

Preliminary Draft. Please do not cite without permission of the author.

A Law and Economics Approach to Resolving the Conflict between Politics and Science in Health Risk Regulation under the World Trade Organization

Jinyul JU

Prof. of Law at Pusan National University Graduate School of Law, Busan 609-735, Korea
(Email) jinyul_ju@pusan.ac.kr

Abstract

This Article seeks a way to resolving international trade disputes due to domestic health risk regulation from the perspective of rational choice model. It mainly addresses the problems of (1) legal uncertainty of the WTO/SPS Agreement and (2) non-compliance with the WTO law and/or ruling on the matter of health risk. As we can observe in notorious trade disputes between the EC and the U.S. on growth-hormones-treated beef and genetically-modified organisms, with respect to public health, even though the exporting countries win the case in the WTO, there is a possibility that representative governments of the losing defendants do nothing for compliance with the WTO law. Moreover, the WTO has no effective way to make the losing defendants to comply with its ruling. Trade retaliation of the exporting countries does not always guarantee the losing defendant to abide by the WTO ruling. When the importing countries deliberately take imports ban for domestic political reason, the WTO can not play a role in trade dispute settlement. Importation ban based on the public misperceptions of risk would ultimately impede economic efficiency, consumers' welfare, and the credibility of the multi-national trade system as well. It is critical to correct consumers' irrational misperceptions of risk to effectively and ultimately resolve trade dispute due to health risk regulation. This Article argues that the dispute parties should establish rational risk communication system in which every interest group participate and exchange correct information about risk to eliminate or drastically abate irrational public fears.

Keywords: public health, public perception of risk, risk regulation, WTO

JEL Classification: I18, K2

<Table of Contents>

I. INTRODUCTION	2
II. TRADE DISPUTES DUE TO HEALTH RISK REGULATION	4
A. Conflict Between EC and U.S./Canada on Hormones Beef.....	4
1. First Phase of Dispute under the Old GATT.....	4
2. Second Phase of Dispute under the WTO: EC–Hormones	5
3. Third Phase of Dispute under the WTO: U.S.–Trade Retaliation	6
B. Conflict Between EC and U.S./Canada/Argentina on GMOs: EC-GMOs.....	7
III. WTO JURISPRUDENCE ON HEALTH RISK REGULATION.....	7
A. Problem of WTO Jurisprudence on Health Risk Regulation: Legal Uncertainty.....	7
B. Lessons from Dauber Rule for WTO	9
IV. COPING WITH PHANTOM RISKS	11
A. Problem of Compliance with WTO Law.....	11
B. Eliminating Misperceptions of Risk through Risk Communication	13
V. CONCLUDING REMARKS.....	14
<REFERENCE>.....	15

I. Introduction

There can be little doubt that sovereign states have the right to regulate “risk”¹ concerning human life or health to protect their own citizens. However, when health risk regulation has adverse effect on international trade, the regulation can be challenged by the exporting countries under the World Trade Organization (“WTO”) law, especially the WTO Agreement on the Application of Sanitary and Phytosanitary Measures (“SPS Agreement”). Above all, the SPS Agreement requires the WTO member countries to implement their own health risk regulation based on scientific risk assessment.² It would be illegal when a member state

¹ Although the ordinary meaning of risk can be defined as possibility of suffering harm or loss, the word “risk” in “risk regulation” can be defined and categorized in different ways for different purposes. For the purpose of this paper, risk is simply categorized into (1) scientifically-identifiable risk and (2) phantom risk. In contrast to “phantom” risk, risks which can be measured by available scientific knowledge can be categorized into “scientifically-identifiable” risk.

² *Cf.* Article 2.2 of the SPS Agreement: “Members shall ensure that any sanitary or

restricts import of a certain product from others without scientific evidence of risk.

On the other hand, consumers sometimes may have irrational³ fears about some kind of risks which cannot be proven by available scientific knowledge. For the purpose of this article, the terms *the public (or consumers) misperceptions of risk* and *phantom risk*⁴ will be used interchangeably. In the context of international trade, as both of (1) almost 25-year long trade disputes between the European Communities (“EC”) and the United States (“U.S.”)/Canada on growth-hormones-treated beef (“hormones beef”)⁵ and (2) trade conflict between the EC

phytosanitary measure is applied only to the extent necessary to protect human . . . life or health, is based on *scientific principles* and is not maintained without *sufficient scientific evidence...*” (emphasis added).

Article 5.1 of the SPS Agreement: “Members shall ensure that their sanitary or phytosanitary measures are based on *an assessment*, as appropriate to the circumstances, *of the risks* to human . . . life or health, taking into account *risk assessment* techniques developed by the relevant international organizations.” (emphasis added).

In 1994, professor Wirth pointed out “[t]he emphasis on science-based trade disciplines...raises new challenges for national public health regulatory authorities, for the international trade regime, and especially for the trade agreement dispute settlement process.” See David A. Wirth, “Role of Science in the Uruguay Round and NAFTA Trade Disciplines,” 27 *Cornell Intl L. J.* 817 (1994), at 858.

For various legal scholarship on the role of science in the WTO law, see Jeffery Atik & David A. Wirth, “Science and International Trade—Third Generation Scholarship,” 26 *B.C. Intl & Comp. L. Rev.* 171 (2003).

³ For the purpose of this article, “irrational” means lacking correct information.

⁴ Cf. Peter W. Huber, “Coping with Phantom Risks in the Courts,” Based on a presentation at an October 1994 conference in Concord, NH. Jennifer A. Kispert & Adam C. Solomon, available at <www.piercelaw.edu/risk/vol6/spring/huber.htm> (“Phantom risk” is a terribly value laden term. In contrast to risks that get nailed down, e.g. smoking and thalidomide, it describes risks that tend to hover indefinitely in the background and never seem to crystallize. Phantom risks tend to arouse suspicion, but the carcass is never found.”).

The details of many interesting legal issues concerning phantom risk in the context of the U.S. laws are given in Kenneth R. Foster et al.(ed.), *Phantom Risk: Scientific Inference and the Law* (The MIT Press, 1993).

⁵ With respect to the U.S., there are four decisions of the WTO panels and the Appellate Body on hormones beef: Panel Report, *EC—Measures Concerning Meat and Meat Products (Hormones)*, WT/DS26/R/USA (18 August 1997) [“EC—Hormones”]; *Appellate Body Report, EC—Measures Concerning Meat and Meat Products (Hormones)*, WT/DS26/AB/R, WT/DS48/AB/R (5 January 1998) [“EC—Hormones”]; Panel Report, *United States—Continued Suspension of Obligations in the EC—Hormones Dispute*, WT/DS20/R (31 March 2008) [“U.S.—Trade Retaliation”]; and Appellate Body Report, *United States—Continued Suspension of Obligations in the EC—Hormones Dispute*, WT/DS320/AB/R(16 October 2008) [“U.S.—Trade Retaliation”]. These cases are notorious for their complex issues about the limit of the right of the WTO member countries to regulate health risks.

A commentator said that “the beef hormones dispute between the United States and the European Union may seem to exemplify how the SPS provisions rob democratic communities of sovereign regulatory choices.” See Robert Howse, “Democracy, Science, and Free Trade: Risk Regulation on Trial at the World Trade Organization,” 98 *Mich.L.Rev.*2329 (2000), at 2330.

and the U.S./Canada/Argentina on genetically-modified organisms (“GMOs”) ⁶ demonstrates, phantom risk can give rise to serious trade conflicts which can hardly be settled by the WTO.⁷ In addition, phantom risk can undermine the credibility of multilateral trade system.

Part II of this article briefly introduces the WTO cases on health risk regulations. Part III discusses the problem of legal uncertainty of the WTO jurisprudence on the SPS Agreement. Part IV examines the problem of non-compliance of the losing defendant with the WTO rules on health risk regulation from the perspective of rational choice model. Finally, Part V concludes that the dispute parities should correct public misperceptions of risk directly through bilateral cooperation.

II. Trade Disputes Due to Health Risk Regulation

A. Conflict Between EC and U.S./Canada on Hormones Beef

Trade disputes between the EC and the U.S./Canada on hormones beef consists of three phases: (1) first phase of dispute under the old General Agreement of Trade and Tariffs (“GATT”) during 1980s; (2) second phase of dispute under the WTO during 1990s; and (3) third phase of dispute under the WTO during 2000s.

1. First Phase of Dispute under the Old GATT

The origin of the *Hormones beef* conflict between the EC and the U.S. go back to the 1980s. In 1985, the EC issued the hormones risk regulation which prohibits the use of six hormones (*Oestradiol 17 β* , *Testosterone*, *Progesterone*, *Zeranlon*, *Trenbolone*, and *Melengestrol Acetate*) in cattle, on the ground that the hormones may cause a significant risk to human health.⁸ The U.S. contested that the EC’s ban on hormones beef is not supported by valid scientific evidence. Although the U.S. tried to negotiate with the EC to resolve the problem under the old GATT

⁶ Panel Report, *EC–Measures Affecting the Approval and Marketing of Biotech Products*, WT/DS291/R, WT/DS292/R, WT/DS293/R (29 September 2006) [“EC–GMOs”]. Like *EC–Hormones*, *EC–GMOs* is also notorious for both its complexity and over one thousand pages long.

⁷ See, e.g., Andrew T. Guzman, “Food Fears: Health and Safety at the WTO,” 45 *Va. J. Int’l L.* 1 (2005), at 38 (“The WTO’s existing jurisprudence handles the clash between international regulation and domestic authority poorly.”).

⁸ *Council Directive 85/649/EEC of 31 December 1985 prohibiting the use in livestock farming of certain substances having a hormonal action.*

regime, it failed.⁹ At last, the U.S. imposed unilateral trade retaliation, 100% duties on one hundred million dollars of imports from the EC.¹⁰ Now then the EC filed a complaint against the U.S. retaliation before the old GATT. The U.S., however, blocked the establishment of a GATT panel.¹¹ In this context, a commentator said “[T]he dispute over hormone additives was one of the prime examples of the weakness of dispute resolution mechanism in the GATT, which led to the establishment of the much more disciplined system created by the Uruguay Round.”¹²

2. Second Phase of Dispute under the WTO: EC–Hormones

In 1996, one year after the establishment of the WTO, the EC reissued its directive (Council Directive 96/22/EC of 29 April 1996) prohibiting import of hormones beef. Right after the EC’s measure, the U.S. and Canada filed a complaint against the EC before the WTO DSB. In 1996, the panel in *EC–Hormones* concluded that the EC’s measures are not consistent with the SPS Agreement.¹³ Right after the panel’s decision, the EC appealed to the Appellate Body of the WTO. In 1998, the Appellate Body dismissed the EC’s appeal against the panel’s decision on the ground that: “[The studies submitted by the respondent] constitute general studies which do indeed show the existence of a general risk of cancer; but they do not focus on and do not address the particular kind of risk here at stake. . . .as is required by. . . .the SPS Agreement”.¹⁴ The Appellate Body also denied the EC’s argument that the SPS Agreement should be interpreted in the light of the precautionary principle.¹⁵ Although the EC lost the case in the WTO, it did not lift the import ban.

In 1999, the WTO Dispute Settlement Body (“DSB”) authorized the U.S. and

⁹ See Holly Hammonds, “A U.S. Perspective on the EC Hormones Directive,” 11 *Mich.J.Int’l L* 840 (1990), at 840–41.

¹⁰ See Andreas Lowenfeld, *International Economic Law* (Oxford University Press, 2002), at 325.

¹¹ See *id.*

¹² *Id.*

¹³ See Panel Report on *EC–Hormone*, para. 9.1.

¹⁴ See Appellate Body Report on *EC–Hormones*, para. 200.

¹⁵ See *id.*, para. 125. Though the EC argued that the precautionary principle is a customary international law, the Appellate Body did not decide whether the principle obtained the status of customary international law. See *id.*, paras. 16 & 123.

The precautionary principle implies that lack of full scientific certainty is not a justification for preventing an action that might be harmful. The principle is widely reflected in international environmental agreements. See Julian Morris, “Defining the precautionary principle,” in Julian Morris (ed.), *Rethinking Risk and Precautionary Principle* (Butterworth Heinemann, 2000), at 1–21.

Canada to impose trade retaliation against the EC if it failed to bring its risk regulation into compliance with the SPS Agreement.¹⁶

3. Third Phase of Dispute under the WTO: U.S.–Trade Retaliation

After the above-mentioned WTO's ruling, the EC commissioned 17 scientific studies to assess the risks to human health posed by the six hormones concerned in *EC–Hormones*.¹⁷ In 2003, the EC notified to the WTO its new regulation (Directive 2003/74/EC), and claimed that because the new regulation is fully into compliance with its WTO obligations, the U.S. should withdraw its trade retaliation.¹⁸ The EC said that the new regulation was based on scientific basis for permanent prohibition of one of the six hormones, *oestradiol 17β*, and the continuation of provisional bans on the five other hormones under Article 5.7¹⁹ of the SPS Agreement. The U.S., however, did not lift its trade sanctions on the EC on the ground that the EC's new regulation was not confirm with the SPS Agreement.²⁰ In 2005, the EC initiated new WTO dispute settlement proceedings against the U.S., alleging that the U.S' continued trade retaliation was no longer justified under the WTO law.²¹ However, in 2006, the Panel ruled that the EC's new regulation was inconsistent with the SPS Agreement.²²

In 2008, the EC appealed to the Appellate Body of the WTO. The Appellate Body reversed the above mentioned panel's decision.²³ However, the Appellate Body ruled that it “is unable to complete the analysis and therefore makes no findings as to the consistency or inconsistency of” the EC's new regulation with the

¹⁶ See Decision by the Arbitrators, *EC–Measures Concerning Meat and Meat Products (Hormones)*, Original Complaint by the United States – Recourse to Arbitration by the European Communities under Article 22.6 of the DSU, WT/DS26/ARB (12 July, 1999); Decision by the Arbitrators, *EC–Measures Concerning Meat and Meat Products (Hormones)*, Original Complaint by Canada – Recourse to Arbitration by the European Communities under Article 22.6 of the DSU, WT/DS48/ARB (12 July, 1999).

¹⁷ See Appellate Body Report on *U.S.–Trade Retaliation*, para. 267.

¹⁸ See *id.*, para. 268.

¹⁹ “ In cases where relevant scientific evidence is insufficient, a Member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary or phytosanitary measures applied by other Members. . .”(emphasis added). Cf. The Appellate Body in *EC–Hormones* said that the precautionary principle is reflected in the Article 5.7. See Appellate Body Report on *EC–Hormones* para. 124.

²⁰ See Appellate Body Report on *U.S.–Trade Retaliation*, para. 268.

²¹ See Panel Report on *U.S.–Trade Retaliation*, para. 1.1

²² See Panel Report on *U.S.–Trade Retaliation*, paras. 7.573, 7.578, 7.579, 7.835, and 7.836.

²³ See Appellate Body Report on *U.S.–Trade Retaliation*, para. 736 (c) (vi) & (d) (vi).

SPS Agreement²⁴ and “the recommendations and rulings adopted by the DSB in *EC – Hormones* remain operative.”²⁵ Thus it is still not clear the EC’s new regulation is consistent with SPS Agreement.

B. Conflict Between EC and U.S./Canada/Argentina on GMOs: EC-GMOs

In 1999, the EC temporarily banned import of GMOs from the U.S., Canada, and Argentina on the ground that there is scientific uncertainty concerning the safety of GMOs.²⁶ The U.S. strongly contested that the safety of GMOs is already fully proved under rigorous scientific risk assessment.²⁷ In 2003, the U.S., Canada, and Argentina filed a complaint against the EC before the WTO.

In 2006, after three years deliberation, following the jurisprudence of *EC – Hormones*, the Panel in *EC-GMOs* concluded that the EC’s measures are not consistent with the SPS Agreement.²⁸ In *EC-GMOs*, the panel refused the EC’s argument that the SPS Agreement should be interpreted in the light of the precautionary principle.²⁹ The EC did not appeal to the Appellate Body. It is because the EC believed that the U.S. lost the case. It implies that there can be second-round conflict regarding compliance of the WTO ruling.

III. WTO Jurisprudence on Health Risk Regulation

A. Problem of WTO Jurisprudence on Health Risk Regulation: Legal Uncertainty

Although the WTO panels and Appellate Body in *EC-Hormones* and *EC-GMOs* ruled that the EC’s imports ban not based on scientific evidence of risks are not inconstant with the SPS Agreement, there still exists *legal uncertainty* in determining whether a certain health risk regulation is legal under the SPS Agreement. This legal uncertainty mainly comes from that the Appellate Body in *EC-Hormones* (1) did not clarify the meaning of “scientific” risk assessment in the SPS Agreement, and (2) denied the distinction between risk assessment and risk

²⁴ See *id.*

²⁵ See *id.*, para. 737.

²⁶ See Panel Report on *EC-GMOs*, paras. 4.130-4.135 & 4.152-4.154.

²⁷ Cf. U.S. Agency for International Development, *Fact Sheet: Food Safety Assessment for Bio-Engineered Crops in U.S. Food Aid Donation (2 December, 2002)*, available at <www.usaid.gov/press /releaseFs/2002/fs021202_2.html>

²⁸ See Panel Report on *EC-GMOs*, paras. 8.21-8.32.

²⁹ See Panel Report on *EC-GMOs*, paras. 7.53 & 7.75.

management.³⁰ It is obvious that the more legal uncertainty, the more trade disputes will take place.

Above all, legal uncertainty regarding scientific risk assessment in the SPS Agreement would create never-ending debates on legality of health risk regulation among the WTO members.³¹ As the WTO recognized that its members may take imports ban based on diverse scientific opinions³², the WTO members can always argue that any health risk regulation in question is based on scientific risk assessment under the SPS Agreement. If so, it could make the requirement for scientific risk assessment of the SPS Agreement ineffective.

Prior to the Appellate Body's decision, the panel in *EC-Hormones* distinguished between risk assessment and risk management. The panel observed that an assessment of risk is, at least with respect to risks to human life and health, a "scientific" examination of data and factual studies.³³ According to the panel, risk assessment is not a "policy" exercise involving social value judgments made by political bodies.³⁴ The panel described policy or social value judgments as "non-scientific" and as pertaining to risk management rather than to risk assessment.³⁵ The Appellate Body in *EC-Hormones*, however, rejected the panel's view.³⁶ And

³⁰ See Appellate Body Report on *EC-Hormones*, para. 187.

³¹ See Guzman, *supra* note 7, pp. 22-3 ("As with divergent risk preferences, if states have different in determining whether what constitute good science or how to interpret scientific evidence, a panel or the Appellate Body will have great difficulty in determining whether the defendant state is, in fact, acting out of a sincere belief that science indicates a significant health risk or is merely making claims about the science to justify its protectionist measure."); Jinyul Ju, "Trade Disputes concerning Genetically Modified Foods and Scientific Risk Assessment under the WTO Sanitary and Phytosanitary Agreement," 52 *International Trade Law* 8 (2003) (published by Korean Ministry of Justice in Korean), at 11.

³² The Appellate Body just said that "The risk assessment could set out both the prevailing view representing the "mainstream" of scientific opinion, as well as the opinions of scientists taking a divergent view. Article 5.1 does not require that the risk assessment must necessarily embody only the view of a majority of the relevant scientific community." See Appellate Body Report on *EC-Hormones*, para. 194.

³³ See Panel Report on *EC-Hormones*, para. 8.94.

³⁴ See Panel Report on *EC-Hormones*, paras. 8.94 & 8.95.

³⁵ See Panel Report on *EC-Hormones*, para. 8.98.

³⁶ The reasoning of the Appellate Body was that the SPS Agreement stipulates "risk assessment" only and there is no such term as "risk management" in the Agreement. See Appellate Body Report on *EC-Hormones*, para. 181.

The Appellate Body's decision can be understood that the WTO member countries have the right to consider democratic controls even at the phase of risk assessment. See Robert Howse & Petros C. Mavroidis, "Europe's Evolving Regulatory Strategy for GMOs-The Issues of Consistency with WTO Law: Of Kind and Brine", 24 *Fordham Intl L.J.* 317 (2000), at 335 ([A]ppellate Body...opts for a deferential posture to national regulation-by allowing WTO Members to view the factors mentioned in the list from the perspective of democratic regulation...")

the Appellate Body stressed that “[T]he risk that is to be evaluated in a risk assessment under the SPS Agreement is not only risk ascertainable in a science laboratory, but also risk in human society as they actually exist, in other word, the actual potential for adverse effects on human health in the real world...”³⁷

It seems that the above mentioned Appellate Body’s decision denying the distinction between risk assessment and risk management³⁸ can be misleading. First of all, risk assessment is clearly different from risk management.³⁹ If risk assessment is not different from risk management in context of the SPS Agreement, there is a possibility that political value judgments may enter at risk assessment phase. Then, any country could argue that import ban for conciliating the public opinion would be justified under the SPS Agreement. When political value judgment is considered at risk assessment phase, it would be extremely difficult for the WTO to decide whether an import ban based on *phantom risk* is confirmed with the SPS Agreement. Moreover, any health risk regulation can be easily linked to the so-called precautionary principle that emphasis on scientific uncertainty through legal rhetoric.⁴⁰

B. Lessons from Dauber Rule for WTO

It seems that the U.S. Supreme Court’s decision in *Daubert v. Merrell Dow Pharmaceuticals, Inc*⁴¹ (“Daubert”), a seminal case on the characteristics of scientific evidence, can be helpful for the WTO in coping with the problem of legal uncertainty.⁴² In *Daubert*, the Court based its decision on an interpretation of the words “scientific knowledge” in the Federal Rules of Evidence. The *Daubert* Court determined that scientific evidence should be subject to a reliability test, rather than the common law “general acceptance test” set forth in *Frye v. United States*.⁴³

³⁷ See Appellate Body Report on *EC-Hormones*, para. 187.

³⁸ See, e.g., Fiona Macmillan, *WTO and the Environment* (London: Sweet & Maxwell, 2001), at 179.

³⁹ See, e.g., Jan Bohanes, “Risk Regulation in WTO Law: A Procedure-Based Approach to the Precautionary Principle,” 40 *Colum. J. Transnat’l L.* 323 (2002), at 338-39; Jeremy D. Fraiberg & Michael J. Trebilcock, “Risk Regulation: Technocratic and Democratic Tools for Regulatory Reform,” 43 *McGill, L. J.* 835 (1998), at 847-49.

⁴⁰ Cf. *Supra* notes 15 & 29. The EC’s argument on the precautionary principle in *EC-Hormones* and *EC-GMOs*.

⁴¹ 509 U.S. 579 (1993). For a comprehensive explanation of *Daubert*, see Kenneth R. Foster & Peter W. Huber, *Judging Science: Scientific Knowledge and the Federal Courts* (The MIT Press, 1997).

⁴² See Ju, *supra* note 31, at 48-9.

⁴³ 293 F. 1013 (D.C.Cir. 1923). Under the *Frye* test, courts focused on whether the scientific principle at issues had “gained general acceptance in the particular field in which it belongs.”

The Court in *Daubert* changed the nature of the admissibility determination by judges from the *Frye*'s deference to the views of scientists in a relevant field to an independent evaluation of the proffered evidence.

The decision in *Daubert* was directed to the question of the admissibility of scientific evidence. The *Daubert* Court stated that the Federal Rules of Evidence requires scientific evidence to be scientifically valid and reliable. In addition, the Court stated that legal "reliability" depends on the scientific "reliability" of the proffered testimony.⁴⁴ The Court outlined four "general observations" to guide the inquiry⁴⁵: (1) testability⁴⁶; (2) rate of error⁴⁷; (3) peer review and general acceptance⁴⁸; and (4) fit⁴⁹.

To lessen legal uncertainty as much as possible, it may be helpful for the WTO panels and Appellate Body to consider the *Daubert* rule that distinguishes *sound*-science from *pseudo*-science. Above all, the WTO is required to clarify the meanings of "scientific" in the SPS Agreement to exclude *pseudo*-scientific claims that unreasonably put stress on theoretical scientific uncertainty. The meaning of "scientific" in the SPS Agreement should be interpreted as "scientifically valid and

⁴⁴ See *Daubert*, at 590.

⁴⁵ See *id.*, at 594.

⁴⁶ The *Daubert* Court held that: "Ordinarily, a key question to be answered in determining whether a theory or technique is scientific knowledge that will assist the trier of fact will be whether it can be (and has been) tested." *Id.*, at 593. It means that "testability" is the keystone of the scientific method. The Court cited two of the preeminent philosophers of science, Carl Hempel and Karl Popper to support the proposition that testability is characteristic of scientific method. Citing a book by Carl Hempel, the Court stated: "[T]he statements constituting a scientific explanation must be capable of empirical test." *Id.* And then a quote from Karl Popper: "[T]he criterion of the scientific position of a theory is its . . . testability." *Id.* Citing Karl Popper, the Court explained that testability is what distinguishes science from non-science. *Id.*

⁴⁷ The *Daubert* Court stated: "In case of a particular scientific technique, the court ordinarily should consider the known or potential rate of error, and the existence and maintenance of standards controlling the technique's operation." *Id.*, at 594.

⁴⁸ The *Daubert* Court opined: "Submission [of a proposition] to the scrutiny of the scientific community is a component of a 'good science,' in part because it increases the likelihood that substantive flaws in methodology will be detected." *Id.*, at 593. The Court explained that submitting an expert's work to the scientific community is "a relevant, though not dispositive, consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised." *Id.*, at 594.

⁴⁹ The *Daubert* Court said: "Rule 702...requires that the evidence or testimony 'assist the trier of fact to understand or determine a fact in issue.'...The consideration has been aptly described...as one of 'fit.'" *Id.*, at 591. According to the Court, this requirement "requires a valid scientific connection to the pertinent inquiry as a precondition to admissibility." *Id.*, at 592. Expert testimony must be "sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute." *Id.*, at 591. The key question is whether "reasoning or methodology properly can be applied to the facts in issue." *Id.*, at 593.

reliable.” In determining the legality of a health risk regulation under the SPS Agreement, the WTO panels and/or the Appellate Body should evaluate whether the result of risk assessment in question comes from “sound and reliable scientific method”⁵⁰ rather than “qualified scientists”⁵¹ opinions or “qualified and respected sources.”⁵² Because qualified and respected scientists are not always free from methodological errors in risk assessment, methodological soundness and reliability of risk assessment should be evaluated. Therefore, any defendant of WTO members arguing its health risk regulation based on scientific risk assessment should be required to present all relevant data regarding methodological soundness before the WTO panels. Because the panelists usually lack of scientific knowledge to evaluate methodological soundness and reliability of risk assessment, they are needed to be assisted from scientific expert witnesses.⁵³

In addition, the issues of scientific evidence of risk should be clearly separated from political judgment values. In contrary to the Appellate Body’s decision in *EC – Hormones*,⁵⁴ risk regulation must be separated into two phases: (1) risk assessment, the scientific and technical phase; and (2) risk management, the social and political phases. Though political values judgment could be considered at risk management phase, risk regulation should not be based phantom risk.

IV. Coping With Phantom Risks

A. Problem of Compliance with WTO Law

Legal certainty is not enough to cope with phantom risk. Lessening legal uncertainty concerning legality of health risk regulation under the SPS Agreement is only the beginning. Even though the WTO get rid of legal uncertainty perfectly, there still exists the problem of compliance. With regard to public health risk, just like the EC in *EC-Hormones* and *EC-GMOs*, the losing defendant in the WTO

⁵⁰ See, e.g., David Goodstein, “How Science Works”, in Federal Judicial Center, *Reference Manual on Scientific Evidence*, 2nd ed. (West Group, 2000), at 69 (“[W]hat is science?, the answer will be almost surely be that *science is a process*, a way of examining the natural world and discovering important truth about it. In short, *the essence of science is the scientific method.*”) (emphasis added).

⁵¹ See Appellate Body Report on *EC-Hormones*, para. 194.

⁵² See *id.*

⁵³ See Article 11.2 of the SPS Agreement: “In a dispute under this Agreement involving scientific or technical issues, a panel should seek advice from experts chosen by the panel in consultation with the parties to the dispute. . .”

⁵⁴ See Part III.A. of this article.

may choose to do nothing for compliance with the WTO ruling. In addition, the WTO has no effective way making the losing defendant to abide by its ruling.

Then what make the losing defendant to choose non-compliance? How to solve the problem of non-compliance? This article seeks the answers through rational choice model that assumes politicians and/or governments are rational and self-interested behaviors, pursuing to maximize their own preference⁵⁵ in regard to public health issue. It implies that states can ignore the WTO law when they prefer popularity from their citizens regardless of whether scientific evidence of risk in question exist or not. If the importing country or the losing defendant prefers “popularity from voters” to “compliance with the WTO law or ruling,” phantom risk can hardly be resolved through the WTO dispute settlement system.⁵⁶ Especially when the public put huge political pressure on the government to prohibit importation of a product in question, the importing country may politically decide to choose non-compliance.⁵⁷ It may be rational for the losing defendant just to follow the public opinion in the name of democracy. Non-compliance will occur when the benefit of non-compliance (getting popularity from the public) is larger than the cost of that (suffering trade retaliation from the exporting country), or the benefit of compliance (avoiding trade retaliation) is smaller than the cost of compliance (losing popularity or nationwide anti-government movement).⁵⁸

⁵⁵ See, e.g., Richard A. Posner, “Some Economics of International Law: Comment on Conference Papers,” 31 *J. Legal Stud.* S321 (2002), at S321 (“[N]ations in their relations with each other, whether commercial or noncommercial...behave much like individuals in their commercial relations.”); Jack L. Goldsmith & Eric A. Posner, *The Limits of International Law* (Oxford University Press, 2005), at 7–10; Alexander Thompson, “Rational Choice and International Law Applying Rational Choice Theory to International Law: The Promise and Pitfalls,” 31 *J. Legal Stud.* S285 (2002); Kenneth W. Abbott, “Enriching Rational Choice Institutionalism for the Study of International Law,” 2008 *U. Ill. L. Rev.* 5 (2008). Cf. For a critic of rational choice model in international law, see Robert O. Keohane, “Rational Choice Theory and International Law: Insights and Limitations,” 31 *J. Legal Stud.* S307 (2002).

Cf. For a general discussion of law and economics methods in international law, see Jeffrey L. Dunoff & Joel P. Trachtman, “Economic Analysis of International Law,” 24 *Yale J. Int’l L.* 1 (1999); Trachtman, Joel P., “Methodology of Law and Economics in International Law,” 6 *Int’l L.F. D. Int’l* 67 (2004).

⁵⁶ See Guzman, *supra* note 7, at 26 (“[B]ecause health and safety are important for voters, political leaders who bend to pressure from the WTO may fall out of favor with the public.”).

⁵⁷ See Bohanes, *supra* note 39, at 348–49 (“[T]he SPS Agreement...may be politically...too sensitive, to the extent that the losing party will simply refuse to comply with the WTO ruling for lack of domestic political support.”).

⁵⁸ See Guzman, *supra* note 7, at 26 (“Face with larger political and social costs from compliance, states will comply less...”); Andrew T. Guzman, “A Compliance-Based Theory of International Law”, 90 *Cal.L.Rev.* 1823 (2002), at 1866 (“When the total benefits of a violation of international law outweigh the benefits of performance, it is preferable that

In a certain situation, the government's rejection of the public protests for import ban can stir up anti-government movement. Indeed, in 2008, when the Korean government decided to lift import ban on the U.S. beef products, NGOs initiated nationwide scale anti-government movement.⁵⁹ At that time Korean mass media and NGOs warned that eating the U.S. beef product may cause the so called human-mad-cow-disease (*new variant Creutzfeldt-Jacob Disease*: "nvCJD"). Although there was no scientific evidence of the casual relationship between consuming the U.S. beef and nvCJD, because of misleading mass media and NGOs' warning, many Korean people strongly believed that importation of the U.S. beef will cause serious public health risk.

B. Eliminating Misperceptions of Risk through Risk Communication

Individuals often use heuristic devices that can distort judgments, by making people unduly fearful of some risks, especially in dealing with ambiguous risk.⁶⁰ It should be noted that irrational fears of risk may induce health risk regulation unsupported by scientific risk assessment that give rises to the conflict between politics and science in health risk regulation.⁶¹ Without addressing phantom risk, the problem of compliance with the WTO cannot be properly solved. Therefore, first of all, a practical way to resolve the conflict and the problem should be sought in eliminating consumers' misperceptions of risk.

This article assumes that individuals can make a right decision when they have correct information as much as possible, and irrational fears of risk come from

there be a violation").

⁵⁹ For a more explanation of public protests against the U.S. beef and the Korean government as well, see Wikipedia, *US beef imports in South Korea*, available at <http://en.wikipedia.org/wiki/US_beef_imports_in_South_Korea>; *South Koreans Hold Candle-Lit Vigil Against U.S. Beef Imports (June 3, 2008)*, available at <www.bloomberg.com/apps/news?pid=b20601101&sid=aBLA8yOA6tus&refer=japan> ("More than 10,000 South Koreans staged rallies and held a candle-lit vigil overnight in Seoul to protest the government's plan to resume U.S. beef imports...AntiMadCow, an umbrella organization of South Korean consumer groups, food safety advocates and student activists concerned about mad cow disease, has been holding daily rallies since President Lee Myung Bak agreed in April to lift a ban on U.S. beef...").

⁶⁰ See Amos Tversky & Daniel Kahneman, "Judgment of Under Uncertainty: Heuristics and Bias," 185 *Science* (1974), at 1124-31; Reid Hastie & W. Kip Viscusi, "What Juries Can't Do Well: The Jury's Performance as a Risk Manager," 40 *Ariz. L. Rev.* 901 (1998), at 912-13; Daniel Ellsberg, "Risk, Ambiguity, and the Savage Axioms," *Quarterly Journal of Economics* 75 (1961), at 643-49.

⁶¹ Cf. Howard F. Chang, "Risk Regulation, Endogenous Public Concerns, and the Hormones Dispute: Nothing to Fear but Fear Itself," 77 *S. Cal. L. Rev.* 743 (2004), at 773 ("This role for consumer anxieties in justifying regulations raises to fears unsupported by risk assessments.").

incorrect or misleading information on the risk. Bearing in mind that consumers get misleading information produced by advocates of *pseudo*-scientists or NGOs through mass media, the dispute parties should make every effort to establish and run *rational risk communication system* in which every interest group (such as consumers, NGOs, mass media, scientists, exporting companies, and regulatory authority) participate and exchange correct information and rational opinions about risk.⁶² Through rational risk communication system, irrational public fears of risk could be eliminated or drastically abated.⁶³ Then, the conflict between politics and science can be properly resolved.

V. Conclusion

States can use legalistic rhetoric such as (1) the precautionary principle, (2) sovereign right to regulate health risk, (3) principle of democracy, to justify domestic risk regulation based on phantom risk. Legal rhetoric regarding phantom risk can be used as a thick and broad shield by the importing countries to defend against a sharp attack of the SPS Agreement. Yet phantom risk has nothing to do with justifiable legal claims under the SPS Agreement.

Phantom risk requires international legal scholarship to re-think the traditional way most of international lawyers approach the study of health risk regulation under the WTO law. With regard to public health risk, the public opinion strongly affects representative governments' willing to comply with the WTO law or ruling. As we observed in *EC-hormones* and *EC-GMOs*, phantom risk can give rise to complex and serious trade disputes that cannot be properly resolved by the WTO. It is highly important to note that trade retaliation cannot induce the importing countries to comply with the WTO rules on the matter of health risks. Therefore an ultimate solution to the conflict between politics and science in health risk regulation should be sought in addressing phantom risk directly.

To resolve the conflict ultimately, the dispute parties need to correct irrational

⁶² See Jinyul Ju, "WTO and Modern Biotechnology," 76 *International Trade Law* 179 (2007) (published by Korean Ministry of Justice in Korean), at 214-16.

⁶³ See Richard C. Rich et al, "Introduction: The Challenge of Risk Communication in a Democratic Society," 10 *Risk* 189 (1999), at 191 ("Cognitive, psychological, cultural, political, and social structural barriers keep citizens from fully understanding technical risks. These barriers seriously limit citizens' abilities to respond adequately to personal and to participate effectively public decisions about risks."); *Id.*, at 194 ("[R]isk communication can assist citizens and public officials in overcoming or limiting the impact of those barriers").

misperceptions of risk. It is recommended that the dispute parties should focus on conclude a kind of bilateral binding or non-binding agreement that aims to establish the system in which consumers misperceptions of risk can be properly addressed. When phantom risk matters, risk communications among the dispute parties can create international obligation⁶⁴ to eliminate misperception of risk

<Reference>

- Abbott, Kenneth W., "Enriching Rational Choice Institutionalism for the Study of International Law," 2008 *U. Ill. L. Rev.* 5 (2008)
- Abott, Kenneth W., "Modern International Relations Theory: A Prospectus for International Lawyers," 14 *Yale J.Int'L* 335 (1989)
- Atik, Jeffery & David A. Wirth, "Science and International Trade—Third Generation Scholarship," 26 *B.C. Int'l & Comp. L. Rev.* 171 (2003)
- Beecher-Monas, Erica, "Blinded by Science: How Judges Avoid the Science in Scientific Evidence," *Temp.L.Rev.*, 71 (1998)
- Bohanes, Jan, "Risk Regulation in WTO Law: A Procedure-Based Approach to the Precautionary Principle," 40 *Colum. J. Transnat'l L.* 323 (2002)
- Carmines, Edward G. & Richard A. Zeler, *Reliability and Validity Assessment* (Sage Publications, Inc., 1979)
- Chang, Howard F., "Risk Regulation, Endogenous Public Concerns, and the Hormones Dispute: Nothing to Fear but Fear Itself," 77 *S. Cal. L. Rev.* 743 (2004)
- Dunoff, Jeffrey L. & Joel P. Trachtman, "Economic Analysis of International Law," 24 *Yale J. Int'l L.* 1 (1999)
- Ellsberg, Daniel, "Risk, Ambiguity, and the Savage Axioms," *Quarterly Journal of Economics* 75 (1961)
- Foster, Kenneth R. et al.(ed.), *Phantom Risk: Scientific Inference and the Law* (The MIT Press, 1993)
- Foster, Kenneth R. & Peter W. Huber, *Judging Science: Scientific Knowledge and the Federal Courts* (The MIT Press, 1997)
- Fraiberg, Jeremy D. & Michael J. Trebilcock, "Risk Regulation: Technocratic and

⁶⁴ Cf. Jack L. Goldsmith & Eric A. Posner, "Moral and Legal Rhetoric in International Relations: A Rational Choice Perspective," 31 *J.Legal Stud.* S115 (2002) at S136–S138.

- Democratic Tools for Regulatory Reform,” 43 *McGill, L. J.* 835 (1998)
- Goodstein, David, “How Science Works,” in Federal Judicial Center, *Reference Manual on Scientific Evidence*, 2nd ed. (West Group, 2000)
- Goldsmith, Jack L. & Eric A. Posner, “Moral and Legal Rhetoric in International Relations: A Rational Choice Perspective,” 31 *J. Legal Stud.* S115 (2002)
- _____, *The Limits of International Law* (Oxford University Press, 2005)
- Guzman, Andrew T., “Food Fears: Health and Safety at the WTO,” 45 *Va. J. Int’l L.* 1 (2005)
- _____, “A Compliance-Based Theory of International Law,” 90 *Cal.L.Rev.* 1832 (2002)
- Hastie, Reid & W. Kip Viscusi, “What Juries Can’t Do Well: The Jury’s Performance as a Risk Manager,” 40 *Ariz. L. Rev.* 901 (1998)
- Huber, Peter W., “Coping with Phantom Risks in the Courts,” Based on a presentation at an October 1994 conference in Concord, NH. Jennifer A. Kispert & Adam C. Solomon, available at <www.piercelaw.edu/risk/vol6/spring/huber.htm>
- Howse, Robert, “Democracy, Science, and Free Trade: Risk Regulation on Trial at the World Trade Organization,” 98 *Mich. L. Rev.* 2329 (2000)
- Howse, Robert & Petros C. Mavroidis, “Europe’s Evolving Regulatory Strategy for GMOs—The Issues of Consistency with WTO Law: Of Kind and Brine,” 24 *Fordham Intl L.J.* 317 (2000)
- Ju, Jinyul, “Trade Disputes concerning Genetically Modified Foods and Scientific Risk Assessment under Sanitary and Phytosanitary Agreement,” 52 *International Trade Law* 8 (2003) (*published by Korean Ministry of Justice in Korea*)
- _____, “WTO and Modern Biotechnology,” 76 *International Trade Law* 179 (2007) (*published by Korean Ministry of Justice in Korean*)
- Keohane, Robert O., “Rational Choice Theory and International Law: Insights and Limitations,” 31 *J. Legal Stud.* S307 (2002)
- Lowenfeld, Andreas, *International Economic Law* (Oxford University Press, 2002)
- Macmillan, Fiona, *WTO and the Environment* (Sweet & Maxwell, 2001)
- Mercuro, Nicholas & Steven G. Medema, *Economics and Law: From Posner to Post-Modernism and Beyond*, 2nd ed. (Princeton University Press, 2006)
- Morris, Julian, “Defining the precautionary principle,” in Julian Morris (ed.), *Rethinking Risk and Precautionary Principle* (Butterworth Heinemann, 2000)

- Posner, Richard A., "Some Economics of International Law: Comment on Conference Papers," 31 *J. Legal Stud.* S 321 (2002)
- Rich, Richard C. et al, "Introduction: The Challenge of Risk Communication in a Democratic Society," 10 *Risk* 189 (1999)
- Thompson, Alexander, "Rational Choice and International Law Applying Rational Choice Theory to International Law: The Promise and Pitfalls," 31 *J. Legal Stud.* S285 (2002)
- Trachtman, Joel P., "Methodology of Law and Economics in International Law," 6 *Int'l L.F. D. Int'l* 67 (2004)
- Tversky, Amos and Daniel Kahneman, "Judgment of Under Uncertainty: Heuristics and Bias," 185 *Science* (1974)
- U.S. Supreme Court, *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993)
- U.S. Agency for International Development, *Fact Sheet: Food Safety Assessment for Bio-Engineered Crops in U.S. Food Aid Donation (2 December, 2002)*, available at < http://www.usaid.gov/press/releaseFs/2002/fs021202_2.html >
- Wirth, David A., "Role of Science in the Uruguay Round and NAFTA Trade Disciplines," 27 *Cornell Intl L. J.* 817 (1994)
- WTO Appellate Body Report, *EC–Measures Concerning Meat and Meat Products (Hormones)*, WT/DS26/AB/R, WT/DS48/AB/R (5 January 1998)
- WTO Appellate Body Report, *United States–Continued Suspension of Obligations in the EC–Hormones Dispute*, WT/DS320/AB/R(16 October 2008).
- WTO Decision by the Arbitrators, *EC–Measures Concerning Meat and Meat Products (Hormones), Original Complaint by the United States – Recourse to Arbitration by the European Communities under Article 22.6 of the DSU*, WT/DS26/ARB (12 July, 1999)
- WTO Decision by the Arbitrators, *EC–Measures Concerning Meat and Meat Products (Hormones), Original Complaint by Canada – Recourse to Arbitration by the European Communities under Article 22.6 of the DSU*, WT/DS48/ARB (12 July, 1999)
- WTO Panel Report, *EC–Measures Concerning Meat and Meat Products (Hormones)*, WT/DS26/R/USA (18 August 1997)
- WTO Panel Report, *EC–Measures Affecting the Approval and Marketing of Biotech Products*, WT/DS291/R, WT/DS292/R, WT/DS293/R (29 September 2006)
- WTO Panel Report, *United States–Continued Suspension of Obligations in the EC–Hormones Dispute*, WT/DS20/R (31 March 2008)