Malachy James Gavan

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25-27 C. Ramon Trias Fargas, Barcelona, Spain
Citizenship: British ⋄ **Date of Birth:** 25/03/1996
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Education

Ph.D. in Economics 2019 - Present
Universitat Pompeu Fabra, Barcelona, Spain
Advisor: Professor Antonio Penta

M.Res. Economics 2018 - 2019
Universitat Pompeu Fabra, Barcelona, Spain

M.Sc. Economics 2017 - 2018
Barcelona School of Economics, Barcelona, Spain

B.Sc. Economics 2014 - 2017
University of Surrey, Guildford, United Kingdom

Fields

Primary: Game Theory and Mechanism Design
Secondary: Negotiation, Agreements, Robust Implementation

Working Papers

Negotiated Binding Agreements (Job Market Paper)

I study binding agreements that can result from negotiation, where the agreement is over agents' behaviour in an underlying strategic environment, represented by a game. To do so, I propose a negotiation protocol where, in each round of negotiation, agents make public proposals of the action they will take. The protocol terminates when these proposals are confirmed. Confirmation results in a binding agreement and payoffs are that of the agreed action profile. I provide easy-to-check necessary and sufficient conditions for the outcomes of this game using the solution concept *Negotiated Binding Agreements*, a refinement of subgame perfect equilibria where agents only propose actions they could agree to. A full characterisation of these outcomes is provided for two-player games. I show these general conditions are robust to perturbations in the negotiation procedure including timing of proposals, proposing actions for all agents, and variation in the payoff of perpetual disagreement. The necessary and sufficient conditions generalise when coalitions may jointly deviate in a cooperative way and are consistent with perturbed versions of the β-core.

Safe Implementation (with A. Penta)

We introduce *Safe Implementation*, a notion of implementation that adds to the standard requirements the restriction that deviations from the baseline solution concept induce outcomes that are *acceptable*. The primitives of Safe Implementation therefore include both a Social Choice Correspondence, as standard, and an Acceptability Correspondence, each mapping every state of the world to a subset of allocations. This framework generalizes standard notions of implementation, and can accommodate a variety of considerations, including robustness concerns with respect to mistakes in play, model misspecification, behavioral considerations, state-dependent feasibility restrictions, limited commitment, etc. We provide results both for general solution concepts and for the case in which agents' interaction is modelled by Nash Equilibrium. In the latter case, we identify necessary and sufficient conditions (namely, *Comonotonicity* and *safety-no veto*) that restrict the joint behavior of the Social Choice and Acceptability Correspondences. These conditions are more stringent than Maskin's (1978), but coincide with them when the safety requirements are vacuous. We also show that these conditions are quite permissive in important economic applications, such as environments with single-crossing preferences and in problems of efficient allocation of indivisible goods, but also

that Safe Implementation can be very demanding in environments with 'rich' preferences, regardless of the underlying solution concept.

Existence of Weak Coalitional Equilibrium: Allowing for Overlapping Coalitions

In this paper, I show the methodological advantage of taking the notion of "an improvement for a group" to mean that there is a joint action of the group that induces a strict improvement in utility for all its members. This is opposed to assuming that no agent in the group is worse off while one is strictly better off. To do so, I show that the sufficient conditions of Ray and Vohra (1997)'s Coalitional Equilibrium can be weakened when this interpretation is taken. I do so by showing that, taking the interpretation that no joint deviation induces a strict improvement for all agents, the existence of Coalitional Equilibrium is implied by the existence of a Nash equilibrium of an auxiliary game. Further to this, I show that the proof of existence can be extended to a generalisation of the concept, where groups may overlap but do not necessarily include the grand coalition. This allows for coalition configurations to be taken from a specific set of covers, while still ensuring existence. This provides the first step in answering the question of the existence of solution concepts with overlapping coalitions, while a deviation of the grand coalition is not permitted.

Work in Progress

Efficient Tariffs under Strategic Side Payments (with M. Ptashkina)

Grand Coalition Rationalizability and Undominated Correlated Equilibria (with P. Ennuschat)

Seminars, Conferences, and Summer Schools

Presentations

Asian School in Economic Theory	(NUS, 2022)
33rd Stony Brook International Conference on Game Theory	(Stony Brook University, 2022)
2022 Conference on Mechanism and Institution Design°	(NUS, 2022)
International Conference Game Theory and Applications°	(St. Petersburg, 2022)
The 12th Conference on Economic Design	(University of Padova, 2022)
BSE Ph.D. Jamboree	(2020°, 2021°,†, 2022)
UPF Internal Microeconomics Seminar	(2022)
UPF Student Seminar	(2021 and 2022)

Attendance

31st Jerusalem Advanced School in Economic Theory°	(HUJI, 2021)

(°online, †discussant)

Teaching Experience

Barcelona School of Economics

Microeconomics I	2018, 2019
Masters Level, Instructor: Joan de Martí, Practical Sessions	
Microeconomics II	2019, 2020, 2021
Masters Level, Instructor: Joan de Martí, Practical Sessions	
Advanced Microeconomics II	2019, 2020
Ph.D. Level, Instructor: Antonio Penta, Practical Sessions	
Advanced Mathematics Brush-Up	2019, 2020, 2021
Ph.D. Level, Instructors: Piotr Zwiernik (2019, 2020) and Alexander Frug (2021), Practical Sessions and Lectures on Set Theory	
Probability and Statistics Brush-Up	2020, 2021, 2022
Masters Level, Instructor: Christian Brownlees, Practical Sessions	

Universitat Pompeu Fabra

Topics in Microeconomic Theory 2019

Undergraduate Level, Main Instructor: Francesco Cerigioni, Other Instructors: Jose Apestaguia, Alexander Frug, Andreu Mas-Colell, Massimo Motta, Rosemarie Nagel, Experimental Sessions and Lectures on Risk

Game Theory and Design of Institutions 2020, 2022

Undergraduate Level, with Antonio Penta, Practical Sessions and Lectures on Bayesian Games (2022)

Mathematics for Economics and Finance 2019, 2020

Ph.D. Level, Instructor: Piotr Zwiernik, Practical Sessions

Research Experience

Research Assistant for Professor Antonio Penta 2020 - present

Univeristat Pompeu Fabra, Barcelona, Spain

Referee Services

Games and Economic Behavior

Academic and Departmental Services

UPF Student Seminar Co-Organiser 2020 - 2021

with Andrea Sy

UPF Microeconomics Reading Group Co-Organiser 2020 - 2021

with Evangelia Spantidaki Kyriazi

Skills

IT

LaTeX, TikZ, LyX, MATLAB, Mathematica

Languages

English (Native), Spanish (Basic), British Sign Language (Basic)