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The Role of Science in Trade Agreements

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Member nations of the World Trade Organization are permitted to develop regulations that might restrict trade if they do so for the purpose of protecting human, animal or plant life or health. The regulations, under both the Sanitary/Phytosanitary and Technical Barriers to Trade agreements, must be based on science, be non-discriminatory and be the least-trade-restrictive alternative. Uncertainty, a lack of adequate scientific evidence and differing interpretations have led to disputes about regulations applied by particular countries. If consultations cannot resolve the issues, dispute settlement panels and an appellate body adjudicate them; in these forums, scientific knowledge, studies and testimony by scientists play key roles.

Keywords: dispute settlement, international trade, precautionary principle, sanitary/phytosanitary provisions, technical barriers to trade, World Trade Organization

Introduction

Science, scientists and scientific analyses are playing an increasingly important role in the operation of international trade agreements, especially since the inauguration of the World Trade Organization in 1995 upon completion of the Uruguay Round of trade negotiations under the General Agreement on Tariffs and Trade (GATT).¹ Scientific principles are especially important in two of the agreements, the Sanitary and Phytosanitary (SPS) and Technical Barriers to Trade (TBT) agreements; in addition, they have implications for agreements in the areas of intellectual property rights (the TRIPS Agreement), agriculture and the environment. Scientific issues usually become operational and significant during the dispute settlement process as governments protest provisions by other countries that affect their abilities to export products affected by the SPS and TBT agreements or other trade regulations.

WTO Provisions for Science

GATT/WTO provisions requiring that scientific principles be used in the development of regulations that affect international trade are included in the SPS and TBT agreements. The specific provisions in the SPS Agreement are found in Article 2, as follows (WTO, 1994a):

1. Members have the right to take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health, provided that such measures are not inconsistent with the provisions of this Agreement.
2. Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, *is based on scientific principles and is not maintained without sufficient scientific evidence*, except as provided for in paragraph 7 of Article 5 [emphasis added].

The TBT provisions, found in Article 2 of that agreement, state the following (WTO, 1994b):

- 2.2 Members shall ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create. Such legitimate objectives are, *inter alia*: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment. *In*

assessing such risks, relevant elements of consideration are, inter alia: available scientific and technical information, related processing technology or intended end-uses of products [emphasis added].

Sanitary/phytosanitary measures include measures to protect human, animal and plant life and health from risks associated with entry and spreading of pests, diseases, disease-causing and disease-spreading organisms and risks associated with additives, contaminants, toxins or disease-causing organisms in food, beverages and feedstuffs; measures to protect human life and health from diseases carried by animals, plants or products thereof; and measures to prevent or limit damage from the entry, establishment or spread of pests (WTO, 1994a).

Technical barriers are regulations and documents that define product characteristics, their related processes and production methods as well as terminology, symbols, packaging, marking and labeling requirements that apply to a product, process or production method (WTO, 1994b). Included here are, for example, safety features such as safety glass in automobile windows, environmental requirements related to auto emissions and fuel efficiency and labeling requirements, including lists of ingredients and nutrition information on processed food, etc.

Article 5 of the SPS Agreement requires that regulations be based on risk assessments conducted using appropriate techniques and available scientific knowledge (Isaac, 2003; Peel, 2004; WTO, 1994a). Article 5.7 allows regulation where knowledge is not sufficient for scientific conclusions to be drawn, but these regulations must be provisional, available science must be used and a risk assessment based on scientific approaches must be conducted to justify any restrictions that affect trade. In addition to the SPS and TBT provisions, Article XX of the GATT Agreement provides for general exceptions that allow trade regulations based on the need to, among other things, protect human, animal and plant life and health and renewable natural resources. Article XX does not mention science, but it has been interpreted to require similar justifications as the SPS and TBT provisions (Peel, 2004; WTO, 1986).

Science and Trade Disputes

While scientific knowledge should play a role in establishing and justifying regulations and restrictions that apply to traded products, it generally becomes an important issue only when one WTO member files a complaint against another country with the WTO's Dispute Settlement Body (DSB) under the Dispute Settlement Understanding (DSU), alleging that an action restricting trade is illegal under one or more WTO provisions; generally complaints are brought under more than one provision. The U.S. complaint against the EU in the biotech (GMO) case, for example, alleged violations of Articles 2, 5, 7 and 8 and Annexes B and C of the SPS

Agreement, Articles I, III, X and XI of the GATT 1994, Article 4 of the Agricultural Agreement and Articles 2 and 5 of the TBT Agreement (WTO, 2005). The complainant only has to make a *prima facie* case against the restriction; however, unlike in U.S. courts where the defendant is assumed innocent until proven guilty, the respondent is required to provide the burden of proof that the appropriate science, risk assessment and other requirements have been met (WTO, 1994c).

The members are to consult to try to resolve the issue, but if they cannot agree to a resolution within 60 days the complainant can request that a dispute settlement panel be appointed to hear and resolve the case. A panel consists of three persons with expertise in the issues raised by the complaint and selected from a list kept by the WTO. The panel hears the case and makes a preliminary report with its findings. After all parties have had an opportunity to respond to the preliminary report, a final report is issued. Either party can appeal the panel's findings to the Dispute Appellate Body, a permanent seven-person group from which three are selected to hear the appeal. The Appellate Body can uphold, reverse and/or modify the holdings of the panel. The DSB must give final approval to either the panel's or Appellate Body's final report. If the panel or Appellate Body finds for the complainant, the defending country is to remove the restriction or change it to the satisfaction of the complainant within a reasonable time or face possible penalties, often in the form of higher tariffs on a list of selected products (usually selected for a major impact on its exports to the complaining country). Other members can join in the proceedings as third parties, or, if more than one country files a complaint on the same issue, the DSB can appoint separate panels or form a single panel to hear all the complaints simultaneously. Thus, in the U.S. complaint on the EU biotech regulations, Argentina, Australia, Brazil, Canada, Chile, China, Chinese Taipei, Colombia, El Salvador, Honduras, Mexico, New Zealand, Norway, Paraguay, Peru, Thailand and Uruguay are listed as third parties (Canada and Argentina filed separate complaints). In late 2005 this issue still had not been resolved, due to delays requested by the parties to prepare their rebuttals to the material presented by the other parties and to the decision of the panel to seek outside scientific and technical expert advice on the dispute (Marchant and Song, 2005; WTO, 2005a). Such delays are common in major disputes.²

The panel's preliminary report was finally released to the parties concerned on 7 February 2006 with a basic finding that the EC and several of its member countries (Austria, France, Germany, Greece, Italy and Luxembourg), which have stricter provisions including bans on GM products, were not in compliance with WTO requirements (ICTSD, 2006a; Meller, 2006).³ While the panel did not rule on the safety aspects of biotech foods or whether they are like conventional counterparts

(U.S., Canadian and Argentine contentions) and found that the EC's procedures for assessing biotech products were within the meaning of the SPS Agreement, they did find that the EC was not in compliance because of its continued *de facto* moratorium between October 1998 and 29 August 2003, the date the panel was established, during which it failed to complete individual product approval procedures (ICSTD, 2006a). The panel also found that there was sufficient scientific evidence to undertake a risk assessment and that the several EC member states listed above were not in compliance with the SPS Agreement in continuing to prohibit imports of specific biotech products, especially maize and oilseed rape. It should be noted that the report is preliminary and that it can be modified after all the parties have had a chance to respond to the findings.

One way that WTO members can avoid disputes in setting their SPS and related regulations that affect trade is to base them on international standards, The Codex Alimentarius Commission in the case of food safety, the International Office of Epizootics for animal health and the International Plant Protection Convention for plant health (Peel, 2004; WTO, 1994a). When countries set standards that restrict trade and are outside of such international standards, the restrictions are more apt to be challenged by other members whose exports are threatened by the restrictions.⁴ Prominent examples of trade disputes that have involved science, in addition to the biotech cases cited above, include French (EC) restrictions on asbestos, the European Communities' ban on beef from cattle that have been fed growth hormones, the Australian ban on salmon imports to prevent the introduction of diseases that might affect domestic production, and Japanese restrictions on apples due to possible introduction of fire blight – all cases in which the United States and/or Canada have been involved as complainants.⁵ In all of these cases, the complainants included scientific evidence in the panel hearings to indicate that the trade restrictions were not based on science. The respondent countries then introduced scientific evidence in the form of studies and testimony to attempt to rebut the charges that the restrictions were not based on science.

An important difference in the cases heard by the dispute settlement panels and those heard in U.S. and most other courts is that the panels can assemble their own scientific and technical experts to provide independent evaluations of the science and other matters involved. In the beef hormone case, for example, the panels obtained the services of six expert witnesses to assist in the evaluation of the scientific evidence (WTO, 1997a). Since the complaining and responding parties are apt to be selective in the scientific evidence they present to the panel, the panel's own experts are expected to provide a more complete and unbiased analysis of the evidence. While the

presentations of both sides might be expected to fully cover the available science, it can become difficult to determine which side is correct, since studies often have conflicting results. The beef hormone panel, in consultation with the parties to the dispute, developed a set of written questions for written responses by the panel's experts. In addition, the experts also testified during the panel hearings. The panel report contained extensive discussion of the science involved, including the written responses to the panel's questions, the disputants' evaluations of the science, and testimony from the experts. The panel report found that the EC was not in compliance with the SPS Agreement. The EC appealed and the panel's findings were largely upheld, although the Appellate Body toned down some of the more rigorous findings with respect to the role of science; the United States and Canada also appealed since they did not agree with all of the panel's findings (WTO, 1997b). However, the Appellate Body confirmed the importance of science in establishment of SPS regulations.

A major part of the finding was that the EU had not carried out an adequate risk assessment. The risk assessment is to be carried out under Article 5 of the SPS Agreement to determine the risks posed to human, animal or plant life or health due to the banned or restricted product. In carrying out the risk assessment, the member is to take into account "risk assessment techniques developed by the relevant international organizations" (WTO, 1994a, p. 71). It is also to utilize the available scientific evidence as well as "relevant inspection, sampling and testing methods". Although the Appellate Body seemed to provide greater scope than did the dispute settlement panel for non-scientific risk management procedures to be used in deciding on SPS measures, the final result was that members "have little discretion to stray too far from a scientific assessment of risk" (Peel, 2004, p. 69). As a result of the finding against the EC and with the EC's failure to remove the ban on beef imports, the United States on 29 July 1999 imposed a 100 percent tariff on selected imports from the European Communities to recoup the estimated \$116.8 million in estimated annual damages to the beef industry (WTO, 2005b). On 5 January 2005, the EC requested that the DSB establish a panel to hear its complaint that the United States has continued its penalty and to determine when it should be suspended; the EC maintains that its new directive, which continues the ban, is now consistent since the EC has carried out a risk analysis based on new research that shows "the avoidance of the intake of oestradiol 17 β is of absolute importance to human health ..." (WTO, 2005b, p. 2). The United States denied that the new directive was based on science. The EC, in its filing, contends that it consulted with the United States but that the United States did not agree to suspend the high tariffs. The DSB agreed to establish a panel, with public

hearings scheduled for 13-15 September 2005, but had not yet issued a report by late 2005 (WTO, 2005c).

The Precautionary Principle

The EC, particularly, has maintained that where knowledge of risks associated with introduction of a product is lacking or uncertain because of mixed results in scientific studies, it is justifiable to ban or restrict the use of the products as a precaution to avoid possible harm to humans, animals or plants, i.e., that the precautionary principle is applicable (IISD, 2000; Inter-departmental Liaison Group on Risk Assessment, 2002). The EC maintained, both in the evidence presented to the dispute settlement panel in the hormones case and in its appeal, that the precautionary principle should apply to the directive that established the ban on the use of growth hormones in beef, that the situation was characterized by uncertainty and, thus, that the restrictions were permitted under the SPS agreement (WTO, 1997; WTO, 2005c). The Appellate Body, however, upheld the panel's finding that the precautionary principle, while having some validity in applying the SPS Agreement, did not override the other provisions of the agreement. They stated, "We agree with the finding of the Panel that the precautionary principle does not override the provisions of Articles 5.1 and 5.2 of the SPS Agreement" (WTO, 1997, para. 125). The report also noted that Article 5.7 allows application of the principle, but that the article applies only to new products where scientific knowledge is lacking. Products can be restricted only on a provisional basis and can remain restricted only until such a time that knowledge is sufficient to make an adequate risk assessment. It might be noted that the biotech case against the EC brought by the United States, Canada and Argentina is being defended, in part, under the precautionary principle (WTO, 2005a).

Discussion

There is little doubt that the SPS and TBT provisions of the WTO agreements have engendered a significant role for science in the development and implementation of regulations affecting international trade. However, there are disagreements about the proper role for science and about how the WTO panels and Appellate Body have interpreted the provisions of the agreements. Business-oriented groups, which tend to support the expansion of trade, generally support the use of science since this means that countries must be cautious in developing restrictions that limit trade (see, e.g., Ambrose, 2000). Among those who feel that the provisions have given too significant a role to science, thus making trade restrictions more problematic, are those who tend

to oppose globalization and trade, including some environmental and development-oriented groups (Greenpeace, 2004, 2005).

In addition to these opponents are some legal and other scholars who object to the interpretations and use of the science provisions of the SPS and/or TBT agreements.⁶ Walker (2003), for example, objects to the view that science can be a “neutral arbiter” in “triggering precautionary measures” and calls the view that it can be neutral a myth, but he does not document that this is a common point of view or is important in the WTO dispute settlement process, which requires that regulations be based on scientific evidence.

Peel (2004), in addition, faults the dispute settlement panels and Appellate Body for their interpretations of the science-based approach in that they failed to give proper deference to the regulatory bodies, as is done in cases in U.S. courts, or to the precautionary principle, as is the practice in EU courts. She believes that the approach in the WTO has given science a privileged and unjustified position in determining how SPS risks are managed. Peel also finds fault with “generalist decision makers”, i.e., the dispute settlement panel members, in assessing the legality of regulations that they “are not technically competent to examine in depth,” although she does not carry out an analysis of the competency of any of the panels, which the WTO is required to select based on their experience and expertise (WTO, 1994c). Furthermore, the panels are allowed to consult with experts and any available source of information to assist in their decisions. The panels generally select and appoint a group of persons with scientific and technical expertise to supplement the information provided by the complainant and respondent countries. This is in contrast to the U.S. and other court systems, where only the litigants provide the expertise.

Christorforou (2000), however, criticizes the way the dispute settlement panels select and utilize the scientific experts they consult in reaching their decisions. He faults the “entrenched practice” of the panels seeking advice by consulting scientific experts in their individual capacities rather than as a panel of experts. The understanding that regulates the dispute settlement process does not prescribe how the panels are to appoint or utilize the experts and, thus, it has evolved into a set of practices that panels tend to follow.

Winickoff et al. (2005) believe that science is given too great a role in the settlement of disputes, to the exclusion of cultural and political factors. Their preferred approach would involve exhibiting sensitivity to cultural views and deference to public views of risk, especially in “novel risk situations characterized by low certainty and low consensus.” Since the current SPS and TBT agreements do not mention either cultural or political considerations as justifications for regulation of

trade, Winickoff et al. believe they should be modified to take such factors into account when setting or evaluating regulations.

These criticisms, to some extent, fail to adequately consider the basic purpose of the GATT/WTO agreements, which is to facilitate a freer flow of goods and services between nations. Hudec (2003) cautioned critics of the process to remember that the Uruguay Round agreements added the goal of preventing unjustified regulation, *per se*, and not just the elimination of discriminatory practices as in previous agreements. When members disagree over the legitimacy of a regulation that the imposing member claims is for health or safety but others view as an unjustified barrier to trade, the dispute settlement mechanisms must decide who is correct; science plays a key role in this process.

Conclusions

Science was given an important role in determining the legitimacy of regulations that affect the flow of trade under the SPS and TBT provisions of the WTO. The members of the WTO have agreed to the provisions of these trade agreements, which were negotiated through a process that required a consensus among all members before they became part of the process. This began with the GATT agreement in 1947 when there were relatively few members and has expanded through time to include most of the world's nations and a large share of international commerce. The WTO came into being in 1995 following the Uruguay Round of GATT negotiations, which was the culmination of several previous rounds, with the expansion and modification of the terms based on experience and with the accession of new members who saw advantages to joining the multilateral trade organization, *i.e.*, the advantages of freer trade that made markets more accessible. Since the GATT/WTO provisions are arrived at by consensus, they represent the consent of each of the members to abide by the rules. These, however, are often vaguely written, leaving room for disagreements and disputes for which a settlement process was also arrived at by consensus. That flaws exist in the process is not deniable, but there is the opportunity to correct these in the current, Doha Round, or in future rounds of negotiations. Changing any of these processes, including those for using science in establishing regulations, requires a consensus of all the members.

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Endnotes

1. The WTO maintains a website that provides access to a large number of documents, including the 1994 GATT and other agreements negotiated in the Uruguay Round (1987-1994) that resulted in the creation of the WTO. The agreements consist of a number of separately negotiated agreements that were then generally approved by the member countries as a unit. The portal is at: <http://www.wto.org>. The basic agreement is the 1986 GATT Agreement as modified by the Uruguay Round negotiations.
2. The DSU sets limits of six and at most nine months for the dispute panels to issue their reports unless there is mutual agreement to extend the time. The panels can also request that the DSB extend the time for issuing reports.
3. While the interim reports are supposed to be confidential and are distributed only to the participants, the results in the GMO case were immediately leaked and commented on by all the participants. In addition the conclusions and recommendations of the 1,050 page document were posted by ICTSD on its website (ICTSD, 2006b).
4. In addition to the requirement that the restrictions be based on science and that a risk assessment be made, the restrictions must meet other requirements. They

must be transparent, be the least-trade-restrictive of alternative approaches, apply to domestic as well as international producers and be nondiscriminatory, i.e., apply equally to all countries. Thus, not all trade disputes arise from disagreements related strictly to the science involved.

5. Two important cases brought against the United States are the tuna/dolphin case brought by Mexico and the shrimp/sea turtle case brought by East Asian countries, but these were based largely on U.S. laws aimed at protecting dolphins and sea turtles (the Marine Mammal Protection Act and the Endangered Species Act). While science was an aspect of the cases, it was not the predominant factor. The cases did involve the protection of those animals. Information on all disputes can be found on the WTO web pages: http://wto.org/english/tratop_e/cases.htm.
6. There are a large number of publications that deal with these issues and not all can be reviewed here. Those included in this discussion represent the major categories of criticisms. References in the cited publications provide a more complete list of the relevant work.

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