

Abstract

The cooperative game theory studies two problems: one is called coalition formation and the other is called payoff distribution. In order to focus on the payoff distribution problem, the theory assumes formation of the grand coalition, i.e. the full cooperation among the individuals when it brings the largest social surplus. However, if we think along the concept of the core, we cannot say that the grand coalition is always formed because a smaller group has an incentive to deviate from the grand coalition when the core is empty. On the other hand, they will form the grand coalition in the games with the non-empty core where there is no smaller group that can be better off by the deviation. Hence, there should be a difference of coalition formation between the games with the non-empty core and ones with an empty core. Also, the importance of communication among individuals is emphasized in a textbook of the cooperative game theory. It is possible that whether they can communicate with each other or not affects coalition formation. We hypothesized and examined these things by running a laboratory experiment where subjects bargain with each other about coalition formation and payoff distribution simultaneously. It is characteristic that the bargaining protocol is unstructured, i.e. similar to the real bargaining situation. As experimental results, we have found the following things. First, the grand coalition was not always formed even though it brought the largest social surplus. Second, the grand coalition was more likely to be formed when the core is non-empty. Third, the possibility of communication among the subjects induced their cooperation. Finally, the resulting payoffs reflected their power measured by the theory: stronger individuals take more.

Keywords: laboratory experiment, unstructured bargaining, cooperative game, coalition formation, payoff distribution, the core, communication

JEL Classification: C71, C92