

Existence of equilibria in mixed large games

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The presentation tackles the problems of existence of Nash equilibria, in the framework of Debreu, i. e. with constraints on the players' actions, in general mathematical setting. However, the games we deal with may also include, apart from usual players, a number of types of infinite homogeneous populations of „small” players. Payoffs of the usual („large”) players depend on the actions of all large players and distributions of the actions of all types of small players. The payoff of a small player depends on the same but also on the chosen action of this particular small player. An *admissible state* of the game is defined as an assignment of an available action to each large player and a distribution of actions to each type of small players in such a manner that all constraints (imposed on actions) are satisfied.

A *Nash equilibrium* is defined as a state s of the game such that all large players use a best response to s while the distributions of actions of all types of small players are concentrated on respective sets of their best responses to s .

We formulate necessary conditions for the existence of Nash equilibria.