Auction Empirics, Collusion and Bidding Rings, Part III
Antitrust and a general perspective on the economics of cartels

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1 Preliminaries: Antitrust and a general perspective on the economics of cartels

This handout is intended to give you a map of US antitrust law, which is similar to much of the EU law, and is worth knowing a bit about since it is often referred to in the economics literature on cartels. Also, since it has been around for a lot longer, the case law (especially the early case law when the Americans were fumbling around with how to think about anticompetitive conduct) is interesting for coming up with research ideas.

We've already had an introduction to a bidding cartel. This section has a the following objectives:

1. Introduce US competition law (and by association, the EU law)
2. Give a framework for thinking about cartel research generally
3. Give a few other examples of cartels that have operated in auctions

2 Introduction

The Antitrust law is comprised of a range of statutes, including, but not limited to, the Sherman Act, the Clayton Act, the FTC Act, the Hart-Scott-Rodino Act, the National Cooperative Research and Production Act, Antitrust Criminal Penalty Enhancement and Reform Act and the Robinson Patnam Act. The centerpiece of the law, however, is sections 1 and 2 of the Sherman Act. The entire original version of the Act is reproduced below:

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Transcript of Sherman Anti-Trust Act (1890)

Fifty-first Congress of the United States of America, At the First Session,

Begun and held at the City of Washington on Monday, the second day of December, one thousand eight hundred and eighty-nine.

An act to protect trade and commerce against unlawful restraints and monopolies.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Sec. 1. Every contract, combination in the form of trust or other- wise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is hereby declared to be illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, at the discretion of the court.

Sec. 2. Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a misdemeanor, and, on conviction thereof; shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 3. Every contract, combination in form of trust or otherwise, or conspiracy, in restraint of trade or commerce in any Territory of the United States or of the District of Columbia, or in restraint of trade or commerce between any such Territory and another, or between any such Territory or Territories and any State or States or the District of Columbia, or with foreign nations, or between the District of Columbia and any State or States or foreign nations, is hereby declared illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Sec. 4. The several circuit courts of the United States are hereby invested with jurisdiction to prevent and restrain violations of this act; and it shall be the duty of the several district attorneys of the United States, in their respective districts, under the direction of the Attorney-General, to institute proceedings in equity to prevent and restrain such violations. Such proceedings may be by way of petition setting forth the case and praying that such violation shall be enjoined or otherwise prohibited. When the parties complained of shall have been duly notified of such petition the court shall proceed, as soon as may be, to the hearing and determination of the case; and pending such petition and before final decree, the court may at any time make such temporary restraining order or prohibition as shall be deemed just in the premises.

Sec. 5. Whenever it shall appear to the court before which any proceeding under section four of this act may be pending, that the ends of justice require that other parties should be brought before the court, the court may cause them to be summoned, whether they reside in the district in which the court is held or not; and subpoenas to that end may be served in any district by the marshal thereof.

Sec. 6. Any property owned under any contract or by any combination, or pursuant to any conspiracy (and being the subject thereof) mentioned in section one of this act, and being in the course of transportation from one State to another, or to a foreign country, shall be- forfeited to the United States, and may be seized and condemned by like proceedings as those provided by law for the forfeiture, seizure, and condemnation of property imported into the United States contrary to law.

Sec. 7. Any person who shall be injured in his business or property by any other person or corporation by reason of anything forbidden or declared to be unlawful by this act, may sue therefor in any circuit court of the United States in the district in which the defendant resides or is found, without. respect to the amount in controversy, and shall recover three fold the damages by him sustained, and the costs of suit, including a reasonable attorney's fee.

Sec. 8. That the word "person," or " persons," wherever used in this act shall be deemed to include corporations and associations existing under or authorized by the laws of either the United States, the laws of any of the Territories, the laws of any State, or the laws of any foreign country.

Approved, July 2, 1890.

Needless to say, there have been a few amendments to this statutes over time, the current versions of sections 1 and 2 are:

§1 Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal. Every person who shall make any contract or engage in any combination or conspiracy hereby declared to be illegal shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding $100,000,000 if a corporation, or, if any other person, $1,000,000, or by imprisonment not exceeding 10 years, or by both said punishments, in the discretion of the court.

§2 Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations, shall be deemed guilty of a felony, and, on conviction thereof, shall be punished by fine not exceeding $100,000,000 if a corporation, or, if any other person, $1,000,000, or by imprisonment not exceeding 10 years, or by both said punishments, in the discretion of the court.

[see http://uscode.house.gov/download/pls/15C1.txt]

Notice how broad the wording in these sections are. Unsurprisingly, judicial interpretation of these statutes is extensive and sufficiently important that Antritrust Law is often referred to as "Statutory Common Law". That is, the law is developed in the case law. The courts are central to the formulation of the Antitrust Laws.

3 Why Antitrust?

The purpose of antitrust laws is to control how firms attain and maintain their market position; presumably for the betterment of consumers, or at least for the benefit of society.

It is tempting to think of this as a weighted average of consumer surplus and total efficiency. However, the law is more subtle and tends to cast things in a more dynamic framework. For instance:

For instance:

> **VERIZON COMMUNICATIONS INC., PETITIONER v. LAW OFFICES OF CURTIS V. TRINKO, LLP (Sup. Ct 2004)**
>
> "The mere possession of monopoly power, and the concomitant charging of monopoly prices, is not only not unlawful; it is an important element of the free-market system. The opportunity to charge monopoly prices at least for a short period is what attracts business acumen in the first place; it induces risk taking that produces innovation and economic growth. To safeguard the incentive to innovate, the possession of monopoly power will not be found unlawful unless it is accompanied by an element of anticompetitive conduct.
>
> Firms may acquire monopoly power by establishing an infrastructure that renders them uniquely suited to serve their customers. Compelling such firms to share the source of their advantage is in some tension with the underlying purpose of antitrust law, since it may lessen the incentive for the monopolist, the rival, or both to invest in those economically beneficial facilities. Enforced sharing also requires antitrust courts to act as central planners, identifying the proper price, quantity, and other terms of dealing a role for which they are ill-suited. Moreover, compelling negotiation between competitors may facilitate the supreme evil of antitrust: collusion."
>
> ...
>
> Antitrust analysis must always be attuned to the particular structure and circumstances of the industry at issue.
>
> ...
>
> Against the slight benefits of antitrust intervention here, we must weigh a realistic assessment of its costs. Under the best of circumstances, applying the requirements of §2 can be difficult because the means of illicit exclusion, like the means of legitimate competition, are myriad. *United States v. Microsoft Corp., 253 F. 3d 34, 58 (CADC 2001) (en banc) (per curiam).* Mistaken inferences and the resulting false condemnations are especially costly, because they chill the very conduct the antitrust laws are designed to protect. *Matsushita Elec. Industrial Co. v. Zenith Radio Corp., 475 U. S. 574, 594 (1986).* The cost of false positives counsels against an undue expansion of §2 liability. "

That said, much of the mechanics of the economic analysis (as currently practiced) continues to be static, with dynamic considerations being added subsequently (and usually informally).

A justification for Antitrust, of which I am fond (in part because of the Chicago School association) is in Robert Bork's fascinating and provocative book, *The Antitrust Paradox*, at p.311[This is a book that should be read critically, at times the economics is wrong, but always for subtle and interesting reasons].

> "Antitrust is valuable because in some cases it can achieve results more rapidly than can market forces. We need not suffer loses while waiting for the market to erode cartels and monopolistic mergers."

For more on this see Posner's overview of Antitrust in his book (see references)

4 What is the scope of regulation?

Before going into specific topics, here is a (incomplete) washing list of the conduct that antitrust has something to say about:

- Monopolization:
  - Predatory conduct
  - Refusal to deal
  - Other exclusionary conduct
- Anticompetitive (horizontal) Agreements:
  - Price fixing
  - Bid rigging
  - Market division schemes and other forms of "non-price" collusion
  - Group boycotts
  - Coordinated refusal to deal
  - Joint ventures
  - Information sharing among competitors
- Anticompetitive Vertical Restraints:
  - Resale Price Maintenance
  - Exclusive Dealing /Exclusive Distributorships
  - Exclusive sales terriories
  - Tying / Full Line Forcing
  - Various quantity limit provisions etc
- Mergers and Aquisitions:
  - Horizontal
  - Vertical
  - Conglomorate

  - Large asset aquisitions e.g. Nortel Patent Portfolio

- Price Discrimination
  - Robinson Patnam Act largely about protecting small business in B2B transactions
- Unfair/Deceptive Methods of Competition (§5 of FTC Act)
- Exemptions
  - Various industries have some sort of exemption from the Antitrust Laws, these include:
  - Agriculture (narrowly construed)
  - Interstate Transport (primarily, the Federal Maritime Commission can approve agreements which are them exempt)
  - Export Trade Associations (you can collude overseas subject to Commerce department saying OK, of course you may have some issues with the overseas jurisdiction...)
  - Bank Mergers (exempt from private enforcement)
  - Insurance (covered by state law not federal)
  - Stock Exchanges (if covered by SEC some ambiguity as to whether limited price fixing OK)
  - Labor Unions
  - Professional Baseball
  - Lobbying Activity
  - Some folks think there is slightly odd applications to "learned" professions...

5 How does enforcement work?

Government enforcement is shared between the DoJ and the FTC. The DoJ is part of the executive, and as such handles all criminal matters (such as price fixing). The FTC enforces the FTC Act (among other things) and tends to have a primary role in consumer protection. Beyond that the jurisdictions are shared. This leads to a cooperative posture to handling matters, with the matters being allocated to the agency that has the greatest expertise in the industry at issue (in the case of mergers) or the legal issue at hand or just the spare resources to handle it...

Both the DoJ and the FTC have large economics groups staffed by PhD economists. Presenting research in front of this audience is aways fun and thought provoking. Both agencies also have large

groups of lawyers. The dynamic seems tobe that the economists provide analysis that feeds into the ultimate enforcement decisions, which seems made mostly by the lawyers (who have to bring the cases). The process in the FTC and the DoJ differs slightly due to the fact that the FTC, by virtue of being a statutory authority has an administrative law function. One aspect of this is that the commissioners take a quasi-judicial role: they make judgements which have legal standing that can get appealed to the US Court of Appeals. The DoJ does not have this feature.

Private enforcement is also an important part of Antitrust enforcement. That is, individuals can bring actions against those that have caused them to suffer an Antitrust harm. This allows for the recovery of damages and the creation of Class Actions. Hence, the private plaintiffs bar is, at times, quite entrepreneurial in bringing (lucrative) actions.

6 Section 2 cases: Monopolization

I'll be brief on this area, although there is interesting work to be done here. The basic statement of principle is:

> If that allegation states an antitrust claim at all, it does so under §2 of the Sherman Act, 15 U. S. C. §2, which declares that a firm shall not monopolize or attempt to monopolize. ... It is settled law that this offense requires, in addition to the possession of monopoly power in the relevant market, the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident. *United States v. Grinnell Corp., 384 U. S. 563, 570571 (1966).*

To construct a case, the complainant needs to establish: 1) definition of a relevant market; 2) existence of market power; 3) some kind of anti-competitive conduct other than the exercise of what might be considered normal business acumen, industry, foresight etc. (see Trinko, above)

What is interesting, and I think fairly open, is the refusal to deal in the context of network industries and emerging technologies. Two cases are illustrative:

> **OTTER TAIL POWER CO. v. UNITED STATES, 410 U.S. 366 (1973)**
>
> In this civil antitrust suit brought by appellee against Otter Tail Power Co. (Otter Tail), an electric utility company, the District Court found that Otter Tail had attempted to monopolize and had monopolized the retail distribution of electric power in its service area in violation of §2 of the Sherman Act, 26 Stat. 209, as amended, 15 U.S.C. §2. The District Court found that Otter Tail had attempted to prevent communities in which its retail distribution franchise had expired from replacing it with a municipal distribution system. The principal means employed were (1) refusals to sell power at wholesale to proposed municipal systems in the communities where it had been retailing power; (2) refusals to "wheel" power to such systems, that is to say, to transfer by direct transmission or displacement electric power from one utility to another over the facilities of an intermediate utility; (3) the institution and

> support of litigation designed to prevent or delay establishment of those systems; and (4) the invocation of provisions in its transmission contracts with several other power suppliers for the purpose of denying the municipal systems access to other suppliers by means of Otter Tail's transmission systems.

The court found that the conduct was a breach of §2, Trinko, which covers somewhat similar territory, found that refusal to deal was within a ATT's independent discretion (although such a right was not unqualified - See *Aspen Ski* for an example). For related issues in a new technology setting see *Berkey Photo, Inc. v. Eastman Kodak*

The issues raised here encompass what is often referred to as the "essential services doctrine". The courts have been confused (in my view) about how to handle these types of cases, and empirical work, that carefully untagles these issues would be welcome. In addition to being instructive as to how the matter should be weighed in practice.

7 Section 1 cases: Anticompetitive Agreements

This is where our primary focus lies. Recall that section 1 reads:

> Sec. 1. Every contract, combination in the form of trust or other- wise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is hereby declared to be illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding five thousand dollars, or by imprisonment not exceeding one year, or by both said punishments, at the discretion of the court.

Basically you need i) capacity to agree, ii) an agreement, iii) a restraint of trade, and iv) unreasonableness. Note that without unreasonableness, pretty much every commercial contract would have trouble.

There is an expansive set of American law that unpacks all of this stuff. The main point is that harm to competition is the basic key to unreasonableness. Further, a lot more than collusion is covered by this section. However, collusion is often treated as a per se offense, which means that very very fact of it is enough to gets past the unreasonableness standard.

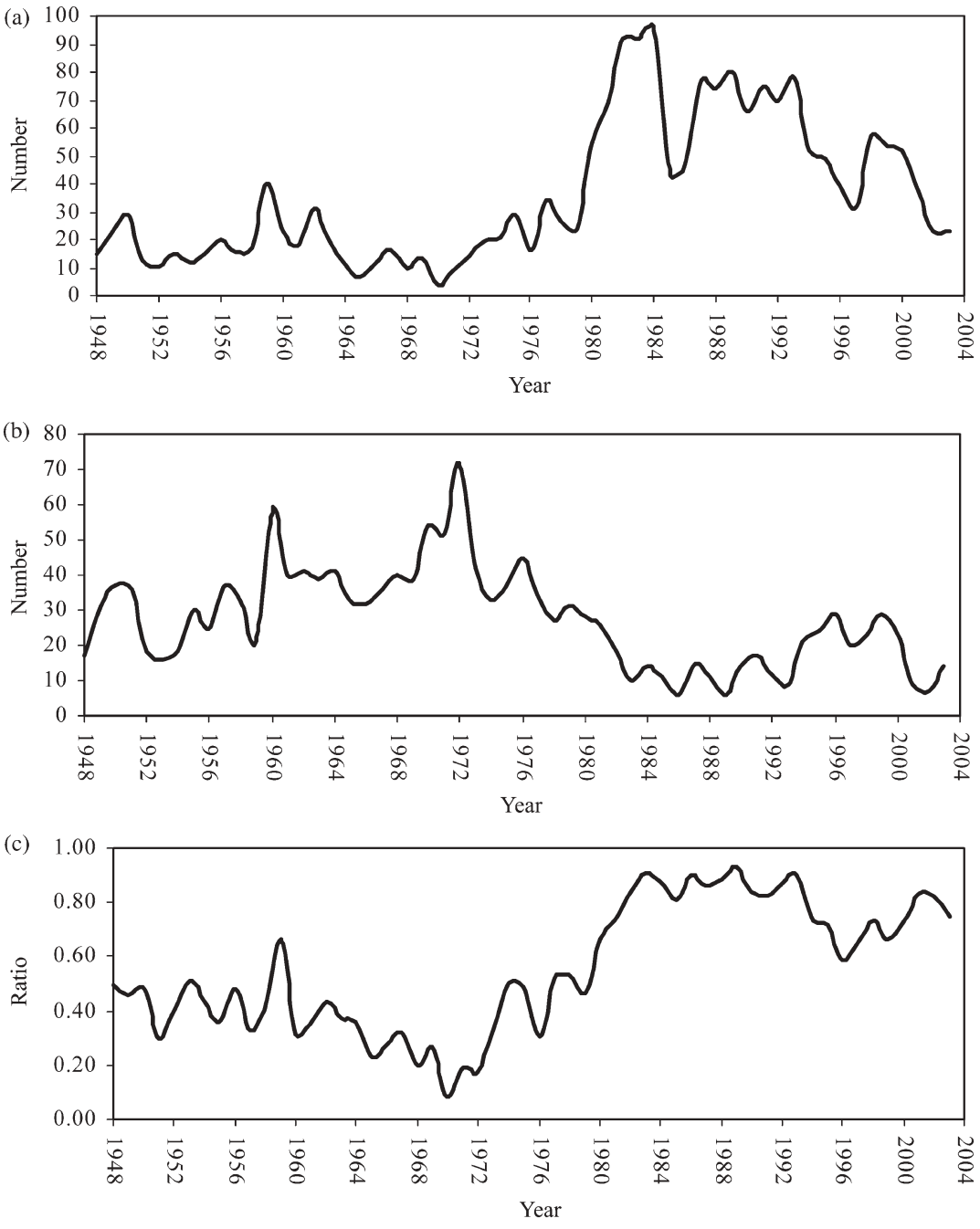


Figure 1. Total (a) criminal and (b) antitrust cases filed, 1948–2003. (c) Ratio of criminal to total cases.

lower but more individuals and corporations were charged per prosecution; that is, per capita fines were lower. During the later years, the number of individuals and corporations charged per prosecution were lower, but fines were much higher. This indicates that the criminal enforcement strategy shifted to one of sending a clear deterrence signal through higher monetary fines.

Figure 2. Grand jury investigations initiated, 1969–2003.

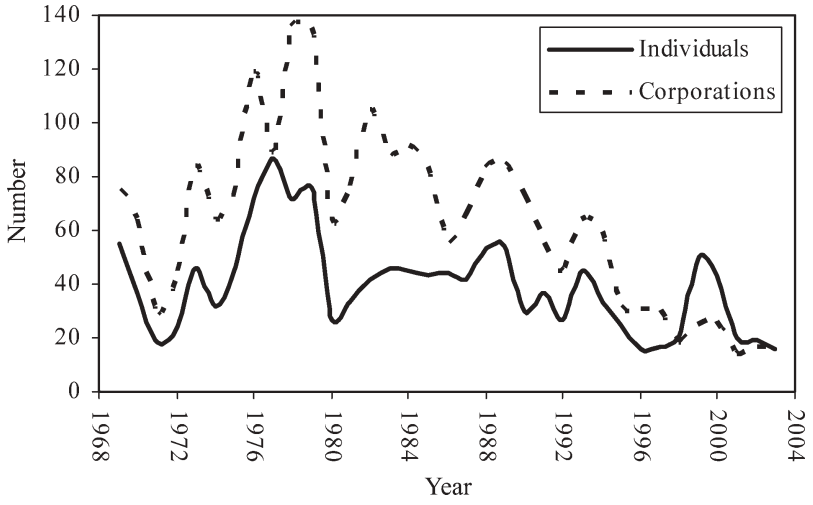


Figure 3. Corporations and individuals convicted, 1969–2003.

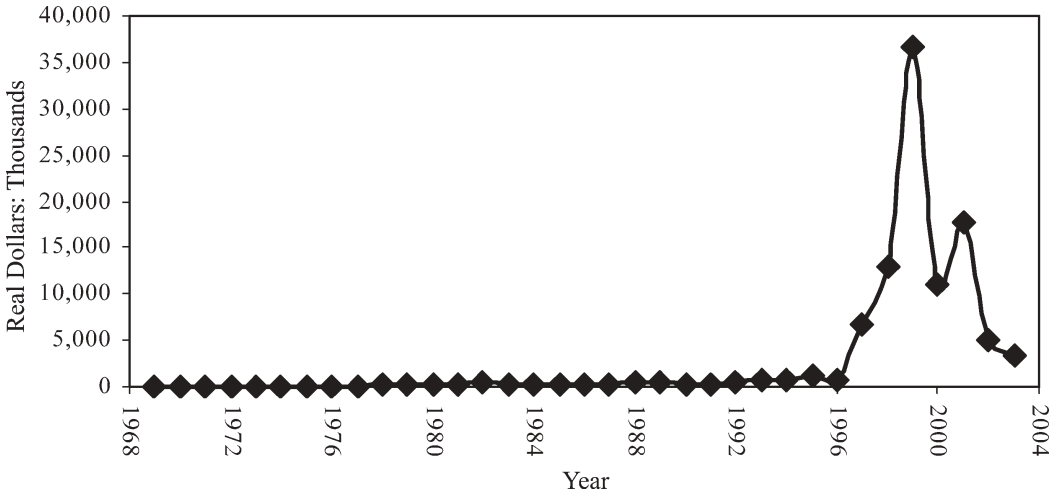


Figure 4. Fine per corporation, 1969–2003.

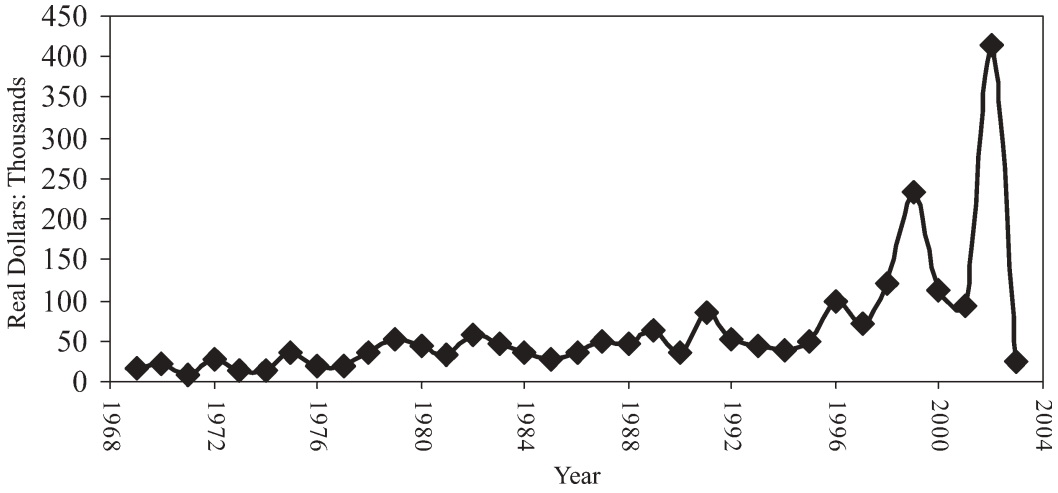


Figure 5. Fine per individual, 1969–2003.

IV. EMPIRICAL FRAMEWORK

Given our discussion in Section II regarding the process of criminal investigations, and the information sources that lead to criminal investigations and timeline, it appears very difficult to determine which variables might be jointly determined (endogenous) or predetermined (exogenous). For example, prosecution of an individual or firm may reveal new information leading to follow-on prosecutions. Similarly, a grand jury investigation may lead to prosecution of firms and individuals for the violation under scrutiny, but also generate new criminal cases. Finally, information gleaned during a civil investigation—merger or monopolization case—may lead to the discovery of information about criminal violations with subsequent investigation and prosecution. This implies that variables related to the total number of criminal cases filed in court, the number of grand jury investigations, the number of firms and individuals prosecuted, among others, are best treated as being jointly determined (or endogenous).

Our primary objective is to examine the dynamic interrelationships between the different components of the criminal investigative process, such as the total number of criminal cases filed in court by the Antitrust Division, the number of grand jury investigations, the number of firms and individuals prosecuted, among others. Our main approach is to use the vector autoregressions (VAR) methodology to study the dynamic interrelationships. The VAR framework has proved useful in studying the historical dynamics of sets of jointly determined variables; Hamilton (1994), Enders (1995), Brooks (2002), and Pagan (1995) present details about this methodology and the pros and cons. In contrast to univariate methods, VARs explicitly allow cross-variable dynamics. In VAR modeling, each system (jointly determined) variable is modeled as a function of its own lagged values,

8 Structuring the economics of collusion

I find the introduction to the following paper from McAfee and Macmillan to be helpful in this regard.

Bidding Rings

By R. PRESTON MCAFEE AND JOHN MCMILLAN*

We characterize coordinated bidding strategies in two cases: a weak cartel, in which the bidders cannot make side-payments; and a strong cartel, in which the cartel members can exclude new entrants and can make transfer payments. The weak cartel can do no better than have its members submit identical bids. The strong cartel in effect reauctions the good among the cartel members. (*JEL* D44, D82, L41)

A successful cartel must overcome at least four obstacles. First, the conspirators must devise some mechanism for dividing the spoils. Each cartel member has an incentive to argue for a bigger share. Second, an agreement is worthless without some way of enforcing it. Since contracts to fix prices cannot usually be written, any collusive agreement must be designed to be self-enforcing. Third, collusion contains the seeds of its own destruction. The high profits earned in a successfully colluding industry attract new firms into the industry; the competition from those new entrants then tends to destroy the collusive arrangements. Fourth, the victims of the cartel, on the other side of the market, may take actions to destabilize it. The first of these problems is empirically at least as important as the other three: for example, in a sample of international cartels that were temporarily successful but then broke down, almost half were destroyed by internal squabbling over how to share the profits (Paul Eckbo, 1976 Ch. 3). Most of the U.S. Department of Justice's bid-rigging convictions begin when one of the cartel members, dissatisfied with his share of the spoils, turns in his coconspirators.

The main subject of this paper is how cartels overcome the division-of-the-spoils difficulties, in the specific context of bidding at auctions.[1] The colluding bidders must overcome an adverse-selection problem: they do not know how much each of their fellow cartel members is willing to pay for the item being sold. We shall derive the optimal mechanism for the cartel to use to decide who receives the item and how the proceeds are distributed. Our model will also have something to say about two of the other cartel problems listed above: entry deterrence and active seller responses. We shall, however, have nothing to add to what has already been said about cartel enforcement (see e.g., George Stigler, 1964; Dilip Abreu et al., 1986).

We examine primarily all-inclusive bidder cartels at sealed-bid first-price auctions,[2] except in Section VI, where we offer a partial analysis for bidder cartels that contain

*Department of Economics, University of Texas, Austin, TX 78712-1173, and Graduate School of International Relations and Pacific Studies, University of California-San Diego, La Jolla, CA 92093-0519, respectively. We thank Louis-André Gérard-Varet, Charles Holt, Ignatius Horstmann, Chantale LaCasse, Robert Marshall, Joel Sobel, and three referees for comments. McAfee's research was begun at the U.S. Department of Justice. McMillan thanks the National Science Foundation for research support under grant no. SES-8721124.

[1] Biddings conspiracies are prevalent enough to have added some exotic locutions to the English language. Cartels are variously called "rings," "pies," and "kippers." A "schlepper" is an insincere bidder attracted solely by the cartel's profits, and a "shill" is a phony bidder used by the auctioneer to drive up the price. A "knockout" is a private auction held by the cartel to determine which member gets the item and how much he pays the other members.

[2] On collusions not involving all bidders and on collusion in English and second-price auctions, see Daniel Graham and Robert Marshall (1987), Thomas von Ungern-Sternberg (1988), and George Malaith and Peter Zemsky (1991).

That is, a successful cartel must overcome at least four obstacles.

- First, the conspirators must devise some mechanism for dividing the spoils. Each cartel member has an incentive to argue for a bigger share.
- Second, an agreement is worthless without some way of enforcing it. Since contracts to fix prices cannot usually be written, any collusive agreement must be designed to be self enforcing.
- Third, collusion contains the seeds of its own destruction. The high profits earned in a successfully colluding industry attract new firms into the industry; the competition from those new entrants tends to destroy the collusive arrangements.
- Fourth, the victims of the cartel, on the other side of the market may take actions to destabilize it.

A large body of theory, mostly in repeated games and mechanism design is directed at understanding points 1,2 and 4. See, for instance: McAfee and McMillian; Graham, Marshall and Richard; Harrington and Skrzypacz. I will come back to point 3 later.

On the empirical side I tend to think of papers as tending to be cover one or more of the following topics

1. How to detect a cartel
2. Assessing damages
3. Testing theory/Descriptive

This means that you tend to be able to put an empirical paper on cartels in a 4x3 square. Sometimes things fall in the gaps, but it's a useful way to place papers in the literature and see open issues. Of the papers we have seen so far, let's try to understand where they lie.

9 Cartel Examples

Before diving into some other areas of the literature, let's have a look at some canonical examples of cartels in auction settings:

9.1 Knockouts

Department of Justice

United States Attorney Benjamin B. Wagner
Eastern District of California

FOR IMMEDIATE RELEASE
FRIDAY, FEBRUARY 24, 2012
WWW.JUSTICE.GOV/USAO/CAE

CONTACT: LAUREN HORWOOD
(916) 554-2706

CALIFORNIA INVESTOR PLEADS GUILTY TO BID RIGGING AND FRAUD AT PUBLIC REAL ESTATE FORECLOSURE AUCTIONS

10th Guilty Plea in the Investigation to Date

SACRAMENTO, Calif. – A real estate investor pleaded guilty today in U.S. District Court in Sacramento to conspiring to rig bids and commit mail fraud at public real estate foreclosure auctions held in San Joaquin County, Calif., Sharis A. Pozen, Acting Assistant Attorney General of the Department of Justice's Antitrust Division, and Benjamin B. Wagner, U.S. Attorney for the Eastern District of California, announced.

Wiley C. Chandler pleaded guilty to conspiring with a group of real estate speculators who agreed to rig bids and commit mail fraud when purchasing selected properties at public real estate foreclosure auctions in San Joaquin County. The goals of the conspiracies were to suppress and restrain competition, to fraudulently obtain selected real estate at noncompetitive prices and to divert money to coconspirators that would have gone to the beneficiaries, the department said in court papers.

According to the court documents, after the conspirators' designated bidder bought a property at a public auction, they would hold a second, private auction, at which each participating conspirator would bid the amount above the public auction price he or she was willing to pay. The conspirator who bid the highest amount at the end of the private auction won the property. The difference between the price at the public auction and that at the second auction was the group's illicit profit. The illicit profit was divided among the conspirators in payoffs. According to Chandler's plea agreement, the conspiracies began at least early as September 2008 and continued until at least October 2009.

To date, 10 individuals, including Chandler, have pleaded guilty in U.S. District Court for the Eastern District of California in connection with the investigation. They are: Anthony B. Ghio; John R. Vanzetti; Theodore B. Hutz; Richard W. Northcutt; Yama Marifat; Gregory L. Jackson; Walter Daniel Olmstead; Robert Rose; and Kenneth A. Swanger.

Chandler was indicted by a federal grand jury in Sacramento on Dec. 7, 2011 with three investors – Andrew B. Katakis, Donald M. Parker and Anthony B. Joachim – and one auctioneer, W. Theodore Longley. Trial dates for these individuals have yet to be set.

"The Antitrust Division will continue to cooperate with its law enforcement partners to bring to justice those who undermine the competitive market for foreclosed properties and harm consumers," said Acting Assistant Attorney General Pozen.

"Public auctions are meant for the public, not for an elite group conspiring together for their own profit," U.S. Attorney Wagner stated. "The prosecution of these defendants is necessary to protect the integrity of the housing market."

Chandler pleaded guilty to bid rigging, a violation of the Sherman Act, which carries a maximum penalty of 10 years in prison and a $1 million fine. The maximum fine may be increased to twice the gain derived from the crime or twice the loss suffered by the victims of the crime if either of those amounts is greater than the statutory maximum fine. Chandler also pleaded guilty to conspiracy to commit mail fraud, which carries a maximum sentence of 30 years in prison and a $1 million fine.

These charges arose from an ongoing federal antitrust investigation of fraud and bidding irregularities in certain real estate auctions in San Joaquin County. The investigation is being conducted by the Antitrust Division's San Francisco Field Office, the U.S. Attorney's Office for the Eastern District of California, the FBI's Sacramento Division and the San Joaquin County District Attorney's Office. Trial attorneys Anna Pletcher and Tai Milder from the Antitrust Division's San Francisco Field Office and Assistant U.S. Attorney Russell L. Carlberg are prosecuting the case.

Today's charges are part of efforts underway by President Barack Obama's Financial Fraud Enforcement Task Force. President Obama established the interagency Financial Fraud Enforcement Task Force to wage an aggressive, coordinated and proactive effort to investigate and prosecute financial crimes. The task force includes representatives from a broad range of federal agencies, regulatory authorities, inspectors general and state and local law enforcement who, working together, bring to bear a powerful array of criminal and civil enforcement resources. The task force is working to improve efforts across the federal executive branch, and with state and local partners, to investigate and prosecute significant financial crimes, ensure just and effective punishment for those who perpetrate financial crimes, combat discrimination in the lending and financial markets, and recover proceeds for victims of financial crimes. One component of the task force is the national Mortgage Fraud Working Group, co-chaired by U.S. Attorney Wagner. For more information on the task force, visit www.StopFraud.gov.

Anyone with information concerning bid rigging or fraud related to real estate foreclosure auctions should contact the Antitrust Division's San Francisco Field Office at 415-436-6660, visit www.justice.gov/atr/contact/newcase.htm, contact the U.S. Attorney's Office for the Eastern District of California at 916-554-2700 or contact the FBI's Sacramento Division at 916-481-9110.

# # #

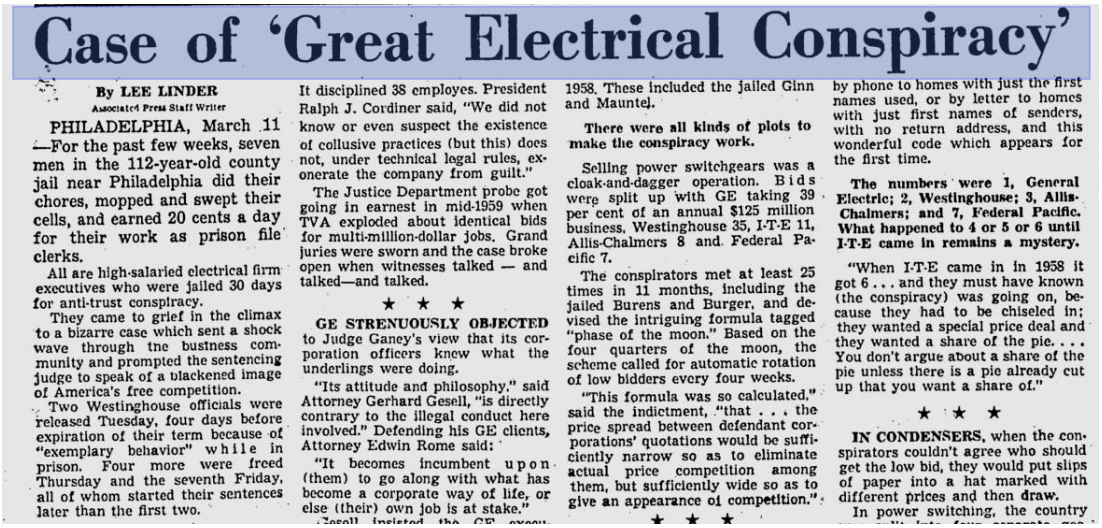
- see also US v Seville (machine tools), US Ronald Pook (antiques) and DC v George Basiliko (real estate)

- Recall, also Asker, *A Study of the Internal Organisation of a Bidding Cartel*, AER v100(3), 724-762, 2010 and also the Ruxley Lodge auction of rare books discussed there-in

9.2 Bid Rotation

Consider the following system, and think about how it relates to the knockout system and the ability of a cartel to make explicit transfers. Why might a cartel not be able to make transfers?

Pittsburgh Post Gazette March 12 1961



Case of 'Great Electrical Conspiracy'

By LEE LINDER
Associated Press Staff Writer

PHILADELPHIA, March 11 —For the past few weeks, seven men in the 112-year-old county jail near Philadelphia did their chores, mopped and swept their cells, and earned 20 cents a day for their work as prison file clerks.

All are high-salaried electrical firm executives who were jailed 30 days for anti-trust conspiracy.

They came to grief in the climax to a bizarre case which sent a shock wave through the business community and prompted the sentencing judge to speak of a blackened image of America's free competition.

Two Westinghouse officials were released Tuesday, four days before expiration of their term because of "exemplary behavior" while in prison. Four more were freed Thursday and the seventh Friday, all of whom started their sentences later than the first two.

It disciplined 38 employes. President Ralph J. Cordiner said, "We did not know or even suspect the existence of collusive practices (but this) does not, under technical legal rules, exonerate the company from guilt."

The Justice Department probe got going in earnest in mid-1959 when TVA exploded about identical bids for multi-million-dollar jobs. Grand juries were sworn and the case broke open when witnesses talked — and talked—and talked.

★ ★ ★

GE STRENUOUSLY OBJECTED to Judge Ganey's view that its corporation officers knew what the underlings were doing.

"Its attitude and philosophy," said Attorney Gerhard Gesell, "is directly contrary to the illegal conduct here involved." Defending his GE clients, Attorney Edwin Rome said:

"It becomes incumbent upon (them) to go along with what has become a corporate way of life, or else (their) own job is at stake."

Gesell insisted the GE execu-

1958. These included the jailed Ginn and Mauntel.

There were all kinds of plots to make the conspiracy work.

Selling power switchgears was a cloak-and-dagger operation. Bids were split up with GE taking 39 per cent of an annual $125 million business, Westinghouse 35, I-T-E 11, Allis-Chalmers 8 and Federal Pacific 7.

The conspirators met at least 25 times in 11 months, including the jailed Burens and Burger, and devised the intriguing formula tagged "phase of the moon." Based on the four quarters of the moon, the scheme called for automatic rotation of low bidders every four weeks.

"This formula was so calculated," said the indictment, "that . . . the price spread between defendant corporations' quotations would be sufficiently narrow so as to eliminate actual price competition among them, but sufficiently wide so as to give an appearance of competition."

★ ★ ★

by phone to homes with just the first names used, or by letter to homes with just first names of senders, with no return address, and this wonderful code which appears for the first time.

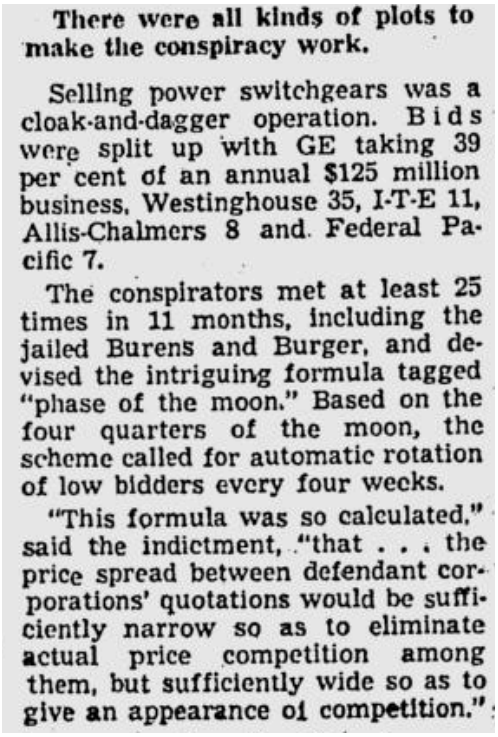
The numbers were 1, General Electric; 2, Westinghouse; 3, Allis-Chalmers; and 7, Federal Pacific. What happened to 4 or 5 or 6 until I-T-E came in remains a mystery.

"When I-T-E came in in 1958 it got 6 . . . and they must have known (the conspiracy) was going on, because they had to be chiseled in; they wanted a special price deal and they wanted a share of the pie. . . . You don't argue about a share of the pie unless there is a pie already cut up that you want a share of."

★ ★ ★

IN CONDENSERS, when the conspirators couldn't agree who should get the low bid, they would put slips of paper into a hat marked with different prices and then **draw.**

In power switching, the country



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9.3 Market Division

US v. Stolt-Nielsen et al, US District Court of Pennsylvania 2007

"In 1998, the Stolt-Nielsen Transportation Group (Stolt-Nielsen), a Luxembourg parcel tanker shipping company, entered into a customer allocation conspiracy with two of its primary competitors, Odfjell Seachem AS (Odfjell), a Norwegian shipping company, and Jo Tankers B.V. (Jo Tankers), a Dutch shipping company. As part of the agreement, Stolt-Nielsen and its co-conspirators would refrain from bidding or competing for customers on deep-sea trade routes allocated to the other party. While Stolt-Nielsens agreement with Odfjell was formalized through the exchange of customer lists, its arrangement with Jo Tankers was ad hoc."

This was a §1 case. it is a form of collusive agreement often referred to as market division. Here is an example of the sort of evidence you see in this sort of case:

A. USG - FAR EAST

SN (BJ)	OT (TMH)
ALBRIGHT & WILSON	BP
AMOCO	DSM
ARCO CHEMICAL	DUPONT
BASF NJ	EASTMAN
CHEVRON CHEMICAL	GREAT LAKES CHEMICALS
D.S. CHEMICAL	MITSUI EDC
DOW CHEMICAL (PO)	MITSUI HMD
DOW CHEMICAL	MOBIL
DOW CORNING	OCCIDENTAL
ETHYL	UCC
EXXON CHEMICAL	VELSICOL (plasticizers)
HARIMA MID INC	MGCC (MX)
ITOCHU TOKYO (Alcohol)	
KANEMATSU - GOSHO (Lube Adds)	
KOHAP CHEMICAL	
LUBRIZOL	
MERICHEM	
MITSUBISHI (Cumene/IPA)	
MITSUI & Co. USA (Alcohol & Molasses)	
ROHM & HAAS	
TEXACO PANAMA	
TOMEN CORP. USA	
UNION PETROCHEM	
UNITY CHEM CORP	
VISTA CHEMICALS	
WITCO	

B. NWE - FAR EAST (via Suez/Cape)

SN (BJ)	OT (TMH)
BASF (MEG & MDI)	ACETEX CHIMIE
BP (50% AA)	BP (50% AA)
DOW (MDI)	BRENNTAG
DSM (CYCLO)	ICI
ESBJERG FISK	SABIC
RHONE POLENC	SOLVAY
SHELL CHEMICAL	SASOL
SOLWAY CHEMICAL	

[illegible] 14.10.98 EN/pk

OD 0076871
* Confidential *

[redacted]

C. FAR EAST - USA & NWE

SN (BJ)

ASIA ASSOCIATES
DAICEL CHEMICAL
ENNAR BAKRIE
GENERAL LATEX
GUTHRIE LATEX
ILLOVA
KAUTCHUK
KOLMAR
LITHCON/SINOCON WAX
MARUBENI (MX)
MERICHEM
MITSUBISHI
MITSUI (Alpha Olefin, DCPD)
NATURA OLEO

NIPPON SHOKUBAI
NISSO SHOJI
SAFIC ALCAN
SASOL
SUMITOMO (CYCLO)
TOMEN
TRAMMOCHEM (CYCLO)

DED. VEGOIL TRADE
AARHUS (EUR/USA)
ACIDCHEM (USA)
ACME HARDESTY (EUR/USA)
ADM (EUR/USA)
AKZO (EUR/USA)
CHURCH DWIGHT (USA)
CIIF (EUR/USA)
CONAGRA (EUR/USA)
GRANEX (EUR/USA)
KARLSHAMS (EUR/USA)
KUOK (EUR)
MBK (USA)
PROCTER/FELDA (EUR/USA)
SALIM OLEOCHEM (USA)
SAN MIGUEL (EUR/USA)
TEJANA TRADING (USA)
TWIN RIVERS (USA)
UNITED COCOCHEM (USA)
VAN DER MOORTELE (EUR)

OT (TMH)

NWE:
GREAT LAKES CHEMICALS
MITSUI (Phenol, Ams & Aniline oil)
SUMITOMO (Phenol & Alkyl Benzene)
VINMAR
INERCHEM 2000
USA:
DENOFA
EUREKA
GRAIN MERCHANTS (S.Africa)
GREAT LAKES CHEMICALS
ICI
INTERNATIONAL FURAN CH.
KARLSHAMNS (PG to Rdam)
KUALA LUMPUR
(Palmoil fm Taiwan & PG to Rdam)
MITSUI (Phenol, AMS & Aniline Oil)
MOBIL
MOSSGAS
PAN CENTURY
RAWLING
ROCKMOOR
SALIM OLEOCHEMS
SUNGAI BUDI
UNITED COCONUT CHEM
VALHORNE
VINMAR
SK
FELDA BRIDGE
SHELL INDIA + PAK
SHELL WW

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D. SAM - FAR EAST

SN (RJ)	OT (TMH)
ACRINOR	OXITENO
DOW QUICIMA	YPF
METHANEX	
RHODIA	
TRIKEM	
YASUHARA	
NEALE PETR	
MOSS GAS	
ED & F MANN	

E. FAR EAST - SAM

SN (RJ)	OT (TMH)
AARHUS OLIEFABRIK	
ASAHAI GLASS	
GESSY LEVER	
NISSHO IWAI	
SALIM OLEOCHEM	
SASOL	
U SANTA RITA	
UNILEVER / S. COMM	
WILMAR / HCI	

F. AUSTRALIA / NZ

SN (RJ)	OT (TMH)
ALBRIGHT & WILSON	ORICA
ARCO CHEMICAL	UCC
ASOMA	
BENTLY CHEMPLAX	
CHEVRON CHEMICAL	
DOW CHEMICAL	
DOW CORNING	
EXXON CHEMICAL	
LUBRIZOL	
NOVUS	
ROHM & HAAS	
SHELL CHEMICAL	

G. NWE - SOUTH AFRICA/INDIA/MIDDLE EAST

SN (RJ)	OT (KHH)
CHEMTRADE	DOW/SENTRACHEM
CONDEA AUGUSTA	ICI
MAROC PHOSPHORE (125.000 mts)	ICC
	UNITED FOOD
	SHELL
	ENOC
	SENCHIM
	MAROC PHOSPHORE (300.000 mts)
	DSM

H. INDIA & MIDDLE EAST - EUROPE & USA

SN (RJ)	OT (KHH)
SABIC CHEMS	SABIC CHEMS
SABIC MTBE	SABIC MTBE
EQUATE	SPDC

I. MIDDLE EAST / FAR EAST

SN (RJ)	OT (KHH)
	EQUATE
	SABIC
	NESTE
	MGCC
	DAEWOO

J. USG - S.AFRICA & MIDDLE EAST

SN (RJ)	OT (KHH)
ARCO	DOW/SENTRACHEM
CELANESE	DSM
DOW CHEM (PO)	EASTMAN
ETHYL	ENOC
EXXON CHEM	FOSKOR
LUBRIZOL	KOHLER VERSAPAK
METHANEX (?)	SASOL
OCCIDENTAL	UCC
PECTEN	UNFOODS
SCENECTADY	
SCHUMANN/STEIER	
TEXACO/CALTEX	

[illegible] 14.10.02 EN/gsb

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K. USG - MED

SN (RJ)
ATOCHEM
BP
CELANESE
CONDEA VISTA
DOW IBERICA
EXXON CHEMICAL
LUBRIZOL
MILLENNIUM
NOVUS INTL
PETRESA
STERLING
UCC

OT (JS)

L. NWEX USG - SOUTH AMERICA & SAM - NWE & USG

SN (TRM)

ARCO
BASF
CELANESE
CHEMINTER
DOW CORNING
EKA CHEMICAL
EXXON CHEMICAL
GEORGIA GULF
LUBRIZOL
OCCIDENTAL
OXICHIM
PANACHEM
PARAFINA DEL PLATA
PECTEN
PEREZ & JACARD
RHODIA
ROHM & HAAS
STANDARD CHLORINE
SUDAMERICANA DE FIBRAS
TESSENDERLO KERLEY
VISTA
WATERFRONT

OT (TEL)

USA:
CELANESE
CIA DE ACRILICOS
DOW
DUPONT
EASTMAN
NOVUS
UCC
YPF
PAMSA
COPENE
NWE:
SHELL
TORTUGA
HENKEL
SOLVAY
YPF
RUHRKOHLE
NIDERA

OD 0076865
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M. NWE - USA

SN (TRM)	OT (JS)
BAYER	AMOCO
CHEVRON	BP
CLARIANT	CELMEX
CONTICHIM	FINNSUGAR
ESSAR	ICI
UNICHEMA	KOPPERS
UCC	NORANOA
WITCO	PHENOLCHEMIE (all except Savannah)
	SOLVAY (GLS)
	PCS (GLS)

N. USA - NWE

SN (TRM)	OT (JS)
ARCO	ALCOTRA
CELANESE	AMOCO
CHEVRON	ANGUS
DOW CORNING	BP
ESAR	CELMEX
ETHYL	EASTMAN
EUROCOMPOUND	FINNSUGAR
LUBRIZOL	GANTRADE
MERICHEM	HUNTSMAN
NOVARTIS	ICI
OCCIDENTAL	MILLENNIUM
OLIN CHEM.	NOVA CHEMICALS
OSCA	NOVUS
PROCTER & GAMBLE	PECTEN
SCENECTADY	PHENOLCHEMIE
STANDARD CHLORINE	STERLING
UNICHEMA	SUN
UCC	VALHORNE
VISTA	VELSICOL
WITCO	

Note also the use of fake bids. See this complaint from Ohio AG in an ongoing case in procurement of Salt to remove ice on highways. Note the exclusionary conduct alleged, and sham bidding.

IN THE COURT OF COMMON PLEAS
TUSCARAWAS COUNTY, OHIO
GENERAL TRIAL DIVISION

STATE OF OHIO, ex rel. Michael DeWine
ATTORNEY GENERAL OF OHIO,
150 East Gay St., 23rd Floor
Columbus, Ohio 43215

Plaintiff,

v.

CARGILL INCORPORATED
15407 McGinty Rd. West
Wayzata, MN 55391

and

CARGILL DEICING TECHNOLOGY
24950 Country Club Blvd., Suite 450
North Olmsted, OH 44070

and

MORTON SALT, INC.
AKA MORTON SALT COMPANY
123 N. Wacker Dr.
Chicago, IL 60606

and

MORTON INTERNATIONAL, LLC
100 Independence Mall West
Philadelphia, PA 19106

Defendants.

CASE NO: 2012 CV 03 0268

JUDGE: ELIZABETH L. THOMAKOS, JUDGE

COMPLAINT WITH JURY
DEMAND ENDORSED HEREON

Cargill has mined and extracted rock salt from the Cleveland Mine and has sold rock salt to the State of Ohio and other Ohio Public Purchasers.

21. In addition to the Cleveland Mine, Cargill operates salt mines in New York (Lansing) and Louisiana (Avery Island).

22. In connection with the 1996 acquisition of the Cleveland Mine, Cargill was required by state and federal authorities to supply a limited amount of Ohio-mined rock salt to competitor American Rock Salt for a period of four years. Thereafter, and continuing to the present, Morton and Cargill have been the only two companies that supply Ohio-mined rock salt and make it available for commercial sale.

23. The vast majority of Public Purchasers purchase rock salt through a competitive bidding process prescribed by state and local statutes and ordinances.

24. In 1983, the Ohio General Assembly enacted statutory provisions that give, under certain circumstances, a preference to products that are produced or mined in the United States, the State of Ohio, and/or in states that share a geographic border with the State of Ohio and are sold to the State and its agencies (the "Preference Statute").

25. At least as early as 1996, the Ohio Department of Transportation ("ODOT") implemented processes for selecting winning bidders of rock salt based on its interpretation of statutes and regulations related to the Preference Statute codified, in part, in Ohio Revised Code §§ 125.09, 125.11, 5513.02, and 5513.07, and Ohio Administrative Code §§ 123:5-1-06 and 123:5-1-07.

26. Pursuant to the selection process ODOT had implemented, if there was one bidder offering Ohio-mined salt or border state salt, then that bidder received a five percent preference,

meaning that that bidder won the bid as long as it was not more than five percent higher than the next lowest bid.

27. Pursuant to the selection process ODOT had implemented for the majority of the time period relevant to this Complaint, if there were at least two bidders offering Ohio-mined salt, then the low bidder offering Ohio-mined salt won the bid regardless of how much lower the bid(s) of companies bidding non-Ohio-mined salt were. This was commonly referred to as a "Lockout."

28. Since 1997, Cargill and Morton have been the only two companies that mine rock salt in the State of Ohio and make it available for commercial sale. Thus, they were the only two companies that could possibly have benefited from ODOT's Lockout interpretation of the Preference Statute.

29. ODOT typically sends out invitations to bid annually, sometime between April and September. While ODOT sends out a single invitation to bid covering the entire State of Ohio, bid amounts, quantities and prices are separately specified or bid for each of the eighty-eight counties in Ohio.

30. Pursuant to Ohio Revised Code § 5513.01(B), political subdivisions, the Ohio Turnpike Commission and public colleges and universities throughout the State of Ohio can participate in the ODOT cooperative purchasing program (the "ODOT Contract"). Such public entities can agree to be included in the ODOT Contract and purchase rock salt on the same terms and price as awarded under the ODOT Contract for the county in which the public entity is located. Many public entities throughout Ohio do participate in the ODOT Contract. Other individual public entities and purchasing cooperatives submit their own invitations to bid and purchase rock salt separately from the ODOT Contract ("Individual Public Contracts").

55. A Morton executive stated that Morton bids "more aggressively" on incumbent accounts or accounts they typically win. In discussing the ODOT Cuyahoga County contract, on which Morton submits a bid each year, the same executive confirmed that "we did not expect to get it."

56. Defendants' common scheme included submitting supra-competitive bids on their Primary Accounts, or those accounts they were predetermined to win in the State of Ohio.

57. Defendants' submission of purposefully losing bids on accounts they were predetermined to lose in the State of Ohio had the purpose and effect of feigning the appearance of competition and concealing the existence of their unlawful conspiracy from Public Purchasers of rock salt.

58. The majority of Defendants' purposefully losing bids in the State of Ohio were accompanied by non-collusion affidavits which contained Defendants' false affirmations under oath that no collusion had occurred in the preparation of such bids. Each and every such false affirmation had the purpose and effect of concealing the existence of Defendants' unlawful conspiracy from Public Purchasers of rock salt.

Coordinated Efforts to Exclude Competitors by Misusing Ohio's Competitive Bidding Statutes

59. At all relevant times herein, Defendants employed a bidding strategy designed with the purpose and effect of categorically excluding all competitors from submitting successful bids on the ODOT contract.

60. Defendants' purposefully losing bids on accounts they were predetermined to lose had the further purpose and effect of triggering the Lockout provision with regard to their sales of rock salt to ODOT and all Public Purchasers in the North Market that procured rock salt via the ODOT Contract.

61. Defendants, being the only two entities with salt mines in Ohio, were consciously committed to triggering the Lockout by *both* bidding Ohio-mined salt in all counties in the North Market for the purpose of restricting competition and excluding competitors from the market. Morton and Cargill each continually and consistently bid entities on the ODOT Contract that they were pre-determined to lose with the purpose and effect of triggering the Lockout provision, thereby excluding the possibility that any of Defendants' competitors could be the successful bidder for ODOT or any of the public entities in the state that procured rock salt via the ODOT Contract.

62. In some years, Morton submitted bids – some of which were sham bids – specifying such a quantity of Ohio salt that Morton likely would not have had the capacity in its Fairport Harbor Mine to supply all of the salt it bid had it won the contracts. Morton submitted such bids in adherence with the Defendants' common scheme for the purpose and effect of feigning competition and triggering the Lockout to exclude all rock salt suppliers except Cargill from the North Market.

63. The Preference Statute, together with ODOT's Lockout interpretation, helped create an environment conducive to the formation and execution of Morton and Cargill's unlawful agreement to allocate markets and exclude other competitors in the North Market so long as each Defendant bid in each county in each year. For this reason, Defendants' common scheme included the coordination of efforts to preserve the Lockout. Morton and Cargill executives frequently discussed the Preference Statute, and discussions included Morton's compilation of a "data sheet outlining important economic aspects of their salt facilities in Ohio with emphasis on Rock Salt Mine. This data includes: total employees, total payroll, total taxes, tons produced, tons sold in [the] State of Ohio." The information that was compiled and

discussed by Defendants included documents showing market prices. The discussion further focused on the fact that "Cargill Salt needs to put together data similar to what Morton has done."

64. Morton's adherence to the common scheme was further demonstrated when, in 2003, a Morton executive wrote in relation to the ODOT bid opening: "after a cursory examination it appears OH DOT purchasing prevailed over DAS. Furthermore the 'Buy Ohio' rule that states 'when two ohio [sic] purchasers bid – others are rejected' was strictly adhered to." A Morton executive reflected the company's commitment to being prepared to act on any deviation by ODOT that would threaten its supra-competitive profits resulting from its conspiracy by commenting: "[l]ooks like we can shelve the TRO for another year? I'll advise all when a more in depth analysis is completed."

65. Defendants wanted to keep the Preference Statute issue out of the limelight to conceal their conduct and protect the legislation that facilitated their conduct. In response to news in 2009 that proposed legislation making changes to the Preference Statute had been abandoned and "the status quo on Buy Ohio" would remain in effect, a Cargill executive stated "A good development. But I hope 'Buy Ohio' doesn't become a spotlighted item that Strickland and other pols will demagog [sic] around..."

Excessively High Incumbency Rates

66. At all relevant times herein, Defendants' incumbency rates in Ohio were extremely high – much higher than is typically seen in markets where vendors are competing, and much higher than in previous years. In the years 1997 through 1999, the percentage of Ohio counties with incumbent winning vendors ranged from 32 percent to 43 percent for the ODOT Contract. In 2000, however, the incumbency rates sharply increased and remained extremely

9.4 Tacit Communication and within Auction Coordination

See following examples from Spectrum Auctions: these are all ascending price auctions. A large part of the debate is how much information to give at the end of each round

From: Peter Cramton and Jesse A. Schwartz, Collusive Bidding: Lessons from the FCC Spectrum Auctions, Journal of Regulatory Economics, 17, 229-252, May 2000. and Pat Bajari and Jungwon Yeo (2008) Auction Design and Tacit Collusion in FCC Spectrum Auctions, UMinnesota Working Paper.

geographic area covered by the license. An activity rule requires each bidder to maintain a minimum level of activity in each round of the auction. Activity in a round is defined as placing a new bid on a license or being the standing high bidder on a license in the prior round. If a bidder fails to maintain the required level of activity in a round, its eligibility to bid in future rounds is reduced. This rule forces bidders to bid actively throughout the auction, and prevents bidders from holding back until late in the auction.

4.0.0 Code Bids, Reflexive Bids, and Retaliating Bids

Bids are in dollars. Since the bids are reported in their entirety, and since bids on all but the smallest markets are at least six digits, bidders can use the last few digits of a bid to encode messages. For example, in the AB auction (Auction 4), GTE frequently ended its bids with "483," which spells GTE on the telephone keypad. In the same auction, American Portable, a subsidiary of TDS, signaled interest in some markets by spelling "TDS" (837) in the last three digits. In the nationwide narrowband auction (Auction 1), one bidder ended its bid with the phone number of Congressman John Dingell, who introduced the legislation to auction spectrum. This type of behavior caught the attention of the FCC, but it was not viewed as compromising either efficiency or revenues.

However, in the DEF auction (Auction 11), some bidders were more aggressive in their use of the last few digits of their bids. In a particularly noticeable case mentioned in the introduction, Mercury PCS ended its bids with market numbers to signal its rival, High Plains Wireless, that it wanted it to move off of Lubbock, Texas or that it would be punished on Amarillo, Texas. Each market has a three digit market number (for example, 264 for Lubbock and 013 for Amarillo). After trading bids on block F of Lubbock for several rounds, with the price rising by 10% in each round, Mercury bumped High Plains in round 121 from Amarillo, a market on which High Plains had been the standing high bidder since round 68. This was Mercury's first bid on Amarillo during the auction. The bid served as a punishment to High Plains for bidding against Mercury on Lubbock, a punishment made clear since it contained as its last three digits "264," the market number for Lubbock. Mercury's bid on Amarillo said to High Plains, "I am bumping you from Amarillo, a market you have held since round 68, a market that I have shown no interest in whatsoever. To win Amarillo back you will have to bid higher by at least two bid increments more than your previous bid. I want you to back off of Lubbock, leaving it to me." To clarify that the Amarillo bid was a retaliation for High Plains bid on Lubbock, Mercury tagged its rebid in Lubbock with "013," Amarillo's market number. Tagging both the rebid in the market of interest and the punishment bid with the market numbers of the punishment market and market of interest, respectively, is called *reflexive bidding*.

What made this example exceptionally clear was that High Plains bid again on Lubbock in round 124, enticing Mercury to repeat its punishment with another bid ending in Lubbock's market number, and a rebid in Lubbock ending in Amarillo's market number. The second time, the punishment worked. High Plains placed no further bids on block F of Lubbock, and Mercury placed no further bids on Amarillo. However, since High Plains still wanted a block of Lubbock, it switched over to the D and E licenses and won the D block license with a $2.38 million bid. Its highest bid on Lubbock block F was $2.11 million. The $2.38 million bid on a D block license had a much higher cost to High Plains when one realizes that had it won the F-block, High Plains, as a preferenced bidder,[8] would have received a 25% bidding credit and an installment payment plan at attract rates worth an additional 25%. Hence, the net increase in cost of the D block bid was $2.38 - 0.5 \times 2.11 = \$1.32$ million. High Plains, during and after the auction, complained to the FCC about Mercury's practice. The complaints led to investigations by the FCC and the Department of Justice. The FCC tentatively fined Mercury $650,000 for making 13 code bids—bids ending in market numbers which might be construed as signals to rivals.[9]

Punishments for deviations from tacit agreements need not include market numbers to be clear. Imagine that Mercury ended its bids on Amarillo and Lubbock with "000" rather than with market numbers. As long as High Plains could deduce that Mercury's bids on Amarillo were a punishment, or *retaliation*, for High Plains' continued bidding on Lubbock, the message to back off of Lubbock would be clear. A high-stakes example of retaliation that did not use trailing digits occurred between NorthCoast and NextWave. These bidders were competing intermittently on block F of Boston early in the auction, before NorthCoast placed a bid on Boston in round 43. This bid remained the high bid until NextWave bumped NorthCoast in round 67. Then in the following round, NorthCoast retaliated by bumping NextWave from block F of San Francisco with a bid of over $5 million (NextWave had been the standing high bidder on San Francisco since round 28). In round 70, NextWave recaptured San Francisco for $5.8 million and NorthCoast recaptured Boston for $8.9 million. What made NorthCoast's retaliation clear was that it was NorthCoast's only bid on any block during the auction on San Francisco and that these two markets were the only two markets that NextWave and NorthCoast were trading bids on between rounds 67 and 70. Thus, a retaliation need not contain market numbers to be effective. However, code bidding is a more powerful collusive device, since it can be used to split up markets between two bidders that are competing for many markets.

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[8] The FCC rules often gave designated bidders preferential treatment. We refer to these bidders as "preferenced bidders." The preferences were some combination of bidding credits, installment payments, and tax breaks. See Ayres and Cramton (1996) for an analysis and discussion of bidder preferences.

[9] *Notice of Apparent Liability for Forfeiture*, FCC 97-388, October 21, 1997.

2.3 Information Disclosure

The FCC used the Full Information Disclosure Procedures in its auction rules until the 700 MHz auction. Under these procedures, the FCC posted the bids placed by each bidder on each license, the identity of the bidder, and the change in each bidder's eligibility. Economic theory suggests that collusion is easier to enforce firms in markets that are highly transparent because it is easier to punish deviators from collusive arrangements. Anecdotal evidence on retaliating bids are abundant. For example, in the AWS-1 auction, T-Mobile placed a bid only once on Columbia, MO (BEA098) throughout the auction in round 117. It was right after Cavalier Wireless had bid on Hawaii (REAG008) for which T-Mobile had been the standing high bidder since round 55. Cavalier Wireless had been the standing high bidder on Columbia, MO since round 62 until it was challenged by T-Mobile in round 117. While placing a retaliatory bid on Columbia, MO, T-Mobile also placed a bid on Hawaii in round 117 to reclaim it. Cavalier also placed a new bid on Columbia, MO in round 118 to reclaim it and has never placed a bid on Hawaii since then. Bajari and Fox (2007) also provide anecdotes on retaliatory bids in the PCS C block auction.

In response to concerns about potential collusion, the FCC considered limiting the amount of publically available information in the AWS-1 auction. Commissioner Deborah Taylor Tate stated that:

> "There has been much debate about whether, and to what extent, tacit collusion, or the opportunity for collusion and other anti-competitive behavior, exists in our current AWS auction rules. Some of the finest scholars have cautioned us that our rules allow—may even invite— such anti-competitive behavior. Economic experts and authors have written articles that support such conclusion and describe how easily bidders can "game" auctions under our current rules. "

However, the FCC applied the usual full information procedures to the AWS-1 auction the gauge it used to measure of the likely level of competition turned out to be above the pre-specified level.[3] In the 700 MHz auction, the FCC used *anonymous bidding*, that is it only posted the standing high bid for each license after each round. The identity of the bidder, the bid amounts other than the standing high bid, and the initial level and changes of each bidder's eligibility were not revealed until the auction ended. [4]

[3]The FCC announced that if the ratio of the sum of all the bidders' initial eligibility, subject to the cap, to the sum of bidding units of all the licenses offered for sale, is equal to or greater than 3, it would conduct AWS-1 under Full Information Disclosure Procedures. The ratio turned out 3.04.

[4]The Public Interest Spectrum Coalition (PISC) along with Verizon and Google agreed with the FCC's decision. Other bidders, including MetroPCS, argued that anonymous bidding would hurt small firms because

9.5 Problems with official documents

Sometimes official documents can be irritatingly opaque as to what the cartel behavior was. For instance, see the following press release from the DoJ

Department of Justice

FOR IMMEDIATE RELEASE
THURSDAY, FEBRUARY 23, 2012
WWW.JUSTICE.GOV

AT
(202) 514-2007
TTY (866) 544-5309

TWO FINANCIAL INVESTORS PLEAD GUILTY TO BID RIGGING AT MUNICIPAL TAX LIEN AUCTIONS IN NEW JERSEY

WASHINGTON – Two financial investors who purchased municipal tax liens at auctions in New Jersey pleaded guilty today for conspiring to rig bids for the sale of tax liens auctioned by municipalities throughout the state, the Department of Justice announced.

A felony charge was filed today in U.S. District Court for the District of New Jersey in Newark, N.J., against Robert W. Stein of Huntington Valley, Pa., and David M. Farber of Cherry Hill, N.J. Under the plea agreements, which are subject to court approval, Stein and Farber have both agreed to cooperate with the department's ongoing investigation.

According to the felony charge against Stein, from as early as 1998 until approximately spring 2009, Stein participated in a conspiracy to rig bids at auctions for the sale of municipal tax liens in New Jersey by agreeing to allocate among certain bidders on which liens to bid. According to the felony charge against Farber, from as early as the beginning of 2005 through approximately February 2009, Farber also participated in a conspiracy to rig bids at auctions for the sale of municipal tax liens in New Jersey. The department said that both Stein and Farber proceeded to submit bids in accordance with their agreements and purchased tax liens at collusive and non-competitive interest rates.

"Today's guilty pleas demonstrate that the Antitrust Division will not tolerate those who manipulate the competitive process in order to harm home and property owners," said Sharis A. Pozen, Acting Assistant Attorney General in charge of the Department of Justice's Antitrust Division.

The department said that the primary purpose of the conspiracies was to suppress and restrain competition to obtain selected municipal tax liens offered at public auctions at non-competitive interest rates. When the owner of real property fails to pay taxes on that property, the municipality in which the property is located may attach a lien for the amount of the unpaid taxes. If the taxes remain unpaid after a waiting period, the lien may be sold at auction. State law requires that investors bid on the interest rate delinquent homeowners will pay upon redemption. By law, the bid opens at 18 percent interest and, through a competitive bidding process, can be driven down to zero percent. If a lien remains unpaid after a certain period of time, the investor who purchased the lien may begin foreclosure proceedings against the property to which the lien is attached.

According to the court documents, Stein conspired with others not to bid against one another at municipal tax lien auctions in New Jersey. Farber also agreed not bid against certain bidders at tax lien auctions. Because the conspiracies permitted the conspirators to purchase tax liens with limited competition, each conspirator was able to obtain liens which earned a higher interest rate. Property owners were therefore made to pay higher interest on their tax debts than they would have paid had their liens been purchased in open and honest competition.

Each violation of the Sherman Act carries a maximum penalty of 10 years in prison and a $1 million fine for individuals. The maximum fine for a Sherman Act violation may be increased to twice the gain derived from the crime or twice the loss suffered by the victim if either amount is greater than the $1 million statutory maximum.

Today's pleas are the result of an ongoing investigation into bid rigging or fraud related to municipal tax lien auctions. On Aug. 24, 2011, Isadore H. May, Richard J. Pisciotta Jr. and William A. Collins each pleaded guilty to one count of bid rigging in connection with their participation in a conspiracy to allocate liens at New Jersey municipal tax lien auctions.

Today's charges are part of efforts underway by President Barack Obama's Financial Fraud Enforcement Task Force (FFETF). President Obama established the interagency FFETF to wage an aggressive, coordinated and proactive effort to investigate and prosecute financial crimes. The task force includes representatives from a broad range of federal agencies, regulatory authorities, inspectors general and state and local law enforcement who, working together, bring to bear a powerful array of criminal and civil enforcement resources. The task force is working to improve efforts across the federal executive branch, and with state and local partners, to investigate and prosecute significant financial crimes, ensure just and effective punishment for those who perpetrate financial crimes, combat discrimination in the lending and financial markets, and recover proceeds for victims of financial crimes. For more information on the task force, visit www.StopFraud.gov.

The ongoing investigation is being conducted by the Antitrust Division's New York Field Office and the FBI's Atlantic City, N.J., office. Anyone with information concerning bid rigging or fraud related to municipal tax lien auctions should contact the Antitrust Division's New York Field Office at 212-335-8000, visit www.justice.gov/atr/contact/newcase.htm or contact the Atlantic City Resident Agency of the FBI at 609-677-6400.

# # #

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