Collusive Agreements
Plan of the lectures

• Functioning of a collusive agreement.

• Structural factors that facilitate collusion:
  – Concentration ✓
  – Entry barriers ✓
  – Frequency of orders ✓
  – Evolution of demand ✓
  – Symmetry ✓
  – Market transparency ......

• Facilitating practices
  – Exchange of information
  – RPM
  – Meeting-competition clause ..... 

• R&D agreements
• **Market transparency**
  The lack of transparency on prices and sales makes it more difficult to sustain collusion and more limited in scope

  - If firms do not observe individual prices (and cannot infer from readily available market data), deviations cannot be identified and punished.
Green and Porter (1984)

- Each firm only observes its own price and sales
- In each period, with some probability, demand vanishes.

- Perfect collusion no longer possible
  - Each firm would have incentive to deviate blaming low demand

- Best collusive scheme:
  - Monopoly price as long as each firm maintains its mkt. share
  - Whenever a firm is unable to sell, price war for T periods
    (afterwards, revert to monopoly price).

  - T long enough to deter potential cheaters.
  - Since price war triggered by pure bad luck, T cannot be too long.
• **Price wars** are an indispensable element of a collusive strategy. The observation of some periods with low prices does not exclude collusion in the industry.

• Collusive prices are **pro-cyclical**.

• Anti-trust agencies should pay special attention to practices that help firms monitor each other’s behaviour.

• Phases of the Moon Case
• **(Horizontal) Product Differentiation**

Ambiguous impact:
- Lower gain from deviation (it is more difficult to attract customers when undercutting rivals).
- Punishment less severe (positive payoff during the punishment phase)

However, product differentiation may exacerbate informational problems in non-transparent markets (usually anti-trust agencies interpret product homogeneity as facilitating collusion).
• **Network industries**

Collusion more difficult to be sustained:

– Competition “winner take all” creates strong incentives to deviate

– “Lock-in” effects limit effectiveness of punishments.
• **Multi-market contacts**
  Easier to sustain collusion when firms are present on several markets.

  – Frequency of orders ↑.

  – May soften asymmetries that arise in individual markets. (Bernheim and Whinston, 1990).

  – May allow collusion in markets where it would not be sustainable, by exploiting more favourable conditions on other markets.
• **Example 1**: multi-market contacts soften asymmetries

• Two firms (1,2), two markets (A,B), specular market shares: $\alpha^{1,A} = \frac{1}{4}; \alpha^{1,B} = \frac{3}{4}$.

• Let us analyze each market separately. Collusion is sustainable if $(\alpha=1/4 , \alpha=3/4)$:

$$\pi^m - \frac{\pi^m}{4} < \frac{\delta}{1-\delta} \frac{\pi^m}{4} \iff \delta > \frac{3}{4}$$

$$\pi^m - \frac{3\pi^m}{4} < \frac{\delta}{1-\delta} \frac{3\pi^m}{4} \iff \delta > \frac{1}{4}$$
• If the same firms operate in both markets, the IC is:

\[
\frac{1}{1-\delta} \frac{\pi^m}{4} + \frac{1}{1-\delta} \frac{3}{4} \pi^m > \pi^m + \pi^m + \delta (0 + 0) + \delta^2 (0 + 0) + \ldots
\]

\[
\pi^m < \frac{\delta}{1-\delta} \pi^m \iff \delta > \frac{1}{2}
\]

• Firms consider cost and benefits of deviation on all the markets where they are active: this makes them more similar \(\rightarrow\) easier to sustain collusion.
Example 2: multi-market contacts allow to extend collusion from a more favourable market to a less favourable one.

2 firms in market A, 3 in market B;

\[ \delta \in (1/2,2/3): \text{collusion sustainable in market A, but not in market B (considered separately)}. \]

The two firms active also on A, in market B can assign a larger share to the third rival in order to induce it to collude.
• On market B, let us compute the market share that makes the third firm indifferent between colluding and deviating:

\[ \pi^m - \alpha \pi^m = \frac{\delta}{1-\delta} \alpha \pi^m \iff \alpha = 1 - \delta \]

• Let us compute the IC of the two firms on both markets (on market B, they share equally the remaining fraction \( \delta \))

\[ \left( \frac{\pi^m}{2} + \frac{\delta}{2} \pi^m \right) \frac{1}{1-\delta} > \pi^m + \pi^m \iff \delta \geq \frac{3}{5} \]

• If \( \delta \in (3/5, 2/3) \), collusion is sustainable on both markets.
Facilitating practices

• **Exchange of information**
  A) on past or current prices and quantities
  – Facilitates detection of deviations
    • Ex.: Danish experience in ready-mixed concrete market
  – But, also efficiency reasons
    • Ex. Implementation of relative performance incentive schemes.

The latter do not require disaggregate data

Anti-trust agencies should treat severely exchange of information about individual prices and quantities (the more severe, the more recent and detailed).
B) Announcements on future prices and quantities

- Facilitates coordination on a particular equilibrium among all the possible ones.

- **Private announcements** (directed only to competitors): pro-collusive and no efficiency reasons
  - Ex.: Airlines case in the US.
  - Ex.: Communication in simultaneous ascending auctions (where several objects are for sale at the same time).

Public statements about bidding intentions should be forbidden
Bidders should be forced to bid round numbers
Bids should be made anonymous
• **Public announcements** (seen also by customers): potentially pro-collusive but also pro-competitive
  
  – Ex.: press advertising

  Usually, the latter effect is considered dominant. (**Not always**: see Ethyl case.)
**Resale price maintenance**

RPM can enhance cartel stability by eliminating the retail price variation.

- Local shocks on retail cost or demand (observed by retailers but not by producers).
- If retailers free to choose the final price: prices would adjust to shocks
- If producers choose final prices (based on average demand): more stable prices
  - Lower (short-run) profits
  - Easier to monitor each other’s behaviour (if wholesale prices not observable)

*(Jullien and Rey, 2001)*
• **Meeting-competition clause**
  Collusion is easier for two reasons:
  – Deviations are more easily detected;
  – Gains from deviation ↓.

• **Cross-Ownership**
  Collusion is easier for three reasons:
  – Easier to coordinate behaviour
  – Easier to exchange information
  – Gain from deviation ↓.
R&D agreements

• Knowledge is a public good (non-rival; limited scope for exclusion)
  ➡️ The market produces a suboptimal level of knowledge.

• R&D cooperation may be welfare beneficial:
  – Internalization of externalities ➡️ stronger incentives to invest.
  – Free riding avoided.
  – Cost duplications avoided.
• However, R&D cooperation may entail welfare costs:
  – Weaker incentives to engage in R&D to take the lead over rivals
  – Cooperation may extend to the product market → pro-collusive effect

• Overall, R&D cooperation more likely to be welfare beneficial
  – The stronger externalities (basic research).
  – If independent use of R&D results.
  – The lower the market power of the cooperating firms.
PRACTICE: How to detect and fight collusion?

- For economists, collusion as an **outcome**
  - Both tacit and explicit agreements may sustain collusion

- So, why not inferring collusion from market data?

**Inferring collusion from data.** Problems, I: price levels
- Price data availability (list v. effective prices)
- Difficult to estimate ‘monopoly price’ and marginal costs
- Where to set the threshold level?

A **dangerous principle**: firms guilty because able to set a high price...(market power not a problem *per se*)
Standards of proof, II: data

• **Inferring collusion from data. Problems, II: evolution of prices**
  – *Price parallelism*: not a proof of collusion (common shocks)

Which legal certainty if firms are found guilty for independent business practices?
  – *Parallelism plus*’ not convincing either, unless there is proof of coordination on facilitating factors (eg., RPM, info exchange)
  – Periods of ‘price wars’ not sufficient condition for collusion either (new capacity, new competitors, demand shocks…)

• **Conclusion**: Econometric tests as complementary evidence, not proof of collusion (results sensitive to different techniques used)
Standards of proof, III: hard evidence

• **Hard evidence only** (of communication on prices and/or coordination on facilitating practices) as *proof*
  – (focus on observable elements verifiable in courts, to preserve legal certainty: fax, e-mail, phone calls, video etc.)

• **Too lenient with the firms?**
  (Since collusion can be reached tacitly, focusing on ‘hard evidence’ amounts to permitting collusion?)

• Not necessarily: firms will try to coordinate to avoid costly market experimentation and will leave ‘traces’

• More active policies can be used, ex ante and ex post
Ex ante policies to fight collusion

• Black list of facilitating practices might deter collusion and free resources for cartel detection
  – Private announcements of future prices/outputs
  – Exchange of disaggregate current/past information
  – Meeting competition, RPM and other clauses, if adopted by coordination
  – Cross-ownership among competitors not to be allowed
  – Merger control (joint dominance)

• Deterrence of collusion: criminal sanctions?
Ex post policies to fight collusion

- Surprise inspections

**Leniency programmes**

- The US and EU experience:
  - Leniency must be clear and certain (not discretionary)
  - Leniency should be extended to firms that report *after* an investigation has started