Lexicographic allocations and extreme core payoffs in assignment games

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Abstract

We consider various lexicographic allocation procedures for coalitional games with transferable utility where the payoffs are computed in an externally given order of the players. The common feature of the methods is that if the allocation is in the core, it is an extreme point of the core. We first investigate the general relationships between these allocations and obtain two hierarchies on the class of balanced games.

Secondly, we focus on assignment games and sharpen some of these general relationships.

Our main result is the coincidence of the sets of lemarals (vectors of lexicographic maxima over the set of dual coalitionally rational payoff vectors), lemacols (vectors of lexicographic maxima over the core) and extreme core points.

As byproducts, we show that, similarly to the core and the coalitionally rational payoff set, also the dual coalitionally rational payoff set of an assignment game is determined by the individual and mixed-pair coalitions, and present an efficient and elementary way to compute these basic dual coalitional values.

This provides a way to compute the Alexia value (the average of all lemacols) with no need to obtain the whole coalitional function of the dual assignment game.