

Cooperative Fuzzy Games Extended from Ordinary Cooperative Games with Restrictions on Coalitions

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Abstract: Cooperative games are very useful in considering profit allocation among multiple decision makers who cooperate with each other. In order to deal with cooperative games in practical situations, however, we have to deal with two additional factors. One is some restrictions on coalitions. This first factor has been taken into consideration through feasibility of coalitions. The other is partial cooperation of players. In order to describe this second factor, we consider fuzzy coalitions which permit partial participation in a coalition to a player. In this paper we take both of these factors into account in cooperative games. Namely, we analyze and discuss cooperative fuzzy games extended from ordinary cooperative games with restrictions on coalitions in two approaches. For the purpose of comparison of these two approaches, we define two special classes of extensions called U -extensions which satisfy linearity and W -extensions which satisfy U -extensions and two additional conditions, restriction invariance and monotonicity. Finally, we show sufficient conditions under which these obtained games in two approaches coincide.

Keywords: cooperative games; cooperative fuzzy games; restricted games; coalitions;

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