6 Other Market Structures

6.1 Lecture 13: Oligopoly

6.1.1 Oligopoly overview

- **Oligopoly** is a small group of firms in a market with substantial barriers to entry by additional firms
- In an oligopoly, firms can behave cooperatively or noncooperatively. If they behavior cooperatively, they can form a **cartel**. If they act noncooperatively, they can move back towards the competitive outcome, with lower profits.
- A market with two firms is called a duopoly.

6.1.2 Game theory

- Two key points of game theory are:
  - Each firm will produce a strategy, which will be dependent on what it thinks the other firms are doing, and these set of strategies taken together will jointly determine the outcome
  - Game will end when the market is in equilibrium
- **The Nash Equilibrium**: o firm wants to change its strategy given what other firms are doing
- **Prisoner's dilemma**: a simple example of game theory. We illustrate the problem with a **payoff matrix**.
- **Dominant strategy**: the best thing to do no matter what the other guy does

6.1.3 Cournot Model of Noncooperative Equilibrium

- **Cournot equilibrium**: the set of quantities for each firm such that, holding the quantities of all other firms constant, no firm can obtain a higher profit by choosing a different quantity
- **Reaction curve**: relationship between firm's profit maximizing output and output it thinks its competitor will produce. Cournot equilibrium is where the reaction curves intersect.
- Math to calculate the Cournot equilibrium:
  - Calculate residual demand for a given firm (in other words, the demand for a firm's product subtracting out other firm' output decisions)
  - Create a total revenues function

- From the total revenues function, derive marginal revenues
- Solve its profit maximization problem ($MR = MC$). This will give you a firm's best response function to other firms' output decisions.
- Solution is a set of quantities (one for each firm) that solves the system of equations in 4.

6.1.4 TO KNOW – Conceptual Understanding

- Explain the "prisoner's dilemma"
- Understand why cooperation can be sustained in a infinitely repeated game but not in a game with finite periods
- Explain why cartels are unstable

6.1.5 TO KNOW – Graphical and Math Understanding

- Find the Nash equilibrium of a game, given a payoff matrix
- Solve for quantities and prices when two firms compete in Cournot equilibrium
- Solve for a cartel equilibrium with n firms

14.01 Principles of Microeconomics
Fall 2023