

Some Thoughts on Why Certain Markets are More Susceptible to Collusion

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Introduction

Overview

- 1 General description of the conditions under which we expect collusion to occur.
- 2 Some empirical observations regarding which markets are most prone to have cartels.
- 3 An approach to structural screening based on induction with an application to cement cartels.

Theoretically, When Do Cartels Form?

What conditions must be satisfied for collusion to occur in *this market at this time*?

- 1 Stability condition: When is collusion *feasible*?
- 2 Participation condition: When is collusion *desirable*?
- 3 Coordination condition: When is collusion *achievable*?

Theoretically, When Do Cartels Form?

Stability condition: When is collusion *feasible*?

- Internal: When does there exist a self-enforcing (stable) collusive arrangement?
 - Gain from cheating on the collusive outcome is small relative to the punishment.
 - Likelihood of non-compliance being detected is sufficiently great.
 - Example: More product homogeneity raises the gain from cheating but also raises the foregone collusive profit from cheating.
- External: When is there not a significant threat of non-cartel supply?
 - Cartel is sufficiently all-inclusive.
 - Entry barriers
- Relevant factors: product homogeneity, excess capacity, demand volatility, entry conditions, etc.

Theoretically, When Do Cartels Form?

Participation condition: When is collusion *desirable*?

- Economic conditions
 - Incremental profit from collusion is high
 - Example: homogeneous products with excess capacity
 - Current competitive profit is low relative to profit in recent periods
 - Managerial compensation (bonuses, promotion, reputation) may be tied to relative performance
 - Example: demand decline with excess capacity results in lower sales and more intense price competition
- Penalties, intensity of enforcement

Theoretically, When Do Cartels Form?

Participation condition: When is collusion *desirable*?

- Cultural conditions
 - Organization
 - More performance-driven corporate cultures may be more susceptible to ethical and legal lapses.
 - Examples: Akzo Nobel, Archer Daniels Midland
 - Market
 - Past episodes of collusion in this or related markets may lead managers to view collusion as an option.
 - Example: government procurement
 - Country
 - If collusion was recently lawful or even encouraged as part of industrial policy, managers may be more receptive to it.
- Market and country culture may also lead a manager to believe that managers at *other* firms are receptive to collusion.

Theoretically, When Do Cartels Form?

Coordination condition: When is collusion *achievable*?

- Firms must coordinate a shift in expectations from competition to collusion.
- Communication
 - Can be a serious challenge with non-express communication.
- Bargaining (or negotiation)
 - Historical stability in cost and capacity contribute to reaching an agreement

Theoretically, When Do Cartels Form?

- Collusion occurs when
 - ① there exists a stable collusive arrangement,
 - ② all (or sufficiently many) firms prefer to replace competition with one of those stable collusive arrangements, and
 - ③ those firms are able to orchestrate a coordinated shift from competition to collusion.
- Collusion will occur most often in those markets that satisfy these conditions.
- A few speculative thoughts on which condition is the determining one.
 - With near-perfect monitoring, the participation condition is more likely to be binding than the stability condition.
 - With highly imperfect monitoring, the stability condition could be binding.
 - With non-express communication, the coordination condition could be binding.

Empirically, When Do Cartels Form?

Methodological Issues in Measuring the Cartel Rate

How do we measure in which markets cartels are most likely?

- Desired measure: Probability that a market has a cartel.
- Empirical proxy: Historical frequency for a type of market = number of markets with cartels divided by the total number of markets.
- Proper measurement of the number of markets
 - Consider: Are cartels more common in chemical markets or in cement markets?
 - Number of chemical markets = number of global chemical markets
 - Number of cement markets = number of local cement markets
 - Are there many cement cartels because there are many cement markets?

Empirically, When Do Cartels Form?

Methodological Issues in Measuring the Cartel Rate

Sources of bias in measuring the number of cartels

- 1 Some cartels are not discovered.
 - Problem because the likelihood of discovery is probably correlated with market traits that affect collusive practices and collusive outcomes.
- 2 Explicit collusion is easier to detect than less explicit (but still unlawful) collusion.
 - Are there more documented episodes of collusion in intermediate goods than retail goods because the former requires more explicit forms of collusion and thus are more detectable?
- 3 Observers may have self-fulfilling beliefs.
 - If we believe cartels are more common in certain markets and tend to look for them there then we are more likely to find them.
 - Could become a practical concern if screening is more widely adopted.

Empirically, When Do Cartels Form?

- When buyers' decisions are largely based on price, competition results in low price-cost margins and low profits.
 - A firm's demand is more sensitive to its price which leads it to set a lower price.
 - As all firms act in this manner, prices are close to costs and profits are low.
- Firms go to tremendous effort to avoid buyers making decisions largely based on price
 - Enhancing product differentiation
 - develop new products, new variants
 - create the perception of differentiation through advertising
 - Offering ancillary services
 - Developing customer loyalty programs

Empirically, When Do Cartels Form?

But this is difficult in some markets

- Some markets are designed so that buyers' decisions are based only on price
 - Procurement auctions - contract goes to the lowest bidder
 - Nasdaq
- Many intermediate goods markets because
 - products are often identical
 - industrial buyers are sophisticated and savvy
 - not swayed by advertising
 - low search costs
 - willing and able to bargain
 - high-powered incentives to get as low a price as other customers

Empirically, When Do Cartels Form?

- In markets where buyers are price-sensitive, competition tends to drive price down to cost.
- How can firms maintain a high price-cost margin in these markets?
 - Binding capacity constraints
 - Agree not to compete in price - **Collusion**

Empirically, When Do Cartels Form?

- Empirical regularity: Collusion occurs disproportionately in markets in which buyers' decisions are almost exclusively based on price either because products are perceived to be homogeneous or due to market design.
 - Bidding rings in procurement auctions
 - Cartels that occur in intermediate goods markets with commodities such as cement, chemicals, industrial gases, pipes & hoses, glass, shipping, paper products, etc.
 - Cartels in retail markets for products that are largely undifferentiated such as bread and gasoline.

Inductive Approach to Screening

Screening Methods

- Screening is the activity of using market data to identify possible episodes of collusions.
- *Structural screening* identifies industry traits thought to be conducive to collusion or empirically associated with collusion.
 - Traits include high market concentration, homogeneous products, excess capacity, stable demand, among others.
- *Behavioral screening* looks for evidence of collusion in the conduct of firms; specifically, firms' prices and quantities.
 - Patterns include low price variability, stable market shares, lack of strong correlation between price and cost, among others.
- Structural screening is based on data that makes it more likely that a cartel *will* form.
- Behavioral screening is based on data that may be evidence that a cartel *has* formed.

Inductive Approach to Screening

Structural Screening

- Structural screen developed in Grout and Sonderegger (2005)
 - Data from U.K. Office of Fair Trading, 1999-2003.
 - Observation is a Standard Industrial Classification (SIC) three-digit industry.
 - Variables include industry sales, net capital expenditure per firm, C3 concentration ratio, market share volatility, among others.
 - Estimates how variables correlate with the probability of having a cartel in a 3-digit SIC industry.
- Concerns
 - A 3-digit industry is generally more aggregated than the typical cartelized market.
 - Analysis is constrained to considering only those factors for which there is data for all industries.

Inductive Approach to Screening

Description of Method

- Method of analysis: Deduction
 - Develop theory that identifies those factors determining collusion.
 - Use industry data to substantiate the theory.
 - Assess the predictions of the theory for the likelihood of collusion in particular markets.
- Method of analysis: Induction
 - Extrapolate from specific observations to make broad generalizations.
 - Useful for generating hypotheses.

Inductive Approach to Screening

Description of Method

- An inductive approach to screening involves three steps.
 - ① Find a market for which the rate of cartel formation is high.
 - ② Describe the constellation of traits for that market.
 - ③ Identify other markets with that same (or almost same) collection of traits.
- Inductive hypothesis: "Cement markets have these traits and cement markets frequently have cartels. Therefore, most markets with that set of traits frequently have cartels."

Inductive Approach to Screening

Cement

Step 1: Document that cement markets frequently have cartels.

- Ivaldi, Jenny, and Khimich (2015) reviewed all 249 cartels prosecuted in 22 developing countries during 1995-2013.

Most Frequent Markets with Cartels

Number of Countries	Market
9	Petroleum products
8	Cement , Poultry
6	Medical & health services, Public transportation, Shipping
5	Industrial and medical gases
4	Bakeries, Beer, Concrete products, Insurance, Liquefied petroleum gas, Pharmaceuticals

Inductive Approach to Screening

Cement

Step 1: Document that cement markets frequently have cartels.

- Countries with cement cartels for which the official decision occurred since 2000 include:

Argentina	France	Philippines
Australia	Germany	Poland
Austria	Honduras	Romania
Belgium	Hungary	South Africa
Brazil	India	Taiwan
Canada	Indonesia	Turkey
Colombia	Italy	United Kingdom
Egypt	Pakistan	

Inductive Approach to Screening

Cement

Step 2: Describe the constellation of traits for cement markets.

- Product traits
 - Homogeneous across firms
 - Short shelf life of around 30-60 days \Rightarrow limited role for inventories
- Demand traits
 - Largely purchased by industrial buyers
 - Most common use is in the production of concrete for construction
 - Share of cement in construction costs is around 2% (though higher for certain construction projects).
 - Highly price-inelastic demand: estimates range from 0.14 to 0.55.
 - Common price increases are highly profitable \Rightarrow supports participation condition.
 - Subject to seasonal and business cycles
 - Strong incentive to deviate right after a boom \Rightarrow does not support stability condition.
 - Excess capacity during downturn \Rightarrow supports participation condition.

Inductive Approach to Screening

Cement

Step 2: Describe the constellation of traits for cement markets.

- High transportation costs resulting in local geographic markets.
 - Low-value commodity relative to weight which has the implication that transportation costs are a significant proportion of cost.
 - Local nature of markets tends to make markets relatively concentrated.
- High capital costs resulting in concentrated markets and entry barriers.
- Capital-intensive mature production technology
 - Technological maturity could result in stable market shares \Rightarrow supports coordination condition.
 - Lack of differentiation in product and technology intensifies competition \Rightarrow supports participation condition.
- Excess capacity (in some cement markets).

Inductive Approach to Screening

Cement

Step 2: Describe the constellation of traits for cement markets.

- Product homogeneity and short shelf life
- Price-inelastic market demand from industrial buyers that is highly sensitive to seasonal and business cycles
- High transportation costs resulting in local geographic markets
- High capital costs resulting in concentrated markets and entry barriers
- Capital-intensive mature production technology
- Excess capacity

Step 3: Identify other markets with that same (or almost same) collection of traits.

- Candidates for consideration are other construction inputs such as bricks, concrete, gypsum, gravel, lumber, and roofing material.

Thank you
and
policy recommendations to come

Policy Recommendations

Introduction

William Kovacic (OECD Conference, October 2013), former Chair of the U.S. Federal Trade Commission:

No modern development in antitrust law is more striking than the global acceptance of a norm that condemns cartels as the market's most dangerous competitive vice [but] is modern antitrust cartel enforcement attaining its deterrence goals?

Policy Recommendations

Introduction

Evidence of deterrence is difficult to obtain and is ambiguous.

- Cartels continue to form (including some of the world's largest cartels).
- No downward trend in the caseload of the Antitrust Division of the U.S. Department of Justice.
- Collusion appears still to be profitable in expectation.
 - Based on fines, damages, and the likelihood of paying them (though estimates of the latter are biased).
 - Little indication that senior management is investing substantive resources into preventing employees from colluding.

Policy Recommendations

Introduction

Key implication: It is prudent to put more effort into detecting and convicting cartels.

- Higher probability of discovery and conviction both disables and deters cartels.
- Concerns that leniency programs are heavily used by dying cartels and thus do not shut down active cartels.

U.S. Senator Bill Blumenthal (2013): "My concern is that most of the cases that are brought today are ... generated exclusively from firms that decided to come forward and seek a leniency application I'm worried that the success of the leniency program combined with budget constraints that [the Antitrust] Division faces will, in effect, give you incentives to pursue only the companies that come forward."

Policy Recommendations

Screening

Recommendation: Pursue screening based on an inductive approach.

- Look for structural traits consistent with those industries with the highest rate of cartel formation, such as cement, construction, chemicals.
- Identify those markets with the same or almost-same constellation of traits.
- Such markets are candidates for behavioral screening using price and quantity data.

Policy Recommendations

Screening

Recommendation: Develop market-specific behavioral screens for markets with the highest rates of cartel formation.

- Identify common collusive practices in, say, cement cartels.
- Derive the implications of those practices for conduct.
- Knowing the types of collusive practices will produce a more precise set of predictions regarding firm conduct.
- Competition authorities could educate buyers in those markets regarding what to look for with regards to sellers' prices and quantities.
- (Industrial) buyers are the first line of defense against cartels.
 - Buyers have the best data and the strongest incentives for uncovering cartels.
 - Competition authority is the best informed about what to look for in the data.

Policy Recommendations

Development of Global Database on Cartels

Recommendation: Creation of a global database on collusive practices and price and quantity patterns.

- Collecting multiple instances of cartels may allow us to identify commonalities in how they operate that could result in better market-specific screens.
- Common template for reporting the facts surrounding an episode of collusion
 - market traits (e.g. concentration, product homogeneity)
 - cartel traits (e.g., inclusiveness, managerial levels)
 - collusive practices (e.g., market allocation, monitoring)
 - price and quantity patterns (e.g., reduced price volatility, stable market shares)
 - cartel experience (e.g., event that triggered cartel formation, cartel duration).

Policy Recommendations

Whistleblower Rewards

Recommendation: Whistleblower rewards to aid in detection.

- As with cartels in other markets, some cement cartels were originally reported by uninvolved employees:
 - Argentina: “disgruntled employee revealed to a newspaper that the cement companies were exchanging information and dividing their market shares”.
 - Brazil: Former employee of Votorantim Cimentos reported cartel.

Policy Recommendations

Whistleblower Rewards

- Some cases in which employees suspected something was awry but did not report:
 - Carbonless paper: “A Sappi employee admits that he had very strong suspicions that two fellow employees had been to meetings with competitors. He recalls that they would come back from trade association meetings with a very definite view on the price increases that were to be implemented and that they were relatively unconcerned by competitor reactions.” (EC Decision)
 - Fine arts auction houses cartels: “Sotheby’s submits that some of its personnel commented that they had a ‘feeling’ that the introduction of the fixed vendor’s commission structure may have arisen out of some sort of understanding with Christie’s.” (EC Decision)

Policy Recommendations

Whistleblower Rewards

- Only three countries have whistleblower rewards: Hungary, South Korea, United Kingdom
- DOJ has expressed opposition because “jurors may not believe a witness who stands to benefit financially from successful enforcement action against those he implicated.”
- Concern seems misplaced because
 - rewards are paid only upon conviction and the standards for conviction are high.
 - very small percentage of cases actually go to trial.
 - an investigation initiated by a whistleblower is likely to induce a leniency application if there is a cartel.

Policy Recommendations

Eliminate Accentuating Factors from Fining Policies

Recommendation: Do NOT fine recidivists more.

- Recidivism is generally listed as an "accentuating factor" in fining guidelines.
 - 20 out of 22 countries reported recidivism as an accentuating factor (ICN, 2008)
- Given there is a statutory maximum fine, fining recidivists *more* means fining first-time offenders *less* which means weaker penalties for first-time offenders.

Policy Recommendations

Eliminate Accentuating Factors from Fining Policies

- Preferable fining policy:

Fines are set at the maximum level allowed by the law with the exception that reductions will be provided when firms exhibit exceptional behavior in discontinuing collusion or cooperating with the investigation.

- No accentuating factors
- Mitigating factors are only those that create social gains by either
 - decreasing cartel duration.
 - increasing expected penalties (by assisting in prosecution).

Policy Recommendations

Summary

- 1 Screen markets with comparable traits to those of cement markets.
- 2 Develop market-specific behavioral screens for markets with the highest rates of cartel formation.
- 3 Create a global database on collusive practices and price and quantity patterns.
- 4 Adopt of whistleblower rewards to aid in detection.
- 5 Raise base fine to maximal level, eliminate accentuating factors, retain those mitigating factors that reduce duration or enhance prosecution.