PREFACE

Preface to the Special issue on "Group Formation and Farsightedness"

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The two issues of group formation and farsightedness are closely connected. To understand coalition formation and the effects of coalition formation on economic and social outcomes one needs to take stand on the behavior of agents: are they myopic or farsighted? Past models of coalition formation typically assumed that individuals behaved myopically. However, recent experimental and empirical studies suggest that the society is rather composed of (limited) farsighted individuals. The papers in this special advance our understanding of the effect of farsighted behavior on group formation.

This special issue contains eleven original articles. Some of them introduce new solution concepts when individuals are farsighted, others compare the predictions of existing solution concepts, others propose new models of coalition formation, and others apply existing solution concepts in economic environments and experiments.

In "Social Rationalizability with Mediation," Herings, Mauleon and Vannetelbosch [8] propose a new solution concept for social environments called social rationalizability with mediation that identifies the consequences of common knowledge of rationality and farsightedness. In a social environment several coalitions may and could be willing to move at the same time. The mediator chooses a move for each possible set of moves on which the individuals could agree to join. Individuals not only hold conjectures about the behaviors of other individuals but also about how a mediator is going to solve conflicts of interest. The authors show that the set of socially rationalizable outcomes with mediation is non-empty for all social environments and it can be computed by an iterative reduction procedure. Finally, it

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is shown that social rationalizability with mediation does not necessarily satisfy coalitional rationality when the number of coalition members is greater than two.

In "Farsighted Rationality in Hedonic Games," Demeze-Jouatsa and Karos [3] consider hedonic games where each player's payoff in each coalition is predetermined once a partition has formed. The authors consider perfectly farsighted players that have a common expectation function. The novelty of the paper is that the expectation function is not deterministic but probabilistic and specifies for each state (partition) an ordered list of coalitions and a probability distribution over states each coalition might move to. By defining a player's utility as the expected utility over all partitions weighted by the stationary distribution of the irreducible Markov process, the authors define a coalitional game that specifies for each completely mixed strategy profile a payoff vector. The authors then show that in this kind of hedonic games, there is a mixed strategy profile from which no coalition has a profitable one-shot deviation.

In "Coalition Formation Under Dominance Invariance", Kimya [10] investigates sufficient conditions for abstract games such that the farsighted stable set and the largest consistent set coincide. Following Mauleon, Molis, Vannetelbosch and Vergote [13], an abstract game satisfies dominance invariance (DI) when the (direct) dominance relation coincides with the indirect dominance relation. Under DI, farsighted solution concepts coincide with their myopic counterparts. An abstract game satisfies no infinite chains (NIC) when the game has no infinite chain of direct dominance. The author shows that in abstract games that satisfy dominance invariance (DI) and no infinite chains (NIC) there is a unique farsighted stable set and it coincides with the largest consistent set. That is, under DI and NIC, predictions derived from stable sets are robust not only to the type of individuals (myopic or farsighted) but also to other common solution concepts like the largest consistent. In addition, the author shows that, under DI and NIC, the farsighted stable set and the largest consistent set do satisfy maximality. Finally, the author provides two classes of games that do satisfy each condition.

In "Assortative Matching with Externalities and Farsighted Agents", Imamura and Konishi [9] consider a one-to-one assortative matching problem in which matched pairs play a Tullock contest where each agent of a pair chooses his/her effort level simultaneously and independently to increase their pair's probability of winning the prize. In this matching problem, agents care not only about their own partners but also about other pair's profiles. With such externalities, and under the standard effectiveness function of Roth and Vande Vate [16], there may not be a pairwise stable matching in this problem when agents are myopic. The authors consider then farsighted agents and analyze the largest consistent set (LCS) of Chwe [2]. By means of an example it is shown that the LCS can contain the set of all matchings under the standard effectiveness function. The authors then show that the LCS becomes a singleton of the positive assortative matching under an alternative effectiveness function proposed by Knuth [11].

In "Subgame Perfect Coalition Formation: Pareto optimality, individual rationality and matching soulmates", Leo, Vorobeychik and Wooders [12] propose a finite extensive game with perfect information for analyzing hedonic coalition formation games. Following an ordered list of players, players sequentially propose coalitions that are then accepted or rejected by their prospective members. The authors show that all subgame perfect equilibria of the extensive game have no delay and lead to a unique outcome that satisfies individual rationality and matching soulmates. In addition, if the iterated matching of soulmates matches all players, then the unique outcome is the unique core coalition structure. Finally, the authors study an extension where each player can possibly propose more than one time before it is the turn to another player for making a proposal. They show that if each player is able to

make a number of proposals greater than the number of possible coalitions containing the player, then the subgame perfect equilibrium outcome is Pareto optimal.

In "Coalition Formation in Games with Externalities", Montero [15] considers partition function games that allow for externalities between coalitions and studies a coalitional bargaining model to determine the coalition structure that will emerge at equilibrium and the division of payoffs among coalition members. It is shown that when the partition function game is positive and fully cohesive, then in any stationary subgame perfect equilibrium of the extensive form game, a coalition structure is formed without delay. Moreover, if the grand coalition forms without delay at equilibrium, then expected payoffs must lie in the core of a characteristic function game that assigns to each coalition its equilibrium payoffs. The extensive form game of coalitional bargaining may have a multiplicity of equilibria even for symmetric games without externalities. For symmetric games without externalities and where only one coalition can form, the equilibrium outcome of the extensive form game with random proposers is at least as efficient as the equilibrium outcome of the extensive form game with a fixed rule of order.

In "Limited Farsightedness in R&D Network Formation", Mauleon, Sempere-Monerris and Vannetelbosch [14] adopt the horizon-K farsighted set of Herings, Mauleon and Vannetelbosch [7] to study the R&D networks that will emerge in the long run when firms are neither myopic nor fully farsighted but have some limited degree of farsightedness. The authors show that a singleton set consisting of a pairwise stable network is a horizon-K farsighted set for any degree of farsightedness greater or equal than 2. Hence, R&D networks having two components of nearly equal size are not only stable when firms are myopic but also when all firms are limitedly farsighted. On the contrary, each R&D network consisting of two components with the largest one comprising three quarters of firms is predicted when all firms are fully farsighted. Thus, when firms are homogeneous in their degree of farsightedness, pairwise stable R&D networks consisting of two components of nearly equal size are robust to limited farsightedness.

In "Emergent Collaboration in Social Purpose Games", Gilles, Mallozi and Messalli [6] study a class of non-cooperative aggregative games termed Social Purpose Games, where each player's payoff depends on his own strategy and on a weighted aggregate function of the strategies of all players that represents each player's assessment of the social benefit (public good provision games, tragedy of the commons, pollution abatement games). It is shown that these games have a potential and that the total Nash equilibrium generated level of effort is socially suboptimal. Regular social purpose games allow for the emergence of stable partial cooperation among players (a partial cooperative leadership equilibrium exists) that can alleviate the tension between socially optimal and equilibrium levels of effort. The subclass of strict social purpose games admits the emergence of a coalition of cooperators that is internally and externally stable.

In "An Experiment on Demand Commitment Bargaining," Chessa, Hanaki, Lardon and Yamada [1] report on an experiment on a coalitional bargaining game. They use a simple version of the demand bargaining model proposed by Eyal Winter in 1994 and test whether experimental subjects play according to the subgame perfect equilibrium of the game. Using twelve different treatments, corresponding to four different payoff values in the underlying coalitional game and three different protocols for the bargaining game, they first test whether the efficient grand coalition is formed. The results are disappointing, as the subjects fail to achieve the formation of the efficient grand coalition in three out of the four games. The authors then test whether the distribution of payoffs among players conforms to the equilibrium predictions. The results are encouraging, and the experiment suggests that the experimental payoffs are close to the Shapley values of the underlying coalitional game.

In "Farsighted Clustering with Group-size Effects and Reputations," Takako Fujiwara-Greve and Toru Hokari [5] apply farsighted solution concepts to an industrial organization setting. They consider a dynamic game played by consumers and sellers, where sellers group into franchises and try to maintain a reputation among franchisees. Being part of a franchise increases demand, but also exposes the firm to a reputation loss if one of the other franchise members experiences a negative shock. The paper analyzes this trade-off and computes the equilibrium structure of coalitions of firms in a dynamic game, where every firm anticipates the long-run behavior of other firms. The authors find that clustering into groups occurs when the rate of reputation loss is small, but that firms will not form groups when the rate of reputation loss is too high. The model is solved for three sellers, but some avenues for generalizations of the results are provided in the paper.

In "Layered Networks, Equilibrium Network Dynamics and Stable Coalitions," Fu, Page and Zigrand [4] propose a very general, abstract, model of club networks. They analyze a discounted stochastic game of network formation and claim existence of a subgame perfect equilibrium using new, original mathematical techniques. This general equilibrium existence result is applied to the game of layered network formations, and the ergodic properties of the equilibrium Markov chain are given. The paper thus extends our understanding of layered networks, where players can participate in several interconnected layers, which can also be interpreted as clubs with overlapping membership. Besides the existence result, the paper proves mathematical properties of the equilibrium correspondence, provides a characterization of the basins of attraction of the equilibrium Markov process and discusses the stability of the equilibrium coalition structures.

References

1. Chessa M, Hanaki N, Lardon A et al (2022) An experiment on demand commitment bargaining. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00463-x
2. Chwe MS-Y (1994) Farsighted coalitional stability. J Econ Theory 63:299–325
3. Demeze-Jouatsa G-H, Karos D (2022) Farsighted rationality in hedonic games. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00474-8
4. Fu J, Page F, Zigrand J-P (2022) Layered networks, stable coalitions and equilibrium network dynamics. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00478-4
5. Fujiwara-Greve T, Hokari T (2022) Farsighted clustering with group-size effects and reputations. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00472-w
6. Gilles RP, Mallozi L, Messalli R (2022) Emergent collaboration in social purpose games. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00457-9
7. Herings PJJ, Mauleon A, Vannetelbosch V (2019) Stability of networks under horizon-K farsightedness. Econ Theor 68:177–201
8. Herings PJJ, Mauleon A, Vannetelbosch V (2022) Social rationalizability with mediation. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00465-9
9. Imamura K, Konishi H (2022) Assortative matching with externalities and farsighted agents. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00462-y
10. Kimya M (2022) Coalition formation under dominance invariance. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00437-z
11. Knuth DE (1976) Marriage stables. Les Presses de l'Université de Montreal, Montreal
12. Leo G, Vorobeychik E, Wooders M (2022) Subgame perfect coalition formation: pareto optimality, individual rationality, and matching soulmates. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00467-7
13. Mauleon A, Molis E, Vannetelbosch V, Vergote W (2014) Dominance invariant one-to-one matching problems. Int J Game Theory 43:925–943
14. Mauleon A, Sempere-Monerris JJ, Vannetelbosch V (2022) Limited farsightedness in R&D network formation. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00466-8

15. Montero M (2022) Coalition formation in games with externalities. Dyn Games Appl. https://doi.org/10.1007/s13235-022-00460-0
16. Roth AE, Vande Vate JH (2015) Random paths to stability in two-sided matching. Econometrica 58:1475–1480