EC 360: Industrial Organization
Collusion

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Collusion

- We've spent a lot of time discussing the outcomes of collusion and the behavior of cartels without explicitly discussing why acting like a cartel is in the best interest of it's members
    - This lecture dives deeper into the theory of cartels and enforcing punishments against cartels

Cartel theory

Collusion

- Let's start by imagining a perfectly competitive market
  - 100 firms exist, each with a single plant and identical production technology
  - This leds to each firm producing $\frac{1}{100}$ of the total output
- Now, suppose a monopolist exists and buys all 100 firms
  - The monopolist can allocate production across plants however they choose
  - Graph 10.1 - short run multiplant monopoly

Cartel solution

- A cartel consisting of 100 firms is analytically equivalent to a monopoly that owns 100 plants
  - In the short run, this leads to the same price and output of a multi-plant monopoly
  - The cartel chooses the total amount of the good to provide to the market
  - The cartel agrees on a price to charge
  - By working together, they allocate production in a way that minimizes cost
- Although the cartel and monopoly outcomes are the same in the short run, they are not the same in the long run
  - In the short run, firms can not enter or exit
  - In the long run, entry can occur and entrants choose to join the cartel, which drives profits down to the competitive level

Conditions conducive to collusion

- Several market characteristics tend to be conducive to collusion
  - Government buyers: when vendors are required to submit sealed-bids in government auctions, it enoucrages both collusion and cheating
  - Homogeneous products: similar products lead to simpler collusive agreements
  - Inelastic demand: the lower the demand elasticity, the greater the potential profits from collusion
  - Few sellers: having only a few colluding firms makes coordination easier

Cartel problems

Cartel problems

- Even if cartels were legal, we don't expect them to last very long
  - Entry problems
  - Cartel cheating
  - Unequal costs
- In the long run, the cartel will make zero profit
  - Free entry
  - Infinite number of identical firms

Entry problems: free entry

- In the real world, cartels can deter entry
  - Patents: a company that controls a patent can dictate who is allowed to enter a market and who is not
  - Licensing: forcing entrants to acquire an official permit to operate in an industry (i.e. taxis, cosmetology, liquor stores)
  - Owning an essential input: if an entrant has no access to an essential facility in the production of the good, they cannot enter the market

Entry problems: infinite number of identical firms

- In building our model, we assumed there were an infinite number of potential entrants to the market, who all had access to the same technology (i.e. all had the same cost function)
    - A cartel could exist if its members were all more efficient than the potential entrants (i.e. managerial skill, experience, inside information)
    - Since these firms are more efficient, raising the price induces only a limited number of new firms to enter the market

Cartel cheating

- So far, we've assumed that all cartel members listen to the cartel steering committee
  - This isn't always realistic
- Members of a cartel have incentive to cheat
  - **Claim**: if everyone else is playing fair, a single firm can benefit by expanding their output (at the expense of the cartel)
  - Suppose there exist 100 firms in an industry, with industry demand $Q = 1000 - 2P$
  - Suppose each firm gets an equal $\frac{1}{100}$ share of the industry $\frac{Q}{100} = 10 - \frac{2}{100}P$
  - Graph 10.2 - cartel cheating

Cartel cheating: punishment

- Punishing cheaters is hard
  - As consumers, we have no problem with punishment
  - Cartels are illegal, so they can't ask for legal help
  - Fighting back against cheaters usually means lowering prices, which hurts cartels even more
- Thus, maintaining a cartel relies on deterring cheating
  - To discuss deterrence, we need to think about cartel activities in a dynamic format (i.e. repeated game)

Cartel cheating: punishment

- Let's express the cartel decision as a dynamic game
  - Every period, a member of the cartel can choose to listen to the cartel steering committee, or they can cheat
  - Each member knows each firms strategy in the previous period (i.e. did other firms cheat or play fair?)
  - Every firm is trying to maximize their present value of profit
- This setup incentives firms to employ a **trigger strategy**
  - A single firm can deviate from the cartel agreement and potentially make much more profit in a single period
  - However, after that period, all other firms retaliate and act competitively for the rest of time, thus eliminating any future cartel profits
  - Example 10.1

Unequal costs

- If firms have different cost curves, then this can lead to cartel instability
  - Each firm wants to set a different price
  - Graph 10.4
- This issue can be solved two different ways
  - Divide the market by efficiency
  - Divide the market geographically

Court cases

United States v. Trans-Missouri Freight Assoc. (1887)

- The Trans-Missouri Freight Association was a group of 18 railroads
  - Every month, they met to decide rates, rules, and regulations on shipping
  - Firms who undercut the price were charged $100
- Trans-Missouri claimed the collusion was to avoid “ruinous competition”, and that they agreed upon “reasonable” rates
  - The courts ruled that this was a violation of the Sherman Act, as it was a restraint of trade

United States v. Addyston Pipe & Steel (1898)

- Cast iron steel manufacturers in Alabama colluded to reduce competition through a **customer allocation scheme**, where they assigned each producer a geographic area
  - The colluders rigged bids to allocate customers
  - The member of the scheme who paid the most money into a communal bonus pool was allowed to win the bid
- Addyston offered several defenses
  - The bid-rigging was intended to avoid ruinous competition
  - The bonus pool stopped members from being “too greedy”
  - The fixed prices were subject to competition from outsiders
  - The association only had a 30% market share at the national level
- The courts ruled that the firms were illegally colluding

United States v. Trenton Potteries Co. (1927)

- Trenton admitted that they fixed prices, but the question of the reasonableness of the fixed prices was brought up
  - Up until this point, the level of price fixing was unclear
- This case set precedent that price fixing is a **per se** violation
  - Thus, all price fixing is deemed illegal

United States v. Socony-Vacuum Oil Co, Inc. (1940)

- Gasoline and oil were sold in three separate markets
  - The main market, where most oil and gas went
  - The "hot oil" and "hot gas" market, where illegally produced oil and gas were sold at a discount
  - "Distress sales", where gasoline sold at low prices due to inadequate storage
- The distress market caused prices to fall for major oil companies, so the major companies colluded to buy off all of the distress market oil, so they could raise prices
  - Each major oil company was paired with a "dance partner", and the pair agreed on a price
  - The major oil companies did not agree on a uniform price to charge, and they claimed that the Trenton Potteries case did not apply
  - The courts disagreed, and ruled that any conspiracy to set prices counts as a per se violation

Per se rule application

- The Supreme Court has done a lot to apply the per se rule as broadly as possible; however, there are many instances where that may not lead to the best outcome
    - Let's discuss several cases where the welfare implications of the per se rule are unclear

Goldfarb v. Virginia State Bar (1975)

Goldfarb needed legal help on closing a house in Virginia, and noticed that all lawyers quoted the exact same legal fee

- The Virginia Bar set a standard minimum price for legal services, in hopes of deterring cut-rate lawyers
- Any lawyer who charged less was publicly deemed “unethical”
- The Supreme Court ruled that the minimum fee constituted a price fixing violation

Arizona v. Maricopa County Medical Society (1982)

- The Maricopa case can be thought of as a converse to the Goldfarb case, in that it set precedent for a per se price fixing violation on price caps
    - Doctors in Maricopa attempted to compete with existing health insurance companies by setting a maximum price for service
- Although the courts agreed that a rule of reason approach may lead to better economic outcomes, per se litigation would be much easier
    - The courts did not adopt the rule of reason, and decided the price cap was per se illegal price fixing

United States v. National Society of Professional Engineers (1978)

- The National Society was a group dedicated to bettering the economic interests of its engineers
  - The National Society banned its members from submitting competitive bids for engineering services
  - They argued price competition would lead to engineers undercutting each other and result in shoddy public works projects
- The US government claimed this ban on competitive bidding supressed competition and restrained trade
  - The Supreme Court ruled the National Society cannot ban competitive bidding

Broadcast Music, Inc. v. Columbia Broadcasting System (1979)

- This case is notable for not applying the per se rule for price fixing
  - BMI and ASCAP are organizations that have tens of thousands of composers and musical artists, and hold copyrights to songs composed by their members
  - Both organizations offer a blanket fee to use any copyright material in their collection; however, one could also negotiate directly with the artists for rights to the material
- CBS claimed the blanket license was a per se violation of price fixing
  - The Supreme Court did not apply the per se due to feasibility
  - They believed the the license made it exponentially easier to monitor and enforce copyright law, while providing access to a wide variety of content

Enforcement

Enforcement

- The per se rule on price fixing leads to firms being found guilty of antitrust violations, without being able to discuss the reasons behind their actions
  - Is the per se rule actually raising welfare?
  - Are we catching all of the price fixers, or just the ones who are bad at hiding it?
- Generally, economists agree that the per se rule has improved welfare
  - Customer allocation schemes are the most efficient form of collusion, and these cases are easy to detect and prosecute
  - Firms found guilty of an antitrust violation have shown to lower their price-cost margin after conviction, thus providing evidence of a deterrant effect