

# **Econ 510 Collusion II**

## **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  $\uparrow$  .
- 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:  $\alpha^{1,A} = 1/4$ ;  $\alpha^{1,B} = 3/4$ .
- Let us analyze each market separately. Collusion is sustainable if ( $\alpha=1/4$  , $\alpha=3/4$ ):

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

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

- If the same firms operate in both markets, the IC is:

$$\frac{1}{1-\delta} \frac{\pi^m}{4} + \frac{1}{1-\delta} \frac{3}{4} \pi^m > \pi^m + \pi^m + \delta(0+0) + \delta^2(0+0) + \dots$$

$$\pi^m < \frac{\delta}{1-\delta} \pi^m \Leftrightarrow \delta > \frac{1}{2}$$

- Firms consider cost and benefits of deviation on all the markets where they are active: this makes them more similar  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;
- $\delta \in (1/2, 2/3)$ : 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:

$$\pi^m - \alpha\pi^m = \frac{\delta}{1-\delta}\alpha\pi^m \Leftrightarrow \alpha = 1 - \delta$$

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

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

- 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