A decomposition approach to vector equilibrium problems

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Abstract

A vector equilibrium problem is generally defined by a bifunction which takes values in a partially ordered vector space. In particular, when this space is endowed with a componentwise ordering, the vector equilibrium problem can be decomposed into a family of equilibrium subproblems, each of them being governed by a bifunction obtained from the initial one by selecting some of its scalar components. Similarly to multi-criteria optimization, three types of solutions can be defined for these equilibrium subproblems, namely, weak, strong and proper solutions. The aim of this paper is to show that, under appropriate convexity assumptions, the set of all weak solutions of a vector equilibrium problem can be recovered as the union of the sets of proper solutions of its subproblems.