Farsighted Stable Sets

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Abstract

A coalition is usually called stable if nobody has an immediate incentive to leave or to enter the coalition since he does not improve his payoff. This myopic behaviour does not consider further deviations which can take place after the first move. Chwe (1994) incorporated the idea of a farsighted behaviour in his definition of large consistent set (LCS). In some respects, we propose a different idea of dominance relation based on indirect dominance and on a different concept of belief on moving coalitions’ behavior. A notion of stability for a coalitional game is introduced by taking into account the different degree of risk/safety of any player participating in a move. Some results about uncovered sets, internal stability are investigated. By exploiting our dominance and stability concepts, the prisoner’s dilemma in coalitional form and its Nash equilibrium are studied. Some examples illustrating the differences between the largest consistent set, our stable set and stable set due to von Neumann and Morgenstern (1947) are presented.

1 Preliminaries

Cooperative behaviour often emerges at a group rather than social level. In many instances we observe the formation of independent and sometime competing groups, teams, clubs, cooperatives (coalitions for short) each of them persecuting the same goal (in turn provision of commodities, raising of public funds, standards of behaviour and so on). Examples of this behaviour are numerous both at micro and macro level: scientific research groups, university departments, consumers associations, firms as organizations, consumption and production cooperatives, industrial districts, international commercial treaties among countries are all instances of volunteer agreements among independent parties that coalesce to obtain a same goal. Once coalitions form, society is partitioned in a coalitional structure. Mathematically speaking, a coalitional game can be represented in an effectiveness form in such a way

\[ \Gamma = (N, Z, \{ \prec_i \}_{i \in N}, \{ \rightarrow_S \}_{S \subseteq N, S \neq \emptyset}) \]

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