper, we generalize Ansolabehere and Snyder's result. We determine all the PSNE in the space for any proper spatial voting games (and not only majority games).*

11:00 – 11:30 Coffee break

11:30 – 13 :00 Multiwinner and multidimensional choice rules

1. **Sébastien Courtin** (Université de Caen) Multidimensional rules : *This paper deals with rules that specify collective acceptance or rejection of a proposal with several dimensions. We introduce the notions of separability and weightness in that context. We provide a partial characterization of separable rules and show the independence between separability and weightness.*
2. **Jean-François Laslier** (Paris School of Economics) Choosing some out of many : *French readers' 100 best novels : Inspired by the current research on multiwinner rules, we analyse data from a newspaper survey: "Vote for your 100 preferred novels". Participants were asked to provide and rank up to five titles out of a set of 70,000. In particular we examine to what extent existing methods are able to take into account the particular structure of this set: the partition by authors.*
3. **Vincent Merlin** (Université de Caen) Building an experiment on multiwinner elections : *Since the pioneer works of Plott (1967), and Florina, Morris and Plot (1978), experimental economics, either through lab experiments and or field experiments, contributed to the advancement of research on voting rules, to precise how voters react, adapt their preferences, and vote when confronted to different voting mechanisms. A stream of research aims to understand how voters act strategically in voting and election (Myerson et al., 1993; Laslier et al., 2010). Another direction is to understand how people would react to a modification of the electoral rule (Baujard et al., 2014). A third option is to elicit, under a veil of ignorance, the principles that the voters would back when confronted to a choice. In this line, the major contributions are due to Sertel and Giritligil (2003) and Giritligil and Sertel (2005). These panel studies aim to extract preferences of subjects on how to aggregate individual preferences in a social choice context. Sertel and Giritligil (2003) attempt to empirically understand public preferences concerning four social choice rules of focus, namely Plurality, Plurality with Runoff, the Majoritarian Compromise and the Borda Rule. Giritligil and Sertel (2005), on the other hand, aim to test whether the support for the Borda winner or the Condorcet winner increases when they are among the "Majoritarian Approved" candidates. Recently, researchers working on the axiomatic analysis of committee election rules have emphasized the fact that some voting rules are more suitable in certain context than in others (Faliszewski et al., 2017). They distinguish between three types of contexts. We may wish to select a committee 1) to elect an assembly that represents the preferences of the voters 2) to shortlist a number of candidates, based on their excellence, 3) to get a menu of objects as diverse as possible, so that the tastes of each participant are somehow satisfied. But one may wonder whether these distinctions are pertinent. Our objective is to understand the principles that govern the preferences of voters in committee elections in specified and neutral contexts. In this presentation, we will discuss the protocol we are currently working on, and we will comment preliminary results from a pilote.*

13:00 – 14:30 Déjeuner (mezzanine, Cnam, 2 rue Conté)

14:30 – 15:30 Public vs private Information

1. **Hui Hui Ding** (Université de Cergy-Pontoise) Deliberation and epistemic social choice : *We study the effects of deliberation on epistemic social choice, in two settings. In the first setting, the group faces a binary epistemic decision analogous to the Condorcet Jury Theorem. In the second setting, group members have probabilistic beliefs arising from their private information, and the group wants to aggregate these beliefs in a way that makes optimal use of this information. During deliberation, each agent discloses private information to persuade the other agents of her current views. But her views may also evolve over time, as she learns from other agents. This process will improve the performance of the group, but only under certain conditions; these involve the nature of the social decision rule, the group size, and also the presence “neutral agents” whom the other agents try to persuade.*
2. **Francis Bloch** (Paris School of Economics) A game of hide and seek in networks : *We propose and study a strategic model of hiding in a network, where the network designer chooses the links and his position in the network facing the seeker who inspects and disrupts the network. We characterize optimal networks for the hider, as well as equilibrium hiding and seeking strategies on these networks. We show that optimal networks are either equivalent to cycles or variants of a core-periphery networks where every node in the periphery is connected to a single node in the core.*

15:40 – 16:40 Voting and Information

1. **Manel Ayadi** (Université Paris-Dauphine PSL) Single Transferable Vote : Incomplete knowledge and communication issues : *Single Transferable Vote (STV) is used in large political elections around the world. It is easy to understand and has desirable normative properties such as clone-proofness. However, voters need to report full rankings, which can make it less practical than plurality voting. We study ways to minimize the amount of communication required to use single-winner STV. In the first part of the paper, voters are assumed to report their top-k alternatives in a single shot. We empirically evaluate the extent to which STV with truncated ballots approximates STV with full information. We also study the computational complexity of the possible winner problem for top-k ballots. For $k=1$, it can be solved polynomial time, but is NP-complete when k exceeds 1. In the second part, we consider interactive communication protocols for STV. Building on a protocol proposed by Conitzer and Sandholm (2005), we show how we can reduce the amount of communication required in practice. We then study empirically the average communication complexity of these protocols, based on randomly generated profiles, and on real-world election data. Our conclusion is that STV needs, in practice, much less information than in the worst case.*
2. **Beatrice Napolitano** (Université Paris-Dauphine PSL) Simultaneous Elicitation of Committee and Voters' Preferences : *Social choice deals with the problem of determining a consensus choice from the preferences of different voters. In the classical setting, the voting rule is fixed beforehand and full information concerning the preferences of the voters is provided. Recently, the assumption of full preference information has been questioned by a number of researchers and several methods for eliciting preferences have been proposed. In*

this paper we go one step further and we assume that both the voting rule and the voters' preferences are partially specified. In this setting, we present an interactive elicitation protocol based on minimax regret and develop several query strategies that interleave questions to the chair and questions to the voters in order to attempt to acquire the most relevant information in order to quickly converge to optimal or a near-optimal alternative.

16:40 – 17:15 Coffee break

17:15 – 18:15 Measurement and ranking methods

- 1. Arnold Soh** (Université de Cergy-Pontoise) Decomposition of inequality measures with a hierarchical income distribution : *we propose a new decomposition of inequality measures. This innovative approach is especially suited for the study of income inequality when the income has a hierarchical structure. That is a structure where the income is composed of several primary sources, themselves composed of secondary sources. We revisit the Owen value that quantifies the importance of each of these secondary sources to the overall income inequality. Our main contribution is to decompose this importance into two parts: the first part is the pure marginal contribution of the considering secondary source, and the second part is a sum of pairwise interactions of the considering secondary source with each other.*
- 2. Hossein Khani** (Université Paris-Dauphine PSL) Ordinal power indices for social ranking : *The design of procedures aimed at ranking individuals according to how they behave in various groups is of great importance in many practical situations. The problem occurs in a variety of scenarios coming from topics like social choice theory and cooperative game theory. For instance comparing researchers in a scientific department by taking into account their impact across different teams, or finding the most influential political parties in a parliament based on past alliances within alternative majority coalitions are some of the examples. In many of such real situations it is not possible to evaluate the worth (value) of coalitions precisely due to a bunch of unknown factors: existence of uncertain data, complexity of the analysis, missing information or difficulties in the update, etc. In these situations measuring the importance of individuals using classical power indices is not always straightforward. In this work we model the worth of coalitions in an ordinal way using a binary relation which is defined over the set of coalitions and we try to answer the general question of how to obtain a ranking over a finite set N (called a social ranking), given a ranking over the elements of the power set $2N$ (called a power relation). So far answer to this question leads us to two different social ranking rules, Ceteris Paribus majority rule and ordinal Banzhaf solution, which are respectively inspired from the classical voting theory and semi-values in classical cooperative game theory. In this presentation I am going to introduce these solutions and analyse them from the axiomatic approach.*

19:30 Dinner (Restaurant Au Bascou, 38 rue Réaumur, 75003 Paris)

Liste des participants

- Manel Ayadi (LAMSADE, Université Paris-Dauphine PSL)
- Francis Bloch (Paris School of Economics)
- Olivier Cailloux (LAMSADE, Université Paris-Dauphine PSL)
- Sébastien Courtin (CREM, Université de Caen)
- Hui Hui Ding (THEMA, Université de Cergy-Pontoise)
- François Durand (Nokia Bell Labs France)
- Fabian Gouret (THEMA, Université de Cergy-Pontoise)
- Armel Momo Kenfack (THEMA, Université de Cergy-Pontoise)
- Hossein Khani (LAMSADE, Université Paris-Dauphine PSL)
- Jean Lainé (Cnam-Lirsa)
- Jérôme Lang (LAMSADE, Université Paris-Dauphine PSL)
- Jean-François Laslier (Paris School of Economics)
- Isabelle Lebon (CREM, Université de Caen)
- Mathieu Martin (THEMA, Université de Cergy-Pontoise)
- Vincent Merlin (CREM, Université de Caen)
- Stefano Moretti (LAMSADE, Université Paris-Dauphine, PSL)
- Hervé Moulin (University of Glasgow)
- Beatrice Napolitano (LAMSADE, Université Paris-Dauphine PSL)
- Meltem Öztürk (LAMSADE, Université Paris-Dauphine PSL)
- Remzi Sanver (LAMSADE, Université Paris-Dauphine PSL)
- Thérèse Rebière (Cnam-Lirsa)
- Arnold Soh (THEMA, Université de Cergy-Pontoise)