Collusion and Horizontal Agreements
M.Motta, *Competition Policy: Theory and Practice*, Cambridge University Press, 2004; ch. 4
What is collusion?

- In economic theory collusion is a market outcome (high prices...joint profit maximization..) but Courts consider illegal only practices where firms coordinate actions to get a collusive result
- In economics collusion is identified with prices being higher with respect to a competitive benchmark OR prices close to monopoly prices
- In economics the collusive result is important, not the form of the agreement. In practice, collusion may be “explicit” or “tacit”
Ingredients of collusion

- Collusive outcomes not easy to achieve: each firm has the temptation to unilaterally deviate to further increase its profits.
- Considering the temptation to deviate, in order to achieve collusion participants may be able to quickly detect a deviation. Then a punishment must occur (rivals producing higher quantities...or selling at lower prices).
- If collusion is obtained deviations and punishments are not even observed in equilibrium.
Coordination: tacit and overt collusion

• With tacit collusion firms may reach the fully collusive price but it is only one of the many possible outcomes.
• Under tacit collusion it is more difficult to solve the coordination problem.
• A firm believes the “right” price is higher and increases its price to signal it then it will loose market shares during adjustments.
• If a firm decreases its price to coordinate on a lower equilibrium, it risks being perceived as a deviation and trigger a price war.
Explicit collusion

• Explicit collusion by communication avoids these problems
• Market allocation schemes according to which a firm sells in a region (or to a group of customers) and rivals in other regions (or to other groups) allow for prices to adjust to demand without triggering price wars
• As long as firms do not serve segments of demand allocated to rivals prices can change without disruption of the collusive agreement
Facilitating collusion: structural factors

- *Incentive Constraints* (IC) for collusions: each firm compares the immediate gain it makes from a deviation with the profit it gives up in the future when rivals react.

\[
IC: \quad \pi^c + \delta V^c \geq \pi^d + \delta V^d
\]

- Collusion is more likely the *smaller the number of firms*.
- With *symmetric firms* a lower $n$ is equivalent to a high degree of *concentration* and collusion is more likely to arise. The more firms are asymmetric the less likely collusion will be.
Facilitating collusion: structural factors (cont’d)

• The **easier entry** is the more difficult to sustain collusive outcomes: high profits attracts new entrants
  • 1) if the entrant is aggressive the incumbent should decrease prices and break collusion
  • 2) with an accommodation strategy collusion can continue but more entrants will follow the same strategy as the larger N the less likely collusion can be sustained.

• **Regular Orders** facilitate collusion. Indeed an unusually larger order gives a temptation to deviate (gains in that period may compensate the losses of punishment with regular orders)

• High **frequency of orders** facilitate collusion because it allows timely punishment (infrequent orders delay it)
Facilitating collusion: structural factors (cont’d)

• **Buyer Power**: concentration of buyers power may stimulate competition between sellers (by threats to redirect orders even to potential entrants) or by concentrating orders it can break collusion as above.
Facilitating collusion: structural factors (cont’d)

- The impact of demand evolution depends on the nature of demand shocks
- 1. Shocks are independent current demand conveys no information on future demand larger demand is equivalent to a larger order firms would break collusion
- 2. Demands movement are correlated over time larger orders today signal a steady increase of demand collusion is more likely due to the fear of loosing higher collusive profits in the future
- Demand stability helps collusion to the extent that it increases the degree of observability: frequent shocks and uncertainty makes it difficult to understand if lower sales are due to demand volatility or price undercutting collusion more difficult to sustain
Observability and Enforcement

- Detection of deviations is necessary for collusion enforcement
- Collusive agreements can break down because of secret price cuts
- Green and Porter (1984): if actual price (and price cuts) are not observable collusion would be more difficult to sustain, but it may still arise in equilibrium
- A seller may not know if a reduction of customers is due to a demand shock or to price-cuts by rivals
- G&P show that there exist collusive strategies representing an equilibrium where each firm sets high prices as long as it faces high demand. When demand is low then a punishment is triggered and each firm sets the one-shot equilibrium price. After this phase firms revert to the collusive price
- Then observing price wars is not ad ods with the existence of collusion. In fact, they are an ingredient of collusion if Price and Demand are unobservable
Standard of Proofs: Market data V. Hard evidence

• Although economics has been successful in identifying the mechanism of collusion, its legal implications are less straightforward

• As collusion implies high prices, one should analyze prices in a given industry: if they are above a certain threshold they should be collusive BUT

• 1. Prices may not be available – Actual prices are different from list prices

• 2. Even if data exist there may be disagreement about the monopoly price (estimates of costs differ…)

• 3. Even with agreement about monopoly price how far from monopoly level should prices to be considered collusive?

• 4. Firms cannot be convicted only because they charge higher prices, in fact the reason may be they are successful with consumers willing to pay higher prices
Standard of Proofs: Market data V. Hard evidence (cont’d)

• An alternative would be looking at the evolution of prices over time (price parallelism)
• BUT common exogenous shocks (price of inputs, inflation,...) may lead to the same result
• Firms may not necessarily coordinate behavior, there may be tacit collusion when a firm raises prices with the expectation that the rival will follow, but the rival does it in order to avoid a price war
• Soda-Ash case:.....continuing to share market was a way to reach tacit collusion
• Without hard evidence a court would have to prove infringement of the law by guessing firms 'intentions and motivations
• In some cases price-parallelism can be explained only by coordination.
Standard of Proofs: Market data V. Hard evidence (cont’d)

• If there is no proof that firms have agreed on a particular practice, the very fact they followed that practice is no proof of collusion.
• Periods of price-wars are no proofs of collusion either (Green Porter...) Firms would say that lower prices are due to losses of demand of capacity problems. It would be difficult for courts to rule out such arguments unless there exist evidence of communication among firms to coordinate their behavior.
Standard of Proofs: Market data V. Hard evidence (cont’d)

- The legal approach requesting hard evidence as proof of collusion is sensible in practice.
- There should be proof of communication: minutes of meetings, e-mails, memos or any other written (or recorded) evidence.
- Firms may use trade-associations as a forum to exchange information on prices and quantities.
- The advantage of this approach: it is based on observable evidence verifiable in Courts.
Ex-ante competition policies against collusion (prevention)

- Collusive agreements are considered the most serious infringement of competition laws. FINES are heavy.
- Firms subject to different penalties: 1) pay a fine (transfer to public budget) 2) pay damages to private parties 3) In the US the managers might be given prison sentences.
- For deterrence purposes what matters is not the size of the fine but the EXPECTED FINE = Amount of the fine X probability of being caught and found guilty.
Ex-post competition policies against collusion

- Competition policy intervention to break EXISTING cartels
- “down raids” (surprise inspection) in firms headquarters (or trade associations or even executives’ homes) to seize documents as proofs, but competition agencies should be given extensive powers in cooperation with the police
- Give incentives to firms to withdraw from collusive agreements and reveal information needed to prove collusion (leniency programs)
Leniency Programs

- **Leniency programs**: grant total or partial immunity from fines to firms that cooperate with the Competition Authority.
- First introduced in the US in 1978 then reformed in 1993.
- **Automatic leniency**: for firms reporting evidence of a cartel *before* the investigation begun, provided the firm is the first to come forward. &...
- **Discretionary leniency**: for firms that report evidence after an investigation has started, provided that the Authority has not yet evidence likely to result in conviction.
- The first program was not successful, the 1993 reform has improved leniency programs in two ways: 1) extended leniency for firms that cooperate after an investigation begun 2) amnesty is automatic not discretionary (certainty).
Leniency Programs (cont’d)

• The EU introduce LP in 1996:  a) A fine might be reduced by 75-100% if a company informed EU before the investigation started.  b) The fine might be reduced by 50-75% if cooperation by the firm started after the EU investigation begun. c) The fine might be reduced by 10-50% if the company cooperated with the EU but previous conditions were not met.

• In the EU LP did not give the expected results because 1) leniency was given in a discretionary way (rather than automatic) 2) firms did not know the fine until the final decision was reached

• REFORMS of 2002 (under M.Monti): transparency and certainty.
Leniency Programs: Motta Polo (1999)

- LP might be important in Cartel prosecution provided that firms can apply for leniency before an investigation has started.
- A firm deciding to collude consider the benefits of collusive profits against the expected cost of them: the probability of being caught and the expected fine.
- If after deciding to join a cartel a firm receives the opportunity to report on it its benefit-cost analysis does not change (the expected cost does not change). No reason to report.
Leniency Programs: Motta Polo (1999) (cont’d)

• If LP are open to firms even after the investigation begun: decompose probability that the cartel is investigated
  p=probability that the Antitrust Authority finds enough evidence to prove that the cartel is guilty
• Then a decision to join a cartel depends on αpF, but after the investigation begun the expected cost is pF
• As pF > αpF (α<1) the trade-off has changed: the expected cost of continuing to collude has become higher while the collusive profit is the same  the firm may decide to give-up its participation on the Cartel
Joint –Ventures and Other Horizontal Agreements

• What is a Joint-Venture?

A joint venture is merely the coming together of two business entities to undertake a single project or aspect of business. This does not involve dissolving their original business or changing the organizational structure (differently from a merger).

In a joint venture, each company will then take an interest, both operational and financial, in the new company and their share in the profits or losses of the new venture, which will be directly linked to the level of involvement or commitment they put forth from the start.

Although joint ventures are not as complete, and in some cases not as permanent as mergers, this is not to say that they can be taken lightly.
Mergers

- **Horizontal Merger** - This occurs when two companies that previously were competitors come together to become one larger operation. They join forces to serve the same clients as a newly formed single entity.

- **Vertical Merger** - This type of merger occurs when two companies that are next to each other on the supply-chain decide to become one entity. If for instance a supplier and customer become one, the output of one arm of the company is fed into the other and synergies occur.

- **Conglomeration** - This type of merger occurs when two companies that have no relation to each other join forces. The objective in this case is diversification of assets and portfolios rather than direct benefits from synergistic energies.
R&D Collaboration

- Types of Research Joint Ventures (RJVs)
  - Alliance between two firms (domestic or international)
  - Alliance between universities and firms
  - Consortia among (large) groups of firms with or without government help
    - US: EPRI, Sematech
    - Europe: Eureka (cross-border), Airbus
  - All types have increased during 1980s/1990s
Welfare effects of RJV

• Costs
  • Reduced diversity in R&D
  • May enable anti-competitive behavior by partners (makes it easier to raise prices)

• Benefits
  • In combination, firms may lower R&D cost
  • Enables larger projects via pooling of resources and internalizing spillovers
  • Vertical arrangements more likely to be efficiency-enhancing
Why have RJVs increased?

- Complexity of modern technology
  - Internalizing spillovers and preventing research duplication
  - Access research at lower cost
  - Monitor developments in related technologies
- Globalization
  - Protecting assets
  - Specialized technical skills in foreign firms
  - Non-tariff barriers to trade
- 1982 – antitrust immunity in US
Who forms RJVs?

- Larger firms in R&D-intensive sectors
- Firms in more concentrated sectors
- Firms in sectors where patents less effective (so licensing not as attractive)
- Firms in smaller countries more likely to form an international RJV
- Firms with past experience in RJVs (specialization)

Do we need policies toward RJVs?

Conflict:

- Intellectual Property Rights creates a monopoly (market power)
- Antitrust policy tries to reduce market power
R&D Consortium example - Sematech

• Founded 1987, with 80% of domestic capacity as members (response to Japanese competition)
  • ATT, AMD, IBM, Dec, HP, Intel, Motorola, NCR, National Semi, Rockwell, TI
  • Harris (exit 93), LSI, Micron (exit 92)
• 50-50 sharing with Defense Dept for 10 years ($100M per year)
• Pilot manufacturing facility
Sematech cont’d

- Redirected towards vertical alliance with equipment manufacturing in 1990
  - SME (semiconductor materials & equipment consortium) has about 140 members
  - Resulted in some anti-competitive behavior
    - Member firms had the right to license equip & materials improvements royalty-free
    - Improvements held back for a year from other firms
    - Shift toward privately appropriable research
Antitrust policy overview

• Economics of antitrust policy – tradeoff between
  • More efficient (lower cost production and invention) firms
  • Higher prices and lower consumer welfare; deadweight loss
• Firm behavior examined by FTC (Federal Trade Commission) or DOJ (Department of Justice, Antitrust Division) or EU Antitrust Commission:
  • Collusion
    • Tacit (not really illegal unless...)
    • Naked (direct agreement) – per se illegal
  • Mergers – use guidelines (rule of reason)
  • Other restraints to trade – rule of reason; some are per se illegal
Antitrust in R&D industries

• Antitrust issues raised in innovative industries from the following:
  • Forming a joint venture to do R&D
  • Licensing technology
    • terms and restrictions in license
    • exclusivity
  • Ex post alliance – patent pools
Antitrust and RJVs

• In USA - Rule of reason enforcement:
• Required to register by the NCRA (National Co-Operative Research Act) (1982)
  • Good - pooling R&D can reduce costs without raising prices if firms compete on output market
  • Bad - there can be underinvestment in R&D by joint ventures (like a monopolist, they may delay innovation relative to social optimum)
  • Relatively little effect either way if there are third parties not in the RJV
• In EU: R&D Block Exemption (2000)
Other form of Co-Operation in Technology

- **Technology licensing**
- **Definition** - agreement by the IP owner to allow use of IP by another
- **Possible terms**
  - Exclusive license by licensor
  - Exclusive dealing by licensee
  - Grantback – licensor claims share of output of use of his IP
- **Usual fee structures**
  - Per sales royalty (influences price)
  - Fixed fee (influences division of profit)
- **Cross-Licensing** occurs when two firms reciprocally allow each other to use technology protected by a patent.
Patent pools (grouped licenses)

- Lowers the transaction costs of combining multiple patents to make one product
- Antitrust enforcement based on whether technologies are
  - complements – allows combination at relatively low cost
  - substitutes – acts as collusive agreement
- Can function as a barrier to entry
- Profit division depends on outside option (dropping out)
Antitrust Policy and Licensing

• Potential welfare problems:
  • firm may use a patent to extend market power to non-patentable product (via tying)
  • patent on a technological standard may impede competition that uses the standard
  • patent may prevent efficient combinations of technology if firm refuses to license it or licenses at high cost
  • innovation that builds on the information in a patent may be costly for other firms to perform
Antitrust Policy and Licensing cont’d

• Principle of antitrust enforcement in relationship to IP protection
  • Monopoly power granted by the patent should not be extended to other activities of the firm or used to shift the demand curve for the patented product outward at the expense of competition from substitute products
  • Particularly important in information industries, characterized by network externalities