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COLLECTIVE FIXED POINT, GENERALIZED GAME AND SYSTEM OF GENERALIZED VECTOR QUASI-EQUILIBRIUM PROBLEMS IN PRODUCT FC-SPACES

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Abstract. By applying collective fixed point theorems in product FC-spaces without any convexity structure due to author, Some new equilibrium existence theorems for generalized games are first proved in noncompact FC-spaces. As applications, some new existence theorems of solutions for system of generalized vector quasi-equilibrium problems are established in noncompact FC-spaces. These results generalize some known results in literature.

Keywords. Collective fixed point, Generalized game, System of generalized vector quasi-equilibrium problems, Product FC-space

AMS (MOS) subject classfication: 54H25, 91A13, 92B50

1   Introduction and Preliminaries

In 1991, Tarafdar [17] first established a collective fixed point theorem under compact setting of topological vector spaces and gave applications to the existence of equilibrium points of abstract economies. Since then, there have been a lot of generalizations of the collective fixed point theorem under different assumptions and different underlying spaces, and have given applications in different fields. Such kind of collective fixed point theorems are very useful to establish equilibrium existence theorems of generalized games and existence theorems of solutions for the systems of variational inequalities and for the system of generalized vector quasi-equilibrium problems, etc. see [1,4,5,8,9,14,16,18] and the references therein.

The main purpose of this paper is to prove some new equilibrium existence theorems of generalized games in noncompact FC-spaces without convexity structure by applying collective fixed point theorems in product FC-spaces due to author [4]. Then, as applications, some new existence theorems of solutions for system of generalized vector quasi-equilibrium problems are established in noncompact FC-spaces. These results generalize some known