

Chapter 47

INTERNATIONAL CARTELS

Margaret C. Levenstein and Valerie Y. Suslow*

Most countries prohibit cartels regardless of whether they consist of domestic or foreign firms. International cartels, those comprised of firms from more than one country, were for many years nominally illegal, but with few resources directed at enforcement. International cartel activity therefore was largely invisible. In the early 1990s attitudes and policies changed. Enforcement activities increased and the number of prosecutions grew. We can learn a great deal about international cartel operations from information uncovered in these prosecutions. We review the evolution of the legal treatment of international cartels and then discuss the mechanisms that international cartels use to organize and survive in the face of internal pressures and external shocks.

1. Introduction

Firms form a cartel when they agree to restrict output or set prices. They may set target or minimum prices, rig bids at auctions, set volume or market share quotas, allocate markets geographically or allocate major customers to specific member firms. International cartels are distinguished by the fact that the cartel members are comprised of firms from more than one country.¹ In the first half of the twentieth century, when many countries promoted rather than prosecuted interfirm cooperation, international cartels affected a wide range of goods. Today, most countries prohibit cartels regardless of whether they are made up of domestic or foreign firms.² While there are undoubtedly fewer international cartels today than prior to World War II, there are a surprising number of firms that have, in recent years, reached across national, linguistic, and cultural divides to cooperate with their competitors in the interest of higher profits. With falling tariffs and a rising number of multilateral trade agreements, international trade has increased, expanding the range of products at risk for international price fixing.

* Stephen M. Ross School of Business, University of Michigan. The authors are very grateful to W. James Adams and Ralf Michaels for their suggestions and to Margaret Guerin-Calvert for comments on an earlier draft. The authors appreciate the excellent research assistance of Nicole Maciejewski in the preparation of this chapter.

1. In some cases, the legally responsible firm is based in the same jurisdiction as its fellow conspirators but is a subsidiary of a foreign corporation. The authors include such cases in their definition of international cartels.
2. The authors also restrict their attention to *private* cartels. Although government-run or government-sponsored international cartels are worthy of study, there are both economic and legal reasons for treating them separately. State-run cartels may have much broader goals than profit maximization and different constraints to abide by than private firms. The legal attitude toward international cartels whose participants include sovereign nations also varies from the treatment of private corporations.

In contrast to today's aggressive policies toward "hard core" cartels,³ in most of the world prior to World War II cartels were tolerated or even encouraged. A contemporary scholar commented in the 1920s that although cartels are known to cause economic harm, "one strives for them today, generally speaking, on political grounds. They are to help in smoothing over the economic difficulties created or intensified by the war or in mitigating unwholesome conditions in individual countries and the world."⁴ Estimates of the percentage of world trade controlled by international cartels during the 1930s hover in the neighborhood of 30 to 40 percent.⁵ Chemical firms in Europe and the United States were particularly active in international cartels during this period; for example in a 1942 radio address Thurman Arnold remarked that there were 162 cartel agreements between the German company I.G. Farben and U.S. firms.⁶

After WWII antitrust laws began to change, but slowly. The formation in 1951 of the European Coal and Steel Community (ECSC) reflects the continued emphasis on cooperation among producers as a tool of political stability. The European Union, a direct descendent of the ECSC, now pursues the opposite policy toward cartels—aggressive investigation and large fines—with the hope that competition, rather than cooperation, will integrate previously distinct national markets.

For several decades, international cartels were nominally illegal in some jurisdictions but enforcement remained limited. International cartel activity therefore was largely hidden both from lawyers and economists working at competition agencies and from academic scholars. Cartels have an incentive to be secretive, and enforcement agencies during this era made little attempt to discover them. In the early 1990s attitudes and

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3. See Org. for Econ. Cooperation & Dev., *Recommendation of the Council Concerning Effective Action Against Hard Core Cartels*, OECD Doc. C(98)35/FINAL 3, 1998 (using the terminology "hard core cartels" to refer to private cooperative agreements to set prices or allocate markets).
 4. See Robert Liefmann, *International Cartels*, 5 HARV. BUS. REV. 129, 147 (1927). Liefmann catalogs international cartel agreements of the 19th century. *Id.* at 129 ("40 such agreements were mentioned which had come into existence up to 1896").
 5. Helga Nussbaum, *International Cartels and Multinational Enterprises*, in MULTINATIONAL ENTERPRISE IN HISTORICAL PERSPECTIVE 131-34 (Alice Teichova, Maurice Lévy-Leboyer & Helga Nussbaum eds., 1986) (estimating that international cartels controlled approximately 40% of world trade between 1929 and 1937—an estimate based on a list of 105 commodities with international cartel activity, originally compiled in 1944 by a U.S. Senate committee, known as the Kilgore Committee); see also FREDERICK M. SCHERER, *COMPETITION POLICIES FOR AN INTEGRATED WORLD ECONOMY* 46 (1994) (providing similar examples of international cartel activity); Joel Davidow, *Cartels, Competition Laws and the Regulation of International Trade*, 15 N.Y.U. J. INT'L L. & POL. 351, 351 (1983) ("In the pre-World War II era, cartels were as popular at the international level as they were at the national. Various studies estimated that during the 1930s, 30 to 40 percent of all world trade in manufactured goods was cartelized."). A similar estimate was made in a comprehensive study of cartels conducted by the Great Britain Board of Trade after World War II. This survey attempted to "cover all private international industrial agreements to which British firms were parties before the present war." See GREAT BRITAIN BD. OF TRADE, *SURVEY OF INTERNATIONAL CARTELS AND INTERNAL CARTELS, 1944 AND 1946*, at 80 (1976) (noting that the study primarily covered manufacturing agreements). The list of products totaled 125, and their estimate of the amount of export trade affected was approximately 30%. *Id.* at 90 ("[i]t will be seen that the proportion of the export trade directly affected by international arrangements of various sorts can be put roughly at three-tenths of the total value of the exports of goods wholly or mainly manufactured").
 6. Spencer W. Waller, *The Antitrust Legacy of Thurman Arnold*, 78 ST. JOHN'S L. REV. 569, 604 (2004).

actions began to change (as will be discussed in the next section). Enforcement activities increased and the number of prosecutions grew rapidly. International cartels have been uncovered over the past two decades in such industries as agricultural and food-processing chemicals, graphite and carbon products, and various metals.⁷ While some of these cartels were short-lived, others had been in operation for well over a decade. Average duration for contemporary international cartels is seven and a half years, about the same as the average duration of cartels in earlier periods.⁸ Basic commodities cartels, such as cement, have been prosecuted, as well as specialized services such as fine arts auctions and wastewater treatment facility construction. Price-fixing convictions have also been obtained in high-technology industries such as computer chips.⁹ There is a pattern of follow-on cases in which the discovery of price fixing for one product leads to the discovery of other agreements in closely related products. For example, there have been multiple federal and international prosecutions of graphite and carbon cartels, multiple rubber chemicals cartel prosecutions, and so on. This pattern reflects both economic and legal forces. Firms caught colluding in one product often have an incentive to provide information about other cartels in which they have participated in order to obtain leniency.¹⁰ In addition, the pattern reflects the learning of cartel participants and the organizational structures of many cartels. Firms that participate in one cartel are more apt to participate in others, primarily because they develop the rapport with their competitors and the organizational skills to make collusion more effective.¹¹

There are very few careful analyses of the economic effects of international cartels, and there is no consensus on the correct way to measure these effects.¹² Analyses of the

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7. See Margaret C. Levenstein & Valerie Y. Suslow, *Contemporary International Cartels and Developing Countries: Economic Effects and Implications for Competition Policy*, 71 ANTITRUST L.J. 801, 806 (2004).
 8. See Margaret C. Levenstein & Valerie Y. Suslow, Determinants of International Cartel Duration and the Role of Cartel Organization (Ross School of Business, Working Paper 1052, 2006) (for duration of contemporary international cartels); Margaret C. Levenstein & Valerie Y. Suslow, *What Determines Cartel Success?* 44 J. ECON. LIT. 43, 49-50 (2006) (discussing evidence on duration of international cartels in earlier periods).
 9. See, for example, Press Release, U.S. Dep't of Justice, Sixth Samsung Executive Agrees to Plead Guilty to Participating in DRAM Price-Fixing Cartel (Apr. 19, 2007).
 10. The U.S. Department of Justice has an "amnesty plus" policy that rewards firms for providing information for cartels as yet undiscovered by the Department of Justice. See Scott D. Hammond, Cornerstones of an Effective Leniency Program, Address at the International Competition Network Workshop on Leniency Programs (Nov. 22-23, 2004), <http://www.usdoj.gov/atr/public/speeches/206611.htm>.
 11. Game theoretic explanations of multimarket collusion focus on the ability of firms to punish in one market in order to enforce cooperation in other markets. See, for example, the influential article on multimarket contact by B. Douglas Bernheim & Michael D. Whinston, *Multimarket Contact and Collusive Behavior*, 21 RAND J. ECON. 1 (1990). Although we observe contemporary international cartels occasionally using price wars targeted at particular markets or countries, we have not seen any examples of these cartels using multiproduct punishment strategies to sustain collusion.
 12. Estimates of the effects of domestic (non-U.S.) cartels exist, but here we are only focusing on international cartels; see Organisation for Economic Co-operation and Development, *Issues for Trade and Competition in the Global Context: A Synthesis* 10 (2003), [http://webdomino1.oecd.org/cmnet/ech/tradecomp.nsf/viewHtml/index/\\$FILE/ccnm-3-e.pdf](http://webdomino1.oecd.org/cmnet/ech/tradecomp.nsf/viewHtml/index/$FILE/ccnm-3-e.pdf) (summarizing the results of an OECD

effects of cartels on product prices generally use one of three approaches: changes in price following cartel formation, comparison between “good times” and “price war” periods, and comparison between the cartel price and a counterfactual or “but for” price that would have prevailed absent collusion. In addition to these conceptual difficulties, data problems can make such analyses very difficult. Connor and Lande survey a variety of studies of cartel price effects and find that the median estimated overcharge is approximately 25 percent.¹³

National and international cartels face many of the same challenges, both economic and legal, and make use of similar organizational devices. It is in the collective interest of firms in oligopolistic markets, whether local, regional, national, or international, to coordinate their activities to avoid competition. Each firm is also subject to a countervailing incentive to serve its own short-run self-interest by reneging on the agreement and competing instead. There are differences, however, in some of the collusive instruments used by national and international cartels. For example, and not surprisingly, geographic market allocation rules are used much more frequently by international cartels rather than the simple production quotas favored by domestic cartels.¹⁴ This is easy to understand, given that national barriers provide a ready mechanism for dividing markets as well as a mechanism for monitoring violations in cartel agreements. In addition, international cartels face unique challenges to their stability posed by cultural differences, exchange rate fluctuations, and trade preferences granted by particular countries. Each of these factors can create tensions among cartel members and instability for the cartel.

We turn now to the evolution of the legal treatment of international cartels, followed by a discussion of how international cartels respond to internal and external economic pressures to preserve cartel stability and achieve supranormal profits.

2. Antitrust policies towards international cartels

The legal treatment of international agreements among firms to fix prices or allocate markets has varied over time, with increasing limitations in the post-WWII period and even more since 1990s globalization. Even in the United States, where strong anticartel laws have existed since the Sherman Act of 1890, there was relatively little prosecution of international cartels prior to the 1990s. To our knowledge, the first instance in which the United States prosecuted an international cartel was in 1927, when the Department of Justice (DOJ) indicted participants in the international potash cartel, including the German Kali Syndicate, the French Société Commerciale des Potasses d’Alsace, and the

survey: “The responding countries described a total of 145 cases, but in many of these it was not possible to estimate harm. Still, the amount of commerce affected by just 16 large cartel cases reported in the OECD survey exceeded an estimated USD55 billion world-wide.”)

13. John M. Connor & Robert H. Lande, *How High Do Cartels Raise Prices? Implications for Optimal Cartel Fines*, 80 TUL. L. REV. 513, 540 (2005) (reporting that the “median cartel overcharge for all types and time periods (a median that includes a significant number of zeros) is 25%.”).
14. See Valerie Y. Suslow, *Cartel Contract Duration: Empirical Evidence from Inter-war International Cartels*, 14 INDUS. & CORP. CHANGE 705, 716 (2005) (finding that 40% of the sample of interwar international cartels assigned exclusive territories to cartel participants); Liefmann, *supra* note 4, at 130-31 (describing how international cartels allocate markets geographically).

Potash Importing Corporation.¹⁵ There were a number of international cartel prosecutions immediately after WWII, but activity diminished in the following decades.¹⁶ Prosecuting international cartels was generally avoided for both political and economic reasons. In some cases, international cartels had the active support or participation of sovereign states, making prosecution politically sensitive, if not impossible. In others, international cartels were the sole source of supply of critical raw materials (such as potash), making prosecution risky for the economy as a whole.

During the 1980s, at the height of the Chicago School approach to antitrust, domestic cartels with limited local effects were vigorously prosecuted: “the Antitrust Division concentrated upon conspiracies among local cement producers, milk distributors and wholesale bakeries; the FTC concentrated upon competition-restraining codes of conduct promulgated by associations of small businesses and professionals.”¹⁷ According to Joel Klein at the DOJ, these domestic cartel cases provide evidence that U.S. policy was not consciously directed toward avoiding cartel prosecutions; rather, the DOJ did not bring international cartel cases “because we didn’t have any evidence that international cartels continued to be a problem.”¹⁸

In 1992 Mark Whitacre, an Archer Daniels Midland (ADM) executive, approached the DOJ with stories about international price-fixing agreements in lysine and a variety of other chemicals, including citric acid and high fructose corn syrup.¹⁹ The subsequent investigations and prosecutions precipitated changes in both antitrust law and the prosecutorial tools used against international cartels. One of the most significant changes occurred in 1993, when the DOJ’s Antitrust Division revised and expanded their corporate amnesty program. Amnesty from all U.S. criminal penalties was now automatically granted to the first firm to confess, as long as there was no preexisting investigation of collusion in the industry.²⁰ This policy heightened the incentive of firms and their managers to confess to price-fixing activities. The number of corporations coming forward and seeking amnesty rose in the early 1990s from roughly one per year

15. MIRA WILKINS, *THE HISTORY OF FOREIGN INVESTMENT IN THE UNITED STATES, 1914-1945*, at 224-25 (2004).

16. See Joel Klein, *The War Against International Cartels: Lessons from the Battlefield*, Address at Fordham Corporate Law Institute, 26th Annual Conference on International Antitrust Law & Policy 5 (Oct. 14, 1999), available at <http://www.usdoj.gov/atr/public/speeches/3747.pdf> (noting that during and immediately after World War II, “the Department filed numerous cases (some criminal, some civil) against a wide range of international cartels involving U.S. and European firms. The terms of the challenged cartel agreements varied from case to case, though many were along the lines of the one in *American Tobacco*: U.S. firms agreed not to sell in Europe, European firms agreed not to sell in the U.S., and other arrangements were made to limit competition in third-country markets. The relief the Department obtained against these cartels varied—further implementation of the cartels in U.S. markets was forbidden, and significant criminal fines were sometimes imposed on firms and individuals.”).

17. Robert A. Skitol, *The Shifting Sands of Antitrust Policy: Where It Has Been, Where It Is Now, Where It Will Be In Its Third Century*, 9 CORNELL J.L. & PUB. POL’Y 239, 252 (1999).

18. Klein, *supra* note 16, at 4.

19. Kurt Eichenwald, *Three Sentenced in Archer Daniels Midland Case*, N.Y. TIMES, July 10, 1999, at C1.

20. See Dep’t of Justice Antitrust Div., Leniency Policy Documents, <http://www.usdoj.gov/atr/public/criminal.htm> (linking to the current corporate and individual amnesty policies of the DOJ).

to one per month.²¹ By the early 2000s the number of amnesty applications had risen to an average of two per month.²² Fines levied against international cartels increased dramatically over the past decade (Figure 1) and covered a wide range of industries (Table 1). The magnitude of the overall enforcement activities is summed up in a 2005 speech by Scott Hammond, Deputy Assistant Attorney General for Criminal Enforcement:

Since the beginning of FY 1997, the Division has prosecuted international cartels affecting well over \$10 billion in U.S. commerce Of the nearly \$3 billion in criminal fines imposed in Division cases since FY 1997, well over 90 percent were obtained in connection with the prosecution of international cartel activity In 42 of the 51 instances in which the Division has secured a corporate fine of \$10 million or greater, the corporate defendants were foreign-based. These numbers reflect the fact that the typical international cartel likely consists of a U.S. company and three or four of its competitors that are market leaders in Europe, Asia, and throughout the world.²³

This increased aggressiveness in antitrust enforcement is reflected as well in the move towards criminalization of collusive agreements. The United States has historically been the only country where price fixing, domestic or international, was a

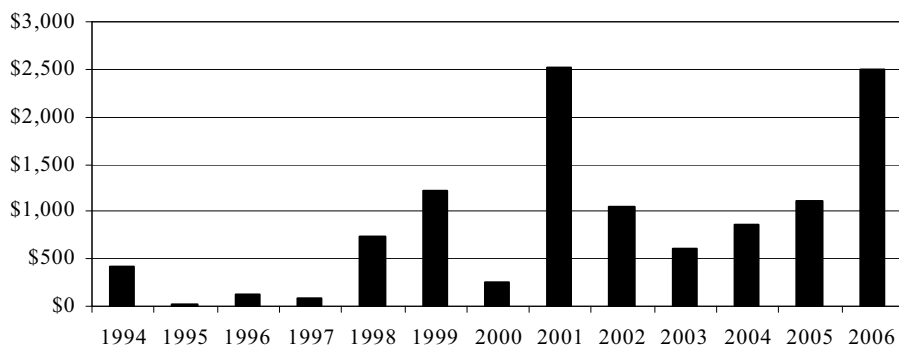


Figure 1.

International cartel fines: The Department of Justice and the European Commission, in nominal U.S. dollars, in millions.

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21. See Anne K. Bingaman, *Opening Markets and Protecting Competition for America's Businesses and Consumers: Goals and Achievements of the Antitrust Division, U.S. Department of Justice, Fiscal Year 1993 through March 1996* 8 (Report for 1996 Spring Meeting of the Section of Antitrust Law, 1996).
22. R. Hewitt Pate, *The DOJ International Antitrust Program—Maintaining Momentum*, Address Before the ABA Section of Antitrust Law 6 (Feb. 6, 2003) (“The Division’s leniency program has played a major role in cracking the majority of the international cartels that the Division has prosecuted. The application rate has surged over the last year to better than two per month.”), available at <http://www.usdoj.gov/atr/public/speeches/200736.htm>.
23. Scott Hammond, *An Update of the Antitrust Division’s Criminal Enforcement Program*, Address Before the ABA Section of Antitrust Law Cartel Enforcement Roundtable 2005 Fall Forum 2 (Nov. 16, 2005), available at <http://www.usdoj.gov/atr/public/speeches/213247.htm>.

Table 1.

International cartel fines by the Department of Justice and the European Commission, 1994–2006, in nominal U.S. dollars, in millions

<i>Case</i>	<i>Department of Justice¹</i>	<i>European Commission²</i>
Acrylic glass		464
Breweries, Belgian		122
Breweries, Luxembourg		1
Carbon and graphite products	10	136
Cartonboard ³		160
Cement ³		147
Citric acid	105	
Copper fittings		423
Copper tubes, industrial		106
Copper tubes, plumbing		298
DRAM	729	
Explosives	25	
Fine art auction houses	45	27
Food flavor enhancers		28
Graphite electrodes	412	294
Graphite, specialty		82
Haberdashery, needles		81
Hydrogen peroxide and perborate		522
Industrial and medical gases		35
Industrial bags		390
Industrial diamonds	10	
Industrial thread		58
Lysine	90	148
Maltol/sodium erythorbate	20	
Marine construction	49	
Marine transportation	15	
Methionine		171
Methylglucamine		4
Monochloroacetic acid	24	292
Organic peroxides		94
Paper, carbonless		422
Parcel tanker shipping	63	
Plasterboard		643
Polyester polyols	33	
Polyester staple	28.5	
Raw tobacco, Spain		27
Rubber chemicals	116	102
Rubber, chloroprene	84	

Table 1—Continued.

International cartel fines by the Department of Justice and the European Commission, 1994–2006, in nominal U.S. dollars, in millions

<i>Case</i>	<i>Department of Justice</i> ¹	<i>European Commission</i> ²
Rubber, nitrile butadiene	10.5	
Rubber, synthetic		698
Sodium gluconate	30	104
Sorbates	132	186
Steel beams ³		108
Steel, preinsulated pipes		124
Steel, seamless steel tubes		133
TACA (shipping conference) ⁴		367
Vitamins	900	1238 ⁵
Wastewater treatment plant construction	137	
Zinc phosphate		16

¹ EU figures from 1994–2002 are from http://ec.europa.eu/comm/competition/citizen/cartel_stats.html and are total (rounded) amounts of fines per case per year. EU figures from 2003–2006 are from Maarten Pieter Schinkel, *Effective Cartel Enforcement in Europe*, ACLE Working Paper No. 2006-14 (Nov. 2006), at Appendix A, <http://ssrn.com/paper=948641>.

² Antitrust Division statistics are from *An Update of the Antitrust Division's Criminal Enforcement Program*, Scott D. Hammond, Deputy Assistant Attorney General for Criminal Enforcement, Antitrust Division, U.S. Department of Justice, Before the ABA Section of Antitrust Law Cartel Enforcement Roundtable, 2005 Fall Forum Washington, D.C., Nov. 16, 2005, <http://www.usdoj.gov/atr/public/speeches/213247.htm>. These figures include only those fines of more than \$10 million as of January 30, 2006.

³ Fines reduced by court judgments.

⁴ Fine including other aspects of antitrust infringements than cartel behavior.

⁵ Includes *Choline Chloride* fine, which was a separate case from the combined *Vitamins* case.

felony. Recently, however, price fixing has been criminalized in the United Kingdom and Ireland, and similar reforms are underway in other countries, including Australia and Israel.²⁴

24. Scott Hammond, *Charting New Waters in International Cartel Prosecutions*, Address Before Twentieth Annual National Institute on White Collar Crime 2 (Mar. 2, 2006), available at <http://www.usdoj.gov/atr/public/speeches/214861.htm> (stating that “A number of nations on at least five continents—including Canada, Japan, the United Kingdom, Israel, Ireland, Korea, and Australia—already have, or are in the process of adopting, laws providing for criminal sanctions. Some of these jurisdictions provided for even greater maximum jail terms than the United States did until the recent passage of the Antitrust Criminal Penalty Enhancement and Reform Act of 2004.”).

Since the mid-1990s we have also seen increasingly vigorous extraterritorial application of U.S. antitrust law. Although it is beyond the scope of this chapter to cover this development in detail, it is worth pointing out that the roots of extraterritoriality can be found in both in the laws themselves and in the courts' interpretation. The "effects test" crafted by Judge Learned Hand in the *Aluminum Company of America* case "authorizes U.S. jurisdiction in an antitrust claim against a foreign defendant who engages in activity 'intended to affect imports or exports' and where 'its performance is shown actually to have had some effect upon them.'"²⁵ The influence of the Alcoa case is aptly described in Spencer Weber Waller's recounting of the judgment relating to Aluminum Limited, a Canadian corporation established in 1928 to take over Alcoa's international properties:

The Court . . . held Limited guilty of participating in an illegal price fixing and market division scheme despite its foreign nationality and the tableau of events taking place outside the United States. The Court expanded a line of cases imposing liability when some of the illegal acts took place within the United States and held that the illegal effects of the cartel within the United States were the legal equivalent of physical acts by human beings within our territory and were equally condemned by the antitrust laws. The court thus rejected any rule that focused on the physical location of the defendants or the site of the illegal acts. However, the court limited its effects test to those agreements which were intended to and, in fact, did affect the U.S. market. The Alcoa intended effects test ushered in the era of the extraterritorial application of the Sherman Act which continues to this day.²⁶

The initial reaction of U.S. trading partners to increased international cartel prosecutions was to resist such extraterritorial prosecution. Japan argued that these prosecutions violated international law and encroached on Japan's sovereignty.²⁷ European governments offered similar objections to the early 1990s U.S. prosecutions of European cartel member firms.²⁸ However, these objections dissipated as Europeans realized that their consumers were also harmed by these international cartels. It was also recognized that international cartels operating in Europe often organized their output allocation by dividing markets along geographic lines. This undermined the economic integration at the forefront of the European agenda and gave the European Commission (EC) even more reason for vigorously pursuing these cartels.

25. Allison J. Himelfarb, Comment, *The International Language of Convergence: Revising Antitrust Dialogue between the United States and the European Union with a Uniform Understanding of "Extraterritoriality,"* 17 U. PA. J. INT'L ECON. L. 909, 922 (1996).

26. Spencer Weber Waller, *The Story of Alcoa: The Enduring Questions of Market Power, Conduct, and Remedy in Monopolization Cases,* in ANTITRUST STORIES (Eleanor M. Fox & Daniel A. Crane eds., 2007) (footnotes omitted).

27. Steven L. Snell, *Controlling Restrictive Business Practices in Global Markets: Reflections on the Concepts of Sovereignty, Fairness, and Comity,* 33 STAN. J. INT'L L. 215, 217-18 (1997).

28. James J. Friedberg, *The Convergence of Law in an Era of Political Integration: The Wood Pulp Case and the Alcoa Effects Doctrine,* 52 U. PITT. L. REV. 289, 289 n.5, 293-94 (1991) (arguing that European legislators have reacted angrily to perceived U.S. extraterritorial antitrust prosecutions and have adopted "blocking" legislation in order to protect their nationals from litigation in the United States).

The trend toward more forceful prosecution of international cartels extends well beyond the United States and the European Union. Like the United States, Canada has a long history of condemnation of price fixing and has in recent years issued substantial fines for many international cartels. Countries in Asia, Latin America, and Africa have begun revising their antitrust laws and stepping up investigations and prosecutions. For example, although domestic cartels and export cartels used to be thought of in Japan as a “useful tool to eliminate excessive competition,” in the early 1990s the Japanese Fair Trade Commission began to eliminate its cartel exemptions.²⁹ Similarly, when Korea adopted its antitrust law in 1980 (the Monopoly Regulation and Fair Trade Act), enforcement of the law was minimal.³⁰ By 1999, though, the tides had changed, and Korea passed new legislation “in order to facilitate the market economy and keep up with international trends by repealing or improving cartels permitted under individual statutes.”³¹ In May 2002 Korea levied its first fine against the members of an international cartel (\$8.5 million against the members of the international graphite electrodes cartel).³²

Other countries with no history of international cartel prosecutions, such as Brazil and Mexico, have become active in this area, fining members of the vitamins, lysine, and citric acid cartels.³³ South Africa is well along the road to antitrust reform: they have invested substantially in developing their competition capability, created an amnesty policy, and begun prosecuting domestic cartels. Still, these actions have yet to result in an indictment of firms belonging to an international cartel.³⁴ In addition to

29. See HIROSHI IYORI & AKINORI UESUGI, *THE ANTIMONOPOLY LAWS AND POLICIES OF JAPAN* ¶¶ 353-369 (1994) (providing a concise overview of the history of cartel policy in Japan and the treatment of exemptions). A 2005 survey of export cartel exemptions in 55 countries reports that nine countries have recently eliminated explicit exemptions for export cartels. See Margaret C. Levenstein & Valerie Y. Suslow, *The Changing International Status of Export Cartel Exemptions*, 20 AM. U. INT'L L. REV. 785, 800, 806 (2005) (“The sample consists of all OECD countries, EU countries, and selected developing countries.... Several countries have recently amended their competition laws to eliminate explicit export cartel exemptions. The countries instituting such changes are Cyprus, Germany, Hungary, Japan, Korea, the Netherlands, Sweden, Switzerland, and the United Kingdom.”).

30. See KOREA FAIR TRADE COMM'N, *COMPETITION LAW AND POLICY IN KOREA*, at 8-10, <http://ftc.go.kr/data/hwp/0210.doc>.

31. See Int'l Bar Ass'n, *The Global Competition Forum*, <http://www.globalcompetitionforum.org/asia.htm#korea>. The new law is called the Act on Regulating Undue Concerted Activities Exempt from the Application of the Monopoly Regulation and Fair Trade Act (Omnibus Cartel Repeal Act).

32. *Korea's FTC Imposes Fines on Graphite Electrode Cartel*, ASIA PULSE, Mar. 21, 2002.

33. See OECD Global Forum on Competition, *Contribution of Brazil*, CCNM/GF/COMP/WD(2002)3 16, at 31-32 (Jan. 29, 2002), <http://www.oecd.org/dataoecd/53/5/1819070.pdf> (describing the early actions by Brazil's competition agency against lysine and vitamins international cartels); OECD, *COMPETITION LAW AND POLICY IN MEXICO: AN OECD PEER REVIEW 20* (2004), <http://www.oecd.org/dataoecd/57/9/31430869.pdf> (stating that Mexico “has also brought follow-on actions against the Mexican subsidiaries of companies involved in the international lysine and citric acid cartels”).

34. See South Africa Competition Comm'n, *Notification*, <http://www.compcom.co.za/> (detailing recent actions taken by the South African Competition Commission); South Africa Competition Comm'n, *Competition Commission to Gazette Corporate Leniency Policy*, in *Competition Commission Media Release No. 3 of 2004*, <http://www.compcom.co.za/resources/Media%20Releases/Media%20Releases>

increased independent enforcement by old and new antitrust agencies, there has also been an increase in collaborative enforcement across national boundaries.³⁵ Such collaboration has occurred in other areas of antitrust enforcement as well, multijurisdictional merger review being one of the most prominent examples.

In sum, numerous changes in enforcement activity against international cartels have occurred over the past two decades: the adoption of antitrust policies prohibiting hard core cartels by countries around the globe, vastly increased enforcement against international cartels by antitrust authorities, increased use of leniency policies, application of extraterritoriality, and a slow but growing trend toward criminalization of price fixing. The net effect of these changes is that numerous competition policy agencies now vigorously pursue and successfully prosecute international cartels, levying increasingly large fines.

3. How do international cartels survive?

Is such vigorous prosecution necessary, given firms' incentive to compete and the increased competitive pressure of global markets? The answer depends on one's view of the stability of cartels, in light of the obstacles they face. Producers form cartels with the goal of increasing profit by restricting supply and raising price. By increasing price, in principle to the price a monopolist would set, the profits received by all firms in the industry are jointly maximized. Creating and maintaining a cartel is not a simple task, however, and cartels face three key challenges. The first is coordination: firms must coordinate their actions, often with limited communication, in order to choose a price and allocate an output target among member firms. Second, cartels must prevent cheating by cartel member firms. The collective interests of all firms are achieved if they restrict output and raise price. But given the price set by the cartel, each firm has an incentive to increase output beyond their allocation. Without enforceable contracts, each firm will do so, undermining the cartel altogether. The tension between the collective and individual interests of firms is represented succinctly in the game

[%202004/Jan/Med%20Rel%20of%2029%20Jan%202004.asp](#) (presenting the South African corporate leniency policy, adopted Jan. 29, 2004).

35. See OECD, *HARD CORE CARTELS: THIRD REPORT ON THE IMPLEMENTATION OF THE 1998 RECOMMENDATION 30* (2005), <http://www.oecd.org/dataoecd/58/1/35863307.pdf> (stating that "OECD members and observers have found that international cooperation in discovering, investigating, and prosecuting international cartels has reached unprecedented levels. New investigative strategies have been used successfully, such as coordinated, simultaneous surprise inspections in several jurisdictions. Confidentiality waivers in cases of simultaneous leniency applications have created more opportunities for multi-jurisdictional cooperation. In several cases, countries were able to assist others in providing access to evidence and witnesses located in their jurisdictions. More countries than ever cooperate by exchanging know-how and expertise in cartel enforcement, in particular in the field of investigative techniques. The number of bilateral cooperation agreements has substantially increased.") (footnotes omitted). One indication of this increased cooperation was the formation in 2001 of the International Competition Network by 13 countries and the European Union. By 2007, over 80 countries were participating in this organization, which is committed to "improving worldwide cooperation and enhancing convergence through dialogue" among competition policy offices around the world. See ICN, *About the ICN*, <http://www.internationalcompetitionnetwork.org/index.php/en/about-icn/>.

theoretic model of the Prisoners' Dilemma.³⁶ In order to solve this dilemma, the cartel must develop an incentive compatible structure—a combination of monitoring, rewards, and punishments—to prevent cheating by members.³⁷ Third, cartels must actively work to create barriers to entry, if such barriers are not natural to the industry.

George Stigler's classic article argued that the incentive to cheat would effectively undermine most attempts to collude.³⁸ Modern game theorists have argued, in contrast, that repeated interaction (over time or across markets) can deter firms from cheating by providing the incentive of future collusive profits.³⁹ Cartels may threaten or resort to price wars to deter cheating. If firms can observe one another's output or pricing decisions, cheating can be punished and therefore can be deterred. In general, collusion is easier to achieve the bigger the difference between cartel and competitive profits, the smaller the number of firms, and the more patient are firms.

In practice, how do cartels solve these three challenges? Extensive information provided in EC decisions allows us to observe the development and internal functioning of international cartels operating in the European market (and other markets as well). In our discussion we focus on 41 international cartels active at some point during the 1990s or 2000s (though some began earlier).⁴⁰

3.1. Coming to agreement

How do firms come to agreement about how to share the reductions in output necessary to increase prices above the competitive level? The first, perhaps obvious, point is that firms—or at least the firms *caught* colluding—seem to need to talk to each other. These conversations often occur at the very highest level of the firm. For many cartels, there are two levels of organization: a high-level group of top executives and general managers, and a working level group of sales managers. The citric acid cartel exemplifies this pattern of development of hierarchical organization. Five citric acid producers fixed prices from approximately July 1991 to June 1995.⁴¹ In order to implement their price-fixing conspiracy, they developed an elaborate hierarchical structure. The senior executives responsible for determining the broad framework of the

36. ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 453-56 (6th ed. 2005).

37. For a general overview of cooperative oligopoly theory, see JEAN TIROLE, THE THEORY OF INDUSTRIAL ORGANIZATION ch. 6 (1988). See also STEPHEN MARTIN, ADVANCED INDUSTRIAL ECONOMICS ch. 10 (2d ed. 2002).

38. George Stigler, *A Theory of Oligopoly*, 72 J. POL. ECON. 44 (1964).

39. Most of the theoretical literature focuses on repeated interaction over time. See James W. Friedman, *A Non-Cooperative Equilibrium for Supergames*, 38 REV. ECON. STUD. 1, 1-12 (1971) (seminal piece initiating this line of research); Jean-Pierre Benoit & Vijay Krishna, *Finitely Repeated Games*, 54 ECONOMETRICA 905 (1985) (providing a theoretical basis for the argument that repeated interaction across space or markets may also support collusion).

40. This discussion draws heavily on Margaret C. Levenstein & Valerie Y. Suslow, *Cartel Bargaining and Monitoring: The Role of Information Sharing*, in THE PROS AND CONS OF INFORMATION SHARING 43 (Swedish Competition Authority, Mats Bergman ed., 2006).

41. Press Release, U.S. Dep't of Justice, Justice Department's Ongoing Probe Into the Food and Feed Additives Yields Second Largest Fine Ever (Jan. 29, 1997); Press Release, U.S. Dep't of Justice, Justice Department's Ongoing Probe Into the Food and Feed Additives Industry Yields \$25 Million More in Criminal Fines (Mar. 26, 1997).

cartel agreement were nicknamed “the masters,” while the lower level executives responsible for the day-to-day workings of the cartel were “the sherpas.”⁴² In the overwhelming majority of recent European prosecutions of international cartels, there were biannual meetings of the upper echelon, and in several cases there were quarterly meetings.⁴³

The bargaining process often begins by focusing on preexisting market divisions, such as geographic or political borders. For certain commodities, however, producers sell globally (or at least in a large number of countries), so that dividing the market along geographic lines is not feasible. In these cases, cartel members set global volume quotas. The vitamin B2 cartel, for example, was organized by using existing market shares to set future global sales quotas.⁴⁴ Whether or not they rely on geographical divisions, the vast majority of cartels allocate the largest customers to particular producers. Allocating customers allows cartel members to engage in price discrimination without undermining collusion. For example, in one of the carbon products cartels, large customer accounts were assigned to individual cartel members in order to avoid “the difficulty of implementing uniform prices for large customers throughout Europe.”⁴⁵ Other cartels, such as industrial copper tubes and methylglucamine, used similar strategies of assigning customers to eliminate competition between cartel members.⁴⁶

Coordination is an ongoing challenge over the life of any cartel. Negotiations are simpler in a stable industry, with competitors who know each other, understand one another’s technology, and have long-established relationships with particular customers. It is much more challenging where there has been recent entry or technological change. In such cases a cartel member may want to signal to other members of the cartel its dissatisfaction with its assigned output or market share allocation. One method of sending such a signal is to refuse to abide by the agreement, often precipitating a price war. These “bargaining price wars” are attempts to redistribute market shares across cartel members, by establishing the new market shares as a starting point for a new

42. Kurt Eichenwald, *U.S. Wins a Round Against Cartel*, N.Y. TIMES, Jan. 30, 1997, at D1.

43. See Levenstein & Suslow, *supra* note 40, at 67-78.

44. Commission Decision of 21 November 2001 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/E-1/37.512—Vitamins), ¶ 272 (“[w]orking from their achieved 1990 sales, and estimating the market share of other producers for each year, they agreed on global quotas to be effective for the period 1992 to 1994 inclusive”) [hereinafter *Commission Decision—Vitamins*].

45. Commission Decision of 3 December 2003 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case C.38.359—Electrical, Mechanical Carbon, & Graphite Products), ¶ 128 [hereinafter *Commission Decision—Electrical, Mechanical Carbon, & Graphite Products*].

46. See Commission Decision of 3 September 2004 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/E-1/38.069—Copper Plumbing Tubes), ¶ 79 (“[i]mplementation was ensured through a market leader arrangement for European territories and key customers”); Commission Decision of 27 November 2002 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/E-2/37.978—Methylglucamine), ¶ 96 (reporting that, in a statement by Aventis, which was one of the cartel members, “[m]arket sharing was achieved only through customer allocation That is, [RPB and Merck] would endeavour not to compete for their respective major customers.”).

cartel bargain.⁴⁷ For example, in the lysine case discussed above, ADM entered the market with a new technology and then demanded a one-third share of the cartel's global allocation.⁴⁸ This was not well received by the incumbent Japanese firms, who were only convinced to cede ADM a large market share by its pursuit of a global price war. The price war provided a meaningful signal to ADM's competitors by demonstrating ADM's ability (and willingness) to produce and sell at low cost.

Cartels often begin with pricing agreements and then find that further negotiations are required to achieve the output reductions necessary to maintain the agreed upon price. This is captured in an exchange among members of the lysine cartel. Having agreed to raise prices in late 1991,

Ajinomoto and ADM met [in 1993] to restore the relationship between the two companies and begin the process of developing a comprehensive volume agreement. During this meeting, ADM alluded to the importance of a company controlling its sales force in order to maintain high prices, and explained that its sales people have the general tendency to be very competitive and that, unless the producers had very firm control of their sales people, there would be a price-cutting problem. Ajinomoto indicated that everybody now understood it is necessary to adjust supply.⁴⁹

Firms' expectations about their competitors' propensity to cooperate can also have a significant impact on the ease of coming to agreement. Simply put, trust facilitates collusion. Firms' expectations may be influenced by previous interaction, interaction in other markets, and cultural similarities or differences. For example, Podolny and Scott Morton find that members of a shipping cartel were likely to accommodate entry by firms of similar social status, but that low social status entrants more often faced a predatory behavior pricing response.⁵⁰ Similarly, Van Driel examines cartel formation and stability for four European transportation industries: he concludes that social background and other characteristics of "group development" that help to construct executives' social identity influence the prevalence of collusion. Interestingly for the study of international cartels, he finds that, contrary to his priors, geographic proximity

47. For examples of bargaining price wars, see generally Margaret C. Levenstein, *Do Price Wars Facilitate Collusion? A Study of the Bromine Cartel Before World War I*, 33 *EXPLORATIONS IN ECON. HIST.* 107 (1996); Bishnupriya Gupta, *Collusion in the Indian Tea Industry in the Great Depression: An Analysis of Panel Data*, 34 *EXPLORATIONS IN ECON. HIST.* 155 (1997). Also see Margaret E. Slade, *Strategic Pricing Models and Interpretation of Price War Data*, 34 *EUR. ECON. REV.* (1990), for an examination of the role of price wars in cartel learning. See also Levenstein & Suslow, *What Determines Cartel Success?*, *supra* note 8, at 48-49, for further discussion of bargaining price wars and cartel stability.

48. Commission Decision of 7 June 2000 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/36.545/F3—Amino Acids), ¶ 73 ("ADM's primary goal was to have the same production share as that of the largest competitor, which would result in one-third of total world demand for ADM, one third for the Ajinomoto group, and one third for Kyowa and the Korean producers.").

49. *Id.* ¶ 98.

50. Joel M. Podolny & Fiona M. Scott Morton, *Social Status, Entry and Predation: The Case of British Shipping Cartels 1879-1929*, 47 *J. INDUS. ECON.* 41, 41-67 (1999).

was not strongly related to collusive success.⁵¹ Trust may flow from preexisting cultural ties, but it can also develop as a result of interactions among collusive firms, both those directly relating to collusion and other types of interactions. For example, diamond miners learned to work cooperatively to address collective action problems such as the resolution of property rights, facilitating a century of collusion in the diamond industry.⁵² There is remarkably little evidence that linguistic and cultural differences posed insurmountable problems for the EC cases discussed here.

Cartels do not come to an agreement once and for all. They are constantly renegotiating their agreement. This is in part because there are external shocks which require that they must the cartel adjust. For example, exchange rate fluctuations can pose significant challenges to international cartels trying to agree on prices and prevent international arbitrage.⁵³ Cartels also renegotiate their agreements because members change their own behavior in response to the cartel agreement, in ways not always foreseen in prior cartel negotiations.⁵⁴ For example, when firms set price and quantity, but make no agreement regarding investment, cartel members will sometimes increase their investment, leading to over-capacity. This problem of “excess” competition in areas that are not explicitly agreed upon by the collusive parties is quite pervasive, extending beyond capacity investment to competition in quality, the provision of credit, the absorption of transportation costs, and other nonprice dimensions. For example, the cement cartel included base-point pricing to avoid competition on transportation charges.⁵⁵ Experienced cartels address costly nonprice competition by including additional such restrictions that limit the incentive to compete in a variety of dimensions.

3.2. *Detecting and deterring cheating*

Price wars and other punishment mechanisms can deter cheating, but they do so at a cost. While the threat of price wars—whether implicit or explicit—is virtually always present, in many cartels price wars are never observed. Instead cartel members take two types of actions. First, they try to reduce the uncertainty that leads to price wars by engaging in extensive information collection and monitoring. Second, they reduce the incentive to cheat directly with compensation, punishment, and side payments

51. Hugo van Driel, *Collusion in Transport: Group Effects in a Historical Perspective*, 41 J. ECON. BEHAVIOR & ORG. 385, 385, 402-03 (2000).

52. DEBORA L. SPAR, *THE COOPERATIVE EDGE: THE INTERNAL POLITICS OF INTERNATIONAL CARTELS* 43-47 (1994).

53. See generally Barbara Alexander, *The Impact of Exchange Rate Levels and Changes on International Cartels: Implications for Liability and Overcharges*, 70 ANTITRUST L.J. 819-46 (2003).

54. See David Genesove & Wallace P. Mullin, *Rules, Communication, and Collusion: Narrative Evidence from the Sugar Institute Case*, 91 AM. ECON. REV. 379, 386-87 (2001) (documenting this process of the development of cartel organization in a sugar-refining cartel that operated from 1927 to 1936).

55. Commission Decision of 30 November 1994 relating to a proceeding pursuant to Article 85 of the EC Treaty (Cases IV/33.126 and 33.322—Cement), ¶ 27 (stating that the price lists were calculated “assuming for a price leader company identical basing-point prices ex-works, for all destinations, even for sales beyond the national borders”) [hereinafter *Commission Decision—Cement*].

schemes.⁵⁶ These provisions most often include agreements to purchase output from firms who sell less than their agreed upon share. For example, members of the citric acid cartel shared monthly sales figures and took stock at the end of the year of each company's total sales.⁵⁷ A company selling more than its quota was required the next year to purchase citric acid from a cartel member that was under quota. Similar provisions are found in many of the cartels listed in Table 1, including lysine and vitamins. A functionally similar provision was agreed to in the cartonboard cartel, where producers would be ordered to shut down their factory temporarily when they had exceeded their agreed-upon sales in the previous period.⁵⁸

In order to implement compensation schemes and reduce uncertainty, cartels routinely collect and share extensive information on firm activities. Cartels use frequent communication in the form of face-to-face multilateral and bilateral meetings, phone calls, e-mails, and faxes, sometimes directly with each other and other times through third-party agents, such as trade associations or retired executives. While executives meet regularly to bargain over the terms of the collusive agreement, lower level managers often meet on a more frequent basis to monitor (and fine-tune) previously agreed-upon collusive terms. Monitoring communication includes firm reports of sales, prices, customer lists, as well as industry and government reports. Almost all cartels monitor output or sales. This is certainly true of recent international cartels. For example, the vitamin D3 cartel, an otherwise relatively unstructured cartel, regularly exchanged quantity data:

Each meeting followed the same structure. The organizer started by disclosing its sales figures (in volume) for the previous six or twelve months as appropriate. The others then shared their sales figures. Estimations were made and agreed of the future size of the market. On the basis of this overview of the market, the participants could monitor performance against target and allocate the volume quotas for the next period, generally in accordance with their agreed market shares. List prices and minimum prices were also set in these meetings.⁵⁹

In addition to sharing information on quantities, many cartels monitored one another's prices. For example, the cement cartel "monitored exports and export forecasts, compared supply and demand on home and export markets and exchanged

56. See generally Joseph E. Harrington, *How Do Cartels Operate?*, in 2 FOUNDATIONS AND TRENDS IN MICROECONOMICS 1-105 (2006) (providing a detailed analysis of 20 EC decisions between 2000 and 2004, with a discussion of properties of firm behavior consistent with collusion).

57. Commission Decision of 5 December 2001 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/E-1/36.604—Citric Acid), ¶¶ 100-101 ("In order to monitor the correct implementation of these quotas and avoid, as far as possible, the need for compensation at the end of each year, a regular exchange of monthly sales information was established from March 1991 Two separate tables exist for each year in the period 1991-94. One provides the information on a cumulative monthly basis and the other on a simple monthly basis.").

58. Commission Decision of 13 July 1994 relating to a proceeding under Article 85 of the EC Treaty, (Case IV/C/33.833—Cartonboard), ¶ 50 (mentioning the "perceived need for temporary plant shutdowns to support price increases").

59. Commission Decision—*Vitamins*, *supra* note 44, ¶¶ 469-470.

information on prices.”⁶⁰ The collection and sharing of information is not limited to prices and quantities. Cartel members share whatever will allow them most effectively to detect and deter cheating. This often includes information about customers or suppliers. For example, the industrial copper tubes cartel “appointed market leaders among each other for the allocated territories and customers to collect market information and monitor customer visits.”⁶¹ The methionine cartel members shared information about raw material suppliers, exchanging data “concerning supplies of the main materials for methionine, capacities [and] rates of operation of plants.”⁶²

Given that monitoring is easier with fewer firms, one would think that cartels are most likely to occur in highly concentrated industries. Surprisingly, this is not always the case.⁶³ Slightly more than half of the cartels discussed here had fewer than six members.⁶⁴ Where there were large numbers of firms, trade associations often played an active role in the cartel. This was historically common in U.S. price-fixing conspiracies.⁶⁵ In the post-World War II period, U.S. trade associations, run by professionals independent of any particular firm and well aware of the laws against price fixing, have been reluctant to involve themselves with explicit collusion. Trade association participation still prevails in Europe. Trade associations played important roles in organizing or monitoring the activities of a large number of international cartels caught and fined by the EC, while in other cases the trade association meetings merely acted as cover for clandestine cartel meetings.⁶⁶ Executives in firms that were cartel ringleaders were often in leadership roles in European trade associations.

Cartels also may rely on other kinds of third parties to collect, verify, and aggregate information. Fides, a Swiss trust company, served this role for several European cartels. According to a 1998 EC decision, the European cartonboard (or paperboard) cartel was

supported by an information exchange organised by Fides, a secretarial company, whose registered office is in Zurich, Switzerland. The Decision states that most of the members of the PG Paperboard sent periodic reports on orders, production, sales and capacity utilisation to Fides. Under the Fides system, those reports were collated and the aggregated data were sent to the participants.⁶⁷

60. *Commission Decision—Cement*, *supra* note 55, at 89 (describing how the cartel monitored detailed tables “giving each exporting country’s exports to each importing country . . . [as well as data] showing export forecasts and outturns for each year and each country”).

61. Commission Decision of 16 December 2003 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case C.38.240—Industrial Tubes), ¶ 11.

62. *Id.* ¶ 71.

63. See Levenstein & Suslow, *What Determines Cartel Success?*, *supra* note 8, at 57-61 (for further discussion of previous findings on the relationship between concentration and the likelihood of collusion).

64. Levenstein & Suslow, *supra* note 40, at 15 (stating that “23 of the 41 cartels had five or fewer members”).

65. Levenstein & Suslow, *supra* note 40, at 27.

66. *Id.* at 26 (“[O]ver one-fourth [of the 41 cartels] had active trade association involvement. Another fifth used meetings of their trade association as cover for cartel meetings.”).

67. Proceedings of the Court of Justice and the Court of First Instance of the European Communities (Case T-334/94, *Sarrió SA v. Commission of the European Communities*, 14 May 1998), at 4.

In other cases, cartel members literally changed industry structure in order to reduce uncertainty in their markets. For example, the preinsulated pipe cartel engaged in “swap deals” to rationalize production and reduce the number of producers in any given market. Pan-Isovit had a small share in the Netherlands, and so agreed to exit the market, in exchange for a greater share of the market in Italy. Another cartel member, Isoplus, did the reverse swap, leaving Italy in exchange for a larger share in the Netherlands. The EC decision describes the transaction as follows:⁶⁸

Those producers whose market shares in particular countries were considered too low were encouraged or required to withdraw from those markets . . . In return for giving up this business, they received compensation in the form of an increase of their quota allocation in other markets in which they were already present. In practice, the “swap deals” were made on a bilateral basis. Pan-Isovit left the Netherlands and was compensated in Italy; Isoplus was the other way round.

In the sorbates cartel there was a similar agreement between Korean and Japanese producers, in which Japanese producers purchased Korean output in exchange for an agreement from Korean producers to refrain from selling directly in European markets. These kinds of actions to reduce uncertainty may not leave the same trail of evidence that a cartel’s monitoring of sales creates. But it serves a similar function and has potentially much longer term consequences for the effectiveness of competition, as these changes in industry structure may well persist after the demise of the cartel. Similar costs are associated with cartel efforts to create durable barriers to entry, to which we now turn.

3.3. *Creating and enhancing barriers to entry*

At the broadest level, cartels that are unable to limit the behavior of outsiders may suffer from both expansion of production by current producers who are not part of the cartel and by new entry into the industry. Cartels rely on a myriad of tactics, some more, some less effective in achieving the goal of slowing or deterring entry. Where the production process relies on proprietary technology or difficult-to-copy technological knowledge, cartels have taken actions to impede diffusion. For example, both the steel beam and graphite electrode cartels were accused of restricting the flow of technical information to outsiders to prevent the production process learning necessary to compete in global markets.⁶⁹ The preinsulated pipe cartel used quality standards to limit the

68. Commission Decision of 21 October 1998 relating to a proceeding under Article 85 of the EC Treaty (Case No IV/35.691/E-4:—Pre-Insulated Pipe Cartel), ¶ 64 [hereinafter *Commission Decision—Pre-Insulated Pipe*]. See paragraph 79 for explicit statement that Isoplus had “quit the Italian market in return for an increased quota in the Netherlands.”

69. See Charles Goldsmith & Martin du Bois, *EU Penalizes 16 Steel Firms Over Pricing*, WALL ST. J., Feb. 17, 1994, at A1 (““This was a situation where everything that could be infringed was infringed by these companies,” said the European Union’s competition commissioner, Karel Van Miert . . . One element of the cartel, he said, involved restricting the flow of information on the steel sector in order to freeze out any new competitors.”); Press Release, U.S. Dep’t of Justice, *Japanese Subsidiary Charged with International Conspiracy to Fix Prices for Graphite Electrodes in U.S.* (Feb. 23, 1998) (where one of the charges listed is that the conspirators “agreed to restrict non-conspirator companies’ access to certain graphite electrode manufacturing technology”).

introduction of a new technology.⁷⁰ In several cases, cartel members agreed to purchase fringe competitors. For example, organic peroxide producers “agreed that each of them would purchase such a (new) competitor. Akzo agreed to acquire the organic peroxide business of Nobel and Enichem. Laporte would purchase Aztec. Atochem would take over [. . .]. Only the latter did not occur.”⁷¹

In other cases, cartels resort to the same tactics that dominant firms sometimes use to deter competition. A common approach is the tried and true practice of John D. Rockefeller and Standard Oil, predatory pricing, often followed by acquisition, to force rivals out of the market.⁷² Citric acid producers “tried to regain some of the customers lost to the Chinese suppliers through a concerted and carefully targeted price war.”⁷³ Indian graphite electrode producers claimed that cartel members dumped graphite electrodes in India in retaliation for increasing exports from India.⁷⁴ Cartels have also been known to follow the example of monopolies in using sophisticated vertical practices to prevent or limit entry. As in the classic monopoly vertical price squeeze by Alcoa, cartels may raise the price of upstream inputs in order to make entry at the downstream level unprofitable.⁷⁵ For example, the sorbates cartel controlled both the production of upstream sorbic acid and downstream potassium sorbates. The production process for the former required more technologically complex knowledge and therefore had higher “natural” barriers to entry. In order to limit competition from fringe producers of potassium sorbates, the cartel raised the price of sorbic acid, maintaining a difference of .5 Deutschmarks between the two.⁷⁶ In other cases, cartels simply refuse to supply necessary inputs to noncartel producers. For example, in 1992 members of the electrical and mechanical carbon cartel reacted to an East German competitor that had entered the market after 1990 unification by refusing to supply any graphite to the

70. *Commission Decision—Pre-Insulated Pipe*, *supra* note 68, at ¶¶ 113-14 (stating that Løgstør’s new continuous production process “with savings of 15 to 20% in production costs” was a source of tension in the cartel, and that “ABB’s internal documentation confirms that compliance with standards was being used as a means of keeping up price levels”).

71. Commission Decision of 10 December 2003 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/E-2/37.857—Organic Peroxides), ¶ 271.

72. IDA M. TARBELL, *THE HISTORY OF THE STANDARD OIL COMPANY* 154-66 (1933).

73. Press Release, Eur. Comm’n, Commission Fines Five Companies in Citric Acid Cartel (Dec. 5, 2001).

74. See Levenstein & Suslow, *supra* note 7, at 840-41.

75. See generally Martin K. Perry, *Forward Integration by Alcoa: 1888-1930*, 29 J. INDUS. ECON. 37, 47 (1980) (discussing Alcoa’s forward integration into fabricating and arguing that this was not undertaken primarily to promote new products but instead as a price discrimination policy). For a discussion of similar practices in the steel industry, see Walter Adams & Joel B. Dirlam, *Steel Imports and Vertical Oligopoly Power*, 54 AM. ECON. REV. 626, 639-40 (1964) (discussing the pricing strategy of vertically integrated steel producers).

76. Commission Decision of 1 October 2003 relating to a proceeding pursuant to Article 85 of the EC Treaty and Article 53 of the EEA Agreement (Case COMP/E-1/37.370—Sorbates), ¶¶ 57, 91 & 215 (detailing that sorbic acid is “a technically complex substance to produce, whilst other sorbate products are the result of a technically simpler conversion step from sorbic acid,” that Hoechst [cartel member] “proposed to establish a price difference between sorbic acid and potassium sorbate and instituted it unilaterally in Europe as an experimental initiative. In autumn 1994, it convinced the Japanese producers to establish it as well,” and that there was a “difference of DEM 0.50” between the two prices).

entrant and by “systematically undercutting it with all customers, so that it would not be able to sell anywhere.”⁷⁷

Finally, cartel members may use government intervention to limit entry. In a particularly egregious case, ferrosilicon producers formed a cartel in 1989 and proceeded to use antidumping laws in the United States and Europe to bar entry by noncartel members.⁷⁸ They intentionally reacted passively to ever-increasing imports, maintaining the cartel price and allowing importers a larger market share. They then filed an antidumping complaint, demonstrating harm to domestic producers from “underpriced” imports. In 1993 antidumping duties were imposed against five countries.⁷⁹

4. Conclusion

Despite strong antitrust laws against price fixing in most countries and increasingly strong enforcement, international cartels continue to operate. International cartels have been uncovered in the past 15 years in a wide variety of intermediate goods and services. Those international cartels that survive for any length of time do so by investing in elaborate communication and information-sharing mechanisms. These investments reduce uncertainty and help cartels escape from the Prisoners’ Dilemma that undermines cartel stability. They use elaborate compensation schemes to deter cheating without resorting to expensive and destabilizing price wars. These cartels last on average seven and a half years and have the potential to cause significant harm to consumers, via increased prices, and significant harm to the nature of competition in the marketplace, if the cartel successfully impedes entry.

77. *Commission Decision—Electrical, Mechanical Carbon, & Graphite Products*, *supra* note 45, ¶ 157.

78. See Richard J. Pierce, Jr., *Antidumping Law as a Means of Facilitating Cartelization*, 67 ANTITRUST L.J. 725, 726-27 (2000) (describing how ferrosilicon producers, in response to increasing international trade “refused to sell at prices below the cartel price and withdrew capacity from the market,” and then later “cartel members filed antidumping complaints in both the United States and in the EEC against non-cartel producers in five countries”).

79. The duties were lifted in 1999. See Thomas S. Jones, *Silicon-1999*, U.S. GEOLOGICAL SURV. MIN. Y.B. 681, 683 (1999) (“In August, in a significant and unique action, the U.S. International Trade Commission reversed its 1993-94 determinations of injury to the domestic industry from imports of ferrosilicon from Brazil, China, Kazakhstan, Russia, Ukraine, and Venezuela. Conspiracy by domestic producers to fix prices was stated by the Commission as a major factor influencing its redetermination . . .”).