

The Strategic Form

Displaying the extensive form is not the only way to depict a game. All finite games can be represented by their strategic forms too, and this is the topic of the next four chapters. As in the extensive form, a list of the players and the payoffs associated with a game's outcomes help characterize its strategic form. Strategies, rather than decision nodes and information, comprise the other main components of the strategic form. A strategy for a player is a complete set of instructions that dictates his behavior throughout the game.

The elements of the strategic form are presented in Chapter 7. Using examples, we demonstrate how to derive the strategic form from the extensive form. Whether the solutions of games presented in the strategic form should differ from those presented in the extensive form is a theoretical matter. But it is of independent interest to know if presenting the game in a different form affects the probability distribution of outcomes in experiments, an issue we also take up in Chapter 7.

Chapters 8 through 10 analyze the solutions to simultaneous move games. In simultaneous move games every player moves without knowing what the other players have chosen. This is an important class of games, because it contains many examples of interest to social scientists and business strategists. Moreover the solution techniques developed for simultaneous move games directly apply to the strategic form of every game.

We begin our discussion of the solution to simultaneous move games with the dominance principle, in Chapter 8. Depending how the payoffs are determined as a function of all the players' choices, the optimal choice for one player might not depend on what the other players choose. When that situation arises we say the player has a dominant strategy. The prisoners' dilemma is a famous example of a simultaneous move game because both players would both be better off if neither played their dominant strategy! The dominance principle can be extended. Recognizing that one player has a dominated strategy, the remaining players might automatically rule out the possibility that it will be chosen. Ruling out this strategy might then reveal a dominated strategy for another player in the reduced game. The successive elimination of dominated strategies is called iterative dominance.

The principle of iterative dominance makes more demands on the sophistication of players than the principle of dominance by itself. In simultaneous move games, applying the principle of dominance is rational regardless of how other players behave. In contrast, a rational player who acts according to the principle of iterative dominance also believes the other players are rational too. This renders the principle of iterative dominance less robust than the principle of dominance, the price of tighter prediction.