

# CONTEMPORARY INTERNATIONAL CARTELS AND DEVELOPING COUNTRIES: ECONOMIC EFFECTS AND IMPLICATIONS FOR COMPETITION POLICY

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## I. INTRODUCTION

During the 1990s, the U.S. Department of Justice and the European Commission prosecuted over forty international cartels for illegal price fixing in the United States and Europe. On the civil litigation front, almost all of the cases involving these cartels have been filed in the United States with its treble damages provisions. In many cases, these cartels sell to markets in developing countries, but prosecutions and civil litigation in those countries have been rare. Thus, in a sense, most antitrust litigation against such cartels has been attacking the symptoms of the problem rather than attacking this worldwide phenomenon across the international front where these companies work. Yet, if the international aspects of these cartels cannot be better addressed, we run the risk, as Justice Stewart explained, that “persons doing business both in this country and abroad might be tempted to enter into anticompetitive conspiracies affecting American consumers in the expectation that the illegal profits they could safely extort abroad would offset any liability to plaintiffs at home.”<sup>1</sup>

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<sup>1</sup> Pfizer, Inc. v. Government of India, 434 U.S. 308, 313 (1978).

In this article, we attempt to demonstrate the widespread effects that these international cartels have on the international trade of developing countries, on developing country consumers, and on developing country producers. We find that the potential impact of these cartels is large and that the existing indigenous policy institutions of developing countries are limited in their ability to address or prevent this kind of harm to their economies. We discuss policy remedies that could ameliorate this situation. However, any definitive estimate of the impact of these cartels on developing countries is undermined by the paucity of the data available to analyze this question. Thus, an important policy change must be to improve the data collection and the sharing of information between the existing competition policy authorities in the United States and the European Union and those in other countries.

There are a wide variety of organizations that may reasonably be described as international cartels. The focus of this article is explicit price-fixing or market division agreements, known in policy circles as “hard-core” cartels, among private producers from multiple countries. Virtually all such agreements are illegal in the United States and the European Union. They are illegal in many other countries as well, although laws and enforcement vary. While other types of cartels, such as purely domestic cartels, private export cartels, and state-run cartels, can have an important impact on economic activity, the analysis in this article is limited to private hard-core international cartels.<sup>2</sup> Finally, tacit collusion, which we also exclude from this discussion, can have equivalent economic effects to explicit price fixing, but is generally treated very differently under most current competition policy rules.

As with the majority of private international cartels over the last two centuries, most of the cartels recently caught in the antitrust net of the U.S. or EU competition authorities are made up of producers in industrialized countries. These cartels produce sophisticated manufactured goods or services; their members are largely multinational corporations based in industrialized countries. While some of these cartels lasted only a few months, several lasted many years and, therefore, may have had an impact not just on short-term transfers from consumers to producers, but also on the structure of the industry.

It is not surprising that most prior studies of the impact of cartels have focused on the better-documented effects on wealthy, industrialized

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<sup>2</sup> International cartels with significant state involvement, such as OPEC, can certainly have important economic effects. Their goals, however, are much more complex than private cartels, including not only the maximization of joint profits, but economic stability and international political influence as well. The economic models that we use here, which presume a simple profit-maximizing objective function, are inadequate to address the

countries.<sup>3</sup> Most cartel member firms come from developed countries, and the largest markets targeted by the cartels are usually in developed countries. Many of these countries have a long history of opposition to price fixing, so that their governmental investigations are a source of information on the impact of these cartels on their domestic markets. More surprising perhaps is that there has been relatively little activity on the part of developing country governments or developing country consumers to respond to these cartels even after they have been shown to exist. This contrasts with the actions of, e.g., the Canadian government, which has consistently pursued anticompetition cases against firms that have been investigated first by either the U.S. Department of Justice (DOJ) or the European Commission (EC). This apparent complacency on the part of developing country governments is changing, with actions or investigations recently undertaken by the competition authorities in Brazil, Korea, and Mexico.<sup>4</sup> There have also now been several suits brought in the United States by consumers from developing countries, but their ability to pursue private actions against multinationals is unclear.<sup>5</sup> There are a variety of reasons—legal, political, and economic—why there has been only limited response from developing countries to these cartels. But, as this article demonstrates, a lack of impact on developing countries is probably not one of them.

We examine two aspects of the effects of private international cartels on developing countries. First, in Part II, we create a quantitative snapshot

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functioning and impact of state-run international cartels. Thus, we have chosen to exclude them from our analysis.

<sup>3</sup> See OECD, *HARD CORE CARTELS 6* (2000), available at <http://www.oecd.org/pdf/M000013000/M00013729.pdf>; see also Mario Monti, *Fighting Cartels: Why and How? Why Should We Be Concerned with Cartels and Collusive Behavior?*, Address at the Third Nordic Competition Policy Conference (Sept. 11, 2000), available at [http://europa.eu.int/comm/competition/speeches/index\\_2000.html](http://europa.eu.int/comm/competition/speeches/index_2000.html); INT'L COMPETITION POLICY ADVISORY COMM., U.S. DEP'T OF JUSTICE, *FINAL REPORT* (2000) [hereinafter *ICPAC FINAL REPORT*].

<sup>4</sup> Brazil has taken action against the lysine and vitamins cartels and is investigating the graphite electrodes cartel. Korea has fined the members of the graphite electrodes cartel. These investigations are discussed below, in Parts III.C. and V.A. The Mexican competition authority has fined producers in the lysine, citric acid, and vitamins cartels. See Working Group on the Interaction Between Trade and Competition Policy, World Trade Organization, *Hard Core Cartels: Contribution by Mexico*, WTO/WGTCP/W/196 (June 28, 2002), available at <http://www.economia-snci.gob.mx/portal/foros/omc/w196.doc> [hereinafter *Hard Core Cartels: Mexico*]; *Alleged Commission of Absolute Monopolistic Practices in the Vitamin Markets in Mexico*, Resolution of the Fed. Comm. on Competition, Doc. IO-09-99 (June 26, 2002), available at <http://sp.cfc.gob.mx:8080/cfc01/Documentos/ing/Resoluciones/Investigaciones/June2002/IO-09-99.htm>.

<sup>5</sup> The U.S. Supreme Court has granted certiorari to resolve a dispute between the circuit courts of appeal on whether a foreign plaintiff may file a suit in this country under the Sherman Act for damages that may have occurred solely outside the United States but where the conduct also injures other consumers in this country. *Empagran S.A. v. F. Hoffmann-LaRoche, Ltd.*, 315 F.3d 338 (D.C. Cir. 2003), *cert. granted*, 124 S. Ct. 966 (2003). See discussion *infra* Part V.B.

of the effect of these international cartels by taking a cross-section of international cartels prosecuted by the United States and European Union in the 1990s and asking, how much trade was there in industries affected by these price-fixing conspiracies? By calculating the imports of “cartel-affected” goods, we get a clearer sense of the magnitude of the effect that these cartels had on developing countries. We find that in 1997, developing countries imported \$51.1 billion in goods from industries that saw international cartel activity at some point during the 1990s. Second, in Part III, we provide a qualitative analysis by examining in more detail the potential effects on developing countries’ producers, either as competitors to, or collaborators with, these international cartels. We consider the creation of barriers to entry by cartels and their impact on developing country producers and potential producers. We also examine the methods used to induce developing country producers to cooperate with the cartel, as well as the effect on developing country consumers. Third, in Part IV, we develop these issues in more detail by focusing on the graphite electrodes cartel.

Finally, in Part V, we examine a range of policy alternatives open to developing countries and their consumers to address the problem of international cartels. While we believe that the effects of cartels are not conceptually different between developing and developed countries, our goal in this article is to document those effects on developing countries that have largely been ignored in discussions of international cartels. We conclude that a more comprehensive approach to promoting competition is necessary. Litigation, both in developing and developed countries, could provide broader opportunities for foreign consumers to pursue remedies against these cartels. Moreover, the establishment of formal and informal bilateral ties between competition agencies has been an important step in this direction. The recently created International Competition Network is also designed to increase cooperation among a large number of competition agencies. But current regulatory institutions are neither international enough nor sufficiently focused on promoting competition, rather than simply prohibiting particular anti-competitive tactics, to assure that global markets will be competitive and open to new producers.

## II. QUANTITATIVE ESTIMATE OF DEVELOPING COUNTRY TRADE AFFECTED BY 1990S INTERNATIONAL CARTELS

The DOJ and the EC have successfully prosecuted numerous international price-fixing conspiracies over the past decade. The surge in U.S. prosecutions of international cartels derives at least in part from the revision and expansion of the Antitrust Division’s corporate amnesty

program in 1993. The number of corporations coming forward and seeking amnesty rose from roughly one corporation per year to one per month, and that rate appears to be increasing.<sup>6</sup> On the heels of this increased enforcement by the United States, both the European Union and some non-European countries have strengthened their anti-cartel laws, stepped up enforcement, and revised their own corporate amnesty and leniency programs.<sup>7</sup>

#### A. CONTEMPORARY INTERNATIONAL CARTEL SAMPLE

From these recent international price-fixing cases, we have created a sample of forty-two successfully prosecuted international cartels on which the cross-section analysis in this paper is based. We believe that this sample is close to the universe of international cartels that have been successfully prosecuted by the United States or the EC for fixing prices during the 1990s.<sup>8</sup> Table 1 summarizes the dates of cartel operation, the legal entity (i.e., the U.S. or the EC) that prosecuted the case, the country of origin of the indicted firms (with developing country participants in italics), those markets known to have been targeted by the cartel's conspiracy, and a measure of market concentration, where available.<sup>9</sup>

<sup>6</sup> See U.S. DEP'T OF JUSTICE, 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 at 8 (Mar. 27, 1996), available at 1996 WL 149352. In a recent speech, the then-Acting Assistant Attorney General for Antitrust stated: "The [leniency] application rate has surged over the last year to better than two per month, and to over four per month in the first three months of the 2003 fiscal year." R. Hewitt Pate, The DOJ International Antitrust Program—Maintaining Momentum, Address Before the ABA Section of Antitrust Law 2003 Forum on International Competition Law 6 (Feb. 6, 2003), available at <http://www.usdoj.gov/atr/public/speeches/200736.htm>. See also Howard Adler Jr. & David J. Laing, *The Explosion of International Criminal Antitrust Enforcement*, BUS. CRIMES BULL.: COMPLIANCE & LITIG., Mar. 1997, at 1 ("In 1991, only 1 percent of corporate defendants were foreign and no foreign individuals were charged that year. From July 1996 to January 1997, 20 percent of all corporations and 27 percent of all individuals charged were foreigners.").

<sup>7</sup> See, e.g., Michael Reynolds, *EU Briefings*, 18 INT'L FIN. L. REV. 48 (1999) (announcing the decision within the European Commission to create a new unit to fight cartel activity). For a brief description of leniency policies introduced by the European Commission and Britain's Office of Fair Trading, see *Cracking Down on the Cartels*, Economist.com/Global Agenda (Apr. 3, 2003), at [http://economist.com/agenda/displayStory.cfm?story\\_id=1602123](http://economist.com/agenda/displayStory.cfm?story_id=1602123).

<sup>8</sup> Additional cartels have recently been discovered in certain product categories that are not covered in our sample. For example, there have been indictments and guilty pleas in the "carbon brush and collector," "extruded graphite," and "polyester staple fiber" cartels since our data analysis was completed. See Pate, *supra* note 6, at 4; Press Release, European Commission, Commission Fines Seven Companies in Specialty Graphites Cartels (Dec. 17, 2002); Press Release, U.S. Dep't of Justice, Company Agrees to Plead Guilty and Pay \$28.5 Million Fine for Participating in Polyester Staple Cartel (Oct. 31, 2002).

<sup>9</sup> This sample, like its intellectual antecedents, may be biased as a result of its dependency on prosecution as a sample selection criterion. See Richard A. Posner, *A Statistical Study of Antitrust Enforcement*, 13 J.L. ECON. 365 (1970); George A. Hay & Daniel Kelley, *An*

Cartel activity has occurred in a variety of industries—from commodities like cement and citric acid to specialized services like fine arts auctions and wastewater treatment facility construction. Chemical products top the list with thirteen different cartels. The next largest product category is transportation (seven cartels in our sample), followed by steel (four), carbon and graphite products (three), plastics and paper (two each), and several miscellaneous goods and services.

The mean duration of these cartels is just over five years, with a median length of roughly four years, but those figures hide significant variation. In this sample, the variance of cartel duration is over twenty years. Cartel duration ranges from a low of two months (ferry operators cross-channel freight cartel) to twenty years (Central West African shipping cartel). Of the forty-two cartels in the sample, twenty-two (52 percent) are believed to have had regional effects (e.g., United States, Europe, or specific developed countries). Sixteen cases (38 percent) were reported to have either direct effects on developing countries, “international” effects, effects in “U.S. and elsewhere,” or in “Europe and certain third markets.” (For the remaining 10 percent of the cases, information on the regions in which the cartel had an effect—or an intended effect—was not available.) The last column of Table 1 shows reported market concentration figures. Where it is possible to find market share or concentration information, we find that the typical contemporary international cartel operated in a highly concentrated market.

Competition agencies and the press occasionally report increases in price allegedly resulting from these cartels. The reported price increases vary widely. At the low end, for example, we have a reported price increase of 10 percent for the thermal fax paper cartel, which was formed as the industry was declining and lasted for less than a year.<sup>10</sup> At the high end there is the stainless steel cartel, which reportedly almost doubled prices.<sup>11</sup> This cartel lasted slightly more than one year (from January 1994 to March 1995) and involved six European steel companies. The industry was investigated for cartel activity after buyers complained to the European Commission about the rapid increase in prices.<sup>12</sup>

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*Empirical Survey of Price Fixing Conspiracies*, 17 J.L. ECON. 13 (1974); Peter Asch & Joseph J. Seneca, *Characteristics of Collusive Firms*, 23 J. INDUS. ECON. 223 (1975).

<sup>10</sup> Robert L. Jackson, *Justice Department Announces Breakup of Price-Fixing Conspiracy on Fax Paper*, L.A. TIMES, July 15, 1994, at 3, available at 1994 WL 2186420.

<sup>11</sup> Press Release, European Commission, Commission Fines Stainless Steel Cartel (Jan. 21, 1998).

<sup>12</sup> Graham Hind, *English Cutlery “Hit by Cartel”*, TIMES (London), Aug. 21, 1994, available at 1994 WL 9149991.

**Table 1**  
**Recent International Cartels Investigated by the U.S. Department of Justice and the European Commission**

<i>Industry</i>	<i>Start<sup>1</sup></i>	<i>End</i>	<i>Conviction</i>	<i>Country of Origin of Indicted Firms (Developing Country Cartel Members in Italics)</i>	<i>Country(ies) Known to Be Affected<sup>2</sup></i>	<i>Market Concentration<sup>3</sup></i>
Aluminum Phosphide	Jan 1990	Nov 1990	DOJ	<i>Brazil, Germany, India, US</i>	US	US: C4 = 90%
Beer	1993	1998	EC	Belgium, France	Belgium	Belgium: C2 = 70%
Bromine Products	Jul 1995	Apr 1998	DOJ	Israel, US	US	World: C3 = 76%
Cable-Stayed Bridges	Sep 1996	Dec 1997	DOJ	France, US	US	
Carbon Cathode Block	Feb 1996	Dec 1997	DOJ	Germany, Japan, US	US and elsewhere	
Carbonless Paper	1992	1995	EC	France, Germany, Spain, <i>South Africa</i> , UK	Europe	Europe: Cartel Share = 85-90%
Cartonboard	1986	1991	EC <sup>4</sup>	Austria, Canada, Finland, France, Germany, Italy, Netherlands, Norway, Spain, Sweden, UK, US (via European subsidiaries)	Europe	Europe: Cartel Share = 80%
Cement	1983	Aug 1994	EC	33 European firms, 8 national cement trade associations, and the European Cement Association	Europe	Europe: C6 = 50%
Citric Acid	1991	1995	DOJ & EC	Austria, France, Germany, Netherlands, Switzerland, US	International	World: C4 = 60% W. Europe: C4 = 85%

*Continued*

**Table 1 Continued**  
**Recent International Cartels Investigated by the U.S. Department of Justice and the European Commission**

<i>Industry</i>	<i>Start</i> <sup>1</sup>	<i>End</i>	<i>Conviction</i>	<i>Country of Origin of Indicted Firms (Developing Country Cartel Members in Italics)</i>	<i>Country(ies) Known to Be Affected</i> <sup>2</sup>	<i>Market Concentration</i> <sup>3</sup>
Explosives	1988	1992	DOJ	Norway, UK, US	US	
Ferrosilicon	Oct 1989	Jun 1991	DOJ	Germany, Norway, US	International	US: C4 = 100%
Ferry Operators (Adriatic Sea)	1987	1994	EC	Greece, Italy	Greece, Italy	
Ferry Operators (Cross-Channel Freight)	Oct 1992	Dec 1992	EC	France, Netherlands, Sweden, UK	Europe	
Fine Arts	Apr 1993	Dec 1999	DOJ (EC issued "Statement of Objections" on April 19, 2002)	UK, US	Australia, Japan, US, Europe	World: C2 = 95%
Graphite Electrodes	Jul 1992	Jun 1997	DOJ & EC	Germany, Japan, US	International	US: C4 = 93% Canada: C2 = 90% World: Cg = 80%
Isostatic Graphite	Jul 1993	Feb 1998	DOJ	Japan, US	Canada, US	World: 6 major firms
Laminated Plastic Tubes	1987	1996	DOJ	Switzerland, US	US	US: C3 = 95%
Lysine	Jun 1992	Jun 1995	DOJ & EC	Germany, Japan, <i>South Korea</i> , US	International	World: C3 = 95% in late 1980s Mexico: C2 = 90%
Maltol	Dec 1989	Dec 1995	DOJ	US + unnamed firms	US and elsewhere	World: C2 = 80-90%
Marine Construction Services (Heavy-Lift)	1993	1997	DOJ	Netherlands, US	US and elsewhere	World: C3 = 100

Marine Transportation Services (Heavy-Lift)	1990	1995	DOJ	Belgium, US	US and elsewhere	
Monochloroacetic Acid	Sep 1995	Aug 1999	DOJ	France, Germany, Netherlands	NA	World: C4 = 75%
Nucleotides	Jul 1992	Aug 1996	DOJ	Japan, South Korea	NA	World: C1 = 45%
Organic Peroxides	1997	1998	DOJ & EC	DOJ: France + unnamed firms EC: France, Netherlands, Spain, UK	NA	World: C2 = 60%
Plastic Dinnerware	Nov 1991	Apr 1992	DOJ	Canada, US	US	US: Cartel share, C2 = 90%
Shipping (Central West African)	1972	1992	EC (conviction, but fine overturned)	Zaire, Angola, Northern part of continental Europe, excluding UK	NA	Shipping conference held more than 90% market share
Shipping (Far East)	1991	1994	EC	30 countries (including Malaysia, South Korea)	International	Shipping conference held 80% market share between northern Europe and Far East
Shipping (French-African)	1975	1992	EC	12 countries (including Senegal, Cameroon)	France, Senegal, Gabon, Central African Republic, Niger, Burkina, Faso, Guinea, Congo, Mali, Togo, and Cameroon	Shipping conference held 90% market share between France and West Africa

*Continued*

**Table 1 Continued**  
**Recent International Cartels Investigated by the U.S. Department of Justice and the European Commission**

<i>Industry</i>	<i>Start<sup>1</sup></i>	<i>End</i>	<i>Conviction</i>	<i>Country of Origin of Indicted Firms (Developing Country Cartel Members in Italics)</i>	<i>Country(ies) Known to Be Affected<sup>2</sup></i>	<i>Market Concentration<sup>3</sup></i>
Shipping (North Atlantic)	1994	1996	EC	11 countries (including <i>Poland</i> )	International	Shipping conference held between 70–80% of trans-North Atlantic container market
Sodium Erythorbate	Jul 1992	Dec 1994	DOJ	US + unnamed firms	US	US: C2 = 90%
Sodium Gluconate	Aug 1993	Jun 1995	DOJ & EC	France, Japan, Netherlands, Switzerland, US	International	Cartel members were world's major producers
Sorbates	1979	1996	DOJ & EC	DOJ: Germany, Japan, US EC: Germany, Japan	International	World: C2 = 71%
Stainless Steel	Jan 1994	Mar 1995	EC	Belgium, France, Germany, Italy, Spain, Sweden, UK	Europe	World: C4 = 52%
Steel Beam	1988	1994	EC	Belgium, France, Germany, Luxembourg, Spain, UK	W. Europe	Europe: C10 = 66%
Steel Heating Pipe (Pre-Insulated Pipe)	late 1990	1996	EC	Austria, Denmark, Finland, Germany, Italy, Sweden, Switzerland	Europe	W. Europe: C4 = 80%
Steel Tube, Seamless	1990	1995	EC	France, Germany, Italy, Japan, UK	Europe and "certain third markets"	Europe Cartel Share = 19%
Sugar	Jun 1986	Jul 1990	EC	Denmark, Ireland, UK	UK	Great Britain: C2 = 90%

Tampico Fiber	Jan 1990	Apr 1995	DOJ	Mexico, Netherlands, US	US	Cartel members had “overwhelming” share of US market
Thermal Fax Paper	1991	1992	DOJ (1 Japanese firm went to trial and won)	Japan, US	North America	US: C3 = 40-45%
Vitamins	Jan 1990	Feb 1999	DOJ & EC	Canada, Germany, Japan, Switzerland, US	International	World: C3 = 75% for bulk vitamins
Wastewater Construction	Jun 1988	Jan 1995	DOJ	Germany, Switzerland, US	Egypt	
Zinc Phosphate	Mar 1994	May 1998	EC	France, Germany, Norway, UK	Europe	Europe cartel share = 90%

<sup>1</sup>Cartel dates are approximate. In particular, indictments of different firms may list different conspiracy dates. Also, for those cartels prosecuted by both the DOJ and EC, we list the DOJ dates only; EC cases will often have different dates. In general, the information presented in this table was gathered from various industry and government sources, including DOJ and EC press releases, European Court of Justice decisions, and industry and business news sources, such as *American Metal Market*, *Chemical Marketing Reporter*, *European Business Week*, *International Cement Magazine*, *Oil and Gas Journal*, and *Wall Street Journal*. Specific sources are available from the authors upon request.

<sup>2</sup>Information on “Country(ies) Known To Be Affected” reported in this table comes from DOJ and EC press releases, indictments, and rulings, as well as articles in the press. These documents, of course, focus on the effects in either the United States or Europe. In most cases there is no information from these sources on who purchased from the cartel.

<sup>3</sup>All concentration and market share figures are approximate. Wherever possible, concentration measures date to the period of the cartel. In other instances, the data were only available for more recent years. References are available from the authors.

<sup>4</sup>Companies appealed, but Court of First Instance confirmed the basic decision, although annulling minor parts of the decision.

B. ESTIMATING THE VOLUME OF IMPORTS OF  
CARTELIZED GOODS BY DEVELOPING COUNTRIES

In order to determine whether developing countries were consumers of one of the cartelized products in the sample, we matched the products in Table 1 with import-export data for the sample period. The trade data come from Robert Feenstra's *World Trade Flows* database.<sup>13</sup> The data include trade flows (imports and exports) for all countries, classified according to the Standard International Trade Classification (SITC), Revision 2.<sup>14</sup> The data include only trade in goods. The list of developing countries is taken from the World Bank's *World Development Report 2002*.<sup>15</sup>

Table 2 summarizes import data for thirty-two of the cartelized products in Table 1 for 1997, the most recent year for which trade data are available. We report the amount of imports of "cartel affected" production in three different ways: as a percentage of total imports, as a percentage of GDP, and as total dollar values. The sample size falls from forty-two to thirty-two for two reasons. First, the data on trade flows exclude services, so cartels that fixed prices on services were ruled out for further analysis. Second, goods were dropped from the sample where the data appeared to be misclassified or aggregated to such a level that no reasonable match to the cartel product could be made.

Table 2 contains results using the best available data for each product in the sample. Whenever possible, the narrower 4-digit SITC product code was used to track the trade data, but if the data were missing for that category, we then used the broader 3-digit code to categorize the cartel product. For example, international trade data for citric acid are missing; at the 4-digit level, the entries are zeroes. In three cases, explosives, nucleotides, and zinc phosphates, we do not even have 3-digit

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<sup>13</sup> ROBERT FEENSTRA, *WORLD TRADE FLOWS, 1980–1997, WITH PRODUCTION AND TARIFF DATA* (Center for Int'l Data, Univ. of Cal. at Davis 1999).

<sup>14</sup> Countries that were formerly part of the Soviet Union are conspicuous by their absence from *World Trade Flows*. Thus, the data on imports, exports, and Gross Domestic Product (GDP) presented here simply exclude those developing countries that were formerly a part of the Soviet Union. There are also cases where *World Trade Flows* grouped smaller countries together (especially smaller island countries). We do not believe that this leads to any substantial misclassification in the data presented here.

<sup>15</sup> The World Bank classifies developing countries in three groups: low income, lower-middle income, and upper-middle income; non-developing countries are classified as "high income" countries. Examples of "low income" countries are Armenia, India, and Vietnam; examples of "lower-middle" are Albania, China, and Thailand; and, examples of "upper-middle" are Argentina, Czech Republic, and Turkey. GDP figures are calculated from World Bank data (<http://www.worldbank.org/data/countrydata/countrydata.html>). After eliminating countries for which trade or GDP data are not available, we include in our data set 51 low-income countries, 35 lower-middle income countries, 24 upper-middle income countries, and 35 high-income countries.

data. We suspect that there is misclassification in the trade data. Of course, even if we did have import data for citric acid, they would understate the full impact of the citric acid cartel on developing country consumers who pay higher prices not only for raw citric acid, but also for a wide range of citric-acid containing goods, such as soft drinks (its largest end use), processed food, detergents, pharmaceuticals, and cosmetics. We can, however, obtain trade data for the broader category of “carboxylic acids and their anhydrides and halides.” This latter category is so broad that it contains at least five different products that have been affected by cartels, as well as many other products with no recorded cartel activity. However, given that it is the best available 3-digit category for citric acid, we use data on trade in “carboxylic acids and their anhydrides and halides” in Table 2.

There are other data problems as well. The best SITC category for graphite electrodes, a cartel that we discuss in detail below, is, unfortunately, “otherwise unclassified electrical equipment.” This broader category includes more than one cartel product, as carbon cathode blocks also fall into this same catchall. The same is true of the seamless steel tube cartel trade data match. The SITC category (“seamless tubes and pipes; blanks for tubes and pipes”) is much broader than the oil and gas goods that were included in this particular conspiracy. However, there have been recent EC decisions convicting an overlapping set of steel producers for fixing the price of steel heating pipes, steel beams, pre-insulated pipes, and stainless steel during the late-1980s to mid-1990s.<sup>16</sup> Thus, it is possible that the prices of the other steel pipe products included in these import data have been affected by cartel activity. Some imports included in these figures were certainly produced by firms that were not a party to these agreements. However, given the substantial market shares of the firms in the seamless steel tubes cartel, it is likely that their behavior changed the prices charged by firms that were not a party to or even aware of the price fixing of their larger competitors. Without more information about the secret activities of cartels, as well as cost and demand in each market, it is impossible to determine precisely the quantitative effect of these cartels on developing country incomes.

If we restrict our attention to the sub-sample of nineteen products for which we were able to obtain better-quality 4-digit trade data, we find that the total value of potentially “cartel-affected” imports to developing countries was \$51.1 billion (see last row of Table 2). To put this number

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<sup>16</sup> Charles Goldsmith & Martin du Bois, *European Commission Fines Steelmakers \$116.7 Million*, WALL ST. J. EUROPE, Feb. 17, 1994, at 3; Emma Tucker, *Europe-ABB Fined Heavily over Role in Cartel*, FIN. TIMES, Oct. 22, 1998, at 3; Philip Burgert, *EC Issues Fines for Stainless Price Fixing*, AM. METAL MKT., Jan. 26, 1998, at 2.

**Table 2**  
**Cartelized Goods in Developing Versus High Income Countries, 1997<sup>1</sup>**

<i>Product</i>	<i>All Developing Countries % GDP</i>	<i>High Income Countries % GDP</i>	<i>All Developing Countries Imports (\$000)</i>	<i>High Income Countries Imports (\$000)</i>	<i>All Developing Countries % Imports</i>	<i>High Income Countries % Imports</i>
Aluminum Phosphide	0.0061%	0.0064%	397,799	1,457,120	0.0290%	0.0354%
Beer	0.0119%	0.0178%	787,333	4,096,711	0.0574%	0.0995%
Bromine	0.0269%	0.0293%	1,739,026	6,679,997	0.1268%	0.1622%
Cable-Stayed Bridges	0.0608%	0.0391%	3,974,115	8,952,019	0.2898%	0.2174%
Carbon Cathode Block	0.1932%	0.1342%	12,493,738	30,636,990	0.9111%	0.7439%
Carbonless Paper	0.0222%	0.0206%	1,440,652	4,704,615	0.1051%	0.1142%
Cartonboard	0.0414%	0.0245%	2,685,390	5,595,488	0.1958%	0.1359%
Cement	0.0258%	0.0131%	1,713,716	3,077,450	0.1250%	0.0747%
Citric Acid*	0.0831%	0.0517%	5,373,873	11,798,216	0.3919%	0.2865%
Explosives**	NA	NA	NA	NA	NA	NA
Ferrosilicon	0.0175%	0.0225%	1,131,337	5,130,916	0.0825%	0.1246%
Fine Arts	0.0057%	0.0334%	370,564	7,625,846	0.0270%	0.1852%
Graphite Electrodes	0.1932%	0.1342%	12,493,738	30,636,990	0.9111%	0.7439%
Isostatic Graphite*	0.0831%	0.0517%	5,373,873	11,798,216	0.3919%	0.2865%
Laminated Plastic Tubes	0.7172%	0.0485%	3,571,599	11,070,148	0.7172%	0.0485%
Lysine*	0.0998%	0.1077%	6,493,439	24,586,007	0.4735%	0.5970%
Maltol	0.0069%	0.0060%	445,878	1,359,342	0.0325%	0.0330%
Marine Construction*	0.2068%	0.0744%	13,442,963	17,260,101	0.9803%	0.4191%

Monochloroacetic Acid*	0.0831%	0.0517%	5,373,873	11,798,216	0.3919%	0.2865%
Nucleotides**	NA	NA	NA	NA	NA	NA
Organic Peroxides*	0.0831%	0.0492%	5,373,873	11,798,216	0.3919%	0.2865%
Plastic Dinnerware	0.1578%	0.1351%	10,225,289	30,858,496	0.7457%	0.7493%
Sodium Erythorbate*	0.0831%	0.0880%	5,366,674	20,070,815	0.3914%	0.4873%
Sodium Gluconate*	0.0831%	0.0517%	5,373,873	11,798,216	0.3919%	0.2865%
Sorbates*	0.0831%	0.0517%	5,373,873	11,798,216	0.3919%	0.2865%
Stainless Steel*	0.3642%	0.1969%	23,558,242	44,930,416	1.7180%	1.0909%
Steel Beam	0.0322%	0.0222%	2,093,764	5,057,488	0.1527%	0.1228%
Steel Heating Pipe	0.0593%	0.0231%	3,852,942	5,264,820	0.2810%	0.1278%
Steel Tube, Seamless	0.0593%	0.0231%	3,852,942	5,264,820	0.2810%	0.1278%
Sugar	0.0477%	0.0110%	3,194,315	2,517,935	0.2329%	0.0611%
Tampico Fiber*	0.0015%	0.0013%	97,350	307,625	0.0071%	0.0075%
Thermal Fax Paper	0.0618%	0.0561%	4,007,146	12,801,473	0.2922%	0.3108%
Vitamins	0.0148%	0.0127%	956,633	2,889,761	0.0698%	0.0702%
Wastewater Construction*	0.0823%	0.0459%	5,329,002	10,483,064	0.3886	0.2545%
Zinc Phosphate**	NA	NA	NA	NA	NA	NA
<i>Total</i>	1.7679%	1.2214%	114,742,779	279,142,859	8.3677%	6.7776%
<i>Total (4 digit industries)</i>	0.7864%	0.6163%	51,107,121	140,754,596	3.7270%	3.4174%

<sup>1</sup>Table 2 uses a combination of 3-digit and 4-digit SITC category matches. The 3-digit codes (annotated with an “\*” and by “\*\*\*” when data was incomplete) were used only when 4-digit data were unavailable. The list of developing countries is taken from World Bank, *World Development Report 2000/2001: Attacking Poverty*, pp. 334–35. As stated on p. 335, “Low income and middle-income economies are sometimes referred to as developing countries.” The column “developing countries” is the sum of “Low Income,” “Low-Middle Income,” “Middle-High Income,” and statistics for the countries of the former Union of Soviet Socialist Republics (not shown). Therefore, the fourth column is *not* the sum of the first three columns.

in perspective, consider that official development assistance (i.e., foreign aid) in 1997 to all developing economies totaled US\$39.4 billion.<sup>17</sup> If the price of these imports increased an average of 10 percent (the lowest reported price increase for this sample of cartels), then without adequate enforcement against international cartels, producers in industrialized, high income, countries could take from developing country consumers in higher prices approximately 15 percent of what their governments donate in foreign aid.

The total figure of \$51.1 billion represents 3.7 percent of all imports to developing countries in 1997 and 0.79 percent of their combined GDP. The impact appears to be largest on the more developed countries of the developing world. Cartel-affected imports made up 3.9 percent of imports and 0.85 percent of GDP for the “upper middle income” countries that have the income and industries that demand and rely on imports of sophisticated intermediate manufactured goods. While the total value of cartel-affected imports is higher for high-income countries (\$140.8 billion compared to \$51.1 billion), these imports represent a smaller proportion of imports (3.4 percent) and GDP (0.6 percent) for richer countries. Of course, in countries where domestic producers belonged to the cartel, production for domestic consumption, which we do not measure, is affected by cartel behavior as well as the imports we do measure.

The data reported in the “Total” row of Table 2 (second-to-last row) is more comprehensive, in that it includes almost all 1990s cartelized goods, but it is also less accurate, because the 3-digit data include trade in many products that were presumably not at all affected by cartel behavior. Thus, these figures present an upper bound to the value of affected trade in these industries. This upper bound for the total value of affected trade is \$114.7 billion of developing country imports, representing 8.4 percent of their imports and 1.7 percent of their GDP.

A slightly different approach to quantifying the trade effects of these cartels is to calculate the *average* annual amount of trade affected during the 1990s (Table 3). For this estimate, we used only the period during which each cartel was known to be active (e.g., 1990–1995) and measured the effect on trade in that industry over those years only. The average annual amount of trade affected in “cartel-affected industries” to developing countries between 1990 and 1997 was \$18.5 billion (including only those industries for which 4-digit data are available), representing 1.9 percent of imports and 0.3 percent of GDP. If one adds to this calculation

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<sup>17</sup> WORLD BANK, WORLD DEVELOPMENT INDICATORS FOR 2001 (CD-ROM, Apr. 2001). The series used was “official development assistance and official aid (current US\$).”

**Table 3**  
**Cartel Affected Imports: Average Statistics for Active Cartels 1990–1997**

		<i>Low Income</i>	<i>Low-Middle Income</i>	<i>Middle-High Income</i>	<i>All Developing Countries</i>	<i>High Income</i>
<i>Value of Cartel-Affected Imports (\$000)</i>	<i>3- and 4-digit</i>	7,520,421	13,881,943	23,930,676	47,043,424	118,135,121
	<i>4-digit only</i>	1,890,044	6,251,263	9,338,353	18,529,824	59,775,867
<i>Value of Cartel-Affected Imports as Percentage of Total Imports</i>	<i>3- and 4-digit</i>	6.2201%	4.1884%	4.8448%	4.7009%	3.5256%
	<i>4-digit only</i>	1.6716%	1.9613%	1.9506%	1.9287%	1.7917%
<i>Value of Cartel-Affected Imports as a Percentage of GDP</i>	<i>3- and 4-digit</i>	0.6517%	1.0646%	0.9516%	0.8717%	0.5904%
	<i>4-digit only</i>	0.2461%	0.4940%	0.3761%	0.3081%	0.3668%

cartels for which only 3-digit data are available, we obtain an upper bound estimate of the size of affected imports equal to \$47.0 billion, representing 4.7 percent of imports and 0.9 percent of GDP. This approach is preferable in some respects to the one above because some of the cartels in the sample were no longer active in 1997. If 1997 trade data are for some reason unrepresentative of the 1990s generally, examining this one year may be misleading. Perhaps more importantly, some of these cartels were active during much of the decade while others were active only briefly. Simply adding together the trade in these different products in one year overstates the effect of cartels that did not last for the entire period. In contrast, the *average* value of affected trade includes trade data for each year only for the cartels that were reported to be active in that particular year. Thus, this second estimate essentially weights the calculation of average imports by the length of the cartel's duration.

As we have emphasized, there are numerous problems with the calculations of cartel-affected trade that we present here. The estimates are, on the one hand, biased downward because we have data on only some of the forty-two known price-fixing conspiracies. At the same time, even our lower estimate of affected trade, including only nineteen products, includes many cases where the trade categories are broader than the products for which prices were fixed by the cartel. We have attempted, by presenting alternative measures, to give the reader an idea of the order of magnitude of the trade affected by international cartels at the end of the twentieth century. While none of these measures is without problems, they all agree that a large amount of trade has occurred in these cartel-affected industries with a potentially large impact on consuming countries. Even with numerous qualifications, it is clear from the magnitude of the total developing country import figures that international cartels have adversely affected a not-insignificant portion of the trade and, therefore, the trade balance and consumption, of developing countries.<sup>18</sup> An important policy advance would be the systematic collection of data to improve upon the estimates available here. In the meantime, a more comprehensive picture of the activities of international cartels and their effects on both consumers and competitors can be derived from a qualitative discussion, to which we turn next.

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<sup>18</sup> Following the industrial organization literature, we focus on trade and consumption, though the impact on the trade balance is not an unimportant issue in a period in which some developing countries have experienced severe currency crises.

### III. QUALITATIVE EFFECTS OF CARTEL ACTIVITY ON DEVELOPING COUNTRY CONSUMERS AND PRODUCERS

#### A. CONSUMERS

We now present a qualitative assessment of potential costs and benefits of private international cartels on developing country consumers and producers. For developing country consumers, or consumers in any country for that matter, the direct cost of a cartel is plain: price will increase if the cartel is successful. Using trade flow data instead of direct price and quantity data, the previous section showed that these costs are likely to be substantial. There may be other costs as well, such as decreased product choice (if the cartelized product is differentiated and geographic markets are allocated among producers) or a slower rate of product innovation and technological change.

In general, we do not believe that the functioning of cartels in developing countries requires a distinct model of cartel activity from those that we use to study cartels in industrialized countries. However, the fact that most of the firms in these cartels were large multinational companies may be significant. Greater multi-market contact—more times and places for firms to interact—increases the number of opportunities to punish cheating; and so increases the likelihood that collusion will succeed.<sup>19</sup> This implies that cartels made up of firms that interact in developing country markets as well as the markets of high-income countries are more likely to succeed than those with a more limited global reach, holding all else equal. This creates the possibility that there may be short-term benefits for developing country consumers, if their markets are used to discipline transgressors. Local price wars can benefit consumers,

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<sup>19</sup> The classic presentation of firms' incentive to cheat on collusive agreements is George J. Stigler, *A Theory of Oligopoly*, 72 J. POL. ECON. 44 (1964). For further discussion of cartel economics and a survey of empirical research on cartel stability, see MARGARET LEVENSTEIN & VALERIE SUSLOW, WHAT DETERMINES CARTEL SUCCESS? (Univ. of Michigan Business School, Working Paper No. 02-001, Jan. 2002), available at <http://eres.bus.umich.edu/docs/workpap/wp02-001.pdf>. For a theoretical discussion of the impact of multi-market contact, see B. Douglas Bernheim & Michael D. Whinston, *Multimarket Contact and Collusive Behavior*, 21 RAND J. ECON. 1 (1990); Jean-Pierre Benoit & Vijay Krishna, *Renegotiation in Finitely Repeated Games*, 61 ECONOMETRICA 303 (1993). It is also possible that multi-market contact may increase informational and monitoring requirements for a cartel such that cartel organization becomes too complex to succeed. The empirical work is mixed. For example, Scott finds that profit rates are significantly higher for firms with multi-market contact in oligopoly industries, but his sample is not limited to industries with cartels. See John T. Scott, *Multimarket Contact and Economic Performance*, 64 REV. ECON. & STAT. 368 (1982); *Multimarket Contact Among Diversified Oligopolists*, 9 INT'L J. INDUS. ORG. 225 (1991). On the other hand, Loretta J. Mester, *Multiple Market Contact Between Savings and Loans*, 19 J. MONEY, CREDIT & BANKING 538 (1987), finds that competition becomes more intense with multi-market contact.

at least in the short run. The impact on local producers, however, can be devastating, as we discuss below.

For most of the international cartels of the 1990s, there is only limited case-by-case quantitative analysis of the price effects for developing countries. The Consumer Unity and Trust Society (CUTS), for example, has estimated the damage to vitamin consumers in six developing countries (India, Pakistan, Kenya, South Africa, Tanzania, and Zambia) at US\$200 million.<sup>20</sup> The competition authorities in Mexico and Brazil have also concluded that their consumers were adversely affected by this cartel.<sup>21</sup> Similarly, the competition authorities in Korea, Mexico, and Brazil have all concluded that the lysine cartel raised prices in their home markets.<sup>22</sup> The only indications we have of the extent of harm are the fines levied by the competition authorities (discussed in Part V below). Still, although concrete evidence on the harm to developing country consumers of international cartels is sparse, it is growing and we expect it will continue to do so as more countries begin their own antitrust investigations.

## B. PRODUCERS

For developing country producers, there are both potential costs and benefits deriving from the existence of an international cartel. Even developing country producers that are excluded from the cartel may benefit from being able to sell under a cartel price umbrella, without having to adhere to a cartel production quota. The possibility of “free riding” on other firms’ output restrictions is a clear potential benefit. There are, however, potential negative effects as well, and developing country producers may be particularly susceptible to these effects.

In order to ensure cartel survival, international cartels may engage in activity that blocks or slows entry by developing country producers. For example, cartel members may use tariff barriers and antidumping duties to prevent entry by developing country participants. International cartels

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<sup>20</sup> CTR. OF COMPETITION, INV. AND ECON. REGULATION, CONSUMER UNITY & TRUST SOC’Y, PULLING UP OUR SOCKS: A STUDY OF COMPETITION REGIMES OF SEVEN DEVELOPING COUNTRIES OF AFRICA AND ASIA: THE 7-UP PROJECT (2003), available at <http://cuts.org/pulling.pdf> [hereinafter *CUTS*].

<sup>21</sup> See *Hard Core Cartels: Mexico*, *supra* note 4; Ministerio da Fazenda Secretaria de Acompanhamento Economico Parecer n. 210/2002/COGDC/SEAE/MF (Dec. 17 2002) (obtained from the Brazilian Secretariat of Economic Supervision of the Ministry of Finance, known as the SEAE) (Brazilian vitamin decision).

<sup>22</sup> OECD, COMPETITION LAW AND POLICY: 1998–1999 ANNUAL REPORT FOR MEXICO 3 (1998), available at <http://www.oecd.org/pdf/M00008000/M00008350.pdf> (“The agreement between the Mexican subsidiaries [of ADM and Kyowa Hakko] gave raise[sic] to substantial parallel price increases in the domestic market.”).

may also use government-authorized, non-tariff barriers to prevent entry (e.g., quotas or regulation) or punish outsiders (e.g., using trade reporting and import surveillance by government agencies to track where other firms are selling). If these cartel-imposed costs are significant, there will be a cost to the pace of economic development and the development process. In addition to those barriers intentionally or inadvertently provided by national governments, cartels can construct private barriers to prevent entry, such as the threat of retaliatory or predatory price wars, use of a common sales or distribution agency (i.e., vertical foreclosure), and patent pooling.<sup>23</sup>

1. *Limiting Access to Technology in Order to Raise Barriers to Entry*

One example of a barrier to entry is provided by the price-fixing conspiracy in the EU steel beam market between 1988 and 1994. Steel makers who were colluding to fix the price of steel beams “restrict[ed] the flow of information . . . in order to freeze out any new competitors,” according to Karl Van Miert, the EU competition commissioner.<sup>24</sup> It is not clear from the published record what type of information steel producers were trying to restrict in the steel beam case, but we do know that in many industries information about technology and more formally, patent pools, have been used by cartels in the past to create barriers to entry.<sup>25</sup>

The laminated plastic tubes cartel (in operation from 1987 to 1996) raised barriers to entry through a formal licensing agreement. The cartel consisted of two firms, American National Can (U.S.) and KMK Maschinen AG (Switzerland). KMK licensed ANC to use its tube-making technology and also gave ANC exclusive rights to buy its tube-making equipment. In exchange, ANC agreed not to acquire or use equipment from any other firm. In addition, ANC agreed to exit the market for tube-making equipment. For its part of the bargain, KMK agreed to exit the North American market and not to sell its equipment or license its technology to other companies for fifteen years.<sup>26</sup> As the court stated in the 1996 case, the actions of these two firms greatly raised barriers to entry in a

<sup>23</sup> Evidence of international cartels’ predatory or exclusionary behavior rarely comes to light, because such conduct is generally not required in cases brought in the United States where price fixing is per se illegal.

<sup>24</sup> Goldsmith & du Bois, *supra* note 16, at 3.

<sup>25</sup> See, e.g., Leonard S. Reich, *Lighting the Path to Profit: GE’s Control of the Electric Light Industry, 1892–1941*, 66 BUS. HIST. REV. 305 (1992); Steven W. Usselman, *Organizing a Market for Technological Innovation: Patent Pools and Patent Politics of American Railroads, 1860–1900*, 19 BUS. & ECON. HIST. 203 (1990).

<sup>26</sup> *United States v. Am. Nat’l Can Co.*, No. 96 Civ. 0145, 1996 WL 760292, at 8–9 (D.D.C. Dec. 12, 1996).

market where entry was already difficult: “Successful new entry into, or expansion within, the laminated tube market is difficult. To be successful, a new entrant must acquire expensive laminated tube-making equipment and essential, related patented and unpatented tube-making technology.”<sup>27</sup>

Finally, consider the actions of graphite electrode producers from the United States, Europe, and Japan between 1992 and 1997 (discussed more fully in Part IV below). The U.S. Department of Justice alleged that graphite electrode producers engaged in activity to disadvantage outsiders to their cartel, claiming that they “agreed to restrict non-conspirator companies’ access to certain graphite electrode manufacturing technology.”<sup>28</sup> Again, while this charge appears in every individual indictment and in press releases from the United States, European Union, Canada, and Korea, the details of the firms’ actions and the mechanisms they used to restrict access to technology are never given.

## 2. *Use of Tariffs and Anti-Dumping Duties as Barriers to Entry*

In a particularly striking case, producers of ferrosilicon from the United States (one of them a subsidiary of a Norwegian firm) formed a cartel in 1989 and proceeded to use antidumping laws in the United States and Europe to bar entry to non-cartel members.<sup>29</sup> By reacting passively to ever-increasing imports—that is, not lowering their price to compete—the firms lost market share. An antidumping complaint was then filed; the U.S. firms used their loss of market share as evidence of harm to the U.S. ferrosilicon industry, and antidumping duties were imposed in 1993 against five countries. The Department of Justice filed indictments in the price-fixing case in 1995 and 1996.<sup>30</sup> The International Trade Commission lifted the duties in 1999.<sup>31</sup>

U.S. citric acid producers have twice tried to use the government to help protect the domestic industry from Chinese imports. The cartel ran from 1991 to 1995 and involved major citric acid producers from

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<sup>27</sup> *Id.* at 7.

<sup>28</sup> Press Release, U.S. Dep’t of Justice, Japanese Subsidiary Charged with International Conspiracy to Fix Prices for Graphite Electrodes in the U.S. (Feb. 23, 1998).

<sup>29</sup> See Richard J. Pierce, Jr., *Antidumping Law as a Means of Facilitating Cartelization*, 67 ANTITRUST L.J. 725 (2000).

<sup>30</sup> See, e.g., Press Release, U.S. Dep’t of Justice, Pittsburgh Metals Producer Pleads Guilty in Nationwide Price Fixing Conspiracy (Sept. 22, 1995).

<sup>31</sup> See *Resentencing Date in U.S. FeSi Price-fixing Case Due in May*, METALS WK., Feb. 14, 2000, at 2.

the United States, Germany, and Switzerland.<sup>32</sup> First, in 1995, *while the cartel was still intact*, producers lobbied the Office of the U.S. Trade Representative to include citric acid on a list of Chinese imports to be hit with a high tariff. A last-minute agreement prevented the sanctions from being imposed.<sup>33</sup> Several U.S. citric acid producers brought a second antidumping allegation at the end of 1999. Archer Daniels Midland, Cargill, and A.E. Staley (a division of Britain's Tate & Lyle PLC) reacted to the rise in imports of citric acid from China by filing a petition with the Department of Commerce and the International Trade Commission seeking antidumping duties of 350 percent on Chinese imports. While U.S. prices in early 2000 averaged around 63–66 cents per pound, citric acid from China was selling for about 53 cents per pound.<sup>34</sup> According to claims made in the case, the filing was prompted in part because two of the largest consumers of citric acid, Procter & Gamble and Ashland Chemical Inc. (a distributor) switched to Chinese citric acid for their raw material needs.

The ITC dismissed the case in February 2000, after deciding that there was no material injury to the domestic citric acid industry.<sup>35</sup> At the hearings, it certainly weighed against the case that some of these same producers had just been convicted and fined for cartel behavior. Exports from China first fell dramatically and then rebounded after the cartel was broken apart, suggesting that the cartel was at least partially successful in creating barriers to entry.<sup>36</sup> U.S. and European governments must be

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<sup>32</sup> See, e.g., Press Release, U.S. Dep't of Justice, Justice Department's Ongoing Probe into 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 Food and Feed Additives Yields \$25 Million More in Criminal Fines (Mar. 26, 1997). Note that reported cartel dates can vary, depending on the particular firm charged and the antitrust authority or private plaintiff bringing the suit.

<sup>33</sup> *Citric Acid Export Will Remain Good in China*, CHINA CHEM. REP., May 6, 1996 at 8, available at 1996 WL 9026358.

<sup>34</sup> Feliza Mirasol, *DOC Investigates Possible Dumping of Citric Acid*, CHEM. MKT. REP., Jan. 17, 2000, at 4.

<sup>35</sup> Clay Boswell, *Pucker Up: A Taste for Tartness Drives Acidulants*, CHEM. MKT. REP., May 29, 2000, at 16.

<sup>36</sup> See Matthew Lerner, *Citric Acid Competitive in Wake of Big Changes*, CHEM. MKT. REP., Mar. 17, 1997, at 5 (discussing a 30–40% decline in Chinese exports to the U.S. in 1997 compared to 1996; Lerner also points out that the Chinese government has stopped giving export tax credits to Chinese citric acid producers), available at 1997 WL 8496497; Lisa Jarvis, *Outlook for Citric Acid Dismal as Prices Nosedive*, CHEM. MKT. REP., Mar. 31, 2003, at 6 (citing varying estimates that China may have a 25–34% share of the global citric acid market). An apparently unintended effect of the geographic distribution of the citric acid market by the cartel was increased competition between Indian and Chinese citric acid producers. In 1998, India imposed antidumping duties on citric acid imports from China. Before the duties were imposed, China had captured close to 40% of the Indian market for citric acid. This may reflect in part China's exclusion from U.S. and European

extremely wary of such attempts by cartels to use the state as a tool for creating barriers to entry.

It is important to note that although there are anecdotal, rather dramatic, stories of attempts by cartels to use antidumping duties and tariffs to raise barriers to entry, there is little evidence that this practice is widespread. The general claim, for example, that firms have systematically filed antidumping claims and then withdrawn them following an agreement with importers (presumably threat-induced) has not stood up to rigorous empirical tests.<sup>37</sup> Yet the fact that attempts are occasionally made suggests that government authorities should be wary. These kinds of activities may be particularly effective in limiting entry by developing country producers that are just entering international markets. If effective, developing country producers may be excluded for a long period of time, conceivably well after the break-up of the formal cartel.

### 3. *Post-Cartel Joint Ventures*

Even after cartels are broken up, the existence of cartel-created barriers may force developing country producers into joint ventures that limit their distribution or restrict sales to certain markets. Such joint ventures could then function as a way for colluding firms to accommodate developing country entry into a cartel under terms favorable to incumbent firms or to engage in an implicit cooperative pricing arrangement among incumbents. These arrangements give developing country producers access to the world market, but may do so at some cost to the degree of competition that would otherwise obtain in the industry. In several recent international cartel cases, joint ventures have been established in the years following the forced break-up of the cartel. This may reflect an attempt to consolidate and restructure the industry in a more direct way, in light of the break-up of the cartel.

For example, there has been rapid consolidation in the citric acid industry since the price-fixing conspiracy was uncovered in 1995. Internationally, Hoffmann-LaRoche has made numerous investments in China for a variety of products it manufactures, including a citric acid facility that opened in 1997 (its partner, Wuxi Zhongya, is one of China's three

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markets, either through antidumping duties or private restraints, so that Chinese producers may have turned to India as an outlet for their product.

<sup>37</sup> Using data from 1990 to 1997, Taylor finds that most withdrawn antidumping cases either have no effect on market price and quantity, or are followed by a decrease in price and increase in quantity. See Christopher T. Taylor, *The Economic Effects of Withdrawn Antidumping Investigations: Is There Evidence of Collusive Settlements* (U.S. Federal Trade Commission, Working Paper 240, Aug. 2001).

largest citric acid producers).<sup>38</sup> Cargill and Tate & Lyle are both investing in Brazil, where a high-quality and low-cost sugar supply is attracting citric acid manufacturers.<sup>39</sup> There are two ways to interpret these events. One is that, as citric acid prices have fallen following the demise of the cartel and Chinese exports have grown, western producers are more accommodating of entry by Chinese producers, by sharing their technology in exchange for access to low-cost production methods.<sup>40</sup> An alternative explanation may be that multinational producers are attempting to assure continued market dominance, without resorting to a formal cartel.

The seamless steel tubes cartel provides another illustration of significant post-cartel industry restructuring. Seamless steel tubes, pipes, and casings are used in the construction of wells in the oil and gas industry. They are often referred to in the trade literature as Oil Country Tubular Goods (OCTG). Leading producers are located in the United States, Japan, Germany, France, Italy, Argentina, Mexico, Brazil, and Sweden. In December 1999, the European Commission fined four European and four Japanese steel manufacturers over \$100 million, charging them with fixing bids on seamless steel tubes and line pipes between 1990 and 1995.

Since the demise of the seamless steel tubes cartel, the industry has undergone a fairly substantial reorganization, in which all parties to the cartel have joined in one of three international alliances. Tenaris, the largest of these alliances had a 25 percent market share of world consumption of OCTG in 1999, and is led by Techint (an Italian-Argentinean firm controlled by the Rocca family).<sup>41</sup> Tenaris includes steel tube and pipe producers from twenty-four countries including Dalmine, the Italian member of the cartel and NKK, another former cartel member based in Japan.<sup>42</sup>

The other three Japanese producers who were members of the cartel (Nippon, Kawasaki, and Sumitomo Metal) have formed an alliance in

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<sup>38</sup> See *Roche Opens New Vitamin A Plant in China*, CHEM. MKT. REP., Oct. 25, 1999, at 44, available at 1999 WL 22724963; Kevin Gopal, *Keeping the Faith*, PHARM. EXEC., Jan. 1, 1998, at 36.

<sup>39</sup> Cargill was not named as a cartel participant by the government, and civil suits against Cargill have been dismissed. For information on expansion into Brazilian markets, see Kiernan Gartlan, *Tate & Lyle to Expand Brazilian Citric Acid Operations*, DOW JONES COMMODITIES SERVS., Oct. 19, 2000.

<sup>40</sup> Jarvis, *supra* note 34.

<sup>41</sup> Jonathan Friedland, *Oilfield Pipe Maker DST Aims to Service Entire Globe*, WALL ST. J., Sept. 10, 1999, at A12.

<sup>42</sup> See *Tenaris Group of Tube Makers Launches Advertising Campaign*, AM. METAL MKT., Oct. 9, 2001, at 3; *About Tenaris*, at <http://www.tenaris.com/infokit/eng/html/0datashe.htm> (last visited June 15, 2003); Friedland, *supra* note 39.

which they use a joint sales agency to distribute goods worldwide.<sup>43</sup> Mannesmann and Vallourec, the other two firms in the cartel have formed a joint venture to which they have transferred all their OCTG production.<sup>44</sup>

Of course, both developing country entrants and established producers could also have other, welfare-enhancing motives for establishing such joint ventures, such as sharing technology, local market expertise, or gaining access to capital. It is important to note that these explanations for joint ventures are not mutually exclusive; a joint venture might well accomplish both welfare-enhancing and competition-reducing goals of the participating firms. Joint ventures (and mergers) in industries known to have a history of international price fixing should be carefully scrutinized by regulatory authorities and structured so as to support the welfare-enhancing gains from cooperation while allowing consumers in both developing and industrialized countries the benefits of enhanced competition.

Given this overview of basic cartel operations and description of how cartel activity might affect developing countries, we now turn to a more detailed discussion of one particular cartel, the graphite electrodes cartel. This case illustrates many of the issues discussed above, including the adverse developmental impact that an international cartel can have. The graphite electrodes case also illustrates recent attempts by developing country consumers and their governments to find policy instruments with which to respond to these cartels.

#### IV. THE GRAPHITE ELECTRODES CARTEL

For five years, the major graphite electrode producers around the world coordinated prices for this critical input into mini-mill steel manufacturing. Many developing countries rely on the mini-mill (electric arc furnace) technology for producing steel. This case, therefore, not only provides an interesting illustration of the operation of a contemporary international cartel in a sophisticated industrial product, but it also provides useful background information for our discussion in the next section of policy remedies for developing countries.

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<sup>43</sup> Audrey McAvoy, *Japanese Steel Companies Discussing Seamless Steel Pipe Tie-Up*, DOW JONES INT'L NEWS, Aug. 18, 1999.

<sup>44</sup> See Commission Decision 31997M0906 of 03/06/1997: Declaring a Concentration to be Compatible with the Common Market (Case No IV/M.906–Mannesmann/Vallourec) According to Council Regulation (EEC) No. 4064/89 (Aug. 5, 1997) (providing an analysis of the OCTG market in Europe and reasons for approval of the acquisition of 21% of the shares of Vallourec SA by Mannesmannroehren-Werke AG).

## A. INDUSTRY BACKGROUND AND STRUCTURE

Graphite electrodes (GE) are large carbon columns used by electric arc furnaces (EAF) or “mini-mills” in the making of steel. Although there are other uses for graphite electrodes, EAF steel producers account for the vast majority of demand.<sup>45</sup> Mini-mills use graphite electrodes to generate the enormous heat necessary to melt scrap metal and convert it back into a marketable steel product. GEs are made from synthetic graphite, the primary raw materials of which are petroleum coke, coal tar, and petroleum pitch. The petroleum coke is crushed and mixed with the pitch into a paste, which is then extruded through a press. Almost 50 percent of GE manufacturing costs goes toward raw materials, the bulk of which is petroleum coke (also called needle coke for electrodes applications). Labor costs represent roughly 20 percent of total costs.<sup>46</sup> The electrodes are baked and undergo a series of refinements, making the production process highly electricity-intensive. The electricity portion of the cost varies by location within a country and across countries. In the final stages of production the electrodes are machined into a number of standard sizes or on a custom basis to meet the buyer’s specifications. The processing time for an electrode is approximately two months.<sup>47</sup> Cost savings have been achieved over the years through technological and process improvements. One graphite electrode producer estimates that the average graphite electrode production cost per metric ton has fallen from about \$1,950 in 1998 to \$1,651 in 2001.<sup>48</sup>

There are three basic processes for steel making: open hearth, basic oxygen furnaces, and electric arc furnaces. The first electric arc furnace used for commercial specialty steelmaking in the United States was installed in 1906; however, the growth of electric furnaces was limited by the high cost of electricity.<sup>49</sup> The mini-mill industry began to take

<sup>45</sup> See Commission Decision of 18 July 2001 Relating to a Proceeding Under Article 81 of the EC Treaty and Article 53 of the EEA Agreement, Case COMP/E-1/36.490—Graphite Electrodes, 2002 O.J. (L 100) 1, 3, available at <http://europa.eu.int/eur-lex/pri/en/oj/dat/2002/L100/L10020020416en00010042.pdf> [hereinafter *EC Graphite Electrodes Decision*] (“[steel producers] account for some 85% of demand.” It is not clear whether this 85% figure refers only to the European market, but we expect that the percentage would be similar on a global basis). GEs are also used for refining steel in ladle furnaces. See *Canadian Subsidiary of UCAR Pleads Guilty to Price Fixing*, WALL ST. J., Mar. 19, 1999, at A4.

<sup>46</sup> Barbara Martinez, *Robert Krass Chairman CEO and President of UCAR International*, DOW JONES INVESTOR NETWORK, Oct. 6, 1995, at 3.

<sup>47</sup> *EC Graphite Electrodes Decision*, *supra* note 45, at 2.

<sup>48</sup> GRAFTECH INT’L LTD., 2001 ANNUAL REPORT TO STOCKHOLDERS, chart at 5.

<sup>49</sup> Dr. John Stubbles, *EAF Steelmaking—Past, Present and Future*, DIRECT FROM MIDREX (3d Quarter 2000) at 3, available at <http://www.midrex.com/uploadedfiles/3Q%202000.pdf> (a publication of Midrex Technologies, Inc).

off in earnest in the late 1980s.<sup>50</sup> As the industry progressed, graphite electrodes grew from 12 inches in diameter to what are now called “supersize” graphite electrodes of 28–30 inches (used in newer, high-powered, furnaces).<sup>51</sup> GEs are currently the only material that can generate sufficient heat to melt scrap steel. There is no competitive substitute, other than the more traditional methods of making steel (i.e., open hearth and basic oxygen). In the EAF process, GEs are consumed on a continuous basis. “Nine electrodes, joined in columns of three” are typically used, and “one electrode is consumed approximately every eight hours.”<sup>52</sup> The three electrodes carry an alternating current, which causes an arc to jump between the electrodes, raising the temperature and melting the scrap. GEs make up about 6–7 percent of the cost of converting scrap to steel.<sup>53</sup>

Competition in the U.S. graphite electrodes market intensified in the early 1980s when Japanese producers increased their exports of high-quality GEs to the United States to take advantage of the strong dollar.<sup>54</sup> There was a shakeout and consolidation in the industry in the late 1980s and early 1990s, just prior to the price-fixing conspiracy, reducing the number of major firms in the industry from eighteen to ten.<sup>55</sup> In addition to increased competition, the consolidation was precipitated in part by slumping steel production, which “chipped 30 percent off electrode prices late in the decade, triggering a round of consolidations.”<sup>56</sup> Although mini-mill steel production may not have been hit as hard as the rest of the steel industry during the downward cycle in steel demand, demand growth was also slowed by simultaneous improvements in EAF production technology that lowered the rate of graphite electrode consumption.<sup>57</sup>

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<sup>50</sup> Hans D. Rosebrock, *Dynamic Changes and Locational Shifts in the U.S. Steel Industry*, 16 *ECON. DEV. REV.* 55, 59 (1999).

<sup>51</sup> Bryan Berry, Adam Ritt, & Michael Greissel, *A Retrospective of Twentieth-Century Steel*, *NEW STEEL*, Nov. 1999, at <http://www.newsteel.com/features/NS9911f2.htm>.

<sup>52</sup> *EC Graphite Electrodes Decision*, *supra* note 45, at 2.

<sup>53</sup> This figure is for one company, Keystone Steel, which was part of a civil suit filed by several steel producers against the graphite electrode cartel members. Conversion costs may vary across mini-mills. See *Electrode Manufacturers Admit to Fixing Prices*, *NEW STEEL*, May 1, 1998, at 8, available at 1998 WL 190759445.

<sup>54</sup> Jerry A. Acciarri & Gordon H. Stockman, *Demand for Superpremium Needle Cokes on Upswing*, *OIL & GAS J.*, Dec. 25, 1989, at 118.

<sup>55</sup> Daily Trial Transcript Day 2 at 93, *United States v. Mitsubishi Corp.*, No. 00-033 (E.D. Pa. Jan. 31, 2001) [hereinafter *Mitsubishi*].

<sup>56</sup> Mark Houser, *Steelmakers Going Wild for Electric Furnaces*, *TRIBUNE REV.* (Greensburg Pa.), Oct. 8, 1995, at 1, available at 1995 WL 8269032.

<sup>57</sup> CANADIAN INT’L TRADE TRIBUNAL, REVIEW NO. RR-91-002, FINISHED ARTIFICIAL GRAPHITE ELECTRODES AND CONNECTING PINS ORIGINATING IN OR EXPORTED FROM BEL-

In this highly concentrated market, UCAR International of the United States and SGL Carbon Corporation of Germany dominate, with a combined world market share of roughly two-thirds. Another U.S. company (Carbide/Graphite Group) and four Japanese producers (Showa Denko, Tokai Carbon, Showa Electrodes Corporation (SEC), and Nippon Carbon), round out the list of major world producers.<sup>58</sup>

Both UCAR and SGL manufacture electrodes in many countries (including developing and transition economies, such as Brazil, Mexico, South Africa, Russia, and Poland) and sell throughout the world. There are a number of firms that are not global producers, but that sell their product globally. The Carbide/Graphite Group, for example, has plants only in the United States, but sells throughout the world. The Japanese manufacturers rely heavily on Japanese trading companies, of which there were several, to distribute their graphite electrodes around the world.<sup>59</sup> In contrast, companies such as SGL and UCAR have their own sales organizations. SGL, for example, uses exclusive sales agents who deal only in SGL's graphite electrodes.<sup>60</sup> One of the largest Japanese trading companies is Mitsubishi, which, at the time of the cartel, had small equity interests in both Tokai Carbon and SEC, and was one of the distributors for Tokai, SEC, and Showa Denko. Mitsubishi purchased a 50 percent ownership in UCAR in 1991, and sold its interest in January 1995.

There are also a number of smaller GE producers worldwide: the European Commission reports, for example, that in addition to the major suppliers, Europe receives GEs from producers in India, China, and Russia.<sup>61</sup> The major producers in India are Hindustan Electro Graphite (HEG), Carbon Everflow Ltd., and Graphite India. In 1997, total Indian graphite electrode production was approximately 5 percent of

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GIUM, JAPAN, SWEDEN AND THE UNITED STATES OF AMERICA 6 (Nov. 27, 1991) ("Since 1985, specific graphite electrode consumption rates have fallen 17 percent, from 4.49 kg/t of steel produced to 3.71 kg/t in 1990."). See also *EC Graphite Electrodes Decision*, *supra* note 45, at 3 ("During the 1980s improvements in both electrode and electric steelmaking technology led to a substantial decline in the specific consumption of electrodes per tonne of steel produced (from 6 kg/tonne in 1979 to 3 kg in 1991: the West European average is now some 2.4 kg).").

<sup>58</sup> See Government's Sentencing Memorandum and Government's Motion for a Guidelines Downward Departure *United States v. Krass*, No. 99-626 (E.D. Pa. filed Oct. 18, 1999); Second Amended Complaint ¶¶ 54-59, *Ferromin Int'l Trade Corp. v. UCAR*, 153 F. Supp. 2d 700 (E.D. Pa. 2001).

<sup>59</sup> Memorandum in Support of Government's Response in Opposition to Defendant's Motion to Strike, *United States v. Mitsubishi Corp.*, No. 00-033 (E.D. Pa. filed May 23, 2000), available at <http://www.usdoj.gov/atr/cases/f7500/7510.pdf>.

<sup>60</sup> *Mitsubishi*, *supra* note 55, Daily Trial Transcript Day 2 at 79.

<sup>61</sup> *EC Graphite Electrodes Decision*, *supra* note 45, at 4.

world production and 14 percent of global exports.<sup>62</sup> Supporting this world market are fairly low transportation costs, generally less than 5 percent of the cost of the electrodes.<sup>63</sup>

The Antitrust Division of the Department of Justice asserts, as does everyone familiar with the industry, that barriers to entry in the GE industry are high: “There have been no significant entrants in the graphite electrode industry since 1950. . . . [P]roducing large graphite electrodes requires highly specialized equipment and a significant capital investment. . . . Opening a new facility would require approximately a \$250 million investment and roughly 18 to 24 months.”<sup>64</sup> Entry appears to be limited not only by high capital requirements but also by the importance of implicit technical and market knowledge. References to proprietary knowledge are made on occasion, as in this brief description of GE operations: “[g]raphite electrodes are composed of a mixture of finely divided, calcined petroleum coke mixed with about 30% coal tar pitch as a binder, *plus proprietary additives unique to each manufacturer.*”<sup>65</sup> Another example comes from a statement by SGL in a Securities and Exchange Commission filing:

The manufacture of high-quality graphite and carbon electrodes is a mature, capital intensive business that requires extensive process know-how, developed over years of experience working with the various raw materials and their suppliers, furnace manufacturers and steelmakers (including working on the specific applications for finished electrodes). It also requires high-quality raw material sources and a developed energy supply infrastructure.<sup>66</sup>

Whatever the varied sources of barriers to entry, it is clear that it is a difficult industry to enter, and, as a result, the industry is highly concentrated. This becomes an issue of concern because GEs are a vital input into EAF steelmaking and EAF technology is the preferred steel technology for many developing countries. In the mid-1990s, EAF plants cost roughly 80 percent less to build than blast furnaces “making them the

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<sup>62</sup> *Graphite Electrodes to Attract Dumping Duty*, ECON. TIMES, Oct. 24, 1997.

<sup>63</sup> Second Amended Complaint at ¶ 50, *Ferromin Int'l Trade Corp. v. UCAR*, 153 F. Supp. 2d 700 (E.D. Pa. 2001) [hereinafter *Ferromin* Complaint].

<sup>64</sup> Verified Complaint, *United States v. SGL Carbon Aktiengesellschaft*, No. 03-521 (W.D. Pa. filed Apr. 15, 2003), available at <http://www.usdoj.gov/atr/cases/f200900/200935.htm>.

<sup>65</sup> Jeremy A.T. Jones, *Electric Arc Furnace Steelmaking*, AMERICAN IRON & STEEL INSTITUTE, available at <http://www.steel.org/learning/howmade/eaf.htm> (emphasis added).

<sup>66</sup> SGL Carbon Aktiengesellschaft, Securities and Exchange Comm'n, Form 20-F, for the fiscal year ended Dec. 31, 1999, at 16, available at [http://www.sglcarbon.com/ir/public/form/pdf/form00\\_e.pdf](http://www.sglcarbon.com/ir/public/form/pdf/form00_e.pdf).

furnace of choice among rapidly industrializing nations.”<sup>67</sup> It is thus not surprising that the share of EAF production as a percentage of total world steel production has grown rapidly over the past two decades.

Table 4 presents the distribution of steel output by production method around the globe. It is interesting to note which regions were major consumers of graphite electrodes at the start of the graphite electrodes cartel in 1992. Asia ranks highest, with a share of world EAF steel production near 35 percent. The European Union is next at almost 22 percent. Although the Middle East ranks near the bottom at 1.72 percent of world EAF output, the last column of Table 4 shows that the Middle East is in fact almost completely reliant on EAF technology—and therefore GEs—for the steel it produces internally. Close to 82 percent of Middle East steel was produced using EAF technology in 2000. Next highest is “Other North America” at roughly 67 percent, which includes Mexico, Cuba, El

**Table 4**  
**Global Trends in Production of Crude Steel in Electric Arc Furnaces**

<i>Region</i>	<i>1992 EAF Output (1,000s metric tons)</i>	<i>Percent of World Steel Output from EAFs in 1992</i>	<i>Percent of Each Region's Steel Output from EAFs in 2000</i>
European Union	45,868	21.61%	41.09%
Non-EU Europe (including Baltic States)	13,593	6.40%	38.67%
Russia & Ukraine	13,588	6.40%	10.61%
Asian Former Soviets	2,441	1.15%	36.94%
Canada & United States	36,589	17.24%	46.58%
Other North America	5,367	2.53%	66.57%
South America	10,519	4.96%	33.18%
Africa	5,902	2.78%	51.68%
Middle East	3,641	1.72%	81.46%
Asia	74,077	34.90%	28.34%
Oceania	648	0.31%	16.61%
WORLD	212,233	100%	—

<sup>67</sup> Junius Ellis, *Why Two Steels in Today's Lowly Steel Sector Could Gain 35% to 50% Next Year*, MONEY, Dec. 1996, at 35, available at 1996 WL 8793212.

Salvador, Trinidad, and Tobago. Some individual countries are entirely dependent on EAF steel production: Croatia, Slovenia, Cuba, Ecuador, Indonesia, Malaysia, and Thailand all relied on EAFs for 100 percent of their domestic steel production in the year 2000.<sup>68</sup>

The development of a domestic steel industry has been considered central to the development strategies of many countries. Anticompetitive behavior in the graphite electrode industry, which affects mini-mill steel production, could therefore have spillover effects on rates of industrialization in developing countries heavily reliant on mini-mill technology. Many developing countries had rapid rates of EAF production growth during the conspiracy period of 1992–1997: Cuba, Chile, Bosnia-Herzegovina, Iran, Hungary, Ecuador, Slovak Republic, Peru, Thailand, Mexico, Malaysia, Vietnam, and Poland all increased their production of EAF steel at a rate of more than 10 percent per year over the entire period of the conspiracy.<sup>69</sup> In order to understand the implications of this conspiracy for these countries and others, we now turn to an account of the graphite electrodes cartel and its potential economic effects on developing country consumers and producers.

#### B. THE ORGANIZATION OF THE CONSPIRACY

According to reports in the press, the U.S. investigation of alleged price fixing by U.S., German, and Japanese graphite electrodes producers began after a complaint from a steel manufacturer.<sup>70</sup> Additional antitrust investigations have since been initiated in several other jurisdictions as well, including Canada, the European Union, Japan, Korea, and Brazil.<sup>71</sup>

Price fixing by graphite electrode producers began in 1992 and continued through at least 1997 (the DOJ lists the cartel dates as July 1992–June 1997, while the EC lists the dates as May 1992 through either 1996 or 1998, depending on the company).<sup>72</sup> In the United States, there were

<sup>68</sup> See COMM. ON ECON. STUDIES, BRUSSELS, INT'L IRON AND STEEL INST., STEEL STATISTICAL YEARBOOK 2002, 1992 data from pages 39–41, 2000 data from pages 31–32 (Dec. 2002), available at [http://www.worldsteel.org/media/ssy/iisi\\_ssy\\_2002.pdf](http://www.worldsteel.org/media/ssy/iisi_ssy_2002.pdf).

<sup>69</sup> *Id.* at 39–41.

<sup>70</sup> Adam Jones, *Blowing the Whistle—American-Style*, THE TIMES (LONDON), Feb. 24, 2000, at 33, available at 2000 WL 2869555.

<sup>71</sup> The Japanese Fair Trade Commission issued a warning to Japanese GE firms in March 1999. There was no conviction or fine, apparently due to a lack of evidence. ICPAC FINAL REPORT, *supra* note 3, at 173.

<sup>72</sup> Press Release, European Union, Commission Fines Eight Companies in Graphite Electrode Cartel (July 18, 2001). As is true in most such cases, the exact dates of the conspiracy are not known. The alleged dates of conspiracies vary depending on the claimant and the accused firm. For detailed information on specific EC conspiracy dates by company, see *EC Graphite Electrodes Decision*, *supra* note 45, at 2.

seven firms indicted for price fixing: UCAR, SGL, Carbide/Graphite Group, Showa Denko, Tokai, SEC, and Nippon; and six firms fined (C/G was granted leniency by the Department of Justice). Mitsubishi was convicted of aiding and abetting the conspiracy in 2002 and fined \$134 million.<sup>73</sup> The EC also fined an eighth firm, VAW Aluminum. Fines (not including civil damages) against these eight firms total more than \$500 million; the largest single fine was \$135 million, levied on SGL by the United States. One can put these U.S. and EU fines somewhat into context by comparing them to estimates of the size of the market during the conspiracy period. The Department of Justice estimates the value of the graphite electrode market in the United States in 1992 at \$275 million per year. Another source estimates that total U.S. sales of graphite electrodes were \$500 million in 1996.<sup>74</sup> The European market was valued at approximately 420 million Euros in 1998 and the global market at \$1.7 billion.<sup>75</sup> Thus, the government fines are relatively large when compared to the U.S. market alone (at least on an annual basis), but seem less so when compared to global sales. U.S. fines may be sufficient to provide deterrence if one focuses on the U.S. market alone, but that may not be the case if the benefits to the cartel are global.

According to the U.S. Department of Justice's investigation, cartel members agreed to: (1) increase and maintain prices, (2) eliminate price discounts,<sup>76</sup> (3) allocate volume among conspirators, (4) divide the world market among themselves and designate the price leader in each region, (5) reduce or eliminate exports to members' home markets, (6) restrict capacity, (7) restrict non-conspirator companies' access to certain graphite electrode manufacturing technology, (8) exchange sales and customer information in order to monitor and enforce the cartel agreement, and (9) issue price announcements and price quotations in accordance with the agreement. The cartel was organized into a "top-level" group and a "working-level" group. The top-level meetings included primarily company presidents and managing directors and were designed to set policies. Lower-level managers, who met more frequently, worked out the details of the agreement and its implementation.

The provision to respect each other's home markets was critical. In practice, this meant that there was a designated price leader for various regional markets (e.g., UCAR was the price leader for the United States)

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<sup>73</sup> Sentencing Memorandum of the United States at 1, *United States v. Mitsubishi Corp.*, No. 00-033 (E.D. Pa. filed Apr. 19, 2001).

<sup>74</sup> Russell Mokhiber, *Stealing from Steel*, MULTINATIONAL MONITOR, Apr. 1998, at 30.

<sup>75</sup> See *EC Graphite Electrodes Decision*, *supra* note 45, at 3-4.

<sup>76</sup> More specific information on this point is given in Government's Sentencing Memorandum and Government's Motion for a Guidelines Downward Departure, *United States v.*

and other cartel members agreed to follow any price increase led by a designated home market producer. In addition, there was an agreement that firms would refrain from exporting into each other's home markets (e.g., Japanese firms would not export to the United States), although this export agreement may have covered only the supersize graphite electrodes. Southeast Asia was called a "non-home market" because none of the cartel members had a production facility in Asia (outside of Japan). Although the Japanese firms did the bulk of the selling to this region, there was no established price leader, which became the source of many negotiations at the top-level cartel meetings.<sup>77</sup>

The conspirators apparently agreed to restrict access to technology, although there are few details of these allegations. Evidence points to some sharing of technical information between cartel members. According to the Mitsubishi trial documents, there was a "technological exchange" between SEC and UCAR (an "agreement" that entailed an exchange of visits of "technical people" between the two firms' plants).<sup>78</sup> The cartel also apparently attempted to control outside competitors' access to critical inputs.<sup>79</sup>

One noteworthy absence in this cartel's organizational structure is a provision for penalties in the event of cheating on the agreement. There do appear, however, to have been side payments among members in response to unexpected fluctuations in demand in different regional markets (as discussed *infra* in this section). Threats to punish were made, but they appear to have been concentrated in the period leading up to the formation of the cartel.<sup>80</sup>

These threats can be distinguished both in theory and in practice from other cartel organization devices. We observe three mechanisms used to improve cartel stability. First, there are pre-cartel threats of future price wars, as in this case. These are akin to off-the-equilibrium-path price war threats. Such threats can be used *ex ante* to induce cooperation by making it incentive compatible; these threats, if credible, can

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Krass, No. 99-626 (E.D. Pa. filed Oct. 18, 1999) (stating that all forms of discounts were to be eliminated, including rebates and consumption guarantees).

<sup>77</sup> *Mitsubishi*, *supra* note 55, Daily Trial Transcript Day 1 at 12, 63, 77; Day 2 at 94-95, 99.

<sup>78</sup> *Id.*, Daily Trial Transcript Day 7 at 121.

<sup>79</sup> *Id.*, Daily Trial Transcript Day 4 at 82-83.

<sup>80</sup> For example, in February 1991 (prior to the first formal meeting of cartel members in May 1992), Mitsubishi met with SEC and noted: "MC [Mitsubishi Corporation] will convince [UCAR] to control volume. . . . It will take retaliatory actions, although the expression sounds terrible, against anyone who cannot keep promises made in such discussions." *Id.*, Daily Trial Transcript Day 3 at 16-17.

enforce cooperative behavior, but are never actually implemented in a collusive equilibrium.<sup>81</sup>

Second, there are side-payments among colluding firms that neutralize any gains from cheating. If there is uncertainty about demand that leads actual market shares to differ from agreed-upon market shares (even in the absence of cheating by cartel members), these side-payments may occur in equilibrium. Firms participating in the lysine cartel, for example, had an end-of-the-year meeting at which they would compute total sales for each firm. If Firm A had sold less than its agreed-upon quota that year and Firm B had sold more than its quota, Firm B would buy the appropriate amount of lysine from Firm A.<sup>82</sup> Given this compensation system, and assuming that sales monitoring is sufficiently accurate, there is no incentive to cheat on the agreement. At the end of the year, everyone will have in fact sold their cartel quota. The graphite electrode cartel apparently relied on an informal system of side payments in its early years. Mr. Burkett (UCAR) said that “the goal was that there would not be any cheating but . . . they had set up a system so that if someone did cheat, people could complain, and then if it was determined that someone had cheated, then they might have to give up tons somewhere else. So it was a check and a balance.”<sup>83</sup> In 1995 the cartel formalized the reporting of sales with the establishment of the “Central Monitoring System,” which called for Tokai Carbon to collect data from UCAR, SGL, and the other Japanese producers and compare actual sales with commitments to adhere to agreed-upon market shares.<sup>84</sup>

Third, there are ongoing negotiations. Cartel members disagreed over issues such as product size,<sup>85</sup> quality,<sup>86</sup> output restrictions,<sup>87</sup> volume discounts,<sup>88</sup> and the timing of price increases.<sup>89</sup> The story told by many executives testifying in the *Mitsubishi* case is that the cartel did not work perfectly, but it worked. Prices did not always rise to the goal set at the

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<sup>81</sup> J.W. Friedman, *A Non-Cooperative Equilibrium for Supergames*, 38 REV. ECON. STUD. 1 (1971).

<sup>82</sup> See JOHN M. CONNOR, GLOBAL PRICE FIXING: OUR CUSTOMERS ARE THE ENEMY 207 (2001) (“Had some of the cartel’s members been far from their targeted shares, a compensation system had been designed involving intra-cartel sales at the elevated monopoly price by deficit firms. . .”).

<sup>83</sup> *Mitsubishi*, *supra* note 55, Daily Trial Transcript Day 8 at 118.

<sup>84</sup> *EC Graphite Electrodes Decision*, *supra* note 43, at 17.

<sup>85</sup> *Mitsubishi*, *supra* note 55, Daily Trial Transcript Day 7 at 27–28.

<sup>86</sup> *Id.* at 47, 154; and Daily Trial Transcript Day 1 at 30.

<sup>87</sup> *Id.*, Daily Trial Transcript Day 1 at 52.

<sup>88</sup> *Id.*, Daily Trial Transcript Day 6 at 82.

<sup>89</sup> *Id.*, Daily Trial Transcript Day 1 at 68–69.

top-level meetings, but prices rose significantly. Price discounts occasionally occurred, but there were no severe price wars.

The inner workings of the graphite electrodes cartel support our view that bargaining problems are the biggest challenge to cartel stability. Deciding how to divide Southeast Asia and hoping that the negotiated agreement remained an equilibrium (in the face of fluctuations in the demand for steel, for example) was one of the biggest problems for this cartel. Successful cartels must develop an organizational design that allows the agreement to accommodate fluctuations in the external environment without requiring costly renegotiations. Secret cheating undermines cartels in some industries, but if collusion is really to be successful, the firms have to make a significant investment in the collusive organization, such as the frequent working-level meetings in this case, and in the development of organizational skills. Cheating becomes a secondary issue.<sup>90</sup>

### C. ECONOMIC EFFECTS OF THE CARTEL

Figure 1 shows graphite electrode prices from 1981 through early 1997.<sup>91</sup> The chart captures the fall in nominal prices during the 1980s and a clear increasing trend in the nominal price of GEs during the cartel period (1992–1997). Data presented by the U.S. Department of Justice for graphite electrode prices in the United States paint a similar picture, with a rise in prices of over 60 percent: from \$0.95 per pound in January 1992, to \$1.21 in January 1994, \$1.43 in February 1996, and finally \$1.56 in February 1997.<sup>92</sup> Prices dropped sharply after the firms were convicted by the DOJ. By mid-2000 the average price was \$2,500

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<sup>90</sup> There are other historical examples that support this theory. The bromine and sugar cartels, for example (both of which began in the late 1800s), got off to a rocky start and then managed to sustain collusion for longer periods. It appears that the participants learned about each other and about organizational features that would help to support collusion in their industry. An excellent example of this feature of cartel design is given in the case of the Sugar Institute, a trade association formed in 1927 that facilitated a cartel agreement among 14 firms in the United States until 1936. The records show that cheating occurred, but that sharp retaliation by cartel members was not common. Instead, price discounts or other deviations from the agreement were either “ignored or matched.” David Genesove & Wallace P. Mullin, *Rules, Communication, and Collusion: Narrative Evidence from the Sugar Institute Case*, 91 AM. ECON. REV. 379 (2001). For a discussion of bargaining price wars in the bromine industry, see Margaret Levenstein, *Do Price Wars Facilitate Collusion? A Study of the Bromine Cartel Before World War I*, 33 EXPLORATIONS IN ECON. HIST. 107 (1996). These and other such cases are discussed more fully in Levenstein & Suslow, *supra* note 19, at 14.

<sup>91</sup> *Mitsubishi*, *supra* note 55, at Daily Trial Transcript Day 8 at 92 (Ex. 280).

<sup>92</sup> Government’s Sentencing Memorandum and Government’s Motion for a Guidelines Downward Departure at 3-4, *United States v. Krass*, No. 99-626 (E.D. Pa. filed Oct. 18, 1999).

per ton (or \$2,756 per metric ton), compared to roughly a \$3,500 per metric ton price indicated as the last observation in Figure 1.<sup>93</sup>

The alleged price increases by the cartel varied by country. In Canada, for example, the size of the market affected was roughly \$440 million between 1992 and 1997 and prices rose by more than 90 percent over that same period.<sup>94</sup> The Canadian market was much more concentrated at the time, consisting only of UCAR and SGL, with a combined market share during the conspiracy years of over 90 percent. (Evidence of increases in price during the cartel period must be interpreted with care because some portion of the increase may reflect other factors, such as rising raw materials costs or increases in demand. The information presented here is purely descriptive and does not purport to control for other relevant factors that may have affected prices during the conspiracy period. Ideally, one would want to compare the cartel price with a counterfactual or “but-for” price that would have been set under competitive industry conditions, but publicly available data are lacking in this case to do such calculations.)

## Graphite Electrode Prices

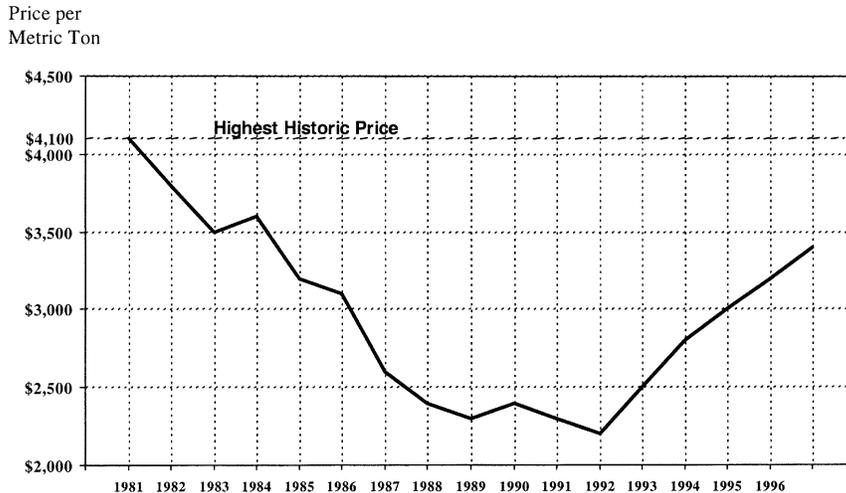


Figure 1

<sup>93</sup> *Purchasing Hotline*, PURCHASING, June 1, 2000, at 3, available at 2000 WL 14166458.

<sup>94</sup> News Release, Competition Bureau, Industry Canada, Foreign Corporation Fined \$12.5 Million for Price Fixing, (July 18, 2000), available at <http://strategis.ic.gc.ca/SSG/ct01800e.html>.

Given the steep price increases, one Canadian reporter wondered why steel producers had not begun a movement to integrate vertically backwards into graphite electrode production. His sources in the industry estimated “that electrode prices would have to increase 25 percent or more just to justify the ever-rising capital investment required of a newcomer to the field.”<sup>95</sup> A 90 percent increase in prices without any discernible effort on the part of steel producers to enter into graphite electrode production once again points to entry barriers other than raising the necessary capital.

After the GE firms pled guilty to the U.S. charges, dozens of civil suits followed (in Canada as well as the United States).<sup>96</sup> Most of these suits have been settled. One civil lawsuit of particular interest, *Ferromin International Trade Corp. v. UCAR International Inc.*, was filed by a group of non-U.S. steel producers.<sup>97</sup> Twenty-seven international EAF steel producers, from Turkey, Thailand, Australia, China, Austria, New Zealand, and Sweden, filed a complaint in February 1999, naming as defendants UCAR, SGL, Tokai, C/G, Nippon, and SEC.<sup>98</sup> The plaintiffs claimed that their purchases of GEs in the United States, Europe, Australia, and Asia totaled \$180 million over 1992–1997 and that they were overcharged an average of 45 percent during this period. In June 2001 a U.S. District Court dismissed most of these cases, agreeing to hear only the complaints of those foreign plaintiffs who could show that the GEs they purchased were *invoiced* in the United States.<sup>99</sup> We will discuss the legal issues arising from this case and others in more detail in Part V.

The Korea Fair Trade Commission conducted its investigation in 2001. Korea has no graphite electrode producer of its own, and according to the KFTC’s report, 90 percent of Korea’s imports of GEs were made from cartel members. The KFTC estimates that Korea demands about 4 percent of the graphite electrodes sold on the world market.<sup>100</sup> The investigation by the KFTC resulted in fines of US\$8.5 million for six

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<sup>95</sup> Ellis, *supra* note 67, at 35.

<sup>96</sup> *EC Graphite Electrodes Decision*, *supra* note 45, at 10 (“Civil proceedings were instituted by purchasers (steel producers) in Canada on 18 June 1998 against UCAR, SGL, C/G and SDK claiming damages for conspiracy and violation of the Canadian Competition Act. In some cases restitution has been negotiated”).

<sup>97</sup> 153 F. Supp. 2d 700, 705 (E.D. Pa. 2001).

<sup>98</sup> One of the plaintiffs is the Ferromin International Trade Corporation, which is a U.S. company that purchased graphite electrodes on behalf of its Turkish affiliates. Second Amended Complaint at ¶¶ 1–3, *Ferromin*, 153 F. Supp. 2d 700.

<sup>99</sup> *Ferromin*, 153 F. Supp. 2d at 706.

<sup>100</sup> Sun Hur & Young Keun Choi, *Theories and Case Study of Extraterritorial Application in International Cartel Cases*, 86 FAIR COMPETITION 11 n.16 (Oct. 2002).

GE manufacturers (UCAR, SGL, Showa Denko, Tokai Carbon, Nippon Carbon, and SEC).<sup>101</sup>

The commission estimated that Korea imported GEs valued at US\$553 million from these six cartel members from May 1992 to February 1998. The average import price increased from US\$2,255 per ton in 1992 to US\$3,356 in 1997, or about a 48.9 percent increase. The total damage to importing companies was estimated at US\$139 million. Note that the total fine is less than one-tenth of the estimated damages. The Monopoly Regulation and Fair Trade Act (enacted in 1980), Article 22, states that the KFTC can impose fines of up to 5 percent of sales, but there are no specific guidelines for setting cartel fines.

The Brazilian antitrust agency is becoming increasingly active in international cartel investigations. It initiated investigations into the lysine cartel in 1999 and the vitamins cartel in 2000. Although there are few details available, Brazilian authorities are also investigating the graphite electrodes cartel. In April 2001, the Secretariat of Economic Supervision of the Ministry of Finance recommended to the Secretariat of Economic Law of the same ministry the opening of a full investigation of the effects of the graphite electrodes cartel on the Brazilian market.<sup>102</sup>

Developing country GE producers may have been able to increase their prices under the rising cartel price umbrella. That does not mean that developing country producers would have charged the cartel price; there may be quality differences, differences in transportation costs, supply assurance, contract terms, and so on.<sup>103</sup> In one of the few pieces of direct information that we have on the difference in price between cartel and non-cartel members, the KFTC reported that "imports from non-cartel member companies amounted to about US\$54 million, and the import price increased from US\$2,205 per ton in 1992 to US\$2,407 in 1997."<sup>104</sup> Outside producers thus appear to have raised their price just over 9 percent during the cartel period. This price was still almost

<sup>101</sup> Press Release, Korea Fair Trade Comm'n, Korea Fair Trade Commission Imposes Surcharge of US\$8.5 Million on International Cartel of Graphite Electrodes Manufacturers from the U.S., Germany and Japan (Mar. 21, 2002), available at <http://ftc.go.kr/data/hwp/pressrelease0321.doc>.

<sup>102</sup> Press Release, Brazilian Ministry of Fin., Seae Recomenda Punição aos Cartéis Internacionais de Lisinas e Vitaminas [Secretariat of Economic Supervision of the Ministry of Finances Recommends Punishment of the International Lysine and Vitamins Cartels], at <http://www.fazenda.gov.br/portugues/releases/2002/r021219.asp> (Dec. 19, 2002).

<sup>103</sup> A 1991 Canadian review of the graphite electrodes industry as part of a dumping complaint, for example, states that graphite electrodes produced in China and the USSR are of a "quality [that] is not up to that required for modern electric arc furnaces." CANADIAN INT'L TRADE TRIBUNAL, *supra* note 55, at 5.

<sup>104</sup> Press Release, Korea Fair Trade Comm'n, *supra* note 101.

30 percent below the cartel's average import price of \$3,356 to Korean steel producers (and of course their price increase is well below the 48.9 percent the cartel price increase claimed by the KFTC). This sizeable price difference between cartel and non-cartel member producers was not confined to Korea: a report on prices of graphite electrodes in India claims that the average price in late 1996 was \$1,972 per ton in India versus \$2,753 per ton in Japan.<sup>105</sup>

But somewhat higher prices are not the only possible effect of the cartel on outside producers. Developing country GE producers may have been damaged if the cartel was able to limit developing country access to global markets. This was presumably the intention of the agreements described above to limit access to technology and critical inputs to cartel members. Earlier cases of sharing of technology had allowed developing country producers to improve quality; for example, Indian graphite electrode producer HEG collaborated with the French firm Pechiney in the late 1970s, obtaining access to its state-of-the-art GE technology.<sup>106</sup> This collaboration ended in 1994.<sup>107</sup>

It is also possible that developing country producers' ability to take advantage of the "umbrella" provided by the high cartel price was limited by cartel retaliation. Indian graphite electrode producers made this accusation in 1997: "Producers claim that the electrodes are being dumped into India at a price of \$2,200 per tonne as against the international price of \$3,200 per tonne."<sup>108</sup> In response to a complaint filed by the Indian Graphite Electrode Manufacturers Association, the government imposed antidumping duties in 1997 on imports from the United States, several European countries, and China.<sup>109</sup> These antidumping

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<sup>105</sup> See, e.g., *Bruised Battered and Dumped*, FIN. EXPRESS INV. WK., Nov. 3, 1996, at 17; *Graphite India to Raise Electrodes Capacity*, BUS. LINE (THE HINDU), Sept. 12, 1995, at 5.

<sup>106</sup> In 1977, HEG's graphite electrode division was set up in technical and financial collaboration with Societe des Electrodes et Refractaires Savoie (SERS), a subsidiary of Pechiney of France. See *Graphite Electrode Division . . . Soaring High*, HEG LIMITED ONLINE (2002), available at [http://www.hegltd.com/heg\\_electrodes.html](http://www.hegltd.com/heg_electrodes.html). In the collaboration, a plant, located in Mandideep, India, began operations with a capacity of 12,500 tons per annum. Over the years, the facility was modernized by deploying Pechiney's upgraded Lengthwise Graphitisation (LWG) technology. LWG allowed the manufacturing of larger diameter and longer length graphite electrodes. See *ICRA Rating Rational*, HEG LIMITED ONLINE (Dec. 2001), available at <http://www.debtonnet.com/icrarr/mc200112hl.htm>.

<sup>107</sup> *HEG Snaps Ties with Pechiney*, FIN. EXPRESS, June 15, 1994, at 16. By the time that this relationship was terminated, Pechiney had exited the graphite electrode business, selling it in 1993 to SGL. See *Graphite Products—Pechiney Sells 70% of Carbone Savoie to UCAR International*, CHIMIE ACTUALITES, June 21, 1996.

<sup>108</sup> *CVD on Graphite Electrodes Imports Likely*, FIN. EXPRESS, Apr. 20, 1997, at 2.

<sup>109</sup> Sharad Goel, *HEG, Graphite Not Elated over Dumping Duty on Electrodes*, ECON. TIMES, June 16, 1997.

claims were filed in 1996, while the conspiracy was still operating. Indian exports had increased substantially during the cartel period, reportedly by 25 percent per year to account for 14 percent of the world market.<sup>110</sup> Indian GE producers explicitly claimed that these low import prices were in retaliation for the expansion of Indian exports.<sup>111</sup>

#### D. POST-CARTEL INDUSTRY RESTRUCTURING

As noted above, there has been a clear downward price trend since the conspiracy ended. This certainly reflects in part the Asian financial crisis that hit the steel industry, and therefore the graphite electrode industry, in late 1998. Still, there is some evidence, albeit anecdotal, that points to readjustment to a new equilibrium in the industry (a “market share driven price war”) since the cartel ended.<sup>112</sup> There has also been a wave of cost cutting and plant shutdowns. UCAR closed its U.S. GE facility in 2001.<sup>113</sup> The Carbide/Graphite group began suffering losses and shutting down plants in 1999, finally filing for bankruptcy in 2001.<sup>114</sup> It is worthwhile to mention, given our discussion above regarding a general lack of post-cartel industry monitoring by competition agencies, that the DOJ filed a lawsuit to block SGL and its U.S. subsidiary from acquiring pieces of Carbide/Graphite, citing concerns about industry competition.<sup>115</sup> The lawsuit was subsequently dismissed when SGL lost its bid in bankruptcy court to another firm.<sup>116</sup>

Joint ventures are also being formed. In 1999, for example, UCAR entered into a production and marketing joint venture with Jilin Carbon, the largest Chinese producer of graphite electrodes.<sup>117</sup> UCAR’s contribution to the venture is expected to be cash and technical assistance.<sup>118</sup> SGL signed an \$80 million joint venture agreement with Shanghai Carbon Works in 1997 (where SGL had a 70 percent interest). According to Hoechst, then-parent company of SGL, this was the first Chinese joint

<sup>110</sup> *CVD on Graphite Electrodes Imports Likely*, *supra* note 108.

<sup>111</sup> *Id.*

<sup>112</sup> *Purchasing Hotline*, *supra* note 93.

<sup>113</sup> *UCAR Announces \$275 Million of Future Cost Savings and Asset Sales; Will Seek Name Change to GrafTech International Ltd.*, *BUS. WIRE*, Jan. 9, 2002.

<sup>114</sup> *AMERICA—U.S. Electrode Maker Files for Chapter 11 Protection*, *METAL BULL.*, Sept. 27, 2001.

<sup>115</sup> Jeff Bater, *U.S. Sues to Block SGL Carbon Acquisition*, *DOW JONES BUS. NEWS*, Apr. 15, 2003.

<sup>116</sup> Jeff Bater, *U.S. Justice Dept. Dismisses Antitrust Lawsuit vs. SGL Carbon*, *DOW JONES NEWS SERV.*, May 8, 2003.

<sup>117</sup> John E. Sacco, *UCAR in Venture with Chinese Jilin Carbon*, *AM. METAL MKT.*, Oct. 18, 2000, at 4.

<sup>118</sup> *China*, *ENG’G & MINING J.*, July 1, 2001.

venture of its kind in this industry.<sup>119</sup> More recently, SGL entered into joint venture with the Japan-based Tokai Carbon Co., to make ultra-high-power graphite electrodes in China.<sup>120</sup>

Whether these joint ventures facilitate or control Chinese entry is not yet clear, but it does suggest that monitoring of industries by competition authorities after the breakup of a price-fixing conspiracy may be warranted, certainly in the case of participation by multiple former cartel conspirators.

#### E. LESSONS FOR DEVELOPING COUNTRIES

There are a number of lessons to draw from the graphite electrodes case. First, consider the potential for consumer welfare effects. This cartel significantly raised graphite electrode prices in many parts of the world for several years, roughly between 45–90 percent. Because GEs are sophisticated intermediate goods, these price increases were passed on, at least in part, to both downstream producers and final consumers of steel. It is particularly costly to the development process to raise prices and limit entry on such goods. Without prosecution by government authorities, consumers lack the information, resources, and, in some cases, legal structure to protect their own interests.

There is also a regrettable lesson for empirical research. The effects of private international cartels on developing countries are quite difficult to determine, even on an individual country or product basis. There are enormous difficulties in estimating the quantitative impact of cartels on developing country incomes because of the secrecy under which cartels operate, the lack of antitrust prosecutions in developing countries themselves (leading to a lack of information on the activities of cartels in developing country markets), and the general lack of data on individual transactions that might have been influenced by the existence of a cartel. Even where there have been developing country prosecutions, they have relied heavily on U.S. and EU investigations to determine the impact of the cartel on their own domestic markets.

Given the actual and potential effects on trade that reach into the tens of billions of dollars, a natural question to ask is why these many affected countries are not seeking damages from cartel member firms in their home countries. In particular, given that the United States has the strongest laws and enforcement record against price fixing, a legal

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<sup>119</sup> *China Shanghai Carbon-Hoechst-3: First of Kind in China*, DOW JONES INT'L NEWS, Nov. 21, 1995.

<sup>120</sup> *SGL Carbon and Tokai Carbon Sign Joint Venture for Carbon Electrodes*, ADVANCED CERAMICS REP., Aug. 1, 2002, at 10.

mechanism for civil suits (which most countries do not have for antitrust violations), and some of the richest companies, why is it that there are relatively few lawsuits brought by foreign companies seeking damages? Not surprisingly, given the many recent international cartel prosecutions, there are a number of parties interested in this issue.

## V. OPTIONS FOR DEVELOPING COUNTRIES

With roughly \$50 billion in annual imports in cartel-affected industries, developing country consumers and governments must ask themselves: what is to be done? What options do individual consumers and individual countries have at their disposal to protect themselves from international cartels? Are international fora, such as the World Trade Organization, better suited to provide effective protection to developing countries from international cartels?

### A. DOMESTIC PROSECUTION

The most obvious solution to the problem of international cartels raising prices for developing country consumers is for governments in affected countries to take action directly against those cartels, as the United States and the European Union have done. In recent years we have seen several developing countries, especially South Korea, Mexico, and Brazil, take steps in that direction. Other countries, such as South Africa, have invested substantially in developing indigenous competition capability, but have yet to take on a particular international cartel case.<sup>121</sup>

Korea adopted its Monopoly Regulation and Fair Trade Act in 1980. Up until 2002, however, the Korean Fair Trade Commission had not used its powers to respond to anticompetitive actions taken by international cartels.<sup>122</sup> In May 2002, South Korea became the first developing country to fine members of an international cartel when it issued \$8.5 million in fines against the members of the graphite electrodes cartel.<sup>123</sup> A year later, in April 2003, it announced fines of \$3 million in the vitamin cartel case.<sup>124</sup> Mexico has fined two participants in the lysine cartel 1.6 million

<sup>121</sup> New competition laws were being written by developing countries as this article was going to press. Egypt and Vietnam, for example, have begun the process of writing such legislation. Other countries in Africa, such as Malawi, Swaziland, and Angola, are doing the same. Nepal is also committed to adopting such legislation and has set a target date for the enactment of a competition law of June 2004.

<sup>122</sup> Korea Fair Trade Comm'n, *Competition Law and Policy in Korea* 8, 10 (Oct. 15, 2002), available at <http://ftc.go.kr/data/hwp/0210.doc>.

<sup>123</sup> *Korea's FTC Imposes Fines on Graphite Electrode Cartel*, ASIA PULSE, Mar. 21, 2002.

<sup>124</sup> Press Release, Korea Fair Trade Comm'n, *The KFTC Imposes Surcharges on the International Cartel of Vitamin Companies* (Apr. 23, 2003), available at <http://ftc.go.kr/data/hwp/vitaminl.doc>.

pesos for price fixing.<sup>125</sup> It has also issued fines or accepted plea agreements in citric acid and vitamins.<sup>126</sup> Brazil has concluded investigations and recommended punishments in the vitamin and lysine cartels, and is soon to announce its decisions regarding the graphite electrode cartel.

But this approach has significant problems. Even where the country that has been harmed by an international cartel has both the legal infrastructure and the political and human resources in its competition policy offices to investigate and prosecute international cartels, it can be very difficult for these offices to obtain the necessary evidence. This evidence usually rests on activities undertaken in foreign countries; evidence gathering thus relies on the cooperation of investigative units elsewhere. But, as we discuss at greater length below, the policies that have allowed U.S. and EU competition authorities to successfully prosecute international cartels in recent years often undermine the ability of developing countries to obtain information regarding these cartels.

Developing countries could take actions to increase the collection of firm-level data, including import and export data. At least as important, they can make sure that such data is accessible to the domestic competition authority, so that any information collected in the regular regulation of business is available for competition analyses. The collection and organization of such statistical information could be an important first step for a new competition authority.

In many developing countries, the question of obtaining information from foreign investigations never even comes to the fore because the countries do not have the legal, political, or bureaucratic resources necessary to prosecute international cartels. As documented in the CUTS report on competition policy in seven south Asian and African countries, "The competition authorities [in India, Kenya, Pakistan, South Africa, Sri Lanka, Tanzania, and Zambia] find it very difficult to attract and retain competent and qualified staff. . . . Adequacy of legal provisions is the most important aspect of a competition regime determining its effectiveness. The inadequacy or lack of legal clarity in dealing with cases, though prevalent in all countries, was most prominent in the case of India. The lack of research and investigative capacity in the seven

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<sup>125</sup> OECD, *supra* note 22 ("Based on the above, the CFC imposed fines of 1,132,500 and 566,250 pesos on ADM Bioproductos and Fermentaciones Mexcianas respectively, for engaging in absolute monopolistic practices forbidden in Article 9(I) of the FLEC.").

<sup>126</sup> See Comisión Federal de Competencia, *Absolute Monopolistic Practices in the Market for Production, Marketing, Distribution and Sale of Citric Acid*, Resolution of the Fed. Comm'n on Competition, available at <http://www.cfc.gob.mx/EnIndex.asp>; *Hard Core Cartels: Mexico*, *supra* note 4, at 9–10.

countries makes it very difficult for the competition authorities to deal with cases judiciously.”<sup>127</sup>

One study of the costs of international cartels and the costs of operating a competition policy office, on a nation-by-nation basis, concludes that there would be a real payoff for many developing countries.<sup>128</sup> But many developing countries simply do not have the ability to invest in competition advocacy and enforcement. This is particularly the case if the country is relatively small or lacking in the economic and political clout necessary to enforce any fines or punishments on which it decides.<sup>129</sup>

An alternative “domestic” strategy is for consumers to sue cartel conspirators for damages in their national courts. For example, Canadian steel producers sued in Canadian courts to recoup damages from the members of the graphite electrodes cartel.<sup>130</sup> Private actions for damages resulting from violations of competition law are permitted in over twenty countries, including Argentina, Brazil, Russia, Slovakia, and Venezuela.<sup>131</sup> However, the damages that can be recouped in most countries are small relative to the United States, which is the only country, except for Taiwan, which provides for punitive damages in addition to actual damages incurred by the plaintiff. It is also more costly and cumbersome to sue in many of these countries because they do not allow class action suits (either at all or for violations of competition law). There are in many countries significant legal and procedural hurdles to such suits. Whatever the *de jure* potential of private implementation of competition policy, in practice such private suits are rare.

## B. PRIVATE ENFORCEMENT IN FOREIGN COURTS OF LAW

In many such instances, consumers from developing countries may look to the courts of developed countries for antitrust remedies. For

<sup>127</sup> CUTS, *supra* note 20, at ix.

<sup>128</sup> *Id.* at 88.

<sup>129</sup> Jason Beaubien, a reporter for National Public Radio, recently described a bribery scandal surrounding the construction of a dam in Lesotho, Africa (not related to competition policy), where fines were levied on multinational companies, but have not been collected yet because the case is on appeal. Jason Beaubien, *Analysis: Bribery Scandal in Lesotho* (NPR radio broadcast, May 19, 2003) (transcript on file with author).

<sup>130</sup> *EC Graphite Electrodes Decision*, *supra* note 43, at 10.

<sup>131</sup> See (1) Argentina: WORLD ANTITRUST LAW & PRACTICE: A COMPREHENSIVE MANUAL FOR LAWYERS AND BUSINESSES § 34.3 (James J. Gattett ed., Supp. 1999) [hereinafter WORLD ANTITRUST LAW]; (2) Brazil: ABA SECTION OF ANTITRUST LAW, 1 COMPETITION LAWS OUTSIDE THE UNITED STATES 16–17 (2001); (3) China: WORLD ANTITRUST LAW, §§ 38.3, 38.5.3, 38.7; (4) Russia: WORLD ANTITRUST LAW, §§ 31.8, 31.10, (5) Slovak Republic: Antimonopoly Office of the Slovak Republic, Legislation in Force, *available at* [http://www.antimon.gov.sk/default\\_a.htm](http://www.antimon.gov.sk/default_a.htm); and (6) Venezuela: WORLD ANTITRUST LAW, § 34.22.2.

example, an English court has recently ruled in a case involving the vitamin cartel that non-English plaintiffs can sue for damages there.<sup>132</sup> The ability of such plaintiffs to sue in U.S. courts, however, has been restricted because U.S. antitrust laws do not reach *all* anticompetitive conduct and by an uncertainty in current law as to what kinds of antitrust cases foreign plaintiffs may bring in the courts of the United States.

The access of foreign antitrust plaintiffs to U.S. courts is largely governed by the Foreign Trade Antitrust Improvements Act (FTAIA) of 1982,<sup>133</sup> which Congress enacted in an effort to clarify application of U.S. antitrust laws to foreign conduct and to limit application of U.S. antitrust laws when non-import foreign trade is involved.<sup>134</sup> Historically, U.S. courts have not been sympathetic to the claims of foreign antitrust plaintiffs whose claims arise from anticompetitive conduct directed at foreign markets. In *Ferromin International Trade Corp. v. UCAR International, Inc.*,<sup>135</sup> for example, twenty-seven plaintiffs had alleged that they suffered injury as a result of price fixing and market allocation in the worldwide market for graphite electrodes between 1992 and 1997. The district court dismissed the claims of sixteen of the plaintiffs, stating that although they had alleged a number of anticompetitive effects upon the U.S. marketplace resulting from the defendants' conduct, they had not alleged that their injuries stemmed from the effect of the higher prices for graphite electrodes in the U.S. market (as opposed to higher prices in other foreign markets).<sup>136</sup> The court allowed the claims of the remaining eleven plaintiffs to go forward, however, because some of the electrodes purchased by these plaintiffs were invoiced in the United States.<sup>137</sup>

However, two recent decisions—the March 2002 decision of the U.S. Court of Appeals for the Second Circuit in *Kruman v. Christie's International PLC*,<sup>138</sup> and the January 2003 decision of the U.S. Court of Appeals for the D.C. Circuit in *Empagran S.A. v. F. Hoffmann-LaRoche Ltd.*<sup>139</sup>—

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<sup>132</sup> Bruce A. Baird, David W. Hull & Steven J. Rosenbaum, *Corporate Leniency Applications*, THE ANTITRUST REVIEW OF THE AMERICAS 2004, at 21, and *Provimi Ltd. v. Aventis Animal Nutrition SA and others*, Queen's Bench Div. (Commercial Court) [2003] EWHC 1211 (Comm) (May 6, 2003).

<sup>133</sup> Pub. L. No. 97-290, 96 Stat. 1246 (codified at 15 U.S.C. § 6a).

<sup>134</sup> See *Eurim-Pharm v. Pfizer Inc.*, 593 F. Supp. 1102, 1105 (S.D.N.Y. 1984) (Congress enacted FTAIA “to eliminate the uncertainty that had arisen from the confusing array of standards employed by federal courts for determining when United States antitrust jurisdiction attaches to international business transactions.”).

<sup>135</sup> 153 F. Supp. 2d 700 (E.D. Pa. 2001), discussed *supra* note 97 and accompanying text.

<sup>136</sup> *Id.* at 705–06.

<sup>137</sup> *Id.* at 706.

<sup>138</sup> 284 F.3d 384 (2d Cir. 2002).

<sup>139</sup> 315 F.3d 338 (D.C. Cir. 2003).

have suggested a broader mechanism by which foreign plaintiffs can pursue legal remedies in the U.S. courts for the anticompetitive behavior of international cartels. Prior to *Kruman*, all of the federal courts that had addressed this issue had agreed that the FTAIA requires foreign plaintiffs suing under U.S. antitrust law to show that: (1) the alleged anticompetitive behavior had a “direct, substantial and reasonably foreseeable effect” on the U.S. marketplace, and (2) that an anticompetitive effect on the U.S. marketplace gave rise to the plaintiff’s claimed injuries.<sup>140</sup> The coupling of these two requirements effectively barred many foreign plaintiffs from suing in U.S. courts for international cartel activities.

In its recent decision in *Kruman*, however, the Second Circuit deviated from prevailing precedent on the meaning of Section 6a(2) of the FTAIA, opening the door to more suits by foreign plaintiffs and creating a circuit split on an issue of significant importance. The *Kruman* court held that foreign plaintiffs need only show that the domestic effects of an international conspiracy violate the Sherman Act, and not that those effects were the basis for their injury, in order to bring suit in the United States.<sup>141</sup>

In January 2003, the U.S. Court of Appeals for the D.C. Circuit issued its ruling in *Empagran S.A. v. F. Hoffmann-LaRoche Ltd.*,<sup>142</sup> which, like *Kruman*, held that the FTAIA permits suits by foreign plaintiffs who are injured by anticompetitive conduct that has effects on foreign commerce, provided that the conduct also has effects on domestic commerce.<sup>143</sup> In *Empagran*, the plaintiffs had filed a class action suit on behalf of foreign and domestic purchasers of vitamins, alleging that the defendants, companies that manufactured and distributed vitamins and vitamin products, had engaged in a long-term conspiracy to, inter alia, fix prices and allocate market share.<sup>144</sup> The trial court dismissed the foreign purchasers’ federal claims, stating that under the FTAIA, it did not have subject matter jurisdiction over those claims.<sup>145</sup> The D.C. Circuit reversed, ruling that federal courts do have subject matter jurisdiction over the foreign

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<sup>140</sup> See, e.g., *Den Norske Stats Oljeselskap AS v. HeereMac vof.*, 241 F.3d 420, 428–29 (5th Cir. 2001); *Ferromin Int’l Trade Corp. v. UCAR Int’l, Inc.*, 153 F. Supp. 2d 700, 705 (E.D. Pa. 2001); *In re Copper Antitrust Litig.*, 117 F. Supp. 2d 875, 876 (W.D. Wis. 2000); *de Atucha v. Commodity Exch., Inc.*, 608 F. Supp. 510, 518 (S.D.N.Y. 1985).

<sup>141</sup> 284 F.3d at 400.

<sup>142</sup> 315 F.3d 338 (D.C. Cir.), cert. granted, 124 S. Ct. 966 (2003).

<sup>143</sup> *Id.* at 341.

<sup>144</sup> *Id.* at 342.

<sup>145</sup> *Id.* at 342–43 (citing *Empagran S.A. v. F. Hoffmann-LaRoche, Ltd.*, 2001 WL 761360, at 2–4 (D.D.C. June 7, 2001)).

plaintiffs' claims under the FTAIA and that the foreign plaintiffs had standing to sue.<sup>146</sup> The D.C. Circuit based its rationale on deterrence, stating: "Disallowing suits by foreign purchasers injured by a global conspiracy because they themselves were not injured by the conspiracy's U.S. effects runs the risk of inadequately deterring global conspiracies that harm U.S. commerce."<sup>147</sup> The U.S. Supreme Court has granted certiorari in the *Empagran* case to resolve this important issue.<sup>148</sup>

These decisions raise significant legal and policy issues. On the policy side, the reliance on U.S. courts by injured parties from developing countries amounts to the quasi-privatization of antitrust enforcement in those countries. Two important questions arise from such an approach. First, as we discuss in the section on information sharing below, the increasing frequency of *civil* suits may undermine the tools, such as leniency, that the state uses to deter anticompetitive activity. Second, it is not clear that punishments imposed in U.S. courts will provide the right amount or the right type of deterrence of anticompetitive activity in developing countries. The reach of U.S. antitrust laws may be arbitrary in the sense that it could treat very differently activities that are economically indistinguishable from the point of view of developing countries. Clearly, such a policy would provide no deterrence to domestic cartels. Developing country consumers harmed by an international cartel, which happened not to affect the U.S. market, would still have no recourse. In this respect, greater international cooperation among national competition authorities and the creation of a supranational authority may be preferable to the expansion of private suits in the United States. On the other hand, in the absence of such international cooperation, the possibility of turning to U.S. courts to collect damages could be a powerful deterrent and a useful compensation mechanism for otherwise vulnerable consumers. Moreover, because these cases often arise out of international cartel activity that also adversely affects consumers in the United States, allowing other avenues for consumers to attack an international cartel may contribute to its demise.

### C. MULTINATIONAL SHARING OF INFORMATION

Another important avenue for the development of competition policy for developing countries is the sharing of information between countries. There are now agreements in place between the United States and several other countries for sharing information in competition cases, including

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<sup>146</sup> *Id.* at 341.

<sup>147</sup> *Id.* at 356.

<sup>148</sup> *Hoffmann-LaRoche, Ltd. v. Empagran S.A.*, 124 S. Ct. 966 (2003).

an agreement between the United States and Brazil. There are also similar agreements among Canada, the European Union, and Australia, and some developing countries, as well as agreements among developing countries themselves, such as the recent agreements between Korea and Russia and the other CIS countries.<sup>149</sup> These agreements are useful steps for those countries that are actively pursuing domestic enforcement of competition policy violations.

There are trade-offs to the expansion of information sharing as well as legal limitations on countries' ability to share information. The leniency programs of the United States and Canada now promise firms that come forward and are the first member of a cartel to confess and provide information to the authorities that they will not disclose the identity of the firm or make public any information that it provides. The EC, on the other hand, is required to reveal the identity of any firm receiving amnesty and provide an explanation of any reductions in fines. This promise of non-disclosure is critical to the willingness of many companies to come forward, as any information that becomes public may be used against them in civil damage suits or prosecutions in other jurisdictions. This issue has become so problematic that the EC has now reverted to oral requests for amnesty so that there is no written documentation that can be subpoenaed by U.S. courts for civil suits. There is, however, precedent for firms to voluntarily agree to information sharing, as was done in the initial stages of the Microsoft investigation. At the urging of Microsoft, the EC and the DOJ coordinated both their investigations and their rulings.<sup>150</sup> Microsoft waived its rights to confidentiality in both jurisdictions. Microsoft did this in order to expedite the investigation and its resolution. Firms requesting amnesty or leniency for cartel violations might similarly prefer a quick and consolidated resolution of the charges.

Two possible resolutions of this conflict between providing firms with an incentive to apply for leniency and providing more countries with information about actions taken against their consumers include, first, coordinated leniency programs across jurisdictions. In such programs,

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<sup>149</sup> See, e.g., Korea Fair Trade Comm'n, Memorandum on Cooperation Between the Fair Trade Commission of the Republic of Korea and the Ministry of the Russian Federation for Antimonopoly Policy and Support to Entrepreneurship (Dec. 26, 2000), available at <http://ftc.go.kr/data/hwp/new/MEMORANDUM.doc>; Korea Fair Trade Comm'n, Cooperation Arrangement Between the Fair Trade Commission of the Republic of Korea and the Australian Competition and Consumer Commission Regarding the Application of their Competition and Consumer Protection Laws (Oct. 9, 2002), available at <http://ftc.go.kr/data/hwp/cooperationarrangement.doc>.

<sup>150</sup> Spencer Weber Waller, *Anticartel Cooperation*, in ANTITRUST GOES GLOBAL: WHAT FUTURE FOR TRANSATLANTIC COOPERATION 108 (Royal Institute of International Affairs, Simon J. Evenett, Alexander Lehmann & Benn Steil eds., 2000).

firms automatically apply for leniency in several jurisdictions, providing information to and receiving leniency from all jurisdictions simultaneously. A second resolution is the creation of an international or supranational competition authority that, in cooperation with national authorities, can punish anticompetitive acts that span national borders. The creation of such a supranational authority raises issues of sovereignty as well as other difficulties; increasing the number of agreements for multilateral information sharing, combined with joint leniency programs, may be much easier to achieve. It may also encourage developing countries, most of which do not now have leniency programs, to adopt them in order to participate in broader information sharing.

#### D. MULTINATIONAL "PROSECUTION"

Ongoing negotiations at the World Trade Organization have discussed a variety of proposals for multilateral or plurilateral agreements on competition policy. We do not have space here for a full discussion of this topic, which we have treated at greater length elsewhere.<sup>151</sup> While there is significant potential payoff for developing countries from international sharing of information on price-fixing conspiracies and from assistance in developing appropriate domestic competition policy apparatus, it is important to keep in mind the practical limitations of any agreement that amounts to a requirement for standardized domestic competition policy rules on the part of developing countries. Given the difficulties of creating and implementing domestic antitrust policies in many developing countries, a WTO requirement for such policies is bound to have limited impact. Or, put another way, its unintended consequences could be much greater than its intended consequences. This is particularly the case if there is a requirement that "phases in" competition policy rules, first making hard-core cartels illegal and only after some period of time trying to introduce the much more costly and complex process of regulating mergers. Since the response of many firms to the enforcement of cartel laws appears to be merger or consolidation, the limited adoption of a competition policy against cartels could result in *more* consolidation and *less* competition, not the opposite.<sup>152</sup> National policies, as well as perhaps an international agency charged with responsibility for promoting competition in international markets,

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<sup>151</sup> See Simon J. Evenett, Margaret C. Levenstein & Valerie Y. Suslow, *International Cartel Enforcement: Lessons from the 1990s*, 24 *WORLD ECON.* 1221 (2001).

<sup>152</sup> For an example of this in an earlier period, see Symeonidis's examination of Britain's adoption of an anti-cartel policy in the 1950s and 1960s. GEORGE SYMEONIDIS, *THE EFFECTS OF COMPETITION: CARTEL POLICY AND THE EVOLUTION OF STRATEGY AND STRUCTURE IN BRITISH INDUSTRY* (2002).

should address these unintended consequences of more aggressive cartel enforcement.<sup>153</sup>

## VI. CONCLUSION

In this investigation of the effects of international cartels on developing countries, we have addressed developing countries, both as consumers and as competitors or co-conspirators. The discussion shows the potential for an international cartel made up of producers from industrialized countries to have simultaneously harmful effects on developing country consumers and either harmful or beneficial effects on developing country producers. We have discussed both the short-term costs, especially higher prices on a significant volume of trade, and possible long-term costs due to the creation of durable barriers to entry.

There are several tentative conclusions that can be drawn and a number of policy implications (and questions) that follow. First, international cartels appear to have an economically significant effect on trade with developing countries. However, in order to properly quantify the effects, governments must do a better job of collecting trade data at the product level. Second, antitrust institutions either do not exist in most developing countries or do not have the wherewithal to address this problem. Anti-trust institutions in the United States and European Union, although highly developed, do not include the effects on “certain third markets” when calculating punishments for price fixers; the details regarding the effects of the cartels outside of the U.S. and EU markets will, in general, never be made public. The competition authorities may well have information regarding restrictions on competition in developing countries, but under current law and multinational agreements there is often not permission, let alone responsibility, to share that information with affected parties. Neither is there consistent authority that allows foreign consumers to seek redress in forums that provide significant remedies, such as those in the courts of the United States. Legal decisions, such as the *Empagran* case, on whether to take a narrow or broad view of the application of U.S. antitrust law will have a direct effect on damages suffered by developing countries and the level of deterrence U.S. law provides. A competition regime in which cartels need fear damages only in a part of the world market, while reaping global benefits, may provide insufficient deterrence.

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<sup>153</sup> See, e.g. Ajit Singh, *Competition and Competition Policy in Emerging Markets: International Developmental Dimensions* (UNCTAD and Center for Int'l Development Harvard Univ. G-24 Discussion Paper Series No. 18, 2002).

Several potentially useful policy proposals emerge from this discussion of cartels and their effect on developing countries. These include the establishment of an international competition authority, increased information sharing, and other kinds of international cooperation among national competition authorities, and greater access for developing country consumers to the civil courts of developed countries. We have also highlighted an important pitfall in the current policy of industrial countries, namely the neglect, in general, of “post-cartel” industry monitoring. The failure to maintain competition after the prosecution of cartels may mean that cartel prosecutions have the unintended effect of encouraging consolidation rather than competition. Greater international surveillance of cartel-affected industries could assure the emergence of real competition after the break up of a cartel. This is particularly important in light of the alternative, which could be the consolidation of the cartel alliance in a single multinational firm.