

Sequential Games with Imperfect Information

The class of sequential games with imperfect information is the intersection of two complements. All games that are not simultaneous move games are sequential, and if a game does not have perfect information, it is game of imperfect information. We explained how to solve perfect information games using the principle of backwards induction in Chapters 5 and 6, and how to find the strategic form solutions of any game in Chapters 7 through 10. The tools developed there are used in Chapters 11 and 12 to study sequential games with imperfect information.

Sequential games with imperfect information can be divided according to whether one or more players has access to any information that is hidden from players who move later. Games where players moving earlier have strictly less information, or exactly the same information, as players moving later, are called complete information games, the topic of Chapter 11. Perfect information games and simultaneous move games are complete information games, and we show how the tools developed to solve those games can be adapted to solve more complicated games.

Within this context we discuss the notion of credibility, or what is described as subgame perfection in the game theoretic literature. A player's threat is credible when it is in her interest to carry out the threat if her bluff is called. We also discuss the connection between discarding Nash equilibrium with weakly dominated strategies and not making incredible threats. Our experiments focus on whether subjects are more likely to play Nash equilibrium that are not subgame perfect when presented with the extensive form, than when they are presented with the strategic form and play the same Nash equilibrium, which contains a weakly dominated strategy .

In games of incomplete information, at least one piece of information is available to a player that another player moving afterwards does not have. This class of games is analyzed in Chapter 12. Players privy to confidential information may wish to signal its nature through their actions to players who move afterwards, if for example they have similar objectives. Alternatively an informed player might wish to disguise her knowledge by taking actions that do not reveal its nature. We investigate how these aspirations are played out in the strategic form solutions, and show how to derive the value of acquiring information in strategic situations.