Introduction to cooperative games **Collège d'économie**

Semester 2, 2020 **CMI**

C.Marlats and N.Pnvematikos

Syllabus

Class Rules This class is in English. Do not hesitate to ask questions. Please, try to ask your questions in English first, and then, if necessary, do it in French. Laptops are prohibited as well as phones. It is understandable that you may prefer to take notes on your laptop, but attention and classroom experience are certainly diminished when one is texting or checking emails.

Outline of the course Game theory provides mathematical tools for analyzing situations in which players (individuals, firms, countries...) can interact; that is their choice influence the welfare of the others.

Non-cooperative game theory model situations where players cannot commit on agreements. The premises of non cooperative game theory models are: a set of players, a set of actions for each player, a utility for each player (a function that goes from the set of action profiles to $\mathbb{R}$) and an information structure.

Cooperative game theory models situations, where agents can benefit by cooperating, and commitment is possible. The premises of cooperative game theory models are a set of players and payoffs. But now, payoffs are fonctions that associate a group of players (a coalition) to a real number. If this payoff can be shared among players without any constraint, then we say that it is a game with Transferable Utility. If there are constraints, then the game is called a game without transferable utility. The main issue in cooperative games is to find "good allocation rules". For instance, think of a situation in which a set of players (entrepreneurs) form a coalition (a start up). Then they work together and create a surplus (profit). How should they share this profit? What sharing rule should they use?

Chapter 1	Bargaining	C. Marlats
Chapter 2	Games with transferable utility	C.Marlats
Chapter 3	Core	C. Marlats
Chapter 4	Shapley value	N.Pnvematikos
Chapter 5	Social Choice and Matching	C.Marlats

Schedule

	Wednesday	Friday
Week 1	Chapter 1	Chapter 1
Week 2	Chapter 1	Chapter 1
Week 3	Chapter 2	Chapter 2
Week 4	Chapter 2	Chapter 3
Week 5	Chapter 3	Chapter 3
Week 6	Exam	Chapter 4
Week 7	Chapter 4	Chapter 4
Week 8	Chapter 4	Chapter 5
Week 9	Chapter 5	Chapter 5
Week 10	Chapter 5	Exam

Graduation There are two exams, each of them counts for 50% of the grade

Textbooks

- Dequiedt, V., Durieu, J., Solal, P. (2011). Théorie des jeux et applications. Economica.
- Maschler, M., Solan, E. S. Zamir (2013). Game theory.
- Osborne, M. J., Rubinstein, A. (1994). A course in game theory. MIT press.