

Week 2: Economic Models – Game Theory and Imperfect Competition

1. Imperfect Competition

Markets with few firms each of whom consequently has the ability to influence price – oligopoly principal example.

Examples – major manufacturing industries such as autos, steel, computer hardware, software; major service providers such as insurance, airlines, banking, ISPs, browsers.

Two big questions: i) how does an oligopoly work?

ii) since many offline industries are oligopolies will that also become the norm for online commerce?

Need game theory to study both questions. Subsequent discussion based on Dutta (1999), chapters 1, 3 and 5.

2. Game Theory - Definition

Formal way to study interaction among a group of rational agents who behave strategically.

Group = Players; Interaction because what any player does affects every other player (possibly after a “few degrees of separation”); Rational because game theory presumes that players act to further their own goals and Strategic because while doing so they try to account for what the other players might do.

Example – case-study: group: students working together; interaction because work needs to be done together and grade is common; rational if each student furthers their goal (could be altruistic) and strategic if the amount of work done determined after a consideration of the others’ contributions.

3. Strategic Form

One of two principal ways in which elements and information of a game can be compactly written. Made up of three components – players, strategies, and payoffs.

When there are two players easy way to represent strategic form – payoff matrix.

Examples – Prisoners Dilemma, Battle of the Sexes, Chicken, Coordination, Art Auction, Other auctions

General formulation required for last two examples.

4 Strategic Form Analysis – Dominant Strategy

Dominant strategy definition – best strategy regardless of what any other player does. Is there a dominant strategy in the case-study game?

Analysis of the Prisoners Dilemma; digression into some real-world applications of the Prisoners Dilemma.

Analysis of Auctions: first-price and second price auctions; former has no dominant strategy but latter does; detailed analysis of why latter does.

What if there is no dominant strategy for every player?

5. Nash Equilibrium

The idea: best response is a “restricted” dominant strategy; the idea of self-enforcing beliefs; the formal definition. Nash parables

Examples – Battle of the sexes, Chicken, Coordination

A dominant strategy solution is also a Nash equilibrium but not vice-versa.