

# Cartels

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## Outline

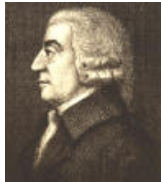
- cartels are bad and common
- why cartels form
- firms cheat on cartels
- conditions for successful cartels
- antitrust laws
- lysine cartel movie

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## Cartels: bad and ubiquitous

“People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public, or some contrivance to raise prices.”

— Adam Smith



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## Why cartels form

- firms form a cartel so that they can raise profits
- they earn greater profit by coordinating their activities rather than acting independently

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## Why cartels can raise profits

- if a firm is maximizing its profit, why should joining a cartel increase its profit?
  - a firm is already choosing output (or price) to maximize its profit
  - however, it ignores effect that changing its output level has on other firms' profits
- cartel takes into account how changes in one firm's output affect cartel profits

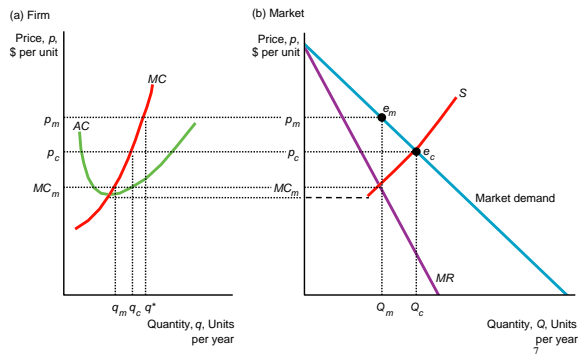
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## Firms “cheat”

luckily for consumers, cartels often fail because each firm in a cartel has an incentive to cheat on the cartel agreement by producing extra output (or lowering its price)

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## Competition Versus Cartel



Source: Jeffrey M. Perloff, *Microeconomics*, 3rd Ed., 2004, p. 435

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## Conditions for cartel success

- low organizational costs
  - few firms (or a few large ones)
  - national association
- many small buyers
- cartel controls market
- cartel can be maintained
  - cheating can be detected and prevented
  - low expectation of severe government punishment

## Entry and cartel success

- barriers to entry help cartel: limit competition
- cartels with large number of firms rare (except professional associations)
- Dept. of Justice price-fixing cases 1963-1972
  - 48% involved 6 or fewer firms
  - average number of firms: 7.25
  - only 6.5% involved 50 or more conspirators
- cartels often fall apart after entry (mercury)

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## Use industry organizations

- to detect cheating
- to give pretext for meetings

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## Detect cheating

- few firms
- homogeneous good
- large infrequent purchases
- divide market
  - by customers (vitamins)
  - by region (mercury cartel, 1928-1972, allocated U.S. to Spain and Europe to Italy)

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## Enforcement

- check each other's costs
  - inspect each other's books
  - most-favored nation clauses
- governments report bids on government contracts
- offer "low price" guarantees

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## Avoid legal problems

- tacit collusion (possibly not illegal)
- international cartels (OPEC) and cartels within certain countries operate legally
- illegal cartel avoids detection or government punishments are small

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## Cartels over time

- according to game theory collusion is difficult in a single period game
- easier in a multi-period game

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## Duopoly

- consider single-period, duopoly, quantity-setting game
- *duopoly*: an oligopoly with two ("duo") firms

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## Prisoners' dilemma: Airlines example

- American Airlines and United Airlines
- compete for customers on flights between Chicago and Los Angeles

example from Perloff (2006) based on Brander and Zhang (1990)



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Table 13.2 Profit Matrix for a Quantity-Setting Game

		American Airlines	
		$q_A = 64$	$q_A = 48$
United Airlines	$q_U = 64$	\$4.1 / \$4.1	\$5.1 / \$3.8
	$q_U = 48$	\$3.8 / \$5.1	\$4.6 / \$4.6

Note: Quantities are in thousands of passengers per quarter; profits are in millions of dollars per quarter.

Source: Jeffrey M. Perloff, *Microeconomics*, 3rd Ed., 2004, p. 427

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## Dominant strategy

- a strategy that strictly dominates all other strategies regardless of which actions rivals' chose
- in this game, each firm has a dominant strategy
- firm chooses its dominant strategy
- where a firm has a dominant strategy, its belief about its rival's behavior is irrelevant

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## Prisoners' dilemma outcome

- both players have a dominant strategy: leads to a profit that is less than what they could achieve if they cooperated and played alternative strategies
  - In Nash equilibrium ( $q_A = q_U = 64$ ), each firm earns \$4.1 million
  - In "cartel" equilibrium ( $q_A = q_U = 48$ ), each firm would earn \$4.6 million
- thus, sum of firms' profits is not maximized in this simultaneous choice, one-period game

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## Why don't firms cooperate?

firms don't cooperate due to a lack of trust:

- each firm can profitably use low-output strategy only if it trusts other firm!
- each firm has a substantial profit incentive to cheat on a collusive agreement

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## Repeated Games

- in a *supergame*, firms' strategies may depend on rivals' actions in previous periods
  - signal
  - threaten to punish
- credibility essential
- unknown ending of game

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## Threat

- suppose American announces to United that it will use two-part strategy:
  - American produces smaller quantity each period as long as United does the same
  - if United produces larger quantity in period  $t$ , then American will produce larger quantity in period  $t+1$  and all subsequent periods
- thus, if firms play same game indefinitely, they should find it easier to collude

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## Known number of periods

- suppose firms know that they are going to play game for  $T$  periods
  - period  $T$  is like a single-period game, and all firms cheat
  - hence  $T-1$  period is last interesting period
  - by same reasoning, they cheat in that period, etc.
- thus, cheating is less likely to occur if there is no end period or it is unknown

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## Reason for U.S. antitrust laws

in late nineteenth century, cartels (trusts) were legal and common in the United States

- oil
- railroads
- sugar
- tobacco
- steel



J.D. Rockefeller

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## U.S. laws against cartels

- in response to trusts' high prices, Congress passed
  - Sherman Antitrust Act in 1890
  - Federal Trade Commission Act of 1914
- these laws prohibit firms from explicitly agreeing to take actions that reduce competition, such as jointly setting price
- these anti-cartel laws are called
  - *antitrust* laws in U.S.
  - *competition policies* in most other countries

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## Effectiveness of Antitrust Laws

- at first U.S. laws had no bite because the language was vague and full of loopholes
- mocked as “the Swiss Cheese Act”

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## Supreme Court

- In 1902, Teddy Roosevelt had DOJ sue Northern Securities Company (railroad — part of J.P. Morgan empire) under the Sherman Act
- 1906 sued to dissolve Rockefeller's Standard Oil
- 1911: Supreme Court breaks up oil trust — Sherman Act gains teeth

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## Antitrust laws require agreement

- 1981-82, American Airlines (AA) and Braniff Airlines (BA) have fare war
- Feb 21, 1982: Robert Crandall (RC), president and CEO of AA calls Howard Putnam (HP), president and chief executive of BA
- HP taped the call (RC didn't know)

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## Phone call

- RC: I think it's dumb as hell for Christ's sake, all right, to sit here and pound the @#%#@!\$ out of each other and neither one of us making a #@\$#!@ dime.
- HP: Well...
- RC: I mean, you know, @\$#@, what the hell is the point of it?
- HP: But if you're going to overlay every route of American's on top of every route that Braniff has—I just can't sit here and allow you to bury us without giving our best effort.
- RC: Oh sure, but Eastern and Delta do the same thing in Atlanta and have for years.

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## Phone call (cont.)

- HP: Do you have a suggestion for me?
- RC: Yes, I have a suggestion for you. Raise your @\$@~!\$ fares 20 percent. I'll raise mine the next morning.
- HP: Robert, we...
- RC: You'll make more money and I will too.
- HP: We can't talk about pricing!
- RC: Oh !#!@\*!, Howard. We can talk about any @#!\$! thing we want to talk about.

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## Aftermath

- HP rejects RC's proposal
- after learning about the call, DOJ files suit accusing Crandall of violating antitrust laws by proposing to fix prices
- but, *proposing* to fix prices doesn't violate Section 1 of the Sherman Act—*proposing and agreeing* does
- because HP rejected RC's proposal, couldn't nail RC for price fixing
- court later ruled: proposing to fix price could be an attempt to monopolize part of the airline industry and, if so may violate Section 2 of the Sherman act
- AA promised never to be bad again

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## Europe vs. the U.S.

- until recently Europe had weaker competition laws than the U.S.
- over the last dozen years, the European Commission has been pursuing competition cases under laws that are similar to U.S. antitrust laws
- recently EC, DOJ, and FTC have become increasingly aggressive, prosecuting many more cases
- following U.S., which uses both civil and criminal penalties, British government introduced legislation in 2002 to criminalize certain cartel-related conduct
- EU uses only civil penalties, but its fines have increased dramatically, as have U.S. fines

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## Corporate Leniency Program

- in 1993, DOJ introduced new Corporate Leniency Program: participant in a cartels that blows the whistle receives immunity from federal prosecution
- consequently, DOJ has caught, prosecuted, and fined several gigantic cartels (e.g. vitamins)
- on Valentine's Day, 2002, EC adopted a similar policy

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## Lysine cartel

- 1996: Archer Daniels Midland (ADM) pleaded guilty to price fixing
- ADM admitted to price fixing in lysine (used in livestock feed) and citric acid (used in soft drinks and detergents)

*sources:* DOJ movie, Eichenwald (2000), Lieber (2000), Connor (2001, 2003)

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## Lysine market

- share of global production of 4 largest manufacturers of lysine in early 1990s
  - > 97% in U.S.
  - > 95% world
- CR4 of buyers < 30%
- large infrequent purchases
- cost of a new plant \$150+ million (over 3 years to build)
- perfectly homogeneous product

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## Lysine agreement

- felt they needed everyone's agreement
- used industry organization to meet and collect data
- shared cost data
- had a punishment scheme in place

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## Fines

- until recently, large fines for cartels were not observed
- lysine firms got an ugly surprise

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## Lysine fines

- 5 corporate fines
  - U.S. corporate fines: \$92.5 million
  - EU: \$97.9 million
  - Canada: \$11.5 million
- lysine cartel U.S. fine was 7x previous highest fine
- 7 personal fines
- in 1999, 3 people got prison sentences of 99 months total (indiv. max 36 months)

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## Individual fines

Michael D. Andreas (U.S.), Vice Chairman, ADM, \$350,000 fine, 36 months of jail  
Terrance Wilson (U.S.), Pres., Corn Products Div., ADM, \$350,000, 33 months  
Mark Whitacre (U.S.), Pres., Bioproducts Div., ADM, \$350,000, 30 months  
Kanji Mimoto (J), Div. Mgr., Ajinomoto, \$75,000  
Hirozaku Ikeda (J), Div. Mgr., Ajinomoto \$0  
Kazutoshi Yamada (J), Mng. Dir., Ajinomoto, Fugitive  
Masaru Yamamoto (J), Div. Mgr., Kyowa, \$50,000  
Jhom Su Kim (SK), Pres., Sewon America, \$75,000

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## Lysine buyers

- individual U.S. buyers received compensation  $\approx$  their losses — that is, they did not get treble damages
- total U.S. corporate settlements: about \$85 million

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