

APPLYING THE REDUCED GAME PROPERTY TO ANALYZE
CORES AND NUCLEOLI OF VARIOUS ENTERPRIZES

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Abstract

Cooperative game theory faces two serious problem whenever there is a need to apply it:

- (1) Quite often, beyond the general definition, one knows little about the solution and so finds it difficult to decide which solution to adopt.
- (2) Even if one decides to employ a certain solution concept, one cannot compute it, because one cannot even load a computer with a worth function of a middle-sized game.

Research therefore is concentrated in studying *family of games* of specific nature with the hope of using their properties in order to find the structures of their solutions and in order to facilitate the computation of these solutions. One feature that can be of help is the *reduced game property* that states that if some of the players leave the game, leaving behind their payments, to help whoever needs them, then the rest of the players find themselves in the solution of their *reduced game*. This is in a sense a cooperative game theoretical analog of the Nash equilibrium notion of non-cooperative game. Applying the reduced game property has its own difficulties. One has to relate it to the real situation. Often, it does not belong to the class of games we started with and one has to extend the class. The study of the reduced game, although simpler than the study of the original problem, but it is not obvious.

We shall illustrate theses ideas by a study of the *Chinese postman problem* — a study in which H. Hammers, D. Granot, J. Kuipers and me were involved, and pass to other examples in which the reduced game property was of prime importance.