Introductory Remarks

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There is a broad division of game theory into two approaches: the cooperative approach and the noncooperative approach. These approaches should not be considered as analyzing different kinds of games; rather, they are different ways of looking at the same game. As Joachim Rosenmüller has said, the game is one "ideal" of which the cooperative and the noncooperative approaches are two "shadows".

The noncooperative theory is strategy oriented. It studies what we expect the players to *do* in the game. The cooperative theory, on the other hand, studies the *outcomes* we expect. In the cooperative approach we look directly at the space of outcomes, not the nitty-gritty of how one gets there. The noncooperative theory is a kind of micro theory; it involves precise descriptions of what happens. In the cooperative theory we are interested in what the players can *achieve*; thus we ask how coalitions can form, what coalitions will form and how the coalitions that do form divide what they achieve.

Why do we call that shadow of the game "cooperative"? "Cooperation" seems to indicate more that that. Indeed, though this term is somewhat misleading, it does have a basis in the theory. In the cooperative theory we are interested in *feasible* outcomes. Thus anything that the players *could* get is taken into consideration, even if it is not incentive compatible for them. For example, in the prisoner's dilemma we are interested also in the cooperative outcome. This is done by assuming that the players have enforceable contracts available to them; i.e., they can make commitments. The players can get into a coalition and agree on a joint course of action, and hence on outcomes; and it is assumed that the players must honor their commitments. We assume that there is some mechanism, like a court, that enforces these contracts, so that all feasible outcomes should be considered. This idea of writing a contract is at least reminiscent of cooperative action.

The distinction between cooperative and noncooperative goes back to the dawning of game theory. It appears already in the works of Nash and others in the early fifties, and I remember a conference in 1955 (attended by von Neumann and Morgenstern) where the issue of cooperative vis-à-vis noncooperative was discussed. However it was only in the 60's that

Harsanyi had the insight of distinguishing commitment as differentiating the cooperative from the noncooperative model.

Summing up, the cooperative (or coalitional) approach studies games from a macro point of view, focusing on the feasible outcomes that can be obtained by enforceable commitments.