Chapter 12. Sequential Equilibrium

12.5 Trembling Hand Perfect Equilibrium

Figure 253.1 An extensive game (left) that has a trembling hand perfect equilibrium that does not correspond to any trembling hand perfect equilibrium of its strategic form (right).

The next exercise gives an extensive game in all of whose trembling hand perfect equilibria at least one player uses a weakly dominated strategy (so that no such equilibrium is a trembling hand perfect equilibrium of the strategic form).

Exercise 253.1 Two people are engaged in the following game to select either a good outcome or a bad outcome. First each of them names either himself or the other person as the one who will make the choice. If they both name the same person then that person selects the outcome. If each of them chooses himself then chance selects each of them with equal probability to make the choice. If each of them chooses the other then the good outcome is automatically chosen. At no point in the procedure is either person informed of the person initially selected by the other person. Each person’s payoff from the good outcome is 2, regardless of who chooses it; his payoff from the bad outcome is 1 if the other person chooses it and 0 if he himself chooses it. Show that the set of trembling hand perfect equilibria of this extensive game is disjoint from the set of behavioral strategy profiles associated with the trembling hand perfect equilibrium of its strategic form; interpret the equilibria.

We conclude the chapter by noting that it follows from Proposition 249.1 that every finite extensive game with perfect recall has a trembling hand perfect equilibrium and hence, by Proposition 251.2, a sequential equilibrium.

**Corollary 253.2** Every finite extensive game with perfect recall has a trembling hand perfect equilibrium and thus also a sequential equilibrium.