Tackling International Anti-Competitive Practices in the Americas:

Implications for the Free Trade Area of the Americas[1]

Julian L. Clarke[2] and Simon J. Evenett[3]

World Trade Institute and the University of Bern

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Abstract:

In the context of the negotiations on the Free Trade Area of the Americas (FTAA), it has been proposed that signatories agree to enact and enforce a national law against private anti-competitive practices. This paper assesses the *feasibility* and *desirability* of such an initiative. The paper starts by documenting and discussing the experience with national anti-cartel enforcement in six jurisdictions in the Americas. In three of these jurisdictions—Brazil, Mexico, and Peru—the prosecution of cartels—including some international cartels—suggests that such enforcement efforts are, indeed, feasible. The paper then goes on to quantify the overcharges paid by Latin American economies on their imports of vitamins during the ten year-long international conspiracy to cartelize the market for such goods. The percentage increase in the import bills for vitamins of those nations that do not have active cartel enforcement regimes is found to be at least eight percentage points higher than those with such regimes. Given the magnitude of vitamins imports in Latin America, in certain jurisdictions this differential increase translates into millions of dollars of extra overcharges on an annual basis—and compares favorably with the state outlays on competition enforcement. Such considerations imply that the proposed FTAA-related initiative considered here is likely to be desirable too.

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[2] Email address: julian.clarke@wti.org

[3] Email address: simon.evenett@wti.org

Table of Contents

1. Introduction 3

2. Negotiations on competition policy matters in an FTAA 3

3. Hardcore Cartels 7

4. Competition laws and experience with cartel enforcement in selected nations in the Americas 10

5. A brief account of the international vitamins cartel 21

6. Theoretical considerations and empirical implementation 23

7. Policy implications of this analysis for the FTAA negotiations 35

1. Introduction

In the context of the negotiations for a Free Trade Area of the Americas, it has been proposed that nations in the region enact and enforce a law against private anti-competitive practices. This paper examines some of the factors that are pertinent to assessing the merits of such a proposal, especially as it relates to laws against cartelization and against so-called hardcore cartels.

The first part of the paper (sections 2-4) describes the status of the ongoing negotiations on competition policy in the FTAA and, given our focus on hardcore cartels, defines and characterizes them. More importantly, section 4 contains accounts of recent initiatives in competition policy in the United States, Brazil, Mexico, Chile, Peru, and Canada. Each account includes an overview of any revisions to national competition legislation during the 1990s, the record of enforcement against hardcore cartels during the time frame, and any proposals advanced for future national and regional initiatives to combat hardcore cartels within the proposed FTAA. As well as providing important context, this part of the study will enable an assessment of the feasibility of national enforcement actions against hardcore cartels in Latin America.

The second part of the paper (sections 6 and 7) is more quantitative in nature and aims to provide some estimates of the costs and benefits of national anti-cartel enforcement. Specifically, this part of the study examines whether the magnitude of overcharges borne by Latin American economies from one prominent international hardcore cartel—the long-lasting vitamins cartel—differs systematically across nations according to the presence of an active anti-cartel enforcement regime. The policy implications of this quantitative analysis, plus the first part of the study, are summarized in section 8.

It is worth noting in passing that this paper will not cover such competition policy matters as mergers and acquisitions, or the relationship between trade and competition policies more generally, except where discussion of those topics is germane to the focus on hard-core cartels.

2. Negotiations on competition policy matters in an FTAA

The countries of North and Latin America are currently negotiating a possible regional integration agreement, and a draft version of the Free Trade Agreement of the Americas (FTAA) is available. The draft agreement on free trade originated as part of a broader agenda

of issues which originated at the Summit of the Americas held in Miami, Florida between December 9 – 11, 1994. The Summit members were motivated to meet together because of their mutual interest in a broad range of issues ranging from trade to the environment and even women's issues.[4] The Summit of the Americas was attended by 34 Latin American nations, all of which continued to meet at a subsequent summit in Denver the following year to discuss the specifics of a future trade agreement. That future trade agreement was to evolve into the draft FTAA. The participating countries, listed in alphabetical order, are Antigua and Barbuda, Argentina, the Bahamas, Barbados, Belize, Bolivia, Brazil, Canada, Colombia, Chile, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St.Kitts and Nevis, Saint Lucia, St Vincent and the Grenadines, Suriname, Trinidad and Tobago, United States, Uruguay and Venezuela.

The draft agreement has not been finalized yet, but it has evolved significantly since inception. The excerpts quoted from the FTAA in this document contain square brackets, which indicate that the text is still in draft form. The text between the brackets is still being debated and may be excluded or amended before the FTAA is finally adopted. All of these considerations should be borne in mind when reading the excerpts quoted below.

Given that some countries have chosen to keep their FTAA proposals confidential, other primary sources such as country submissions to the Working Group on the Interaction between Trade and Competition Policy (WGTCP) at the World Trade Organization (WTO) and to the Organisation for Economic Cooperation and Development (OECD) Global Forum on Competition, have been used to determine national priorities, in addition to various secondary sources by other authors.

The FTAA negotiating group began working on a competition chapter for the proposed FTAA in 1997. The results of the workshop set out a broad agenda for the negotiations to follow. In general, the negotiating parties agreed that they should aim for free competition, within the constraints of existing multilateral commitments. To this end, there was agreement that each country should create a specialized and independent agency capable of applying and reviewing competition policy. The principles of transparency and non-discrimination were to be respected and the philosophy of positive comity was to underlie all the measures adopted. In particular, the Brazil Workshop, in 1997, showed that parties were aware from the beginning that inexperienced Latin American countries were going to require special assistance in adhering to the requirements of a competition agreement and that any competition framework would have to serve the dual purpose of educating members about

[4] See FTAA (1994).

competition and promoting competition in addition to enforcing it. [5] There is no explicit reference to harmonizing the laws of the various members but there is a requirement to grant legal personality to complainants from Member states in the local jurisdictions of other Members, and to work towards agreement on creating a forum for dispute settlement between Members.

In 2002, the FTAA Negotiating Group on Competition Policy compiled an inventory of domestic laws and regulations pertaining to competition policy in the Western hemisphere. This inventory was part of a broader study on existing competition regimes in Latin America. It showed that,

> "… thirteen (13) countries in the Hemisphere have legislation and institutions on free competition: Argentina (1919, amended in 1946 and 1980, and currently under review), Brazil (1962, amended in 1990 and revised in 1994), Canada (1889, and subsequent legislation and amendments), Colombia (1959, supplemented in 1992), Costa Rica (1994), Chile (1959, amended in 1973 and revised and incorporated in 1979), Jamaica (1993), Mexico (1934, replaced in 1992), Panama (1996), Peru (1991, modified in 1994 and 1996), Uruguay (2001), Venezuela (1991) and United States (1890 and subsequent other legislation and amendments).
>
> Furthermore, Bolivia, Ecuador, Honduras, El Salvador, Guatemala, Nicaragua, Dominican Republic, and Trinidad and Tobago are actively designing and debating respective draft legislation on the issue"[6]

The **Draft Agreement on Competition Policy (DACP)**[7] is divided into nine sections: Competition Law, Regulatory Principles, Legal Monopolies, Institutional Provisions, Review Mechanism, Dispute Settlement, Technical Assistance, Transitional Measures, Confidentiality.

It seems that 2002 was a busy year in the FTAA negotiating group for competition policy because the text of the DACP was substantially amended between May and November of that year. Looking at the differences between the DCAP presented in May and the one in November provides a useful insight into the direction being taken by the negotiators.

In its older form, for example, the FTAA stipulates that parties would be allowed to exclude certain cartels from their obligations under the agreement. For example, Section 1.3.3 of the older DACP states that:

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[5] SICE (1997).
[6] FTAA (2002a)
[7] FTAA (2002b).

> **[[**…After the entry into force of this Agreement, the Parties shall make an **[**annual**]** notification to the Committee provided for in point 3.5 of any new exclusion or extended exclusion or category of authorization related to hard core cartels.**]]**

Interestingly, the reference to hard core cartels has disappeared from the most recent version. The new version is somewhat stricter in terms of the right of parties to exempt or exclude certain anticompetitive agreements. Any exclusions must be reviewed periodically by the member country or by a subregional entity to review whether they remain necessary.

> **[1.3** Any exclusions or exceptions from the coverage of national or sub-regional competition measures shall be transparent and [should] be reviewed periodically by the Party or subregional entity to evaluate if they are necessary to achieve their overriding policy objectives. [After the entry in to force of this Agreement, the parties shall make a notification to the Committee provided for in point 3.5 [3.2] of any new or extended exclusion or exemption.]][8]

The review committee mentioned in the last sentence of section 1.3 is a non-binding mechanism which, it must be stressed, does not prejudge any disputes that may arise under the Dispute Settlement provisions outlined elsewhere in the draft FTAA.

Furthermore, under the older DACP, under the heading of "Anti-Competitive Conduct with Cross-Border Impact", the language regarding enforcement cooperation against hard-core cartels is horatory rather than binding. It only asks the parties to the Agreement to "consider cooperating in investigating and taking appropriate action, carrying out joint investigations, where appropriate."[9] There is no obligation on the parties to cooperate in enforcement.

This issue is highlighted again in Section 1.2.2 of the DACP:

> "If there is evidence that anticompetitive practices are being carried out in the territory of a Party, and that these practices negatively affect the interests of another Party, and in the event that such activities are not permitted under the competition law of the Party in which they are occurring, the competition authority of the affected Party *may request* that the competition authority of the other Party investigate and, as appropriate, take appropriate action, pursuant to its own legislation." [italics added.][10]

[8] FTAA (2002b).
[9] FTAA (2002b), Section 1.2.1.
[10] FTAA (2002b), Section 1.2.2.

To reiterate, if the draft agreement were implemented, there would be no obligation for the parties to cooperate in the investigation of any type of cross-border anti-competitive conduct. The use of the words 'may request' (italicized in the excerpt above) indicates the lack of a binding commitment upon signatories in this regard. There is no obligation upon the party receiving such a request to comply with it. Nor is there any remedy for a party affected by cross-border anti-competitive measures originating in another party's territory to seek compensation for damages caused.[11]

The latest DACP is equally weak in this regard. While paying lip service to the principles of notification and comity, it leaves open the final question of whether or not parties will take action based upon requests from a fellow FTAA member to do so. Section 4.3.3 of the DACP states clearly that

> "[…Nothing in this provision limits the discretion of the requested Party's competition authority under its competition laws and enforcement policies as to whether to undertake enforcement activities with respect to the anticompetitive activities identified in a request. (positive comity)][12]

In summary, it would seem that one of the principal obligations of a potential competition agreement (under the auspices of an FTAA) would be to enact some form of legislation against private anti-competitive practices, of which hardcore cartels are a leading example. The next section provides a brief account of what these cartels are.

3. Hardcore Cartels

The term hardcore cartels has acquired a special significance since the Organisation for Economic Cooperation and Development (OECD) members agreed in 1998 to a non-binding "Recommendation" on such cartels. According to the OECD, a hardcore cartel is

> "an anticompetitive agreement, anticompetitive concerted practice, or anticompetitive arrangement by competitors to fix prices, make rigged bids (collusive tenders), establish output restrictions or quotas, or share or divide markets by allocating consumers, suppliers, territories, or lines of commerce.[13]"

[11] FTAA (2002b), Section 5.2 of the DCAP states: "The Dispute Settlement Mechanism of the FTAA shall *not* be applicable for challenging or reviewing the administrative or **[**judicial**] [**jurisdictional**]** decisions of Parties with respect to competition law and policy."[italics added]
[12] FTAA (2002b), Section 4.3.3
[13] See OECD (2000). Notice here that the definition of hardcore cartels is being discussed, not the important issue of the sectoral scope and practices covered by the OECD Recommendation. The latter is discussed in section 6 below.

Interestingly, the FTAA definition of anti-competitive behaviour is almost a replica of the OECD definition. Looking at the latest DACP we see that anticompetitive behaviour has been defined as,

> […anticompetitive agreements, anticompetitive concerted practices or anticompetitive arrangements by competitors to fix prices, make rigged bids (collusive tenders), establish output restrictions or quotas, or share or divide markets by allocating customers, suppliers, territories or lines of commerce…][14]

Perhaps the most important distinction between the definition of a traditional cartel and that of a hardcore cartel is the repeated reference to the phrase "anticompetitive" in the definition of the latter.[15] This raises the issue as to whether a cartel could be pro-competitive, that is, whether a cartel's formation could result in lower prices for purchasers. As some Chicago-school scholars have pointed out, as a theoretical matter it is possible for a cartel—under certain specific circumstances—to result in large enough cost reductions that prices paid by purchasers actually fall.[16] The relevance of this theoretical observation for policy discourse has not been established in the available empirical evidence on recently prosecuted private international cartels.

It should be noted that hardcore cartels exist in both the government and private sector and that they may be either national or international in scope. This paper is concerned with hard-core cartels in the private sector and, where possible, it focuses on cartels that are international in character.

Agreements formed between conspirators in a cartel are, by definition, explicit. Often, meetings between the cartel conspirators are documented and the exact nature of the conspiracy is laid out in considerable detail in agreements between all cartel members. Hardcore cartels are characterized by secretive behaviour. The cartel operators tend to hide documentation outside of the jurisdictions in which they conspire, making the task of prosecuting them difficult unless the cooperation of competition agencies and judiciaries in other countries can be counted upon. Cartels also tend to organize in countries in which competition laws are lax or non-existent. These countries form so-called safe-havens for the conspirators.[17]

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[14] See FTAA (2002b), Section 1.4.1.
[15] Notice that a hardcore cartel may well have an international component to it, but need not do so.
[16] See Landes (1983) for such a claim. Another logical possibility is for the formation of a cartel to increase the sum of consumer and producer surplus, and not just the former. For some empirical evidence on this matter, see Dick (1992).
[17] See Clarke and Evenett (2003).

Hardcore cartels distort competition in markets by conspiring to fix prices, quantities and segregating markets. In doing so they harm customers who are forced to pay higher prices for goods and services. They tend to restrict choice as well as the availability of products. The rents garnered by the cartel conspirators amount to a transfer from the customer. The net result of this rent seeking is normally waste and certainly inefficiency in the affected market. Finally, hardcore cartels are often international in the sense that their effects are felt simultaneously in many jurisdictions or their membership is drawn from firms located in more than one economy.

Measures against hardcore cartels range from orders to discontinue this form of anti-competitive behavior through to fines and the imprisonment of executives. It appears that there are limits to the effectiveness of national enforcement efforts against international hardcore cartels for a number of reasons. Action against a hardcore cartel in one jurisdiction, especially when the jurisdiction in question is small, may have a negligible impact upon the overall conspiracy.[18] Moreover, firms may be reluctant to apply for corporate leniency in a country with a small economy if doing so jeopardizes the profits garnered by cartelizing in larger jurisdictions abroad, especially if the original leniency application decision is eventually made public.

Cartels became the focus of much attention in international discussions on competition policy during the late 1990s. Since 1993, the United States Department of Justice (USDOJ) has prosecuted more than forty private international cartels. During the same period, many Latin American countries reinvigorated their competition regimes and enforcement capacities to cater to large-scale privatization in their economies. Countries such as Mexico, Brazil and, to an extent, Peru, promoted competition policies during this decade as a means of ensuring that domestic market reforms were not eroded by the power of formerly state-run enterprises.

The prosecution of international cartels in the United States during the 1990's formed the first investigative challenge for many of the newly restructured Latin American competition agencies. Confessions of cartel members in the US indicated that conspiracies by firms to fix prices and output were distorting markets not just in the US, but also in certain Latin American economies. Brazil, for example, found itself to be host to the Latin American corporate headquarters of the perpetrators of the Vitamins cartel.[19]

More generally, enforcement activities against cartels in the 1990s also took place in Brazil, Mexico, Peru, and Canada. In Brazil, Mexico, and Canada, action against cartels was

[18] See Evenett, Levenstein, and Suslow (2001) for a fuller explication of this point.
[19] UNCTAD (2002).

prompted at least in part by the USDOJ investigations[20]. In Peru, action was taken against domestic cartels, including the notorious poultry cartel[21], but no enforcement actions in Peru were undertaken against international cartels. The enforcement activities of these Latin American countries against international cartels revealed the scope of industries affected by cartelization and raised the concern that previous enforcement actions undertaken in Latin American countries may not have been of a magnitude sufficient to deter future cartelization.

In addition, the attempts of the Latin American countries to investigate anti-competitive behaviour were hampered by constraints on information sharing between enforcement agencies. The deficiencies of national and regional legislation in the area of cartel enforcement were partially responsible for the initiatives on competition policy that have appeared in the proposed legislation of both Mercosur and the FTAA.

4. Competition laws and experience with cartel enforcement in selected nations in the Americas

This section contains brief accounts of a number of national initiatives in competition law, its enforcement—especially as it relates to hardcore cartels—and certain proposals made in international fora on competition policy-related matters.

4.1 United States of America (US)

The first US competition law was the Sherman Act of 1890. Section One of that Act criminalizes "hard-core cartel activity, price-fixing, bid-rigging and market allocation agreements."[22] The US has the strictest penalties in the region to deter this form of anti-competitive conduct. The US can punish conspirators with fines and prison terms. Fines are based on a complicated formula involving 20% of the affected commerce for the period of the conspiracy plus a multiplier, based on a so-called Culpability Score, which, among other factors, takes the previous violations of anti-trust law by a firm into account. The culpability score then informs the multipliers which are added to the original fine, thus potentially increasing it drastically. The base fine of USD35,090,000 imposed upon Mitsubishi for its part in the graphite electrodes cartel, for example, was increased to USD134,000,000 by the time the culpability score and the multipliers had been factored in. [23]

[20] Mexico (2002).
[21] Peru (2001).
[22] Peru (2001).
[23] Peru (2001).

Prison terms are likewise included in the arsenal of weapons available to antitrust enforcers in the Unites States. These prison terms may be imposed on foreign nationals as easily as upon US citizens. As evidence of this it is worth noting that over twenty defendants have been sentenced to incarceration for one year or longer with an average prison term of fifteen months. Six Swiss and German executives from F. Hoffmann-La Roche AG (HLR) and BASF AG were convicted for their role in one conspiracy alone, and all served time in U.S. prisons. [24]

The USDOJ relies on a 'carrot and stick' approach to uncover and prosecute hardcore cartels. The punishments, as outlined above, are severe. The question may well be asked, therefore, what is the carrot? The USDOJ induces companies to come forward and confess their role in a cartel in return for a full or partial amnesty on punishments. This grant of leniency can extend to all officers, directors and employees of the company who choose to cooperate with the authorities. Full leniency applies only to the first company to come forward with a confession of involvement in a cartel. Moreover, amongst other conditions, such leniency will only be granted if there is no pre-existing investigation by the antitrust authorities.

The success of this approach, which has been in operation since 1993, is described in reports by the USDOJ such as the following:

> "Under the old policy, the Division obtained roughly one amnesty application per year. Under the new policy, the application rate has jumped to more than one per month. Moreover, the 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 this fiscal year. As a result of this increased interest, the Division frequently encounters situations where a company approaches the government within days, and in some cases less than one business day, after one of its co-conspirators has secured its position as first in line for amnesty."[25]

Since 1993, the USDOJ has prosecuted around forty international cartels across a range of industries. In 2001, seventy-percent of the companies charged by the USDOJ Antitrust Division were firms based outside the US and roughly thirty-three percent of the individual defendants were foreign nationals.[26] The scope of US enforcement activity in this area dwarfs that of any other country in the region.

In terms of international cooperation, the United States has worked closely with enforcement officials in certain countries, notably Canada with which it has a Mutual Legal Assistance

[24] Peru (2001).
[25] Hammond (2003).
[26] Hammond (2002).

Treaty that covers anti-trust matters as well as other inter-governmental agreements. Moreover, the Antitrust division of the USDOJ has signed antitrust cooperation agreements with competition agencies in Japan, Brazil, Israel, Mexico, Australia, Germany, Canada and the European Union.[27] And, the USDOJ has made use of the international police force, Interpol, to detain and to extradite criminals wanted for anti-trust crimes undertaken, or having effects in, the US.[28]

These considerations appear to have informed the US position on the Competition chapter DACP in the FTAA. The US believes that cooperation among the FTAA parties is important for the propagation of competition law and policy development. It does not advocate the harmonization of competition law.[29] The US does, however, recommend technical assistance on competition policy and law enforcement.

The US believes that the DACP in the FTAA should mandate that each country have a competition agency at the national or sub-regional level responsible for the enforcement of antitrust laws within its jurisdiction. These agencies should be subject to independent judicial review and operated according to the core principles of transparency, due process and non-discrimination.[30]

4.2 Brazil

In 1994, Brazil passed a new competition law (n.º 8.884) which converted the Administrative Council for Economic Defense (CADE) and the Brazilian Administrative Antitrust Tribunal into independent agencies.[31] In institutional terms, a President and a Board of Commissioners govern CADE. The President is a former federal judge with a background in international law and the majority of the commissioners are economists and lawyers drawn from Brazilian universities. This is part of a concerted effort to maintain the independence of the competition body from the government interference that had plagued the competition authorities in the past. [32]

Brazil offers a 'carrot and stick' approach to enforcement of competition law which mirrors that used by the USDOJ. The two competition agencies that support the CADE in Brazil, which are the Secretariat for Economic Monitoring (SEAE) and the Secretariat for Economic Law (SDE), are able to impose fines, recommend imprisonment (of between 2- 5 years for

[27] Hammond (2002).
[28] Hammond (2002).
[29] USA (n.d.).
[30] USA (n.d.).
[31] Considera and Teixeira (n.d).
[32] Brazil (2000).

cartel members) and offer leniency as an inducement to conspirators who may wish to confess to their involvement in a cartel. [33]

Brazil prosecuted approximately ten hardcore cartels during the 1990's, not all of which had an international character. The industries affected ranged from steel, orange juice, lysine, vitamins, and maritime transportation to aluminum and even gasoline stations.

Brazil claims to have been hampered by lack of cooperation from the United States during its enforcement efforts of the 1990s. It was tipped off to the operation of the vitamins cartel, for example, by the enforcement actions of its US colleagues. After reading about the conspiracy being prosecuted in the US, Brazilian competition agents subsequently discovered that the headquarters for the vitamin conspirators in Latin America were located within Brazil.[34] Frustratingly for the Brazilians, the United States was unable to share more information on this cartel because of legal constraints on confidential information. This left the Brazilians to piece together the conspiracy based upon hints and informal cooperation from their US counterparts.[35]

After its experience investigating and prosecuting the vitamins cartel, Brazil's submissions to international and regional fora has been characterized by proposals encouraging cooperation between countries. Moreover, in October 1999, the Brazilians signed an agreement with the US for the informal exchange of information between their antitrust enforcers.[36] A recent bilateral agreement with Russia contained similar provisions.[37] Brazil's proposal to MERCOSUR on competition policy similarly encourages cooperation in broad terms but it is in its proposal to the FTAA that Brazil is most specific about its requirements, stating that: "the development of mechanisms aiming at promoting cooperation and information exchange among antitrust authorities" is one of its four negotiating goals.[38]

4.3 Mexico

The Federal Competition Commission of Mexico (CFC) was created in 1993 as an independent body charged with overseeing competition in the marketplace.[39] As in Brazil, the competition agency evolved as a means of ensuring competition in the wake of the concurrent

[33] According Brazil (2002) fines are levied on both companies and individuals and are based upon the company's gross pretax revenue, which, according to Article 23 of the Brazilian Antitrust Legislation, "shall by no means be lower than the advantage obtained from the underlying violation, if assessable."
[34] UNCTAD (2002).
[35] Correa (2001).
[36] Correa (2001)..
[37] Considera and Teixeira (n.d.).
[38] Considera and Teixeira (n.d.)
[39] Mexico (2002).

privatization of state-run enterprises.[40] The CFC contains a decision-making body called the Plenum, which is also entrusted with the task of notifying authorities of criminal conduct in antitrust matters. It should be noted that any form of implicit or explicit collusion is *per se* illegal under Mexican law and that the CFC is not obliged to prove distortions to markets as a result of any conspiracy it uncovers; it is assumed to be damaging in all cases.[41] Judicial sanctions take the form of fines. Prison sentences are not included in the catalogue of permitted punishments available to Mexican prosecutors.[42]

The CFC's brief expanded beyond the enforcement of competition in privatized industries to encompass other forms of anti-competitive conduct. Turning once more to the vitamins cartel, we observe that information about its existence in Mexico came to light from a press release by the USDOJ regarding its investigation into this decade-long conspiracy. Mexico initiated an investigation into the branch offices of the same companies under investigation in the US. Unlike their Brazilian counterparts, the Mexican antitrust authorities did not seek information from the United States for information but rather approached the conspirators themselves to gain confessions etc.

The main drawback of Mexico's competition legislation is that it does not provide for corporate leniency, which restricts its ability to successfully uncover and prosecute cartels.[43] The carrot and stick strategy favored by the United States cannot be applied in Mexico. That there is a possibility that some cartels go unnoticed by authorities because of this absence of a leniency provision, and that the Mexicans themselves suspect as much, is made clear in the words of the Mexican submission to the WGTCP,

> "… the legal framework does not provide for leniency programs and so the CFC frequently lacks elements to detect collusive agreements. It also faces some opposition to information and document requirements needed to compile legal evidence to substantiate proceedings."[44]

Mexico's ambitions for competition policy in the FTAA, therefore, may be inferred from its experience in prosecuting cartels as well as it submissions to international bodies regarding competition policy. In fact, Mexico's submission to the OECD Global Forum on Competition in 2001 lists the following three areas in which it envisages the need for further initiatives.

- "Competition advocacy at a social level
- Inability to impose requests for cooperation outside Mexican borders

[40] Mexico (2001).
[41] Mexico (2002).
[42] FTAA (2001).
[43] For more on the topic of leniency please refer to OECD (2001).
[44] Mexico (2002).

- Ability of competition authority to deal with dynamism and progress"[45]

To this end,

> "The FCC has promoted coordination with other countries' competition authorities to exchange experiences and apply techniques of analysis of competition in a global context. This coordination has led to the negotiation and subscription of international treaties and agreements Similarly, there has been active and prominent participation in international fora in which the topics of competition and best practices are discussed, among them are the OECD, WTO, UNCTAD and EFTA. This actions provide the FCC with better tools to protect Mexican interests."[46]

4.4 Chile

Chile's competition enforcement regime is founded on a law from 1973, Decree Law 211, that

> "created diverse organisations in charge of the prevention, correction and repression of commercial practices that might harm freedom of competition in economic activities.
>
> These agencies are:
> The Economic National Prosecutor´s Office.
> The Resolutory Commission
> The Central Preventive Commission, and
> The Regional Preventive Commissions"[47]

The antitrust authority is independent of the government. The National Economic Prosecutor is also independent from the other three Commissions. Penalties may take the form of either fines or imprisonment. Unlike the Mexican law, Chilean law insists that the burden of proof lies with the competition agency. The latter must show that there has been an anti-competitive agreement and, importantly, that damage has resulted from it. Leniency programs are not mentioned.[48]

[45] Mexico (2001).
[46] Mexico (2001).
[47] Chile (2001).
[48] Chile (2002).

Chile considers that cooperation is an issue that should be addressed at a regional level, as evidenced by its recent agreements with Canada and Costa Rica. A memorandum of understanding signed between the three governments aims at harmonizing the enforcement of competition laws by them. [49]

To date, there is no evidence that Chile has cooperated on antitrust matters with other countries (or that other countries have cooperated with Chile.) Moreover, there is no record of international cartels being prosecuted in Chile. The Chilean antitrust bodies are intensely involved in mergers and acquisitions and its appeal for technical assistance—an adjunct to its submission to OECD in 2002—focuses on the complexity of merger requirements rather than on the enforcement actions against cartels.[50]

4.5 Peru

The Peruvian Free Competition Commission operates as a unit within the National Institute of Defence of Competition and Protection of Intellectual Property (INDECOPI), which was established in 1991. The Free Competition Commission operates under Legislative Decree Number 701, which is a

> "law of elimination of monopoly, control and restrictive practices of free competition [which] establishes the prohibition of abusive practices of a dominant position as well as the restrictive practices of competition which involve the concerted action of two or more competitors in the market."[51]

Article 6 of the same decree lists the anti-competitive criteria as,

> "a) direct or indirect agreement among competitors to fix prices or other commercial conditions or services. (...) c) The allocation of production quotas. d) Agreement on the quality of products, as long as they do not correspond to national or international standards and have a negative effect on the consumer. (...) h) Agreement to limit or control production, distribution, innovations and technical development. j) Other cases of similar effect."

Penalties for cartelization include imprisonment and fines. There is no mention in legislation or enforcement practice of a leniency program.[52]

[49] FTAA (2003).
[50] FTAA (2003).
[51] Peru (2002).
[52] Peru (2002).

Peru's experience in prosecuting hardcore cartels is somewhat limited. The most important hardcore cartel case that the Peruvian competition authorities have had to deal with was the poultry cartel. The cartel was preceded by the overproduction of chicks (baby chickens), which depressed prices. The unique nature of the Peruvian poultry industry prevented international competitors from playing a major part in it. Some 80% of total chicken production in Peru is traded live and only 20% is slaughtered chicken. Most slaughtered chicken is sold in refrigerated form to supermarkets and there is a small market for frozen chicken, which is traded mostly in the southern highlands of the country. The only opening for international trade is in the market for frozen chicken in the South, which is a small segment of the overall chicken market. [53]

The lack of international competition made it easy for domestic Peruvian producers to organize and operate a cartel based on price-fixing through output controls on poultry. The cartel included nineteen firms trading in the market for live chickens, which developed anti-competitive mechanisms to suppress and eliminate competitors in the markets of metropolitan Lima and Callao.

Lengthy and detailed investigation by the Peruvian authorities found that the conspiracy had been explicitly managed through a so-called 'statistics committee' run by the poultry industry. They determined that the conspiracy breached Decree 701, which sanctioned any business practice that generated *or could generate* the effect of restricting or hindering competition. In addition, the conspirators were in breach of an amendment, Decree 807 which states in article 6.h) that the "agreement to limit or to control production volumes is an anticompetitive practice."[54]

In its prosecution of this case, the Free Competition Commission respected the confidentiality of business information. Fines were eventually imposed upon twenty-one conspirators and the amount of each fine was not higher than 10% of their sales through the distribution centers, amounts that were later reduced on appeal.

Legislative decree 807 establishes the maximum fine for anti-competitive behaviour to be 1000 Taxing Units. Taxing Units are set by the Ministry of the Economy and generally vary between USD900–1000 per unit depending upon the exchange rate. There is no prison term for anti-competitive behaviour.[55]

Peru's submissions to international competition forums have stressed the need for technical assistance in the analysis of mergers and determination of market dominance but do not focus

[53] Peru (2001).
[54] Peru (2001).
[55] Peru (2001).

in detail on cartels. None of Peru's submissions concern the regional application of competition policy. None of Peru's submissions concern the problems of enforcement against international cartels.

4.6 Canada

Canada's main competition authority is the Competition Tribunal. It came into being in 1986 as a result of reforms to competition policy enacted by the Canadian Parliament. During the late-1990s the Canadian parliament renewed the brief of the competition authority to give it increased powers:

> "The committee's preliminary findings are that the government, after consulting with the public, should consider whether to do the following:
>
> - modify the abuse of dominant position provision (section 79) to deal with predatory pricing and price maintenance
> - introduce guidelines on abuse of dominant position and conspiracies
> - make the price discrimination provisions reviewable
> - permit private individuals to make applications to the Competition Tribunal
> - introduce an interim cease and desist order
> - create a two-track approach for agreements relating to conspiracies (section 45)
> - re-evaluate the minimum thresholds for reviewing a merger."[56]

The Canadians have been actively supporting initiatives to combat anti-competitive practices in their submissions to the FTAA. The Canadians have proposed substantial amendments to the existing DACP. These have been summarized in the FTAA Inventory of Rules and Regulations as follows:

> "The proposed framework [submitted by Canada] includes an obligation from signatory countries to adopt or maintain a competition law and to establish or maintain an independent and impartial competition agency authorized to take appropriate action and to advocate competition in regulated sectors. The framework also includes an obligation for countries to adhere to general principles of transparency, non-discrimination and procedural fair-ness, as well as mechanisms to promote enforcement cooperation and coordination. Consultation mechanisms and peer review are also part of the proposal. In

[56] FTAA (2001).

addition, the negotiating group considered the topic of competition policy in smaller economies and economies without competition regimes, and concluded terms of reference for further study. In the area of technical assistance, the Bureau participated in technical sessions, including one on competition issues related to the deregulation of the electricity sector, in general as well as in Ontario and Alberta.

The draft chapter on competition policy consolidates all countries' proposals and shows that consensus has yet to be reached on many issues."[57]

Canada's enforcement record against hardcore cartels is strong but does not yet compare with that of the United States. Between 1993 and 1999, the Canadian Competition Bureau prosecuted several international cartels that were found to be in breach of the Canadian Competition Act. These cartels operated in eleven industries and included most of the famous hardcore cartels prosecuted by the United States during the same period. The markets for bulk vitamins, citric acid, sorbates, choline chloride, sodium gluconate, graphite electrodes, lysine, fax paper, pipe, chemical insecticide and biological insecticide were all victimzed by cartels in Canada at some point during this period.[58]

Penalties for the conspirators ranged from fines to prison sentences. Fines were imposed both against companies and individuals. Dr Roland Bronnimann, Chief Executive of Hoffman-La Roche, for example, was personally fined CAN$250,000 for his role in the bulk vitamins cartel, in addition to the fine of CAN$48,000,000 which was imposed upon his company. Other executives were not fortunate enough to escape with just a fine. Mr. Russell Cosburn, a former executive of Chinook Group Ltd, was imprisoned for nine months and ordered to serve a further 50 hours of community service for his role in the choline chloride cartel. This punishment was in addition to a fine of CAN$2,250,000 imposed on Chinook Group Ltd itself.

Canada has adopted a stance against hard core cartels in its proposals for the DACP. Canada's proposal highlights three areas of anticompetitive conduct that it wishes to see addressed by the DACP. The first two, abuse of dominance and anti-competitive mergers, are concerns shared by most parties to the draft agreement. The final one, though, is still somewhat controversial in the FTAA context - hard core cartels.

As yet, Canada has made no specific *proposals* on the treatment of hard core cartels in the FTAA negotiations, apart from the fact that it wishes to see hard core cartels defined as a type

[57] FTAA (2001).
[58] ICPAC (2000), Annex 4-C.

of anticompetitive behaviour. In its 2002 submissions to the WTO[59], for example, Canada refrained from making any proposals for multilateral disciplines on hardcore cartels, submitting only questions about the form a future agreement on hard-core cartels may take. Similarly, Canada's draft of the DACP, which can be found on the website of its Competition Tribunal, has no proposed wording on anti-competitive conduct with cross-border impacts. The section is simply left blank.[60]

4.7 Potential lessons from these national experiences

What can be learned from these countries' experiences with cartel enforcement since 1990? First, the countries in this region differ markedly in the nature and extent of their competition laws. Although each of the countries examined above has some form of competition legislation, there are a number of Latin American countries that at present do not. Countries such as Paraguay, Belize, Nicaragua, Guatemala, Honduras, the Dominican Republic and Costa Rica have not yet enacted any form of competition legislation. These points are important to bear in mind when considering proposals in an FTAA that would require each member to enact and enforce certain competition laws.

Second, enforcement of competition law throughout the region is patchy. Since 1990, the US has prosecuted nearly forty international cartels, Canada a third of this amount, while Brazil has prosecuted only three cartels, and Peru and Chile have yet to prosecute a single international cartel (the poultry cartel in Peru was a domestic one). The pecuniary penalties against participating in a hardcore cartel are bounded by legislation in several Latin American countries, and while these bounds may have been high in comparison to pecuniary penalties for other crimes committed in those countries, they are in fact quite low when compared to the profits typically made by cartel operators during their conspiracies. These relatively low fines call into question whether the penalties are sufficiently high to deter cartelization in the first place. Furthermore, some Latin American countries appear reluctant to impose fines and/or jail terms on individuals responsible for operating and organizing a hardcore cartel, which similarly weakens the deterrent effect.

Third, enforcement in most Latin American countries suffers from the absence of a "carrot and stick" approach that has been used to prosecute cartels in the US since the 1970s. So successful has the US leniency program been since it was revised in 1993 that it has resulted in a more than tenfold year-on-year increase in the number of applicants for amnesty.[61] The

[59] Canada (2002).
[60] Canada (n.d.)
61 Hammond (2003).

inability of most Latin American competition authorities to extend leniency to potential conspirators has reduced the number of cartels uncovered within their jurisdiction.

Although there are some examples of formal or informal cooperation between competition agencies in the region, the preponderance of investigations are carried out by a single competition authority; although a admittedly few of these investigations had their genesis in oblique or second-hand information gleaned from competition authorities abroad or from press reports of their activities.

5. A brief account of the international vitamins cartel

The purpose here is to provide a brief account of the international vitamins cartel, and not to repeat the detailed accounts that can be found elsewhere.[62] This cartel has been described as "wheels within wheels" by Connor, principally because it comprised a series of inter-related conspiracies to manipulate the markets of at least eight vitamins and four associated chemical compounds.

The cartel started in 1989 when two European vitamin manufacturers—Roche and BASF—agreed to gradually increase the price of vitamins A and E and to a geographic division of the world's markets for these two substances.[63] Roche and BASF controlled over seventy percent of sales in these markets and subsequently successfully co-opted their principal rivals, Rhone-Poulenc and Eisai. By 1991, these four companies essentially controlled the world price for vitamins A and E; a situation they were able to sustain until 1999 when the conspiracy was prosecuted by the US antitrust authorities.

The conspirators' success encouraged them to widen the scope of the cartel to include other vitamins and other producers. By the end of the 1990s, twenty two manufacturers had at one time or the other been a part of the twelve "wheels" (cartels) within the overall vitamins conspiracy.[64] So extensive was the price fixing within these markets that the European Commission branded the entire vitamins industry a single conspiracy.[65] Table 1 lists the duration of eight such "wheels." It is noteworthy that five of these conspiracies lasted until (at least) 1998, potentially distorting international markets throughout almost the entire 1990s. In

[62] See Connor (2001) and First (2001).
[63] See Connor (2001), at 305-6.
[64] See Connor (2001).
[65] See Arbault, Suurnakki, Peiro, Nijs, Bridgeland, Berger, Lindroos and Marteil (2001).

contrast, the cartel in vitamins B1, B6, and folic acid fell apart in 1994, largely as a result of competition from Chinese exporters that were not members of the cartel.

In late 1998, Rhone-Poulenc sought corporate leniency from the US antitrust authorities for its participation in the vitamins cartel. It has been argued that Rhone-Poulenc's decision was prompted by the earlier indictment by the US authorities of Lonza for the latter's participation in the vitamins B3 cartel. Another factor may well have been the US authorities well publicized investigation into the lysine and citric acid cartels, which included scrutiny of firms that also produced vitamins.[66]

Table 2 lists the names and location of the headquarters of the sixteen firms that, according to US Federal indictments in 1999, participated in the vitamins conspiracy.[67] This subsequent American enforcement action resulted in fines of $10.5 million, $5 million, $500 million, $225 million, $72 million, $40 million, $25 million, $13 million, and $2 million for Lonza, Chinook, Hoffman-La Roche, BASF, Takeda, Eisai, Daiichi, Degussa, and Reilly/Vitachem, respectively.

The European Commission's (EC's) investigation into this cartel's activities revealed a slightly different set of cartel members and estimates of each wheel's duration (see Table 3). Four additional companies were found to have participated in this cartel: Kongo Chemical Co. (headquartered in Japan), Solvay Pharmaceuticals (headquartered in the Netherlands), Sumitomo (headquartered in Japan), and Tanabe (headquartered in Japan.) The EC enforcement action resulted in the following fines for nine firms: Hoffman-La Roche (462 million euros), BASF (296.16 million euros), Takeda (37.06 million euros), Eisai (13.23 million euros), Daiichi (23.4 million euros), Merck (9.24 million euros), Aventis (5.04 million euros), Solvay Pharmaceuticals (9.1 million euros) and Takeda (37.06 million euros).[68]

This brief account of the international vitamins cartel would be incomplete without some mention of the role that Chinese exporters are said to have played in disrupting some of the wheels that made up the vitamins cartel.[69] Chinese firms remained outside the cartel and their exports of vitamins and polyvitamins surged after 1991 (see Figure 1). These exports rose from just under $100 million in 1990 to nearly $350 million in 1995, before falling back to

[66] See Connor (2001), at 368-9.
[67] See United States Department of Justice Press Releases (1999-2000).
[68] See Arbult *et al*. (2001).
[69] See Connor (2001) at 306.

approximately $250 million in 1997, and rising sharply to over $350 million in 2000.[70] (All of these import values were measured in year 2000 US dollars.) It has been claimed that Chinese exports were an important factor in the breakdown in 1994 of the cartel in Vitamins B1 and B6 and in folic acid.[71]As will become clear later, in estimating the effect of the vitamins cartel's formation on value of vitamins exported from countries where the conspirators maintained their headquarters, this paper attempts to control for the effect of Chinese vitamins exports.

6. Theoretical considerations and empirical implementation

In this section the theoretical rationale for the analysis of the vitamin cartel's effects on international trade flows is described, as is the way in which the empirical analysis has been implemented. The former is very similar to another of the authors' papers, but the empirical implementation of this paper differs in important respects from the latter paper.[72]

6.1 Effect of cartelization on prices and total revenues or sales

Theoretical analyses of cartel behavior invariably focus on the conspiracy's effects on the prices charged to buyers, rather than on the effects on total revenues (or total sales) of the cartel members.[73] For our current purposes, this emphasis is unfortunate as international trade data on the price of vitamins is much more scarce than data on the *total value* of purchases by buyers located in an economy from firms/sellers located in another economy. With an assumption on the own price elasticity of the good in question, the implications of a cartel's decision to raise prices in a market for the value of total sales by cartel members in that market can be readily ascertained. If the demand for a good is price inelastic then an increase in its price will generate an increase in total revenues. What is more, because demand falls when prices rise, one can also conclude that the percentage increase in total revenues that result from the formation of the cartel bound from below the price increase that is caused by the conspiracy. These considerations are pertinent to analysis of the international vitamins

[70] The source of this data on Chinese exports of vitamins is the Statistics Canada *World Trade Analyser Database*. Product line number 5411 in this database refers to trade in vitamins and polyvitamins.
[71] See Connor (2001) at 306.
[72] See Clarke and Evenett (2003).
[73] It is straightforward to show that the change in consumer surplus caused by the cartel's formation is (in magnitude) larger than the increase in total revenues of the cartel members. Therefore, any estimates of the changes in the total value of sales of the cartelized product in a given market will also provide a lower bound on the harm done by the cartel's formation to consumers in that market.

cartel because a detailed study of the vitamins-producing sector has concluded that the demand for different types of vitamins is indeed price-inelastic. [74]

6.2 Establishing a benchmark for trade flows in the absence of cartelization

The last sub-section established how total sales in a market—be it domestic or foreign—can be distorted by the creation of a cartel. This begs the question of what benchmark level of sales would have prevailed in the absence of the cartel. In the international trade context, such a benchmark is important because it establishes the value of exports from one nation's firms to another nation's buyers as it would have been in the absence of the cartel. Fortunately, the study of such bilateral trade flows is well advanced in international trade research and provides an empirically-implementable benchmark.

One of the few—perhaps the only—robust empirical regularity in the analysis of international trade flows is known as the gravity equation. This equation relates the total value of one nation's imports from another nation positively to the levels of national income of both countries and negatively to the distance between them.[75] Over the last twenty five years our understanding of the theoretical underpinning of the gravity equation has deepened[76] and empirical analyses of this equation have become more sophisticated.[77] What follows draws upon this substantial body of research into bilateral trade flows. Specifically, this paper adopts a standard formulation of the gravity equation. Denote:

M_{ij}^{v}	As the total value of country i's imports of vitamins (v) from country j.
y_{j}^{v}	As the total value of country j's production of vitamins (v).
Y_i	As country i's national income or gross domestic product.
Y_j	As country j's national income or gross domestic product.
Y_W	As the world's total income or gross product.
M_{ij}	As the total value of all country i's imports from nation j.

[74] For a discussion of the price inelasticity of the demand for vitamins see Connor (2001).
[75] The analogy to the determinants of the force between two masses in the physical sciences is deliberate.
[76] See Anderson (1979), Helpman and Krugman (1985), Deardorff (1998), and Eaton and Kortum (2003).
[77] See Hummels and Levinsohn (1995), and Evenett and Keller (2002)..

Following Anderson's theoretical analysis of the gravity equation[78], in the absence of barriers to international trade flows, with balanced trade in each nation, and each country's buyers have identical and homothetic preferences, one can derive the following two expressions for the gravity equation:

$$M_{ij}^{v} = \left(\frac{Y_i}{Y_w} \right) y_j^{v} \tag{1}$$

$$M_{ij} = \left(\frac{Y_i}{Y_w} \right) Y_j \tag{2}$$

Expression (1) refers to the gravity equation for a single good (v) and equation (2) refers to the gravity equation for a nation's total imports. Dividing (2) by (1) and rearranging yields

$$M_{ij}^{v} = M_{ij} \left(\frac{y_j^{v}}{Y_j} \right) \tag{3}$$

In this formulation, then, country i's imports of vitamins from country j would rise one percent if the proportion of country j's national output $\left(\frac{y_j^{v}}{Y_j} \right)$ that is devoted to vitamins production rose by one percent also. Furthermore, any factor that leads to a one percent reduction in the overall bilateral level of trade between nations i and j will, in this formulation, lead to i's imports of vitamins from j falling by the same percentage. As these predictions were derived in the absence of a cartel, they can form the basis of a benchmark for international trade in vitamins.

Finally, taking logarithms of equation (3) yields

$$\ln\left(M_{ij}^{v}\right) = \ln\left(M_{ij}\right) + \ln\left(y_j^{v}\right) - \ln\left(Y_j\right) \tag{4}$$

which takes a convenient linear form amenable to econometric estimation.

6.3 Econometric strategy

[78] Anderson (1979).

This econometric strategy has two goals. First, by using data on imports by Latin American nations of vitamins before and after the vitamin cartel was formed, one can examine whether the cartel's formation results in a systematic change in the value of bilateral imports of vitamins from that predicted in equation (4) above. As argued earlier, so long as the demand for vitamins is price-inelastic and the conspiracy resulted in higher prices then, if all else is equal, the observed value of a country i's vitamins imports (M_{ij}^{v}) should rise after the cartel's formation. In essence, the analysis uses the intertemporal variation of the trade data in vitamins to identify the effect of the cartel's formation. Second, it is possible to examine whether the impact of the cartel's formation on the total value of nation's vitamins imports (M_{ij}^{v}) depends on whether that nation's cartel enforcement regime is active. As was described in earlier sections, several Latin American nations' enforcement agencies actively prosecuted cartels in the 1990s. Moreover, two of these nations (Chile and Peru) only established active competition enforcement authorities after the cartel's formation, providing an opportunity to examine whether the imports of vitamins responded to the creation of such an authority. Therefore, this paper uses both cross-sectional and intertemporal variation to identify the effects of cartel enforcement on the value of trade in cartelized vitamins.

A time subscript (denoted by t) to each of the variables in equation (4) is added to indicate the year that each (data) observation refers to. Furthermore, to take account of the effect on cartelized imports of competition from Chinese sources, another independent variable, denoted C_t, is included which represents the total exports of Chinese vitamins to all destinations in a given year t. This variable proxies for the marginal costs of production of vitamins in China, with the idea being that lower marginal costs of production in China would translate into—holding other factors constant—higher Chinese exports to all foreign markets.

Next, four parameters were formed to discriminate between the years before and since the cartel was formed, and between those nations with active (A) active cartel enforcement regimes and those non-active enforcement regimes (NA). In our case, the first "wheel" of the vitamin cartel was formed in 1989, implying that 1990 was the first complete year that vitamins trade was distorted by the cartel's formation; and so 1990 was taken as the threshold year in which the cartel's effects were first fully felt. One can, then, denote these four parameters by $A_{<1990}$, $A_{>1990}$, $NA_{<1990}$, and $NA_{>1990}$ respectively. These four parameters, along with variable C_t and a random error term ε_{ijt}, could be added to equation (4) to form the following estimating equation:

$$\ln\left(M_{ijt}^{v}\right)=\mathrm{I}_{it}A_{<1990}+\left(1-\mathrm{I}_{it}\right)NA_{<1990}+\mathrm{I}_{it}^{*}A_{>1990}+\left(1-\mathrm{I}_{it}^{*}\right)NA_{>1990}+\beta_1\ln\left(M_{ijt}\right)+\beta_2\ln\left(y_{jt}^{v}\right)+\beta_3\ln\left(Y_{jt}\right)+\beta_4\ln\left(C_t\right)+\varepsilon_{ijt} \quad (5)$$

where $\beta_1,\beta_2,\beta_3,$ and β_4 are other parameters to be estimated also, I_{it} takes a value of one if country i has an active enforcement regime in year t (where t is before 1990) and zero otherwise, and I_{it}^{*} takes a value of one if country i has an active enforcement regime in year t (where t is after 1989) and zero otherwise. In this formulation an economy that commences active cartel enforcement in 1993 will, for example, see I_{it} take a value of zero throughout and I_{it}^{*} takes a value for years before 1993 and a value of one from 1993.

If equation (5) were confronted with data and estimates of the parameters $A_{<1990},NA_{<1990},A_{>1990},NA_{>1990}$ recovered, then the estimated differences $\left(NA_{>1990}-NA_{<1990}\right)$ and $\left(A_{>1990}-A_{<1990}\right)$ would reveal whether the cartel's formation leads import values to rise faster in nations without active cartel enforcement regimes than nations which have such regimes. Before discussing the econometric estimation in some detail, certain matters relating to data collection are described below.

6.4 Data collection

In section five above, the following eight economies where the headquarters of the members of the vitamins cartel are located were identified: Belgium, Canada, France, Germany, Japan, the Netherlands, Switzerland, and the United States. Each of these economies exported substantial amounts of vitamins over the years 1985-1999. The goal is to examine how these trade flows were distorted—if at all—by the creation of the vitamins cartel. The vitamins exports of other nations where the overseas subsidiaries of the cartel members were based may also have been affected by the formation of this international conspiracy, but lacking detailed data on the location of such subsidiaries, the analysis here focuses only on the exports of vitamins by the eight economies listed above.

Data on vitamins imports by all of the Latin American economies was collected for the years 1985-1999. Statistics Canada's *World Trade Analyzer*—which employs the United Nations' classification of economies and customs territories—was used to identify all of the potential vitamins importers in Latin America. A further adjustment was made to the set of importers. Those economies that had in the year 2000 a population of less than 5 million people or a

national income that was below US $5 billion were deleted.[79] The rationale for this step, which is often taken in studies using the gravity equation, was that such "smaller" economies tend to have unrepresentative trading patterns. Indeed, concerns about the irregular nature of the trading partners of the small Caribbean island economies accounts for this study's focus on the Latin American economies in the first place.

The sample assembled contains annual observations from 1985 to 1999 on the total value of vitamins imports by each (remaining) importer from each of the eight vitamins exporters identified earlier. The value of each importer's total purchases of vitamins can be downloaded from the *World Trade Analyzer* database. The four digit code for the product line that corresponds to trade in "vitamins and polyvitamins" is 5411. No other product line at this level of disaggregation that included the word "vitamins" in the title or descriptor was found. Moreover, further disaggregation of trade in vitamins was not possible with this database. All of the recorded import values in this database are reported in current US dollars and, consequently, each observation was converted into a common base year, specifically year 2000 US dollars. This was accomplished by using the US price deflator for gross domestic product (the so-called US GDP price deflator), which is downloadable from the World Bank's *World Development Indicators*.

Data on each importing economies' total purchases of all goods from a given exporter—that is, the observations on M_{ijt}—were also obtained from the *World Trade Analyzer* database. The absence of production data for vitamins in the eight exporting economies necessitated the construction of a proxy variable for y^v_{jt}. As total sales of vitamins by firms located within a given nation j equals the sum of its total sales within nation j and its total sales abroad, the observed level of total vitamins exports by economy j was used as a proxy for y^v_{jt}. Furthermore, for each nation i, one netted out economy i's total imports of vitamins from j's total annual exports of vitamins; so creating a proxy for y^v_{jt} that is denoted by $y^v_{-i,jt}$.[80] The final piece of international trade data collected was annual data on the total value of Chinese exports of vitamins, again obtained from the *World Trade Analyzer* database.

[79] The World Bank's *World Development Indicators* database was used to discern whether an economy was too "small" on either criterion.

[80] This adjustment is needed because the dependent variable in our econometric analysis—the value of nation i's imports of vitamins from nation j in a given year t—is obviously a component of the total exports of vitamins by nation j to all destinations, y^v_{jt}.

Data on the gross domestic product (denoted GDP) of each exporter was taken from the *World Development Indicators* database. A full set of such GDP data was available for each vitamins exporter except Germany, where GDP data was only available after 1992. The *Penn World Tables* database was the source of the German GDP data before 1992 and, before reunification, only GDP data on West Germany was used.[81]

The last step in data collection was to identify those economies where there was some evidence of active cartel enforcement. For each importer in sample, the extensive number of submissions to the OECD's 2001 and 2002 Global Forums on Competition were examined to see if that importer reported any cases of cartel enforcement activity that resulted in fines or some other form of sanction being imposed, or in an order to cartel members to cease their conspiracy.[82] If there was such evidence then the importer is classified as having an active cartel enforcement regime in the years since 1985 or the year its anti-cartel law came into force, whichever is later. Four jurisdictions in the sample were identified as having an active cartel enforcement regime: Brazil and Chile (whose anti-cartel laws were passed before the vitamins cartel came into effect), Peru (whose anti-cartel law came into effect in 1991), and Mexico (whose anti-cartel law came into effect in 1993.)

As far as creating the indicator variables, introduced in equation (5) above, three cases can be distinguished. First, in an economy where such enforcement activity was reported in OECD documentation and where the economy's anti-cartel legislation came into force before 1990, the indicator variable I_{it} switches from its default value of zero to one for every year since that legislation came into force and the indicator variable I^{*}_{it} takes a value of one for every year in the 1990s. Second, in an economy where evidence of cartel enforcement activity was found and where the economy's anti-cartel legislation came into force during or since 1990, then the indicator variable I_{it} takes a value of zero throughout and the indicator variable I^{*}_{it} switches from its default value of zero to one for every year since the legislation came into force. The third case, where there is no evidence of cartel enforcement by an economy's authorities, both indicator variables I_{it} and I^{*}_{it} take a value of zero in every year.

[81] This widely used cross-country dataset can be accessed at http://datacentre2.chass.utoronto.ca/pwt.
[82] See the recent annual reports of the national competition authorities to the OECD's Committee on Competition Law and Policy for evidence of cartel enforcement activity at http://www1.oecd.org/daf/clp/Annual_reports/1999-00.htm. See documentation for the 2001 OECD Global Forum on Competition at http://www1.oecd.org/daf/clp/GFC_October2001/. See documentation for the 2002 OECD Global Forum on Competition at http://www.oecd.org/oecd/pages/home/displaygeneral/0,3380,EN-document-0-nodirectorate-no-20-24303-0,00.html#title0.

This investigation-based measure of the presence of an active cartel enforcement regime is not without its drawbacks. For instance, the binary nature of the indicator does not take into account the differences in the intensity of cartel enforcement efforts between those nations that do have active enforcement regimes. Probably the best defense of the indicators employed here is that they do discriminate between nations on the basis of whether any cartel enforcement activity is reported at all to the international antitrust community that attends or follows meetings at the OECD. Arguably, a national cartel enforcement regime is unlikely to have a strong deterrent effect if members of this community—some of whom advise corporations—do not know of a regime's record in tackling price-fixing conspiracies and alike.

6.5 Econometric concerns and estimation procedure

In the last sub-section, a sample of Latin America importers of vitamins was assembled. It might be tempting to confront equation (5) with data from each sample and use standard ordinary least squares techniques to recover the relevant parameters. However, this would ignore several important econometric concerns.

First, many of the observed levels of vitamins imports (M_{ijt}^{v}) equal zero—especially in the poorest importing nations. As the logarithm of zero is undefined, this would pose a considerable problem. Often, this problem is—to put it politely—sidestepped by assuming that a dollar's worth of imports actually occurred, which yields a defined value of the dependent variable—namely the logarithm of one. However, there is something very unsatisfactory about assuming that a positive level of bilateral trade exists when the measured data reveals that it does not. Consequently, this paper takes another tack, preferring to eliminate those observations with zero trade from the sample; arguing that the theory predicts positive levels of vitamins trade and that it is most likely—if ever—to fit the data in a setting where positive amounts of trade exist. This step—that of eliminating the zero trade observations—reduces the number of observations in the sample to 1319.

The second econometric problem is that since vitamins imports (M_{ijt}^{v}) are an element of total bilateral imports (M_{ijt}), there must be a contemporaneous correlation between the error term ε_{ijt} and M_{ijt} ; implying that ordinary least squares procedures will generate inconsistent estimates. To break this contemporaneous correlation the variable M_{ijt} is lagged by one year,

essentially creating the variable M_{ijt-1}.[83] A similar but slightly different concern related to the variable C_t. Here a reduction in the formal or informal trade barriers to vitamins might result in both an increase in country i's vitamins imports from nation j and from China. This would induce a positive correlation between ε_{ijt} and C_t, again potentially resulting in inconsistent estimates from ordinary least squares. To break this contemporaneous correlation, C_t is lagged by one year, using data on last year's total Chinese exports of vitamins to all export destinations, C_{t-1}.

As noted in the last subsection, our proxy for country j's production of vitamins (y^v_{jt}) is—in the absence of direct data on the production of vitamins—country j's total export of vitamins in year t (net of its vitamins) exports to country i. This variable too could be contemporaneously correlated with the error term, and so $y^v_{-i,jt}$ is lagged by one year also. This is the third adjustment to equation (5).

In the light of the foregoing remarks the so-called base econometric specification taken to the data is[84]:

$$\ln\left(M^v_{ijt}\right) = \mathrm{I}_{it} A_{<1990} + \left(1-\mathrm{I}_{it}\right) NA_{<1990} + \mathrm{I}^*_{it} A_{>1990} + \left(1-\mathrm{I}^*_{it}\right) NA_{>1990} + \beta_1 \ln\left(M_{ijt-1}\right) + \beta_2 \ln\left(y^v_{-i,jt-1}\right) + \beta_3 \ln\left(Y_{jt}\right) + \beta_4 \ln\left(C_{t-1}\right) + \varepsilon_{ijt} \quad (6)$$

It is worth noting that the base specification does not include a direct role for the distance between countries i and j, which the traditional proxy for international transportation costs in gravity equation studies. However, it should be noted that higher levels of such costs would reduce total bilateral imports, so reducing M_{ijt-1}. More generally, many time-invariant and time-varying determinants of bilateral imports of vitamins (such as bilateral exchange rates and distance) will also affect total bilateral imports; and so the latter variable (ie. M_{ijt-1}) can act as a control for a number of potentially important determinants of vitamins imports.

A final econometric concern is that the estimation results may be sensitive to outliers. This issue has been systematically explored in recently another gravity-equation related

[83] Furthermore, the value of the dependent variable in year (t-1) was subtracted from M_{ijt-1}. Thus the variable M_{ijt-1} is the lagged value of all non-vitamins imports by nation i from nation j.

[84] More parsimonious specifications—that do not take into account the timing of the formation of the cartel or whether a nation has an active cartel enforcement regime—are taken to the data also, see section 6.6 below.

context[85]—which also made extensive use of dummy variables—and it was found that the inclusion of outliers substantially affected the estimated parameters of interest. In that study only when the ten percent of the sample that had the largest (in absolute value) residuals were deleted was a semblance of parameter stability restored. The same concern was explored here by trimming one percent, two and a half percent, five percent, ten percent, and twenty percent of the sample, and examining the stability the parameter estimates as more and more outliers were removed. The consequences of such "trimming" for the parameter estimates are discussed in the next subsection, amongst other matters.

6.6 Econometric findings and their economic implications

Table 4 reports the estimated parameters for the base specification (listed as specification 3 in this table) and two more parsimonious specifications (listed as specifications 1 and 2 in this table). The latter specifications do not discriminate between importers on the basis of the presence of an active anti-cartel enforcement regime as the base specification does. Moreover, specification 1 in Table 4 does not discriminate between the years before and after the formation of the cartel. Specifications 1-3 do include the same slope variables, namely the "gravity like" variables and the same control for the exports of vitamins from China. One of the interesting findings in Table 4 is the relatively similar estimates for the parameters of the slope variables. Moreover, the estimated parameters for the three gravity variables have the correct sign and are statistically significant.

In Table 4 the parameter estimates for the total value of Chinese exports to the all foreign destinations (which is the proxy for the marginal cost of vitamins production in China) is negative and statistically significant. In the base specification (number 3 in Table 4), the estimated parameter on Chinese exports implies that a ten percent increase in Chinese vitamins exports reduces the total value of vitamins imports from cartel members by 3.4 percent. To the extent that the latter reduction represents a fall in the prices that the cartel members charge Latin American consumers, then this finding highlights how openness to trade goes some way to undermine the anti-competitive impact of international hardcore cartels.

In contrast to the stability of the slope parameters in specifications 1-3 (in Table 4), there does appear to be considerable differences across specifications in the estimated values of the indicator variables ($A_{<1990}, NA_{<1990}, A_{>1990}, NA_{>1990}$). Nevertheless, there is one consistent pattern in the estimated parameters. In both specifications 2 and 3 the formation of the cartel leads to an increase in the estimated value of the relevant regression constant which—given the price

[85] See Evenett (2002).

inelasticity of the demand for vitamins—is consistent with the hypothesis that the cartel has been able to raise the price of vitamins.

As noted in the last subsection, the estimated value of constant terms or dummy variables in gravity equation studies can be very sensitive to the presence of outliers. To explore this matter further, outliers were systematically removed from the sample and the parameters re-estimated. Table 5 reports the parameter estimates for each of these sensitivity checks, listed as specifications 4 through 8. (Specification 3 is the base specification with the full sample and is reported for reference purposes in Table 5). Examination of the estimated constants in Table 5 reveals that in both cases (when an importer did an active cartel enforcement regime and when it did not), the estimated total value of vitamins imports increases after the formation of the cartel in 1989. Moreover, the explained variation increases monotonically with the percentage of outliers removed from the sample.

To provide further interpretation, Table 6 calculates the implied percentage increase in the import bills of those Latin American economies that have *never had* an active cartel enforcement regime and contrasts that percentage increase with the comparable increase in a jurisdiction that had an active regime *before and after* the international vitamins cartel was formed. In each specification 4-8 that is, irrespective of the amount of outliers removed, after the vitamins cartel was formed import bills rose more in those Latin American jurisdictions which did not have active cartel enforcement regimes. Figure 2 presents the differences in the estimated increases in import bills of vitamins and, of the samples where outliers were removed, the *smallest* difference in the import bills equals eight percentage points. (This smallest difference is found when five percent of the sample is removed as outliers; that is, in specification 6.) Taking as given the claim that the demand for vitamins is price-inelastic, this finding implies that prices of vitamins rose more than eight percentage points more in those jurisdictions without active anti-cartel enforcement regimes. It would appear, therefore, that this particular international cartel deliberately discriminated across jurisdictions on the strength of their anti-cartel enforcement regimes. If this is the case, then it suggests that there is a price to be paid for non-enforcement or under-enforcement of anti-cartel laws in Latin America.

The econometric estimates can be taken a step further to compute a lower bound (strictly an underestimate[86]) of the overcharges paid by each Latin American jurisdiction on it's vitamins

[86] The parameter estimates enable the change in the total value of imported vitamins to be calculated. The overcharges on vitamins imports caused by the cartel equal the change in the price multiplied by the post-cartelization quantity of vitamins imports. With a downward sloping demand curve and a positive price increase caused by the cartel, then the estimated change in the total value of imported vitamins must exceed the level of overcharges. (Of course, the level of overcharges is itself less than the loss of consumer surplus due to cartelization.)

imports. These estimated overcharges are reported in Table 7 and were calculated using the most conservative set of parameter estimates, specifically those from specification 6 where five percent of the original sample was removed as outliers. Throughout the 1990s the overcharges on vitamins imports paid by the 17 Latin American economies in the sample is at least US$789 million (in year 2000 dollars). The amount of overcharges paid varies considerably from just under a quarter of a billion US dollars for Brazil to under a million US dollars for Panama. Moreover, in 10 of the 17 Latin American economies considered here, the overcharges on vitamins imports exceeded US$10m million, implying overcharges on this cartel alone of over a million dollars per year.

The parameter estimates from the most conservative specification (specification 6) can also be used to estimate the likely increase in overcharges that an active cartel enforcer would have paid if that jurisdiction did not have a cartel enforcement regime. In effect, this quantifies—for the case of the international vitamins cartel—the value of active cartel enforcement. More precisely, in the case of this one international hardcore cartel it provides an estimate of the deterrent effect of active national anti-cartel enforcement. These estimates are presented in the upper panel of Table 8. If Brazil did not enforce it's anti-cartel laws, then the likely overcharges on vitamins imports would have been approximately US$45 million a year higher. This amounts to a saving of approximately US$5 million per year for 1990-1998, when the cartel was known to be in operation. It is also worth noting that in 2000 the Brazilian government spent US$10.96 million on the enforcement of all of its competition laws implying that—had similar levels of state outlays prevailed during 1990-1998—the reduced overcharges on vitamins imports alone would have paid for just under half of those outlays. The comparable total reduction in overcharges in Mexico, Chile, and Peru were in excess of US$28 million, US$9 million, and US$4 million, respectively. In the light of the magnitude of the estimated savings, perhaps the question ought not to be whether Latin American countries can afford to have active anti-cartel enforcement regimes but rather whether they can afford *not* to have such regimes?

The estimated parameters from specification 6 can also be used to calculate how much smaller certain Latin American nations' overcharges would have been if their import bills had increased by the percentage experienced in those jurisdictions with active anti-cartel enforcement regimes. Of course, this calculation can only be performed for those nations that do not have active enforcement regimes and the results are reported in the lower panel of Table 8. As this table makes clear, in the case of the international vitamins cartel, failing to actively enforce an anti-cartel regime was particularly costly for Argentina, Columbia, and Venezuela.

To summarize, the econometric specifications employed here—which were based on the traditional gravity equation—performed well in the sense that all of the parameter estimates of the standard slope variables had the correct sign and were highly statistically significant. Moreover, the finding that import bills rose more (in percentage terms) in jurisdictions that do not actively enforce anti-cartel regimes seems to be very robust to the exclusion of outliers. It appears that jurisdictions without active anti-cartel enforcement regimes saw their import bills rise by at least eight percentage points more than those with such regimes. Given the magnitude of vitamins imports by Latin American economies, this difference translates into millions of dollars of lower overcharges for those nations (Brazil, Chile, Mexico, and Peru) that actively enforced their anti-cartel laws at some point through the 1990s. These reductions in overcharges are a tangible and quantifiable measure of the benefits of targeting hardcore cartels through national competition policies, and are in addition to the benefits created by another deterrent effect of such policies; namely, the disincentive to form a cartel in the first place.

7. Policy implications of this analysis for the FTAA negotiations

Competition policy has tended not to be a priority for Latin American policymakers interested in international trade and regional integration. However, such matters are likely to grow in prominence as negotiations on a potential Free Trade Area of the Americas (FTAA) intensify. Moreover, initiatives on competition policy at the World Trade Organization in the context of the Doha Development Agenda will further raise the profile of private anti-competitive practices and the national and international measures that can be taken to tackle them.

In the context of the FTAA, it has been proposed that signatories agree to enact and enforce laws against anti-competitive corporate practices. An important question, therefore, is whether such a binding obligation will benefit Latin American economies? Two criteria might be employed when assessing the relative merits of such an initiative: feasibility and economic desirability. This paper discusses both criteria in the context of national anti-cartel laws, which are one of the most prevalent laws against certain private anti-competitive practices.

In the earlier part of the paper, the experiences of Brazil, Mexico, and Peru in enforcing their anti-cartel laws was described. As this discussion made clear, enforcement actions against cartels are no longer the sole preserve of industrialized countries such as the United States and Canada. Latin American economies appear to have marshaled the expertise and resources necessary to tackle hardcore cartels, suggesting that the feasibility requirement has been met.

Turning now to assessing the desirability of enacting and enforcing national anti-cartel law, this paper presented estimates of the potential benefits of national anti-cartel enforcement.

Specifically, evidence was presented here that suggested that the international vitamins cartel inflicted higher overcharges on those jurisdictions without active anti-cartel enforcement regimes. Such is the magnitude of vitamins imports into Latin America that the econometric estimates reported in this study imply that active anti-cartel enforcement saved certain nations in the region millions of US dollars per year. In the case of Brazil, on this one hardcore cartel alone, the reduction in overcharges was equal to just under half of the state outlays on enforcing all of its competition laws. As it is unclear why other national and international cartels would not be deterred in a similar manner to the international vitamins cartel, these findings suggest that the reduction in overcharges on those cartels that do have the audacity to form would not go a long way to offset—if not to completely offset—any implementation costs associated with enforcing these laws.

In sum, these latter considerations point to the desirability of adopting provisions to enact and enforce national anti-cartel laws. Having said that, a number of important caveats might be borne in mind. First, the likely net benefits of any FTAA agreement on competition policy matters will depend critically on the provisions contained therein. For example, if such an agreement contains many sectoral exemptions, then the expected benefits are likely to be reduced. Second, the discussion here has focused on the ongoing costs and benefits of an already-established anti-cartel enforcement regime. There may well be costs associated with creating such a regime from scratch, which ought to be factored into any comprehensive economic evaluation of the matter at hand. Such costs could, of course, be mitigated by technical assistance measures, capacity building initiatives, and aid. Third, it should be recognized that this study is based on an analysis of one long lasting and prominent international hardcore cartel. Future studies may arrive at different findings or, indeed, they may reinforce or strengthen the conclusions reached here.

Table 1: Conspirators forming eight global cartels to fix the prices of selected compounds, 1990-1999

Duration of cartel	1990-1999	1990 – 1999	1991 – 1994	1991 – 1995	1991 – 1998	1991 – 1998	1989-1998	1989-1996
Products	A&E	B12	B1, B6 & Folic	C & B2	B5	Beta Carotene	Niacin	Choline Chloride
Cartel Members	Roche BASF Rhone Eisai	Rhone Hoechst	Roche Takeda Daiichi	Roche BASF Takeda E.Merck	Roche BASF Daiichi	Roche BASF	Degussa Lonza Napera	Chinook Mitsui DuCoa BASF Akzo UCB

Source: Connor, 2001, p.307

Table 2: List of companies and the location of their headquarters that were mentioned in US Federal indictments. Producer and Place of Origin

Company	*Country*
Akzo	Netherlands
BASF	Germany
Chinoook	Canada
Daiichi	Japan
Degussa	Germany
DuCoa	USA
Eisai	Japan
Hoechst	Germany
Lonza	Switzerland
Merck	Netherlands
Mitsui	Japan
Napera	USA
Rhone-Poulenc	France
Roche	Switzerland
Takeda	Japan
UCB	Belgium

Source: US Department of Justice Press Releases 1999-2000.

Table 3: List of cartels uncovered in the EC investigation and the participants in those cartels

Vitamin	*Participants*	*Duration (*)*	
		From	*To*
Vitamin A	Roche, BASF, Rhone-Poulenc (Aventis)	September 1989	February 1999
Vitamin E	Roche, BASF, Rhone-Poulenc (Aventis), Eisai	September 1989	February 1999
Vitamin B1 (Thiamine)	Roche, Takeda, BASF	January 1991	June 1994
Vitamin B2 (Riboflavin)	Roche, BASF, Takeda	January 1991	September 1995
Vitamin B5 (Calpan)	Roche, BASF, Daiichi	January 1991	February 1999
Vitamin B6	Roche, Takeda, Daiichi	January 1991	June 1994
Folic Acid (B)	Roche, Takeda, Kongo, Sumika	January 1991	June 1994
Vitamin C	Roche, BASF, Takeda, Merck	January 1991	August 1995
Vitamin D3	Roche, BASF, Solvay Pharmaceuticals, Rhone-Poulenc (Aventis)	January 1994	June 1998
Vitamin H (Biotin)	Roche, Merck, Lonza, Sumitomo, Tanabe, BASF	October 1991	April 1994
Beta Carotene	Roche, BASF	September 1992	December 1998
Carotinioids	Roche, BASF	May 1993	December 1998
Note: (*) The duration of each company's participation in a cartel need not necessarily be the same.			

Source: F. Arbault, S. Suurnakki, F. Peiro, B. Nijs, P. Bridgeland, G. Berger, M. Lindroos & E. Marteil, *Commission Adopts Eight New Decisions Imposing Fines on Hard-Core Cartels*, in the European Commission's COMPETITION POLICY NEWSLETTER, No.1, February 2001, p.32

Table 4: Estimation results

Parameter			Specification number, parameter estimates, and t statistics					
			1		2		3	
Name of parameter		Predicted sign of parameter estimate	Parameter estimate	t statistic	Parameter estimate	t statistic	Parameter estimate	t statistic
Constant for all years		?	1.4212	1.2961				
Constant for pre-cartel years		?			4.7176	3.1765		
Constant for cartel years		?			5.1926	3.2721		
Constants for pre-1990	Enforcer	?					4.7461	3.2067
	Non-enforcer	?					4.2214	2.8600
Constants for post-1990	Enforcer	?					5.1431	3.2680
	Non-enforcer	?					4.6664	2.9592
Last year's total imports from exporter		+	0.9126	34.2033	0.9169	34.4499	0.8482	28.4217
Exporter's national income		-	-0.7881	-19.9627	-0.7983	-20.2333	-0.7256	-17.3405
Proxy for exporter's total vitamins production		+	0.9548	26.9687	0.9588	27.1653	0.9644	27.5446
Last year's total vitamins exports from China		-	-0.1312	-2.9720	-0.3202	-4.4141	-0.3425	-4.7512
Number of observations			1319		1319		1319	
R-squared			0.5734		0.5769		0.5848	

Table 5: Sensitivity to outliers

Parameter			Specification number, parameter estimates, and t statistics											
			3		4		5		6		7		8	
Name of parameter		Predicted sign of parameter estimate	Parameter estimate	t statistic	Parameter estimate	t statistic	Parameter estimate	t statistic	Parameter estimate	t statistic	Parameter estimate	t statistic	Parameter estimate	t statistic
Constants for pre-1990	Enforcer	?	4.75	3.21	5.35	3.81	5.11	3.84	3.81	3.10	3.66	3.32	4.26	4.60
	Non-enforcer	?	4.22	2.86	4.86	3.46	4.64	3.50	3.39	2.76	3.18	2.89	3.83	4.14
Constants for post-1990	Enforcer	?	5.14	3.27	5.80	3.88	5.55	3.93	4.14	3.16	3.92	3.34	4.58	4.65
	Non-enforcer	?	4.67	2.96	5.38	3.59	5.15	3.64	3.78	2.88	3.60	3.07	4.27	4.34
Last year's total imports from exporter		+	0.85	28.42	0.87	30.50	0.87	32.45	0.88	35.01	0.86	38.65	0.90	46.83
Exporter's national income		-	-0.73	-17.34	-0.76	-19.14	-0.78	-20.85	-0.80	-22.80	-0.80	-25.82	-0.83	-31.24
Proxy for exporter's total vitamins production		+	0.96	27.54	1.00	30.03	1.05	32.82	1.08	36.14	1.10	40.74	1.13	47.63
Last year's total vitamins exports from China		-	-0.34	-4.75	-0.38	-5.55	-0.39	-5.92	-0.33	-5.40	-0.32	-5.83	-0.38	-8.18
Number of observations			1319		1306		1286		1253		1187		1055	
Percentage of observations removed as outliers			0		1		2.5		5		10		20	
R-squared			0.5848		0.6185		0.6530		0.6962		0.7530		0.8316	

Table 6: After the cartel is formed, import bills rose more in the jurisdictions with active anti-cartel enforcement regimes

Specification	3	4	5	6	7	8
Percentage of outliers deleted from original sample	0	1	2.5	5	10	20
Percentage increase in imports in jurisdictions with active anti-cartel regimes	48.7291	56.0849	56.1323	38.6019	29.6398	38.0751
Percentage increase in imports in jurisdictions without active anti-cartel regimes	56.049	68.615	66.9089	46.6375	52.9348	56.3887
Additional increase in imports in jurisdictions without active anti-cartel regimes	7.3199	12.5301	10.7766	8.0356	23.295	18.3136

Table 7: Overcharges paid on vitamins imports, 1989-1999	
Active cartel law enforcers	
Economy	Overcharges (US $million)
Brazil	239.149
Mexico	192.526
Chile	50.121
Peru	24.492
Inactive cartel law enforcers	
Economy	Overcharges (US $million)
Argentina	85.417
Colombia	63.577
Venezuela	52.437
Honduras	29.926
Ecuador	17.149
Guatemala	12.047
Paraguay	5.285
Costa Rica	4.421
Bolivia	3.996
Dominican Republic	3.553
El Salvador	3.128
Nicaragua	1.388
Panama	0.787
Total overcharges in these economies (US $million)	789.398

Table 8: Deterrent effects of active cartel enforcement	
Active cartel law enforcers	
Economy	Reduction in overcharges due to active cartel enforcement (US $million)
Brazil	45.913
Mexico	28.394
Chile	9.622
Peru	4.447
Inactive cartel law enforcers	
Economy	Increase in overcharges due to inactive cartel enforcement (US $million)
Argentina	13.758
Colombia	10.240
Venezuela	8.446
Honduras	4.820
Ecuador	2.762
Guatemala	1.940
Paraguay	0.851
Costa Rica	0.712
Bolivia	0.644
Dominican Republic	0.572
El Salvador	0.504
Nicaragua	0.224
Panama	0.127

Figure 1: Chinese exports of vitamins and polyvitamins, 1985-2000

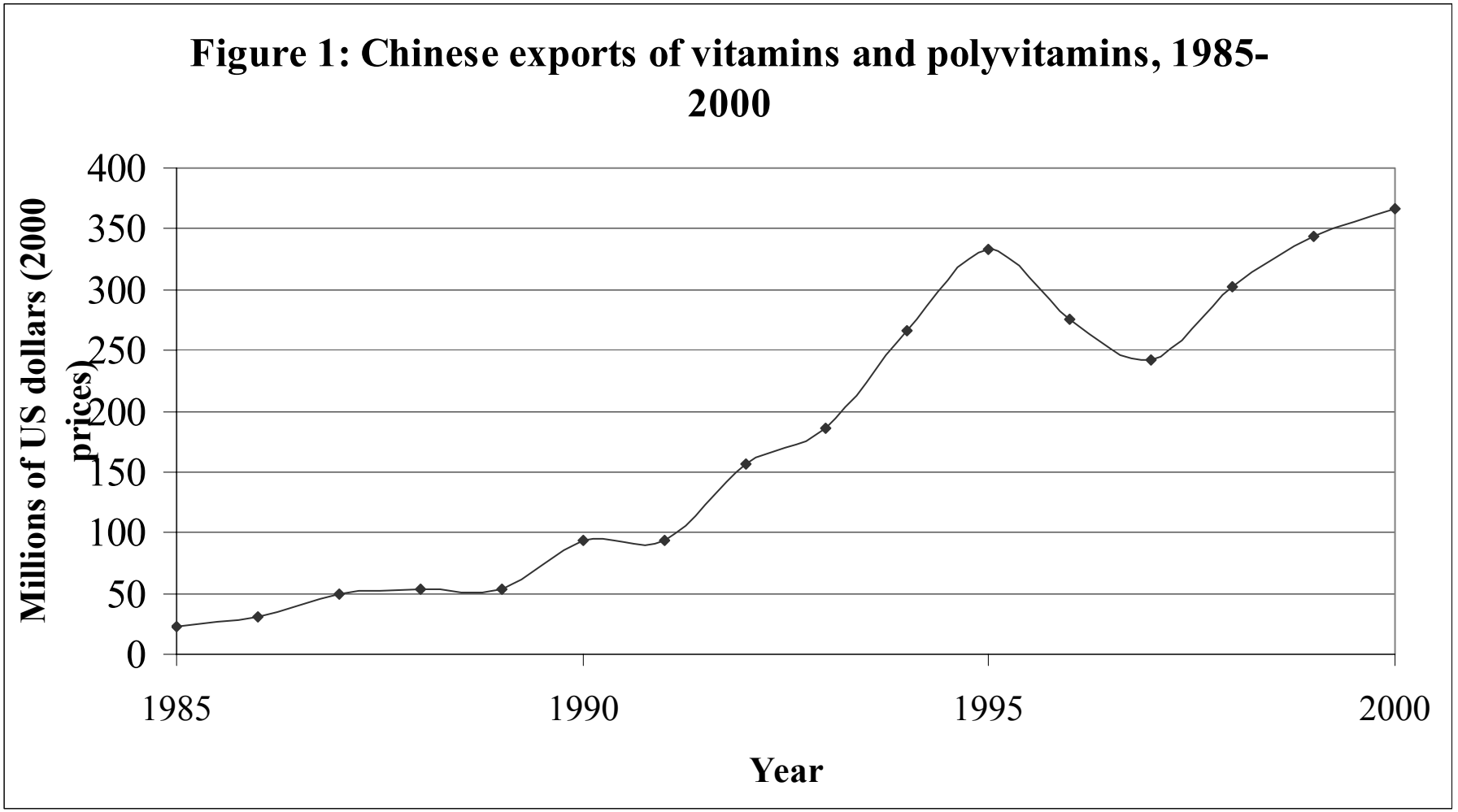
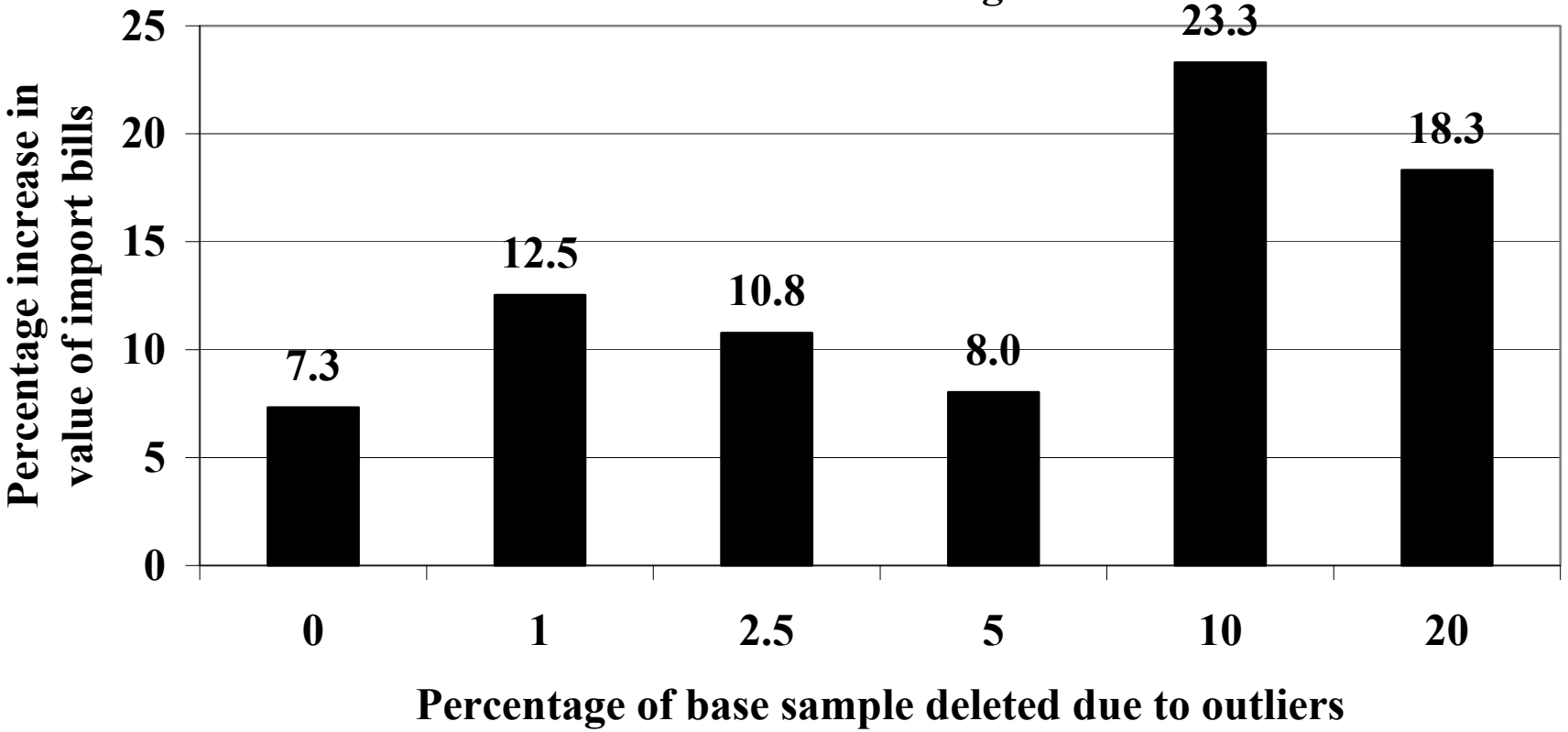


Figure 2: Import bills jumped more in jurisdictions without active anti-cartel regimes



Annex: Chart Showing the Fines Accruing to US and International Firms In Breach of the Sherman Act, As of January 2003

ANTITRUST DIVISION Sherman Act Violations Yielding a Fine of $10 Million or More				
Defendant (FY)	**Product**	**Fine ($ Millions)**	**Geographic Scope**	**Country**
F. Hoffmann-La Roche, Ltd. (1999)	Vitamins	$500	International	Switzerland
BASF AG (1999)	Vitamins	$225	International	Germany
SGL Carbon AG (1999)	Graphite Electrodes	$135	International	Germany
Mitsubishi Corp. (2001)	Graphite Electrodes	$134	International	Japan
UCAR International, Inc. (1998)	Graphite Electrodes	$110	International	U.S.
Archer Daniels Midland Co. (1997)	Lysine & Citric Acid	$100	International	U.S.
Takeda Chemical Industries, Ltd. (1999)	Vitamins	$72	International	Japan
Bilhar International Establishment (2002)	Construction	$54	International	Liechtenstein
Daicel Chemical Industries, Ltd. (2000)	Sorbates	$53	International	Japan
ABB Middle East & Africa Participations AG (2001)	Construction	$53	International	Switzerland
Haarmann & Reimer Corp. (1997)	Citric Acid	$50	International	German Parent
HeereMac v.o.f. (1998)	Marine Construction	$49	International	Netherlands
Sotheby's Holdings Inc. (2001)	Fine Arts Auctions	$45	International	U.S.
Eisai Co., Ltd. (1999)	Vitamins	$40	International	Japan
Hoechst AG (1999)	Sorbates	$36	International	Germany
Showa Denko Carbon, Inc. (1998)	Graphite Electrodes	$32.5	International	Japan
Philipp Holzmann AG (2000)	Construction	$30	International	Germany
Arteva Specialties (2003)	Polyester Staple	$28.5	International	Luxembourg
Daiichi Pharmaceutical Co., Ltd. (1999)	Vitamins	$25	International	Japan
Nippon Gohsei (1999)	Sorbates	$21	International	Japan
Pfizer Inc. (1999)	Maltol/Sodium Erythorbate	$20	International	U.S.

Fujisawa Pharmaceuticals Co. (1998)	Sodium Gluconate	$20	International	Japan
Dockwise N.V. (1998)	Marine Transportation	$15	International	Belgium
Dyno Nobel (1995)	Explosives	$15	Domestic	Norwegian Parent
F. Hoffmann-La Roche, Ltd. (1997)	Citric Acid	$14	International	Switzerland
Merck KgaA (2000)	Vitamins	$14	International	Germany
Degussa-Huls AG (2000)	Vitamins	$13	International	Germany
Akzo Nobel Chemicals, BV (2001)	Monochloracetic Acid	$12	International	Netherlands
Ueno Fine Chemicals Industry, Ltd. (2001)	Sorbates	$11	International	Japan
Eastman Chemical Co. (1998)	Sorbates	$11	International	U.S.
Jungbunzlauer International AG (1997)	Citric Acid	$11	International	Switzerland
Lonza AG (1998)	Vitamins	$10.5	International	Switzerland
Morganite, Inc. (2003)	Carbon Products	$10	International	British parent
Akzo Nobel Chemicals, BV & Glucona, BV (1997)	Sodium Gluconate	$10	International	Netherlands
ICI Explosives (1995)	Explosives	$10	Domestic	British Parent
Mrs. Baird's Bakeries (1996)	Bread	$10	Domestic	U.S.
Ajinomoto Co., Inc. (1996)	Lysine	$10	International	Japan
Kyowa Hakko Kogyo, Co., Ltd. (1996)	Lysine	$10	International	Japan

Source: USDOJ. Available online at http://www.usdoj.gov/atr/public/criminal/12557.htm

Annex:

FTAA Draft Text, Canada's Positions and Proposals, and Frequently Asked Questions

Draft Chapter on Competition Policy - Canada's Position and Proposals

Canada's Proposal

Negotiating Group on Competition Policy - November 2000

Item 1 Scope of the Negotiations on Competition Policy

Objective: To ensure that the benefits of the FTAA liberalization process are not undermined by anti-competitive business practices.

The delegations shall examine whether or not it would be advisable to define the term "anti-competitive."

1.1 Commitments to have, implement and enforce competition policy and measures which will promote competitive markets in the FTAA, both among countries in the Hemisphere and internally in each of those countries.

The term "measures" is intended to cover laws, rules, or other official regulatory acts.

1.2 Anti-competitive conduct with cross-border impact.

1.3 Exclusion and exceptions

Some delegations considered that exclusion refers to areas that are outside the scope of the competition law and that exception refers to case-specific non-application.

Proposal

Commitments to Have, Implement and Enforce Competition Policy

Each Party shall adopt or maintain measures, at a national or sub-regional level, to proscribe anti-competitive business conduct and shall take appropriate action with respect to such conduct.

Anti-competitive conduct with cross-border impact

No Proposal

Exclusions and Exceptions

For the purposes of this Chapter, any exclusions and exceptions from the coverage of national or sub-regional measures to proscribe anti-competitive business conduct should be transparent and reviewed periodically to assess whether they are both necessary and no broader than necessary to achieve their overriding policy objectives.

Item 2 Basic Competition Principles and Criteria

Some delegations consider it would be necessary to define the principles and criteria of competition, while others feel this might not be relevant to negotiations on competition.

Proposal

Each party shall adopt or maintain measures, at a national or sub-regional level, to proscribe anti- competition business conduct with the objective of promoting economic efficiency and/or consumer welfare and shall take appropriate action with respect to such conduct.

Item 3 Identification of Anti-competitive Behaviors to Be Covered by the Negotiations

Proposal

Parties to adopt or maintain measures to proscribe anti-competitive business conduct and to take appropriate action against such practices.
"Anti-competitive business conduct" includes, but is not limited to:
Hard Core Cartels (definition in the OECD Recommendation);
Abuse of Dominant Position (NGCP to develop common understanding and language); and
Anti-competitive Mergers (NGCP to develop common understanding and language).

Item 4 Broad Principles Concerning the Application of Competition Policies and Measures

Proposal

Transparency
Parties to ensure that the measures it adopts or maintains, including laws, regulations, procedures and administrative rulings of general application are published or otherwise publicly available.

National Treatment
Parties to ensure that any actions taken or measures in place to proscribe anti-competitive business conduct are applicable on a national treatment basis.

Non Discrimination
Parties to ensure that any actions taken, measures in place, or rights and remedies available, pursuant to the chapter on competition policy, are applicable on a non-discriminatory basis.

Procedural Fairness
Parties to ensure that administrative and judicial practices and procedures relevant to competition law enforcement are fair and equitable and include reasonable notice and details of claims, an opportunity for defense and to make necessary representations, access to courts and independent decisions.

Item 5 Institutional Provisions

Proposal

Competition Law*
The obligation to adopt or maintain measures to proscribe anti-competitive business conduct and take appropriate action with respect to such conduct

Competent Competition Authorities
Parties to establish or maintain, at the national or sub-regional level, competition authorities which:
are authorized to take appropriate action under the competition laws and are reasonably independent from political interference; and
have reasonably independent authority to advocate pro-competitive solutions in the design, development and implementation of Government policy and legislation.

Appeal Process
Parties to ensure that, where legal action is taken to address anti-competitive business practices, an independent national or sub-regional appeal process is available to firms or individuals who are subject to the action.
* Relates to Item 1.1 of Indicative List: "Commitments to have, implement and enforce competition policy and measures which will promote competitive markets in the FTAA, both among countries in the Hemisphere and internally in each of those countries."
Item 6 Mechanisms for Cooperation and for Exchange of Information

Proposal

Cooperation
Parties to recognize the importance of cooperation and coordination among authorities to further effective competition law enforcement in the free trade area, including notification, consultation and exchange of information relating to the enforcement of competition laws and policies.
Unless providing notice would harm its important interests, Parties to notify another Party when a proposed competition law enforcement action may have an effect on the second Party's important interests, and give full and sympathetic consideration to possible ways of fulfilling its enforcement needs without harming those interests.

Confidentiality Laws
Nothing in this Chapter shall require the provision of information by a Party or its competition authority contrary to its laws including those regarding disclosure of information, confidentiality or business secrecy.
Parties may enter into mutual cooperation and mutual legal assistance arrangements.

Item 7 Technical Assistance and Information Dissemination

Proposal

Parties to recognize the importance of technical assistance and information dissemination to facilitate implementation and enhancement of commitments of member countries under the FTAA chapter on competition policy.

Item 8 Regulatory Policies And Practices, Official Monopolies and State Enterprises

8.1. Effects of regulatory policies on market access and conditions of competition.

8.1.1. Need for pro-competitive regulatory principles.

8.2. Official monopolies and state enterprises.

8.3 Competition advocacy.

8.4. Effects of State aids on competition.

Some delegations feel that this item could be dealt with by the Negotiating Group on Subsidies, Antidumping and Countervailing Duties.
Proposal
No Proposal

Item 9 Dispute Settlement

9.1. Evaluate the possibility of establishing a specific dispute settlement mechanism for competition or the possibility of applying the general FTAA dispute settlement mechanism.

9.2. Evaluate what provisions or commitments, if any, would be

subject to the dispute settlement mechanism.

9.3. Possibility of establishing other mechanisms to ensure or review country compliance with commitments.

The delegations considered that the dispute settlement system should not be launched to challenge or review administrative or judicial decisions made by a country in specific cases of competition law enforcement.

Proposal

Committee
A Committee shall be established whose principal members shall be comprised of a representative from each Party's competition authority and/or another person, including a trade official, with competency and expertise in the area of competition law and policy.
The Committee shall meet to consider matters regarding the operation, implementation and interpretation of this Chapter and to conduct non-binding, periodic reviews of Parties' or sub-regional competition policies and practices.
The purpose of reviews of Parties' or sub-regional competition policies and practices will be to contribute to improved adherence by all Parties to rules, disciplines and commitments under the chapter on competition policy by achieving greater transparency in, and understanding of, the competition policies and practices of Parties and sub-regional groupings and their impact on the FTAA region. Such reviews are not, however, intended to serve as a basis for the enforcement of specific obligations under the chapter on competition policy, or for dispute settlement procedures, or to impose new policy commitments on Parties or sub-regional groupings.
The Committee may make recommendations on the operation, implementation and interpretation of this Chapter as well as whether changes in the obligations under this Chapter are warranted to the FTAA Commission.
The Committee shall act by consensus. Unless the Committee decides otherwise, its reports shall be public.

Confidentiality
Nothing in the chapter on competition policy shall require the provision of information by a Party or its competition authority contrary to its laws including those regarding disclosure of information, confidentiality or business secrecy.

Item 10 Compliance with Commitments Given Asymmetry of Country Development

10.1. Consideration should be given to economic development and the size of the economy, as well as the stage of legislative and institutional development of countries.

10.2 Possibility of a transitional period

Some delegations stated that consideration should be given to the need for a transitional period to implement competition policy commitments within the FTAA. Other delegations see this as a part of FTAA negotiations, where the possibility of a general or specific transition period for FTAA implementation will be determined.

10.3. Some delegations expressed the view that, during the negotiations, consideration will be given to the creation of a permanent, non-binding review mechanism for competition policy making and enforcement. Some delegations consider that the results of such review shall not prejudge any dispute.

Proposal
No Proposal