

# The FBI-CIA Game

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## Abstract

We investigate the behavior of players in a common interest strategic form game who do not communicate with each other. Moreover, the players do not know the utilities at the start of the game, but learn them as the game is repeatedly played. Each player assumes that the other players employ a fixed but unknown mixed strategy. At each stage of the game, the players simultaneously play their best response against their belief distributions for the other players, which they derive from the past history of plays. Unlike fictitious play in which the players are assumed to know the entire utility function, the players in this game base their best response decisions on their current, possibly incomplete, knowledge of the utility. We demonstrate that the sequence of belief distributions converges to the set of Nash equilibria. This concept is illustrated through an example that we call "the FBI-CIA Game".