

## Collusion

Steve Davies  
and  
Morten Hviid

ESRC Centre for Competition Policy  
University of East Anglia

## Objectives of presentation

To expose our ongoing research programme on collusion at CCP to the scrutiny of practitioners

To help inform our research

To enhance practitioners' understanding of the standard economists' model of collusion as the outcome of a repeated game.

## Plan of session

- ❖ **Collusion as seen by economists – why one model might fit all.**
- ❖ **Cartels and concerted practices – why are these the focus of the law?**
- ❖ **Tacit collusion – reached only through mergers?**
- ❖ **Bringing the threads together to identify open questions**

3

## Plan

- ❖ Present a simple model do describe the tensions involved in sustaining collusive outcomes
- ❖ Show that there is basically only one economic model of collusion
- ❖ How easy is it to get collusive outcomes?
- ❖ In these models, what is meant by “punishment”

4

## The Incentive Problem

Simple case of two price setting firms, A and B

|        |            | Firm B    |            |
|--------|------------|-----------|------------|
|        |            | Low price | High Price |
| Firm A | Low Price  | 2, 2      | 5, 0       |
|        | High Price | 0, 5      | 3, 3       |

5



## The Tension

- ❖ Best prediction of an outcome is competition
- ❖ Both firms would prefer to coordinate on setting a high price
- ❖ Setting a high price require each firm to be confident that its rival would do the same
- ❖ Tension between size and slice
- ❖ Key question: When is such trust warranted?

6

## Repetition to the rescue

- ❖ A firm might trust rivals to behave non-aggressively today if they interact again in the future
- ❖ In case above, each firm knows what is in their collective best interest
- ❖ Consider a possible strategy: I'll trust you until you abuse my trust, then I'll never trust you again
- ❖ Result: We can potentially get the "high price" outcome

7



## Repetition to the rescue (2)

More generally:

- ❖ If the firms are sufficiently patient, repetition will enable prices above the competitive level to be sustained

Robust result which relies on

- ❖ Trading off current gains against future losses

Key points:

- ❖ does not necessarily rely on agreements
- ❖ does not necessarily rely on "plus-factors"

8

## What makes a difference?

- ❖ Symmetry (costs; demand) / transparency
  - ❖ What should firms cooperate on?
  - ❖ What are the true incentives of rivals?
  - ❖ What are the true actions of rivals?
- ❖ Norms
  - ❖ Several strategies can support the same outcome, so how can firms take hints and avoid misunderstandings?
- ❖ Number of firms
- ❖ Patience of the decision makers
  - ❖ Who are making the decisions?

9

## Future losses: “Punishment”

Often misunderstood due to loose language

### Case 1: Agreement

- ❖ If lower price, punish with price war

### Case 2: “understanding”

- ❖ Current price above competitive level
- ❖ Deviation leads to break-down of trust
- ❖ Future price at competitive level
  - ❖ Looks like a price war [implicit punishment]

10

## Summing up

- ❖ “Collusion” can emerge from an implicit understanding of the situation
- ❖ Collusion is made possible through a trade-off of future losses against a short term gain
- ❖ Choosing what to coordinate on may be hard
- ❖ Trusting others may depend on transparency
- ❖ The future losses may be a feature of the market or an explicit strategy [implicit vs explicit punishment]

11

## Plan of session

**Collusion as seen by economists**

**Cartels and concerted practices**

**Tacit collusion**

**Open questions**

12

## Enter competition law

Unlike economics, competition law divides collusion into several categories, some of which are treated differently

For example current law distinguishes between

- ❖ Agreements between undertakings [Hard core cartels]
- ❖ Decisions by associations of undertakings
- ❖ Concerted practices
- ❖ Conscious parallelism
- ❖ Coordinated effects/collective dominance

13

## The questions

Focusing on collusion:

- ❖ Can we identify distinct categories of collusion?
- ❖ Should the law reflect this?
- ❖ How does this map back into EU and UK competition law?

To answer these questions, we will start with the most limited information we can observe.

Preview of answers:

- ❖ Key distinguishing feature is what evidence may be available
- ❖ Another feature is the appropriate remedy

14

## Prices move in parallel

What can we infer from just this?

Two stories:

- ❖ Two firms not bothered about competing
  - ❖ Austria - West Germany
  - ❖ Remedy: change the rules of the game
- ❖ Observationally equivalent to vigorous competition
  - ❖ Denmark - Sweden
  - ❖ Chance of error too high
  - ❖ Remedy: can't touch them

Either lack of evidence or "they have done no wrong"

15

## Add cost estimates

With this we can estimate the gap between price and cost

- ❖ Collective dominance + unfair pricing?

Would be brave

- ❖ Errors potentially large
- ❖ If you get punished anyway, why not do the "crime"?
- ❖ Bring the law in to disrepute

16

## Need something extra to do it

- ❖ For example
  - ❖ A statement about intended price increase
  - ❖ An Most-Favoured-Customer guarantee
  - ❖ Price lists
  - ❖ Private actions
  - ❖ Information sharing [via trade association]
- ❖ Such (and other) practices can facilitate collusion
- ❖ Should they be remedied?
  - ❖ Yes, unless there is an alternative reason and no other way of achieving this [defence a la ancillary?]
  - ❖ Remedies: prohibition of particular practices
  - ❖ Errors possible, but consequences can be limited

17

## We've gotta meet

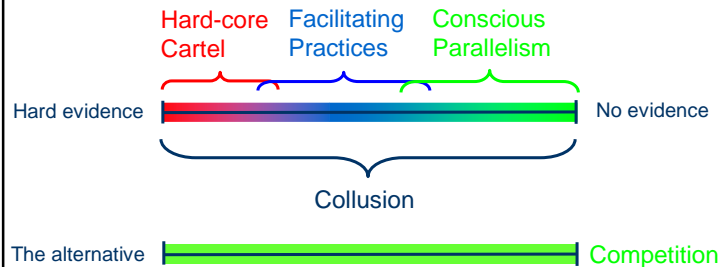
Where the environment is so noisy and changeable that firms need to meet to coordinate their actions we have **hard** evidence of collusion

- ❖ Little chance of making a mistake
- ❖ So we can be harsh
  - ❖ Harsh increase deterrence and saves on detection costs, so is good
  - ❖ But they may become even more careful
- ❖ Remedy: fines; prison

18

## The spectrum of collusion

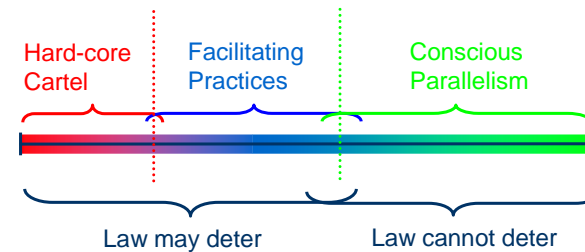
Question: If firms did collude what is the least amount of evidence which would be there for the authorities to find?



19

## Competition law

- ❖ Define boundaries
- ❖ Deter actions
- ❖ Move firms across the boundary - change structure



20

Distinguishing between categories of collusion seem right for two reasons:

- ❖ the likelihood of making errors in judgements differ
- ❖ the appropriate remedies differ

Suggested categories

- ❖ Hard core cartels [Agreement; criminal]
- ❖ Multilateral facilitating practices [Agreement; fines]
- ❖ Unilateral facilitating practices [aim/defence; ban]
- ❖ Conscious parallelism [about which more later]

Suggestion does not map perfectly into existing law

21

- ❖ Would appear important to define what is meant by “agreements” and “concerted practices”
- ❖ Can we stretch articles 81 and 82 to cover proposed groups?
- ❖ Current understanding of concerted practices does not appear to cover facilitating practices.
- ❖ What practices are facilitating? When are they facilitating? When do they have no alternative use?
- ❖ Need for more research - some of this is being done in CCP

22

**Collusion as seen by economists**

**Cartels and concerted practices**

Tacit collusion

**Open questions**

23

- ❖ Definition
- ❖ Illegal?
- ❖ How can we detect it? Or identify the conditions under which it occurs?
- ❖ Our current research findings on EC merger cases

24

## An old definition

I'm interested in the very end of Morten's spectrum – no agreement or information exchange [is this consciously parallelism?]:

"If each (firm) seeks his maximum profit rationally and intelligently, he will realise that when there are only 2 sellers, his own move has a considerable effect upon his competitors, and that it makes it idle to suppose that they will accept without retaliation the losses he forces upon them. Since the result of a cut by any one is inevitably to decrease his own profit, no one will cut, and although the sellers are entirely independent, the equilibrium result is the same as though there were a monopolistic agreement between them" (Chamberlin, Monopolistic Competition, 1929).

25

## A definition: out of the mouth of..

"if we raised prices to a lesser amount than our competitor and it failed to lower its own prices to the same level, there would be an immediate transfer of business to us. This would lead to a long-term retaliation by our competitor" A Firm in The UK Salt Duopoly (MMC, 1986)

26

## Is it illegal?

- ❖ As defined here, without agreements or explicit information exchange, it merely amounts to firms not competing as aggressively as they might – "soft competition" - hardly a crime!
- ❖ This may not be a contravention of articles 81 or 82? Discuss...
- ❖ Virtually the sole point of intervention for CA is under coordinated effects in merger control

27

## Can we say anything empirically about when it occurs?

Academic economists think so:

- ❖ Econometrically:
  - ❖ Observe price reactions between firms to each other
  - ❖ Compare actual market outcomes on price with non-cooperative counterfactuals (based on 'knowledge' of structural parameters)
  - ❖ Indirect comparisons of market structures:
- ❖ Experimental research

But would this stand up outside academic journals?

28

- ❖ The one context in which CA can intervene on tacit collusion – to prevent it from emerging
- ❖ It follows that for mergers which are prohibited/ remedied on grounds of potential coordinated effects, the likelihood of tacit collusion is increased significantly
- ❖ This set of mergers provides a rich source of evidence for economists interested in the conditions under which tacit collusion might occur?
- ❖ Or does it? Depends on our view on the judgments of CAs
- ❖ But even if they're wrong, still provides insights into their 'model of tacit collusion'

29

- ❖ We identify all EU mergers (1991 to date) in which the EC contemplated the possibility of coordinated effects (hereafter collective dominance, CD)
- ❖ Attempt to explain econometrically whether, in the event, they intervened to prohibit or remedy on the grounds of CD
- ❖ We are especially interested in the roles of firm numbers and the symmetry of market shares, as well as identifying the sorts of markets in which transparency, buyer power etc play an important role
- ❖ Obviously a major danger of circularity: we may merely observe some underlying model used by EC which reflects their understanding of the sort of economic theory described earlier by Morten

30

- ❖ Total of just over 3000 potential mergers notified to EC
- ❖ Collective Dominance discussed (substantively) in only 63 (2%)
- ❖ Remember most EC mergers are multimarket : typically impacting on different geographical and product markets. These 63 mergers cover 373 different markets
- ❖ Of these, EC required remedies/prohibited on the grounds of CD in only:
  - 19 mergers
  - 44 markets
- ❖ Interestingly, even in this subsample, EC twice as likely to intervene on grounds of single dominance (80 markets)

31

- ❖ Firm numbers: rarely judged CD if  $N > 2$  (only 8 of 44). In these exceptions  $N = 3$  or 4
- ❖ Firm size asymmetries: rarely judged CD with major asymmetries between 1st and 2nd players post-merger
  - if  $S_1 > 1.4S_2$  (only 9 of the 44)
  - if  $S_1 > 2S_2$  (only 3 of the 44)
- ❖ Neither of these are sufficient conditions: even where  $N=2$  and  $S_1 < 2S_2$ , CD is usually not found

32



### Result 3: Types of market most conducive to CD

Industrial distribution of cases (%)

|                        | CD remedies | all mergers | cartels |
|------------------------|-------------|-------------|---------|
| Chemicals              | 32          | 11          | 30      |
| Metals, metal products | 16          | 6           | 23      |
| Petroleum              | 16          | 2           | 0       |
| Food, drink & tobacco  | 11          | 6           | 10      |
| Utilities              | 11          | 7           | 0       |
| Transport & Comm1      | 11          | 9           | 11      |
| All others             | 37          | 90          | 26      |

*cols don't sum to 100 because some mergers straddle different sectors with thanks to Andreas Stephan for providing the raw data on EC cartels*



33

### Plan of session

Collusion as seen by economists

Cartels and concerted practices

Tacit collusion

Open Questions

34

### Open questions

Does one model really fit all?

If there is a spectrum,

- ❖ Can we populate it empirically?
- ❖ What determines where firms choose to locate within it?
- ❖ How does consumer harm fit on the spectrum?
- ❖ How substitutable are the alternatives?
- ❖ Where does leniency fit on the spectrum?
- ❖ Where does single dominance fit in?

Object vs effect

35

### Does one model really fit all?

But there are some fault lines.

For example:

- ❖ **Punishment strategies:** in cartels, these are explicitly agreed, but in tacit collusion, really a metaphor for the sort of behaviour firms will choose if they believe they are competing with aggressive rivals. Certainly not explicitly agreed. Should punishment should be modelled differently:
  - ❖ Cartels tough & calculated: Nash reversion? Optimal punishment?
  - ❖ Tacit collusion: soft: price matching (Lu & Wright)

36

## Does one model really fit all?

- ❖ **Firm numbers & asymmetries:** Are cartels more or less robust than tacit collusion to large N and greater asymmetries?
- ❖ **The insider-outsider distinction.** Consider a case of tacit collusion where not all firms participate. A smaller firm can
  - ❖ Increase its price and restrain output [act as part of the collusive group]
  - ❖ Increase its price and increase output [act as a free-riding outsider]
  - ❖ What determines which strategy the small firm can follow without undermining the collusive outcome?

37

## If there is a spectrum...

- (i) Can we populate it empirically?
- ❖ Type of industry: similar ranking of industry sectors for both cartels and coordinated effects (see earlier: Chemicals & Metals)
  - ❖ Firm numbers:
    - ❖ coordinated effects – typically just 2
    - ❖ cartels: in sample of 61 EC cases,
      - ❖ mean N = 8, and 13 cases had N>10
  - ❖ Asymmetries.....?



38

## If there is a spectrum...

### (ii) What determines which form firms choose?

- ❖ Again, does it depend on the punishment strategy?
  - ❖ Hard core = tough
  - ❖ Tacit collusion = soft (merely match price cuts, Lu & Wright), and further below full monopoly price

Trade off between fines and higher collusive profit?

39

## If there is a spectrum...

### (iii) How does consumer harm map on to it?

- ❖ Do Hard core cartels harm consumers more than tacit collusion?
- ❖ No firm evidence, but
  - ❖ Typically, the more homogeneous are goods, the bigger the difference between the competitive and the monopoly price level.
  - ❖ Typically, tacit collusion is easier the more homogeneous are goods.

40

## If there is a spectrum...

(iv) How substitutable are the alternatives?

- ❖ Analogy to vertical restraints? If RPM is prohibited, choose an alternative restraint
- ❖ If the risks of getting caught running a cartel are too high, will tacit collusion serve as a safer 2<sup>nd</sup> best? (Remember the RTP legislation – information sharing replaced by merger wave)

41

## If there is a spectrum...

(v) What happens next?

- ❖ Suppose a cartel is broken, what sort of behaviour emerges? Tacit collusion? (perhaps mergers with coordinated effects)
- ❖ If a CD merger is blocked, will firms be tempted to cartelise or introduce concerted practices? (Reverse of UK RTP experience)

42

## If there is a spectrum...

(vi) Where does leniency programmes fit in

- ❖ At one extreme of the spectrum - agreements
- Appears powerful in that part of the spectrum, but
- ❖ What makes for a powerful leniency programme?
    - ❖ The type and level of penalties?
    - ❖ The procedures?

Ongoing CCP research on this

43

## Single Dominance part of the spectrum?

We have found that, even within a given merger, the EC will often find CD in one market, but SD in another

- ❖ Is there a hierarchy? SD the easier case to argue?
- ❖ Is tacit collusion a 2<sup>nd</sup> best for dominant firms?
- ❖ Should the CA have a rigid preference ordering? Is CD always to be avoided? Even if the alternative is SD?
  - ❖ See Compte et al's critique of Nestle-Perrier

44

### Why punish unsuccessful attempts

- ❖ Past legal history of dealing with conspiracies
- ❖ Should we move to an effects base approach?
- ❖ Does investigating and punishing unsuccessful attempts waste resources?
  - ❖ Only waste public resources - no antitrust injury, so no private cases

## Collusion

Steve Davies  
and  
Morten Hviid

ESRC Centre for Competition Policy  
University of East Anglia