Microeconomics, Module 16, “The Theory of Games” (Chapter 12)

Overview and Concepts

(The attached PDF file has better formatting.)

Module 16 deals with strategic behavior in competitive markets, sometimes termed *competitive strategy*. Game theory is a branch of mathematics used to analyze strategic situations and their outcomes. Module 16 explains several concepts and game theoretic strategies often used in economic analysis.

Focus on the following concepts from Section 12.1:

- A *game matrix* models the outcomes from a strategic game. The final exam may give you a game matrix for a 2 by 2 game and ask about certain strategies and outcomes.

- A Nash equilibrium, the most commonly used equilibrium concept for a game, is an outcome *from which neither player would deviate*, taking the opponent’s behavior as given. A Nash equilibrium may or may not be Pareto optimal (see below), and a game may have zero, one, or many Nash equilibria.

- A Pareto optimal outcome is one from which neither player could do better without the other player doing worse. A Pareto optimal outcome need not be a Nash equilibrium.

It is hard to grasp some of these abstract concepts. Landsburg gives simple games that illustrate each idea. You need not memorize the details of these games (except for the prisoner’s dilemma), but you must understand the concepts underlying them.

Section 12.2 deals with sequential games, which are games in which the players take turns choosing their strategies instead of selecting them simultaneously. Sequential games are not covered in this course, and they are *not* tested on the final exam. A *Stackelberg equilibrium* occurs in a sequential game when the first player chooses the strategy with the highest payoff, taking into account an optimal response from the second player. The Stackelberg equilibrium is used in some of the illustrative test questions, but it is *not* tested on the final exam.